



**Mahatma Education Society's  
Pillai HOC College of Engineering and Technology,  
Rasayani**

1.2.1 Number of Add on /Certificate/Value added programs offered during the last five years.

List of Students and attendance sheet of Programs Samples are attached below.

## **Academic year 2018-19**

One Week Training Program as "Network Associate on Routing and Switching" by Telenetworks Technologies organized by Pillai HOC College of Engineering & Technology, Rasayani from Feb 13-19, 2019.

Syllabus:

**PRINCIPAL**

Mahatma Education Society's  
Pillai HOC College of  
Engineering and Technology,  
Pillai's HOC Educational Campus  
Rasayani, Tal. Kheleapur  
Dist. Raigad, Pin-410 207



## Cisco Certified Network Associate (200-125)

**Exam Description:** The Cisco Certified Network Associate (CCNA) Routing and Switching composite exam (200-125) is a 90-minute, 50–60 question assessment that is associated with the CCNA Routing and Switching certification. This exam tests a candidate's knowledge and skills related to network fundamentals, LAN switching technologies, IPv4 and IPv6 routing technologies, WAN technologies, infrastructure services, infrastructure security, and infrastructure management.

The following topics are general guidelines for the content likely to be included on the exam. However, other related topics may also appear on any specific delivery of the exam. In order to better reflect the contents of the exam and for clarity purposes, the guidelines below may change at any time without notice.

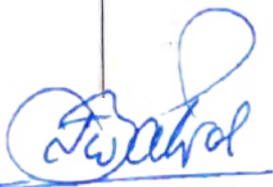
- 15%**   **1.0   Network Fundamentals**
- 1.1   Compare and contrast OSI and TCP/IP models
  - 1.2   Compare and contrast TCP and UDP protocols
  - 1.3   Describe the impact of infrastructure components in an enterprise network
    - 1.3.a   Firewalls
    - 1.3.b   Access points
    - 1.3.c   Wireless controllers
  - 1.4   Describe the effects of cloud resources on enterprise network architecture
    - 1.4.a   Traffic path to internal and external cloud services
    - 1.4.b   Virtual services
    - 1.4.c   Basic virtual network infrastructure
  - 1.5   Compare and contrast collapsed core and three-tier architectures
  - 1.6   Compare and contrast network topologies
    - 1.6.a   Star
    - 1.6.b   Mesh
    - 1.6.c   Hybrid
  - 1.7   Select the appropriate cabling type based on implementation requirements
  - 1.8   Apply troubleshooting methodologies to resolve problems
    - 1.8.a   Perform and document fault isolation
    - 1.8.b   Resolve or escalate
    - 1.8.c   Verify and monitor resolution
  - 1.9   Configure, verify, and troubleshoot IPv4 addressing and subnetting
  - 1.10   Compare and contrast IPv4 address types

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- 1.10.a Unicast
- 1.10.b Broadcast
- 1.10.c Multicast
- 1.11 Describe the need for private IPv4 addressing
- 1.12 Identify the appropriate IPv6 addressing scheme to satisfy addressing requirements in a LAN/WAN environment
- 1.13 Configure, verify, and troubleshoot IPv6 addressing
- 1.14 Configure and verify IPv6 Stateless Address Auto Configuration
- 1.15 Compare and contrast IPv6 address types
  - 1.15.a Global unicast
  - 1.15.b Unique local
  - 1.15.c Link local
  - 1.15.d Multicast
  - 1.15.e Modified EUI 64
  - 1.15.f Autoconfiguration
  - 1.15.g Anycast
  
- 21% 2.0 LAN Switching Technologies
  - 2.1 Describe and verify switching concepts
    - 2.1.a MAC learning and aging
    - 2.1.b Frame switching
    - 2.1.c Frame flooding
    - 2.1.d MAC address table
  - 2.2 Interpret Ethernet frame format
  - 2.3 Troubleshoot interface and cable issues (collisions, errors, duplex, speed)
  - 2.4 Configure, verify, and troubleshoot VLANs (normal/extended range) spanning multiple switches
    - 2.4.a Access ports (data and voice)
    - 2.4.b Default VLAN
  - 2.5 Configure, verify, and troubleshoot interswitch connectivity
    - 2.5.a Trunk ports
    - 2.5.b Add and remove VLANs on a trunk
    - 2.5.c DTP, VTP (v1&v2), and 802.1Q
    - 2.5.d Native VLAN
  - 2.6 Configure, verify, and troubleshoot STP protocols
    - 2.6.a STP mode (PVST+ and RPVST+)
    - 2.6.b STP root bridge selection



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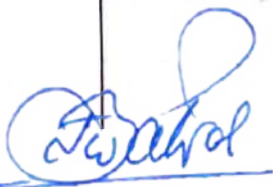
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- 3.8.c Host route
  - 3.8.d Floating static
  - 3.9 Configure, verify, and troubleshoot single area and multi-area OSPFv2 for IPv4 (excluding authentication, filtering, manual summarization, redistribution, stub, virtual-link, and LSAs)
  - 3.10 Configure, verify, and troubleshoot single area and multi-area OSPFv3 for IPv6 (excluding authentication, filtering, manual summarization, redistribution, stub, virtual-link, and LSAs)
  - 3.11 Configure, verify, and troubleshoot EIGRP for IPv4 (excluding authentication, filtering, manual summarization, redistribution, stub)
  - 3.12 Configure, verify, and troubleshoot EIGRP for IPv6 (excluding authentication, filtering, manual summarization, redistribution, stub)
  - 3.13 Configure, verify, and troubleshoot RIPv2 for IPv4 (excluding authentication, filtering, manual summarization, redistribution)
  - 3.14 Troubleshoot basic Layer 3 end-to-end connectivity issues
- 10% **4.0 WAN Technologies**
- 4.1 Configure and verify PPP and MLPPP on WAN interfaces using local authentication
  - 4.2 Configure, verify, and troubleshoot PPPoE client-side interfaces using local authentication
  - 4.3 Configure, verify, and troubleshoot GRE tunnel connectivity
  - 4.4 Describe WAN topology options
    - 4.4.a Point-to-point
    - 4.4.b Hub and spoke
    - 4.4.c Full mesh
    - 4.4.d Single vs dual-homed
  - 4.5 Describe WAN access connectivity options
    - 4.5.a MPLS
    - 4.5.b Metro Ethernet
    - 4.5.c Broadband PPPoE
    - 4.5.d Internet VPN (DMVPN, site-to-site VPN, client VPN)
  - 4.6 Configure and verify single-homed branch connectivity using eBGP IPv4 (limited to peering and route advertisement using Network command only)
  - 4.7 Describe basic QoS concepts
    - 4.7.a Marking

- 4.7.b Device trust
- 4.7.c Prioritization
  - 4.7.c. (i) Voice
  - 4.7.c. (ii) Video
  - 4.7.c. (iii) Data
- 4.7.d Shaping
- 4.7.e Policing
- 4.7.f Congestion management

- 10% 5.0 **Infrastructure Services**
  - 5.1 Describe DNS lookup operation
  - 5.2 Troubleshoot client connectivity issues involving DNS
  - 5.3 Configure and verify DHCP on a router (excluding static reservations)
    - 5.3.a Server
    - 5.3.b Relay
    - 5.3.c Client
    - 5.3.d TFTP, DNS, and gateway options
  - 5.4 Troubleshoot client- and router-based DHCP connectivity issues
  - 5.5 Configure, verify, and troubleshoot basic HSRP
    - 5.5.a Priority
    - 5.5.b Preemption
    - 5.5.c Version
  - 5.6 Configure, verify, and troubleshoot inside source NAT
    - 5.6.a Static
    - 5.6.b Pool
    - 5.6.c PAT
  - 5.7 Configure and verify NTP operating in a client/server mode

- 11% 6.0 **Infrastructure Security**
  - 6.1 Configure, verify, and troubleshoot port security
    - 6.1.a Static
    - 6.1.b Dynamic
    - 6.1.c Sticky
    - 6.1.d Max MAC addresses
    - 6.1.e Violation actions
    - 6.1.f Err-disable recovery
  - 6.2 Describe common access layer threat mitigation techniques
    - 6.2.a 802.1x
    - 6.2.b DHCP snooping



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## Attendance Sheet

Pillai HOC College of Engineering and Technology, Rasayani  
**Department of Computer Engineering**  
 CCNA Training under MOU (ESAY 2018-19)

Attendance sheet

M K E

No.	Name of the Student	Class and SEM	Signature	Signature
			13/02/2019	
1	Ganbas Pooja Ramsing	TE A	<i>Pooja</i>	
2	Deshmukh Trupti Ramdas	TE B	<i>Trupti</i>	
3	Mate Mayuri Maruti	TE B	<i>Mayuri</i>	
4	Punde Shraddha Sunil	TE A	<i>Shraddha</i>	
5	Patil Sakshi Mohan	TE A	<i>Sakshi</i>	
6	Gupta Sonali Nandlal	TE A	<i>Sonali</i>	
7	Salave Samiksha Kondibhau	TE B	<i>Samiksha</i>	
8	Bachche Vivek Jagannath	TE A	<i>Vivek</i>	
9	Naxikar Shrutika Dashrath	TE A	<i>Shrutika</i>	
10	Shete Shivani Shivraj	TE A	<i>Shivani</i>	
11	Patil Shweta Vilas	TE B	<i>Shweta</i>	
12	Kokambe Bhagyashree Ganesh	TE A	<i>Bhagyashree</i>	
13	Patil Sneha Deepak	TE A	<i>Sneha</i>	
14	Dalvi Pooja Dattaray	TE B	<i>Pooja</i>	
15	Mhaskar Manali Machindranath	TE A	<i>Manali</i>	
16	Patil Shweta Vishawanath	TE A	<i>Shweta</i>	
17	Patil Aishwarya Naresh	TE A	<i>Aishwarya</i>	
18	Pawar Rutuja Prabhakar	TE A	<i>Rutuja</i>	
19	Mahadik Venkatesh Sunil	TE B	<i>Venkatesh</i>	
20	Kalambe Prasad Ramesh	TE C	<i>Prasad</i>	
21	Ghanghoria Ayush Sushil	TE A	<i>Ayush</i>	
22	Gupta Muskan Mahendra	TE A	<i>Muskan</i>	
23	Mane Dhiraj Prakash	TE C	<i>Dhiraj</i>	
24	Patil Hrushikesh Sudhir	TE C	<i>Hrushikesh</i>	
25	Shinde Bhavna Shivdas	TE A	<i>Bhavna</i>	

*Abhijeet More*  
 Program Coordinator  
 Mr. Abhijeet More

*Dr. Ashok Kanthe*  
 Head of the Department  
 Dr. Ashok Kanthe

*Principal*

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Attendance sheet

Morning

No.	Name of the Student	Class and SEM	Signature	
			14/02	14/02
1	Ganbas Pooja Ramsing	TE A	<i>Pooja</i>	<i>Pooja</i>
2	Deshmukh Trupti Ramdas	TE B	<i>Trupti</i>	<i>Trupti</i>
3	Mate Mayuri Maruti	TE B	<i>Mayuri</i>	<i>Mayuri</i>
4	Punde Shraddha Sunil	TE A	<i>Shraddha</i>	<i>Shraddha</i>
5	Patil Sakshi Mohan	TE A	<i>Sakshi</i>	<i>Sakshi</i>
5	Gupta Sonali Nandlal	TE A	<i>Sonali</i>	<i>Sonali</i>
7	Salave Samiksha Kondibhau	TE B	<i>Samiksha</i>	AB
8	Bachche Vivek Jagannath	TE A	<i>Vivek</i>	<i>Vivek</i>
9	Naxikar Shrutika Dashrath	TE A	<i>Shrutika</i>	<i>Shrutika</i>
10	Shete Shivani Shivraj	TE A	<i>Shivani</i>	<i>Shivani</i>
11	Patil Shweta Vilas	TE B	<i>Shweta</i>	<i>Shweta</i>
12	Kokambe Bhagyashree Ganesh	TE A	<i>Bhagyashree</i>	<i>Bhagyashree</i>
13	Patil Sneha Deepak	TE A	<i>Sneha</i>	<i>Sneha</i>
14	Dalvi Pooja Dattaray	TE B	AB	AB
15	Mhaskar Manali Machindranath	TE A	AB	AB
16	Patil Shweta Vishawanath	TE A	<i>Shweta</i>	<i>Shweta</i>
17	Patil Aishwarya Naresh	TE A	<i>Aishwarya</i>	<i>Aishwarya</i>
18	Pawar Rutuja Prabhakar	TE A	<i>Rutuja</i>	<i>Rutuja</i>
19	Mahadik Venkatesh Sunil	TE B	AB	AB
20	Kalambe Prasad Ramesh	TE C	AB	AB
21	Ghanghoria Ayush Sushil	TE A	<i>Ayush</i>	<i>Ayush</i>
22	Gupta Muskan Mahendra	TE A	<i>Muskan</i>	<i>Muskan</i>
23	Mane Dhiraj Prakash	TE C	<i>D.P. Mane</i>	AB
24	Patil Hrushikesh Sudhir	TE C	AB	AB
25	Shinde Bhavna Shivdas	TE A	<i>Bhavna</i>	<i>Bhavna</i>

*Abhijet More*

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*Dr. Ashok Kanthe*

**Head of the Department**  
 Dr. Ashok Kanthe

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**Department of Computer Engineering**  
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Attendance sheet

Morning Afternoon

No.	Name of the Student	Class and SEM	Signature	Signature
			15/02	13/02
1	Ganbas Pooja Ramsing	TE A	<i>Ganbas</i>	<i>Pooja</i>
2	Deshmukh Trupti Ramdas	TE B	<i>Deshmukh</i>	<i>Deshmukh</i>
3	Mate Mayuri Maruti	TE B	<i>Mate</i>	<i>Mayuri</i>
4	Punde Shraddha Sunil	TE A	<i>Punde</i>	<i>Shraddha</i>
5	Patil Sakshi Mohan	TE A	<i>Patil</i>	<i>Sakshi</i>
6	Gupta Sonali Nandlal	TE A	<i>Gupta</i>	<i>Sonali</i>
7	Salave Samiksha Kondibhau	TE B	<i>Salave</i>	<i>Samiksha</i>
8	Bachche Vivek Jagannath	TE A	<i>Bachche</i>	<i>Vivek</i>
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10	Shete Shivani Shivraj	TE A	<i>Shete</i>	<i>Shivani</i>
11	Patil Shweta Vilas	TE B	<i>Patil</i>	<i>Shweta</i>
12	Kokambe Bhagyashree Ganesh	TE A	<i>Kokambe</i>	<i>Bhagyashree</i>
13	Patil Sneha Deepak	TE A	<i>Patil</i>	<i>Sneha</i>
14	Dalvi Pooja Dattaray	TE B	<i>Dalvi</i>	<i>Pooja</i>
15	Mhaskar Manali Machindranath	TE A	<i>Mhaskar</i>	<i>Manali</i>
16	Patil Shweta Vishawanath	TE A	<i>Patil</i>	<i>Shweta</i>
17	Patil Aishwarya Naresh	TE A	<i>Patil</i>	<i>Aishwarya</i>
18	Pawar Rutuja Prabhakar	TE A	<i>Pawar</i>	<i>Rutuja</i>
19	Mahadik Venkatesh Sunil	TE B	<i>Mahadik</i>	<i>Venkatesh</i>
20	Kalambe Prasad Ramesh	TE C	<i>Kalambe</i>	<i>Prasad</i>
21	Ghanghoria Ayush Sushil	TE A	<i>Ghanghoria</i>	<i>Ayush</i>
22	Gupta Muskan Mahendra	TE A	<i>Gupta</i>	<i>Muskan</i>
23	Mane Dhiraj Prakash	TE C	<i>Mane</i>	<i>Dhiraj</i>
24	Patil Hrushikesh Sudhir	TE C	<i>Patil</i>	<i>Hrushikesh</i>
25	Shinde Bhavna Shivdas	TE A	<i>Shinde</i>	<i>Bhavna</i>

*Abhijeet*  
 Program Coordinator  
 Mr. Abhijeet More

*Ashok*  
 Head of the Department  
 Dr. Ashok kanthe

*Principal*

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Department of Computer Engineering

CCNA Training under MOU (ESAY 2018-19)

Attendance sheet

Morning

Evening

r No.	Name of the Student	Class and SEM	Signature	Signature
			16/02/19	16/02/19
1	Ganbas Pooja Ramsing	TE A	<i>[Signature]</i>	
2	Deshmukh Trupti Ramdas	TE B	<i>[Signature]</i>	
3	Mate Mayuri Maruti	TE B		
4	Punde Shraddha Sunil	TE A	<i>[Signature]</i>	
5	Patil Sakshi Mohan	TE A	<i>[Signature]</i>	
6	Gupta Sonali Nandlal	TE A	<i>[Signature]</i>	
7	Salave Samiksha Kondibhau	TE B		
8	Bachche Vivek Jagannath	TE A	<i>[Signature]</i>	
9	Naxikar Shrutika Dashrath	TE A	<i>[Signature]</i>	
10	Shete Shivani Shivraj	TE A	<i>[Signature]</i>	
11	Patil Shweta Vilas	TE B	<i>[Signature]</i>	
12	Kokambe Bhagyashree Ganesh	TE A		
13	Patil Sneha Deepak	TE A	<i>[Signature]</i>	
14	Dalvi Pooja Dattaray	TE B	<i>[Signature]</i>	
15	Mhaskar Manali Machindranath	TE A	<i>[Signature]</i>	
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17	Patil Aishwarya Naresh	TE A	<i>[Signature]</i>	
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19	Mahadik Venkatesh Sunil	TE B		
20	Kalambe Prasad Ramesh	TE C	<i>[Signature]</i>	
21	Ghanghoria Ayush Sushil	TE A	<i>[Signature]</i>	
2	Gupta Muskan Mahendra	TE A	<i>[Signature]</i>	
3	Mane Dhiraj Prakash	TE C	<i>[Signature]</i>	
4	Patil Hrushikesh Sudhir	TE C	<i>[Signature]</i>	
5	Shinde Bhavna Shivdas	TE A	<i>[Signature]</i>	

*[Signature]*

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*[Signature]*

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*[Signature]*

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Department of Information Technology

CCNA Training under MOU (ESAY 2018-19)

Attendance List

Session : 1:30 to 4:00

Date: 13/2/2019

Sr No.	Name of the Student	Class and SEM	Signature
1	Araj Poorva	Third Year- VI	
2	Suhani Ture	Third Year- VI	
3	Shubham Phansekar	Third Year- VI	
4	Prathmesh Tamboli	Third Year- VI	
5	Nikhil Wakkar	Third Year- VI	
6	<del>Kishan Patel</del> Jayesh Plinole	Third Year- VI	
7	Prathmesh Satam	Third Year- VI	
8	Shaikh Sameer	Third Year- VI	
9	Shruti Rajan	Third Year- VI	
10	Rahul Khane	Third Year- VI	
11	Paul Sambyal	Third Year- VI	
12	Ketan Mundhe	Third Year- VI	
13	Hemangi Koli	Third Year- VI	
14	Deepti Bhoir	Third Year- VI	
15	Rutika Bangera	Third Year- VI	
16	Mrunali Harpude	Third Year- VI	
17	Pratik Alle	Third Year- VI	
18	Nikhil Karale	Third Year- VI	
19	Khushboo Oswal	Third Year- VI	
20	Siddhi More	Third Year- VI	
21	Shilpa Patil	Third Year- VI	
22	Bhavya Shah	Third Year- VI	
23	SHUBHAM . PATIL	Third Year - VI	
24	Ganesh Minatre	Third Year VI	
25	Priyanka Jadhav	Third Year - VI	

Program Coordinator

Head of the Department

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Department of Information Technology

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Attendance List

Date: 13/2/2019

Session: Morning

Sr No.	Name of the Student	Class and SEM	Signature
1	Araj Poorva	Third Year- VI	
2	Suhani Ture	Third Year- VI	
3	Shubham Phansekar	Third Year- VI	
4	Prathmesh Tamboli	Third Year- VI	
5	Nikhil Wakkar	Third Year- VI	
6	<del>Kishan Patel</del> Jayesh Ghinde	Third Year- VI	
7	Prathmesh Satam	Third Year- VI	
8	Shaikh Sameer	Third Year- VI	
9	Shruti Rajan	Third Year- VI	
10	Rahul Khane	Third Year- VI	
11	Paul Sambyal	Third Year- VI	
12	Ketan Mundhe	Third Year- VI	
13	Hemangi Koli	Third Year- VI	
14	Deepti Bhoir	Third Year- VI	
15	Rutika Bangera	Third Year- VI	
16	Mrunali Harpude	Third Year- VI	
17	Pratik Alle	Third Year- VI	
18	Nikhil Karale	Third Year- VI	
19	Khushboo Oswal	Third Year- VI	
20	Siddhi More	Third Year- VI	
21	Shilpa Patil	Third Year- VI	
22	Bhavya Shah	Third Year- VI	

Program Coordinator

Head of the Department

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Attendance List

Date: 14/2/2019

Session: Afternoon

Sr No.	Name of the Student	Class and SEM	Signature
1	Araj Poorva	Third Year- VI	
2	Suhani Ture	Third Year- VI	
3	Shubham Phansekar	Third Year- VI	
4	Prathmesh Tamboli	Third Year- VI	
5	Nikhil Wakkar	Third Year- VI	
6	Kishan Patel Jayesh Shinde	Third Year- VI	
7	Prathmesh Satam	Third Year- VI	
8	Shaikh Sameer	Third Year- VI	
9	Shruti Rajan	Third Year- VI	
10	Rahul Khane	Third Year- VI	
11	Paul Sambyal	Third Year- VI	
12	Ketan Mundhe	Third Year- VI	
13	Hemangi Koli	Third Year- VI	
14	Deepti Bhoir	Third Year- VI	
15	Rutika Bangera	Third Year- VI	
16	Mrunali Harpude	Third Year- VI	
17	Pratik Alle	Third Year- VI	
18	Nikhil Karale	Third Year- VI	
19	Khushboo Oswal	Third Year- VI	
20	Siddhi More	Third Year- VI	
21	Shilpa Patil	Third Year- VI	
22	Bhavya Shah	Third Year- VI	
23	Priyanka Jaethav	Third Year- VI	
24	Ganesh Mhatre	Third Year- VI	
25	SHUBHAM PATIL	Third Year- VI	

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Attendance List

Date: 15/2/2019

Sr No.	Name of the Student	Class and SEM	Signature
1	Zade Nikhil Poorya Aray	Third Year- VI	
2	Suhani Ture	Third Year- VI	
3	Shubham Phansekar	Third Year- VI	
4	Prathmesh Tamboli	Third Year- VI	
5	Nikhil Wakkar	Third Year- VI	
6	Kishan Patel Jayesh Shinde	Third Year- VI	
7	Prathmesh Satam	Third Year- VI	
8	Shaikh Sameer	Third Year- VI	
9	Shruti Rajan	Third Year- VI	
10	Rahul Khane	Third Year- VI	
11	Paul Sambyal	Third Year- VI	
12	Ketan Mundhe	Third Year- VI	
13	Hemangi Koli	Third Year- VI	
14	Deepti Bhoir	Third Year- VI	
15	Rutika Bangera	Third Year- VI	
16	Mrunali Harpude	Third Year- VI	
17	Pratik Alle	Third Year- VI	
18	Nikhil Karale	Third Year- VI	
19	Khushboo Oswal	Third Year- VI	
20	Siddhi More	Third Year- VI	
21	Shilpa Patil	Third Year- VI	
22	Bhavya Shah	Third Year- VI	
23	Priyanka Jadhav	Third year- VI	
24	Ganesh Trihadre	Third year VI	
25	SHUBHAM. PATIL	Third year VI	

Program Coordinator

Head of the Department

**PRINCIPAL**

Mahatma Education Society's  
Pillai HOC College of  
Engineering and Technology.

Pillai's HOC Educational Campus  
Rasayani, Tal. Kheleapur  
Dist. Raigad, Pin-410 207

Pillai HOC College of Engineering and Technology, Rasayani

Department of Information Technology

CCNA Training under MOU ( ESAY 2018-19)

Date: 15/12/2019

Session: 1:30 to 4:00

Sr No.	Name of the Student	Class and SEM	Signature
1	<del>Zade Nikhil</del> Poorna Aruj	Third Year- VI	
2	Suhani Ture	Third Year- VI	
3	Shubham Phansekar	Third Year- VI	
4	Prathmesh Tamboli	Third Year- VI	
5	Nikhil Wakkar	Third Year- VI	
6	<del>Krishan Patel</del> Jayesh P. L. Jale	Third Year- VI	
7	Prathmesh Satam	Third Year- VI	
8	Shaikh Sameer	Third Year- VI	
9	Shruti Rajan	Third Year- VI	
10	Rahul Khane	Third Year- VI	
11	Paul Sambyal	Third Year- VI	
12	Ketan Mundhe	Third Year- VI	
13	Hemangi Koli	Third Year- VI	
14	Deepti Bhoir	Third Year- VI	
15	Rutika Banger	Third Year- VI	
16	Mrunali Harpude	Third Year- VI	
17	Pratik Alle	Third Year- VI	
18	Nikhil Karale	Third Year- VI	
19	Khushboo Oswal	Third Year- VI	
20	Siddhi More	Third Year- VI	
21	Shilpa Patil	Third Year- VI	
22	Bhavya Shah	Third Year- VI	
23	Priyanka Jadhav	Third Year- VI	
24	Shubham Patil	Third Year- VI	
25	Mhatre Ganesh	Third Year- VI	

Program Coordinator

Head of the Department

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Pillai's HOC Educational Campus  
Rasayani, Tal. Khelapur  
Dist. Raigad, Pin-410 207

Pillai HOC College of Engineering and Technology, Rasayani

Department of Information Technology

CCNA Training under MOU (ESAY 2018-19)

Attendance List

Date: 15/2/2019

Sr No.	Name of the Student	Class and SEM	Signature
1	Zade Nikhil Poorva Aray	Third Year- VI	
2	Suhani Ture	Third Year- VI	
3	Shubham Phansekar	Third Year- VI	
4	Prathmesh Tamboli	Third Year- VI	
5	Nikhil Wakkar	Third Year- VI	
6	Kishan Patel Jayesh Shinde	Third Year- VI	
7	Prathmesh Satam	Third Year- VI	
8	Shaikh Sameer	Third Year- VI	
9	Shruti Rajan	Third Year- VI	
10	Rahul Khane	Third Year- VI	
11	Paul Sambyal	Third Year- VI	
12	Ketan Mundhe	Third Year- VI	
13	Hemangi Koli	Third Year- VI	
14	Deepti Bhoir	Third Year- VI	
15	Rutika Bangera	Third Year- VI	
16	Mrunali Harpude	Third Year- VI	
17	Pratik Alle	Third Year- VI	
18	Nikhil Karale	Third Year- VI	
19	Khushboo Oswal	Third Year- VI	
20	Siddhi More	Third Year- VI	
21	Shilpa Patil	Third Year- VI	
22	Bhavya Shah	Third Year- VI	
23	Priyanka Jadhav	Third year- VI	
24	Ganesh Trihadre	Third Year VI	
25	SHUBHAM. PATIL	Third Year VI	

Program Coordinator

PRINCIPAL  
Mehatma Education Society's  
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Pillai's HOC Educational Campus  
Rasayani, Tal. Khelapur  
Dist. Raigad, Pin-410 207

Head of the Department

Mahatma Education Society's  
Pillai's HOC College of Engineering & Technology, Rasayani  
Department of Electrical engineering

**MoU with Tata Power Skill Development Institute (TPSDI)**

Electrical Engineering department of Pillai HOC College of Engineering and Technology has signed MoU with Tata Power Skill Development Institute (TPSDI) on 17th October, 2019 to impart technical training on power system and PV solar system. Tata Power Skill Development Institute is an endeavour from the Tata Power Company to empower youth and others with employable skills, especially in the Power and allied sectors, and to address the skill gap challenge faced by the Indian Power Sector. Department of Electrical Engineering organized a training programme in association with Tata Power Skill Development Institute (TPSDI) Shahad on "Power System(Transmission and Distribution)" and "Solar PV System". Total 20 students and 5 staff members have completed training. The training was delivered by Mr. S.K.Kulkarni (Principal, TPSDI Shahad), Mr. Hari S. Rohra & team of TPSDI, Shahad. Experts are having more than 40 years of industrial experience. The training consists of both theory and hands-on skills. They gave theory explanations at the beginning of each session. They gave a proper presentation explaining the details of all the Electrical Equipment and measurements. They shared their experience of industrial work and case studies to give more information. Contents that were discussed during the Training are as follows:

- o **Safety precautions** - importance of high danger zone (as the Power plant is of 11kV), various safety were introduced and were given to use by students for example: safety shoes, helmet
- o **Basic overview of power system** - overall generation, transmission, distribution and utilization is explained and how are they performed is demonstrated live.
- o **Circuit breaker and relays** - if fault occurs then Circuit Breaker should work. Also relay should indicate type of fault. This instrument is used to detect and stop the flow of current through the system.
- o **Domestic wiring** - Types of Wiring, House Hold Typical Diagram, Protection, Type of wire & Conductor, Earthing, Types Of Wiring Diagram, Fault
- o **Metering** - Various types of meter, their testing, calculation of billing using meter, smart meter usage in the grid.
- o **Industrial visit to Ambarnath substation and HVDC Padgha** - At Ambarnath receiving station there are three heavy duty step down transformers. Each one of the transformer has the capacity to step down 22kv to 11kv. The transformers are incorporated with all types of indications, alarms and protection. At HVDC Padgha, Students got the basic idea about Transmission Line Power Flow, Convert DC to AC, Thyristor Bank, DC and AC Switchyard Operation, Electrode Station, PLCC and SCADA System Operation, etc.
- o **Solar basics** in-depth knowledge of basics, various components of a photovoltaic power plant such as photovoltaic modules, inverters, charge controllers, switchyard, and so on.



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Dist. Raigad, Pin-410 207



A50352



## Certificate of Completion



*Awarded to*

**Ms. SNEHA SURESH JANGAM**

TPSDI Enrollment No. 20003940SH

*for successfully undergoing a training program titled*

**Power System familiarization**

*as per TPSDI Skill Qualification Framework*

*held at* TPSDI-Shahad

*from* December 12 to 25, 2019

J.C. Mistry  
Chief TPSDI

**TPSDI**  
**TATA POWER**  
SKILL DEVELOPMENT INSTITUTE  
Empowering Skills for Life

The Tata Power Company Limited, Panel Training Station, Panel Tank Road, Mumbai 400 033, Maharashtra, India. Tel: 022 47172182  
Website: <http://www.tpsdi.com> | For verification please visit [tpsdi.aaronline.com](http://tpsdi.aaronline.com)

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Engineering and Technology,

Pillai's HOC Educational Campus  
Rassyan, Tal. Khelapur  
Dist. Raigad, Pin-410 207



## Certificate of Completion



*Awarded to*

**Mr. Saurabh Sandip Mate**

TPSDI Enrollment No. 22000190SH

*for successfully undergoing a training program titled*

**TVAS - Solar PV Fundamentals**

*as per TPSDI Skill Qualification Framework*

*held at TPSDI-Shahad*

**[Recognized by Ministry of Power as Category-I Training Institute]**

**from June 21 to 26, 2021**

**J C Mistry**  
**Chief TPSDI**

**TPSDI**  
**TATA POWER**  
SKILL DEVELOPMENT INSTITUTE  
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The Tata Power Company Limited, Power Resources Division, Parel, Tata Road, Mumbai 400 033, Maharashtra, India. Tel: 022 67172143  
Website: <https://www.tpsdi.com> | For verification please visit [tpsdi.easgridline.com](https://tpsdi.easgridline.com)

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**Pillai's HOC Educational Campus  
Rassyanl, Tal. Khelapur  
Dist. Raigad, Pin-410 207**

**Mahatma Education Society's  
Pillai's HOC College of Engineering & Technology, Rasayani  
Department of Electrical engineering**

**IIT Spoken Tutorial**

Spoken Tutorial is an initiative of the 'Talk to a Teacher' activity by the National Mission on Education through Information and Communication Technology (ICT) launched by the Ministry of Human Resources and Development (MHRD), Government of India and is being developed by IIT Bombay. The objective of Spoken Tutorial is to spread the knowledge of technology and Free Open Source Software (FOSS) across the country to the one who lack access and opportunities to learn any software.

In Computer Engineering Department, we have included the course "C" for second year student and "Java" for third year student and have enrolled 154 and 140 students for particular course respectively. Since the same courses are available in the curriculum also it becomes beneficial for student to understand the concept in more detail. As an audio-video tutorial helps in explaining the activity performed on the computer by seeing and hearing someone explain a process greatly improves understanding. The learning method is highly beneficial for self-learning student as the audio content is available in most 22 Indian languages such as Hindi, Kannada, Marathi, Telugu and etc which overcome the language barrier in understanding the language. Due to Spoken Tutorial Project student are able to enrol in various programming languages, office tools, and graphic and circuit design tools through audio video tutorials. Students are allowed to take online examinations and get certificates which are free of cost. Student will have various course certifications completed along with their UG Degree by the end of Degree course. This will make the student highly knowledgeable and confident enough to compete with the world.

  
Pooja A. Pemsare  
IIT Spoken Tutorial Co-ordinator,  
PHCET, Rasayani.

  
Prof. Pranita Chavan  
Head of Department





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Engineering and Technology,**

**Pillai's HOC Educational Campus  
Rasayani, Tal. Khalapur  
Dist. Raigad, Pin-410 207**



## Certificate for Completion of LaTeX Training

This is to certify that **JANGAM PRATHAMESH** has successfully completed **LaTeX** test organized at **Pillai HOC College of Engineering and Technology, Rasayani** by **Pooja Pemare** with course material provided by the Spoken Tutorial Project, IIT Bombay.

Passing an online exam, conducted remotely from IIT Bombay, is a pre-requisite for completing this training. **Pooja Pemare** at **Pillai HOC College of Engineering and Technology, Rasayani** invigilated this examination. This training is offered by the **Spoken Tutorial Project, IIT Bombay**, funded by **National Mission on Education through ICT, MHRD, Govt., of India**.

October 21st 2019

  
Prof. Kannan M Moudgalya  
IIT Bombay



## Certificate for Completion of LaTeX Training

This is to certify that **GAIKAR DARSHAN** has successfully completed **LaTeX** test organized at **Pillai HOC College of Engineering and Technology, Rasayani** by **Pooja Pemare** with course material provided by the Spoken Tutorial Project, IIT Bombay.

Passing an online exam, conducted remotely from IIT Bombay, is a pre-requisite for completing this training. **Pooja Pemare** at **Pillai HOC College of Engineering and Technology, Rasayani** invigilated this examination. This training is offered by the **Spoken Tutorial Project, IIT Bombay**, funded by **National Mission on Education through ICT, MHRD, Govt., of India**.

October 21st 2019

  
Prof. Kannan M Moudgalya  
IIT Bombay



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Dist. Raigad, Pin-410 207

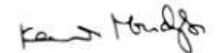


## Certificate for Completion of LaTeX Training

This is to certify that **VIRAJ JADHAV** has successfully completed **LaTeX** test organized at **Pillai HOC College of Engineering and Technology, Rasayani** by **Pooja Pemare** with course material provided by the Spoken Tutorial Project, IIT Bombay.

Passing an online exam, conducted remotely from IIT Bombay, is a pre-requisite for completing this training. **Pooja Pemare** at **Pillai HOC College of Engineering and Technology, Rasayani** invigilated this examination. This training is offered by the **Spoken Tutorial Project, IIT Bombay**, funded by **National Mission on Education through ICT, MHRD, Govt., of India**.

April 3rd 2019

  
Prof. Kannan M Moudgalya  
IIT Bombay



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MAHATMA EDUCATION SOCIETY'S  
Pillai HOC College of Engineering & Technology, Rasayani

*Pillai*

ACCREDITED WITH A GRADE BY NAAC IN BEST CATEGORICAL RECOGNIZED BY UGC  
FOR POLYTECHNIC AND DISTANCE EDUCATION

### Inaugural Program Schedule



Industry sponsored & ISTE approved

SIX DAYS  
SHORT TERM TRAINING PROGRAM  
On <

### "CHALLENGES AND OPPORTUNITIES IN SUSTAINABLE ENERGY CONSERVATION, UTILIZATION AND ITS BUSINESS STRATEGY"

Date: September 19-24, 2023

Time	Session Details
10:15 AM	Saraswati Vandana
10:20 AM	Welcome & opening remarks by Dr. G.V. Patil, Professor & Head
10:25 AM	PHCET tour with Audiovisual
10:30 AM	Presidential Address by Dr. Lata Menon, Dy. CEO, Pillai HOCL Educational Campus
10:35 AM	Address by Dr. J.W. Bakal, Principal, PHCET, Rasayani
10:40 AM	Felicitation of Chief Guest Dr. Ashok Khade, MD, DAS Offshore Engg. Pvt. Ltd.
10:42 AM	Felicitation of Invited Guest Mr. Santosh Naikar, Consultant
10:45 AM	Release of STTP Souvenir by dignitaries
10:50 AM	Inaugural talk by Dr. Ashok Khade, MD, DAS Offshore Engg. Pvt. Ltd.

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### About MES

Mahatma Education Society was established in the year 1970 by a group of teachers with the aim of spreading education for all. The society today has 48 institutions from pre-primary to post-graduation to research with over 35,000 students and over 2,500 teachers. The society manages several schools imparting instruction in S.S.C., C.B.S. E., I.G.C.S.E. and I.B. programs, Junior Colleges, Degree Colleges, Engineering Colleges, Architecture colleges, Management Institutions, Polytechnics and Teacher education programs at different locations in Mumbai, Navi Mumbai and Rasayani (Raigad District). Most of the colleges are reaccredited 'A' Grade by NAAC and also accredited by NBA and other Government bodies.

### About PHCET

The MES group after establishing its name in the field of education with the experience of around 50 years, ventured into the field of Engineering education with the establishment of Pillai HOC College of Engineering and Technology (PHCET) in the year 2009 at Rasayani. PHCET offers both undergraduate (Bachelor of Engineering) and postgraduate (Master in Engineering) programs and PhD programs in Civil & Computer engineering. Institute Accredited with an 'A' grade by NAAC in First Cycle from A.Y. 2019. Two UG Programs viz. Computer Engineering and Mechanical Engineering have been reaccredited by the NBA for three years i.e. up to 2023

### Patrons

**Dr. K. M. Vasudevan Pillai**, Hon. Chairman & CEO, Mahatma Education Society  
**Dr. Daphne Pillai**, Hon. Secretary, MES  
**Dr. Priam Pillai**, COO, MES  
**Mr. Franav Pillai**, DCEO, MES  
**Prof. Munawira Pillai**, Head, Innovation, Research Centre, PHCET  
**Dr. Lata Menon**, Dy. CEO, Pillai HOCL Educational Campus, Rasayani  
**Dr. J. W. Bakal**, Principal, PHCET Rasayani

### Advisory Committee:

Dr. R. C. Prasad, Prof. Mech. Engg. PHCET.  
 Prof. Amar Mange, Principal, Pillai HOC Poly.  
 Dr. M. D. Nadar, Prof. Mech. Engg. PHCET.  
 Dr. B. K. Sarkar, Prof. Comp. Engg. PHCET.  
 Dr. Mansi Subhedar, HOD, ECS Engg.  
 Dr. Divya Chirayil, HOD, IT  
 Dr. Manvendra Vashishtha, HOD, ASH.  
 Prof. Rohini Bhosale, HOD, Comp. Engg.  
 Prof. Amar Jadhav, HOD, Auto. Engg.  
 Prof. Asokan S., Electrical Engg.

### Convenors:

Dr. Gajendra V. Patil, Head, Mechanical Engg.  
 Prof. Raju Narwade, Head, Civil Engg.  
 Prof. Pranita Chavan, Head, Electrical Engg.

### Co-ordinators:

Mr. Sunilraj Rajput, Mech. Engg.  
 Ms. Supriya Shigwan, Electrical Engg.  
 Mr. Prashant Singh, Civil Engg.

### Organizing Committee:



Dr. Suhas Uthale, Mech. Engg.  
 Mr. T.R.B. Sanjai Kumar, Mech. Engg.  
 Ms. Manisha Jangade, Civil Engg.  
 Ms. Smitha J.S., Civil Engg.  
 Ms. Ronita Pawn, Electrical Engg.  
 Ms. Lakshmi C.R., Electrical Engg.

**Industry sponsored & ISTE approved  
SIX DAYS  
SHORT TERM TRAINING PROGRAM**




On  
**“CHALLENGES AND OPPORTUNITIES IN SUSTAINABLE ENERGY CONSERVATION, UTILIZATION AND ITS BUSINESS STRATEGY”**



**Date: September 19-24, 2022**  
**Venue: Conclave-I, PHCET Rasayani**









**Organized by  
Pillai HOC College of Engineering & Technology, Rasayani**

**Supported by**

Industry Sponsored & ISTE Approved Short Term Training Program							
<b>“CHALLENGES AND OPPORTUNITIES IN SUSTAINABLE ENERGY CONSERVATION, UTILIZATION AND ITS BUSINESS STRATEGY”</b> Date: September 19-24, 2022 Venue: Conclave-I, PHCET Rasayani Organized by <b>Pillai HOC College of Engineering &amp; Technology, Rasayani</b>							
STTP SCHEDULE							
Convenors:- Dr. G.V. Patil, Prof. Raju Narwade & Prof. Pranita Chavan							
Session	Time	Day 1 - 19th September 2022	Day 2 - 20th September 2022	Day 3 - 21st September 2022	Day 4 - 22nd September 2022	Day 5 - 23rd September 2022	Day 6 - 24th September 2022
		INAUGURAL FUNCTION					
Session 1	10:30 am To 11:30 am	Dr. Ashok Khade, Managing Director, DAS Offshore 	Dr. Pratibha Sharma, Professor, IIT Bombay 	Mr. Nemade S, Nikhil Comforts 		Dr. Pramod Sharma, Deputy Manager, Suzlon Energy, Pune 	Mr. Kamal Pandey, Scientist/Engineer, IIRS, ISRO  Dr. Praveen Kumar Thakur, ISRO Scientist, IIRS, ISRO 
Session 2	11:30 am To 12:30 pm	Mr. Santosh Naikar, Consultant 	Dr. Pavan Kumar Hari, Professor, IIT Bombay 	Dr. Manvendra Vashishtha PHCET, Rasayani 	<b>INDUSTRIAL VISIT (DAS Offshore &amp; Crystal Industrial Syndicate Pvt. Ltd.)</b>	Dr. Pramod Sharma, Deputy Manager, Suzlon Energy, Pune 	Mr. Palakshi Karjigi, Ex.- Head Exploration (NV) ONGC LTD (11:00 am to 12:00 pm) 
Session 3	12:30 pm To 01:30 pm	Dr. R.C. Prasad Professor, Dept. of Mechanical Engg. PHCET, Rasayani 	Mr. Mahadev Sabale Manager, TATA Power 	Prof. Prashant Jain, KJSCE, Vidyaavihar 		Dr. Sandeep Joshi, Principal, Pillai College of Engineering, Panvel 	Mr. Pratik Prasun, SECL, New Delhi (12:00 pm to 01:00 pm) 
Session 3	01:30 pm To 02:00 pm		Addonix Technology live demonstration on Augmented reality and virtual reality				Valedictory Function
		Remarks by Dr. G.V. Patil & Dr. Suhas Uthale	Remarks by Dr. M.D. Nadar, Dr. Manvendra Vashishtha & Prof. Asokan S.	Remarks by Dr. G.V. Patil, Ms. Ronita Pawn & Mr. Sunilraj Rajput		Remarks by Prof. Raju Narwade & Dr. M.D. Nadar	Remarks by Dr. Karthik Nagarajan & Ms. Pranita Chavan

Principal

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 Dist. Raigad, Pin-410 207

Mahatma Education Society's  
Pillai's HOC College of Engineering & Technology, Rasayani  
Department of Electrical engineering

**STTP on "Challenges and Opportunities in Sustainable Energy Conservation, Utilization and Its Business Strategy"**

Industry sponsored & ISTE approved Six Days Short Term Training Program on "Challenges and Opportunities in Sustainable Energy Conservation, Utilization and Its Business Strategy" organized by Department of Civil, Electrical & Mechanical Engineering

Event Date: 19th to 24th September, 2022  
Mode of Conduct: Offline  
Theme: Interaction with an industry and academia expert  
Organizers: Dr. G. V. Patil, Mr. Raju Narwade and Ms. Pranita Chavan  
No. of Students Participated: 169  
No. of Faculty Participated: 38

**About STTP:** This STTP focused on conservation, storage and utilization of conventional and non-conventional energy resources which includes engineering applications of hydrogen energy, solar energy and wind energy. Currently the global market faces issues to maintain sustainability in the context of environmental economy and social needs. To mitigate energy conservation and storage challenges eminent speakers from industry and academia have been invited. Industry experts explored various opportunities in the energy sector to develop entrepreneurship skills and job opportunities. STTP included a one day industry visit to explore real life issues and solutions in the energy sector. Eminent personalities from industry and academia



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explored business strategies to maximize the profit and reduce the energy exploring cost

**STTP**

**Objectives**

This STTP have been scheduled to achieve following objectives:

- Utilization of conventional and non-conventional energy resources
- To maintain sustainability in the context of environmental economy and social needs.
- To mitigate energy conservation and storage challenges
- To explore various opportunities in energy sector to develop entrepreneurship skills and job opportunities
- Industry visit to explore real life issues and solutions in the energy sector.



Prof. Pranita Chavan

Head of Department



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Mahatma Education Society's  
Pillai HOC College of Engineering & Technology Rasayani

Student List

SR NO	Dept.	Student Name	Type of Activity ( Co-curricular Activities/ Extra Co-curricular/ Social/ Sports)	Date	Venue
1	Electrical	AADINATH PRAVIN PAWAR	STTP on Challenges and Opportunities in Sustainable Energy	19.09.2022 to 24.09.2022	PHCET
2		AKSHAY DATTATRAY GAIKWAD	STTP on Challenges and Opportunities in Sustainable Energy		
3		PRATIKESH DIPAK DESHMUKH	STTP on Challenges and Opportunities in Sustainable Energy		
4		DARPAN VILAS PATIL	STTP on Challenges and Opportunities in Sustainable Energy		
5		Amey Nitin Dandekar	STTP on Challenges and Opportunities in Sustainable Energy		
6		VIGNESH ARJUN SAWANT	STTP on Challenges and Opportunities in Sustainable Energy		
7		TANISH SWAPNIL GURAV	STTP on Challenges and Opportunities in Sustainable Energy		
8		BHARATI TEJARAM SUTAR	STTP on Challenges and Opportunities in Sustainable Energy		
9		ROHIT ROHIDAS GOYAJI	STTP on Challenges and Opportunities in Sustainable Energy		
10		RITIKA RAI	STTP on Challenges and Opportunities in Sustainable Energy		
11		MONISH NIRANJAN BHAGAT	STTP on Challenges and Opportunities in Sustainable Energy		
12		HARSHALA RAMESH JADHAV	STTP on Challenges and Opportunities in Sustainable Energy		
13		VIPIN PRAKASH KAMBLE	STTP on Challenges and Opportunities in Sustainable Energy		
14		ASHUTOSH AJAY KOLI	STTP on Challenges and Opportunities in Sustainable Energy		
15		SHREYAS DATTATREY SAWANT	STTP on Challenges and Opportunities in Sustainable Energy		
16		KUNAL KAMLAKAR DIKLE	STTP on Challenges and Opportunities in Sustainable Energy		
17		KAMBLE SHUBHAM DILIP	STTP on Challenges and Opportunities in Sustainable Energy		
18		SHINDE PRANAV RAMESH	STTP on Challenges and Opportunities in Sustainable Energy		
19		SAGAR KRUSHNAKANT PATIL	STTP on Challenges and Opportunities in Sustainable Energy		
20		TRUNAL MANOJ GOYJI	STTP on Challenges and Opportunities in Sustainable Energy		
21		SANKET SOMESHWAR PANCHL	STTP on Challenges and Opportunities in Sustainable Energy		
22		SHUBHAM SANTOSH DESAI	STTP on Challenges and Opportunities in Sustainable Energy		
23		SHUBHAM SANTOSH PAWAR	STTP on Challenges and Opportunities in Sustainable Energy		
24		JAYESH NEESHKANT KAMBLE	STTP on Challenges and Opportunities in Sustainable Energy		
25		GHAYWAT AVISH SURESH	STTP on Challenges and Opportunities in Sustainable Energy		
26		ROSHANI PADMAKAR BHOIR	STTP on Challenges and Opportunities in Sustainable Energy		
27		SUYOG MORE	STTP on Challenges and Opportunities in Sustainable Energy		



28	ROSHAN PATIL	STTP on Challenges and Opportunities in Sustainable Energy
29	SUJIT PATIL	STTP on Challenges and Opportunities in Sustainable Energy
30	CHIRAG PATIL	STTP on Challenges and Opportunities in Sustainable Energy
31	AJINKYA MAHADIK	STTP on Challenges and Opportunities in Sustainable Energy
32	HRITHIK MHATRE	STTP on Challenges and Opportunities in Sustainable Energy
33	PRATHAMESH DINKAR	STTP on Challenges and Opportunities in Sustainable Energy
34	AAKANSHA SHID	STTP on Challenges and Opportunities in Sustainable Energy
35	PRIYANKA GHUTUGADE	STTP on Challenges and Opportunities in Sustainable Energy

Prof. Pranita Chavan  
Head of Department



*(Signature)*

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**"CHALLENGES AND OPPORTUNITIES IN SUSTAINABLE ENERGY CONSERVATION, UTILIZATION AND ITS BUSINESS STRATEGY"** Organized by Pillai HOC College of Engineering and Technology, Rasayani on September 19-24, 2022

**Dr. G.V. Patil**  
Convener & Head of  
Mechanical Engg.  
Department

**Mr. Raju Narwade**  
Convener & Head of  
Civil Engg. Department

**Ms. Pranita Chavan**  
Convener & Head of  
Electrical Engg.  
Department

**Dr. J.W. Bakal**  
Principal,  
PHCET, Rasayani



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AY\_2019-20

1. Aptitude Training was conducted from 30 Nov 2019 to 11 Dec 2019. 20 students from Information Technology Department attended the training program.

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Mahatma Education Society's  
**Pillai HOC College of Engineering & Technology, Rasayani**  
 Department of Information Technology  
 Aptitude Training 2019-20

Sr.no.	NAME OF THE STUDENT	Sign
1	AHIR VIKRANT PANDHARINATH	VIKANT
2	ANGAT SAYALI GANESH MANISHA	S. G. Angesh
3	AWAD SANIKA JANARDAN	Sanika
4	BHOIR PRAYAG MARUTI	Prayag
5	CHAUGULE AADESH VYANKAT	Aadesh
6	DAWKAR VAISHNAVEE RAJESAHEB	Vaishnavi
7	GAIKWAD APURVA HANUMANT	Apurva
8	GAJARUSHI WANI SHUBHAM DILIP	Shubham
9	GAWAND MANSI CHANDRAKANT	Mansi
10	GAWAND ROUNAK SURESH	Rounak
11	GHARAT DHANANJAY GAJANAN PUSHPA	Dhananjay
12	GHARAT DHIRAJ GAJANAN PUSHPA	Dhiraj
13	GHARAT KAPIL SUBODH	Kapil
14	GHARATKAR SIDHANT ARVIND	Sidhanth
15	GHATAGE KOMAL BHARAT	Komal
16	GOLHAR ABHAY NARAYAN	ABHAY
17	GUPTA DEVEN RAMSAJANLAL	Deven
18	GURAV ANGARK PRAKASH	Prakash
19	HANDE DNYANESHWARI VIKRAM	Dnyaneshwari
20	JADHAV SHRAVANI MANGESH	Shravani

Signature of HOD

Program Name: Value added Course: Solid works Mechanical Design

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## Solidworks Mechanical Design – Associate Level Certification Course (CSWA)

**Date:** 16<sup>th</sup> September 2022 – 15<sup>th</sup> November 2022

**Title -** Solidworks mechanical design - associate level certification

**No. of Students Enrolled:** 40

### Course Benefits

- Students can appear in an online exam and get a certificate on their name from Dassault System.
- Access to more than 400+ training videos from Dassault System.
- 15+hrs of training session from PHCET faculty experts (Prof. Amar Jadhav & Prof. K.S.Anish)

### Course Outcomes:

- Understand basic concepts of part modelling, assembly and drafting
- Internationally recognized certification exam (dassault systems).
- Making students industry ready for placements through certifications.

**Course Coordinators -** Prof. Amar Jadhav (aajadhav@mes.ac.in) & Prof. K.S.Anish (ksanish@mes.ac.in).

**Course Charges:** Rs. 2500/- per student.

**Duration :** 45 days

- 15+ hrs of Solidworks sessions by PHCET Faculty (Solidworks command, practice sessions doubt clearing sessions)

**Eligibility:** Any student with no/basic knowledge of Solidworks software can enroll.

### Registration Process:

- On first come first serve basis
- 

**Certification:** Solidworks mechanical associate certification (CSWA) - if students appear & score more than 70% in the examination conducted by Dassault Systems.

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**Description:** SOLIDWORKS Certifications are a benchmark to measure your knowledge and competency with SOLIDWORKS software. A certification helps you stand out from the crowd and showcases your expertise to businesses and professionals alike—a valuable asset in a competitive job market. The CSWA certification is proof of your SOLIDWORKS® expertise with cutting-edge skills that businesses seek out and reward. This is a globally recognized certificate offered by Dassault Systems after passing the exam conducted by them. The exam consists of topics like Drafting Competencies, Basic Part Creation and Modification, Intermediate Part Creation and Modification, Advanced Part Creation and Modification, Assembly Creation. In all there are 14 questions. Exam duration is of 3 hours and passing percentage 70%.

**Certificate Sample:**



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# TWO DAYS EDUCATIONAL TRAINING CONFERENCE & EXHIBITION

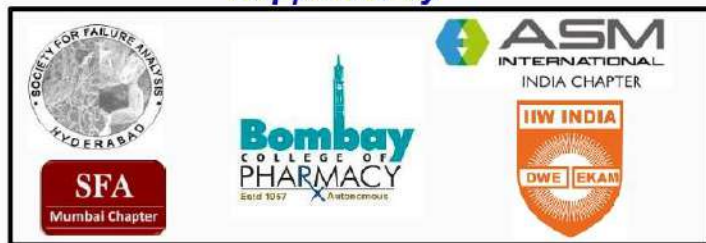
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## CHALLENGES AND OPPORTUNITIES IN DIGITAL DIRECT MANUFACTURING : ADDITIVE MANUFACTURING / 3D PRINTING & WELDING 4.0

Organized by



Supported by



Time	Program Itinerary
09:00 to 10:00 AM	AGM SFA Mumbai Chapter
10:00 to 10:30 AM	Breakfast
10:30 to 11:45 AM	Inauguration
11:45 to 12:00 PM	<b>Dr. Jayesh Bellare, Professor, Department of Chemical Engineering, IIT Bombay</b> "Gel 3D Printing for Biomedical use"
12:00 to 12:30 PM	<b>Dr. Alok Anil., Co-founder &amp; Director Direct Next Big Innovation Lab</b> "Bio printing / 3D Printing for Medical Applications"
12:30 to 01:00 PM	<b>Mr. Bhanupratap Gaur, Senior Researcher, Biomedical Engineering and Technology Innovation Centre, IIT Bombay</b> "Additive Manufacturing for Biomedical Applications"
01:00 to 01:30 PM	<b>Dr. Guruprasad Rao, Director &amp; Mentor, Imaginarium India Pvt. Ltd.</b> "3D printing in healthcare"
01:30 to 02:00 PM	Lunch Break
02:00 to 02:30 PM	<b>Mr. Paresh Haribhakti, Managing Director, TCR Advanced Engineering Pvt. Ltd. Vadodara</b> "Weld Defects , their detection & characterization for Root cause Failure Analysis in Welded structures"
02:30 to 03:00 PM	<b>Mr. Devendra Gope, Manager-Training &amp; Education, Fronius India Pvt. Ltd.</b> "Intelligent welding solutions for smart manufacturing & Industry 4.0"
03:00 to 05:00 PM	<b>Visit to Exhibition / Lecture and Hands on training on</b> "Intelligent welding solutions for smart manufacturing & Industry 4.0"

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# TWO DAYS EDUCATIONAL TRAINING CONFERENCE & EXHIBITION

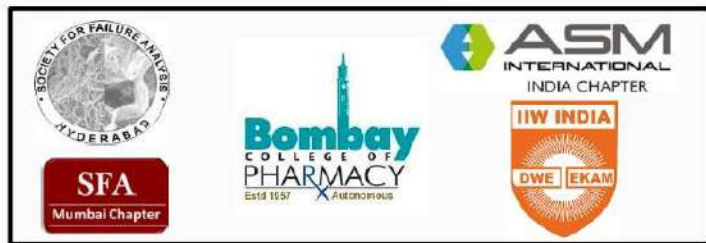
on

## CHALLENGES AND OPPORTUNITIES IN DIGITAL DIRECT MANUFACTURING : ADDITIVE MANUFACTURING / 3D PRINTING & WELDING 4.0

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Time	Program Itinerary
10:30 to 11:00 AM	<b>Dr. Amitava De, Professor, Department of Mechanical Engineering, IIT Bombay</b> "Computer based models for Design for Additive Manufacturing / 3D Printing"
11:00 to 11:30 AM	<b>Dr. B. Basu, Senior Scientist NMRL DRDO Mumbai</b> "Welding technology for Naval Applications "
11:30 to 12:00 PM	<b>Dr. G. Rao, Senior Scientist NMRL DRDO Mumbai</b> "Application of Friction Stir Welding in Defense Sector"
12:00 to 12:30 PM	<b>Mr. R.K. Pillai, President &amp; CEO Aiipitech Pvt. Ltd. Navi Mumbai</b> "Industry 4.0"
12:30 to 01:30 PM	<b>Lunch Break</b>
01:30 to 03:00 PM	<b>Visit to Exhibition / Lecture and Hands on training on</b> "Intelligent welding solutions for smart manufacturing & Industry 4.0"
03:00 to 04:00 PM	<b>Valedictory Function</b>

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## Solidworks Mechanical Design – Associate Level Certification Course (CSWA)

**Date:** 11<sup>th</sup> January 2022 – 12<sup>th</sup> March 2022

**Title -** Solidworks mechanical design - associate level certification

**No. of Students Enrolled:** 24

### Course Benefits

- Students can appear in an online exam and get a certificate on their name from Dassault System.
- Access to more than 400+ training videos from Dassault System.
- 15+hrs of training session from PHCET faculty experts (Prof. Amar Jadhav & Prof. K.S.Anish)

### Course Outcomes:

- Understand basic concepts of part modelling, assembly and drafting
- Internationally recognized certification exam (dassault systems).
- Making students industry ready for placements through certifications.

**Course Coordinators -** Prof. Amar Jadhav (aajadhav@mes.ac.in) & Prof. K.S.Anish (ksanish@mes.ac.in).

**Course Charges:** Rs. 2200/- per student.

**Duration :** 45 days

- 15+ hrs of Solidworks sessions by PHCET Faculty (Solidworks command, practice sessions doubt clearing sessions)

**Eligibility:** Any student with no/basic knowledge of Solidworks software can enroll.

### Registration Process:

- On first come first serve basis
- 

**Certification:** Solidworks mechanical associate certification (CSWA) - if students appear & score more than 70% in the examination conducted by Dassault Systems.

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**Description:** SOLIDWORKS Certifications are a benchmark to measure your knowledge and competency with SOLIDWORKS software. A certification helps you stand out from the crowd and showcases your expertise to businesses and professionals alike—a valuable asset in a competitive job market. The CSWA certification is proof of your SOLIDWORKS® expertise with cutting-edge skills that businesses seek out and reward. This is a globally recognized certificate offered by Dassault Systems after passing the exam conducted by them. The exam consists of topics like Drafting Competencies, Basic Part Creation and Modification, Intermediate Part Creation and Modification, Advanced Part Creation and Modification, Assembly Creation. In all there are 14 questions. Exam duration is of 3 hours and passing percentage 70%.

**Certificate Sample:**



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# CERTIFICATE

Dassault Systèmes confers upon  
**DIVYANK ADHIKARI**  
the certificate for  
**Mechanical Design**



March 11 2022

Academic exam at Addonix Technologies Pvt. Ltd. - EDU

**Manish KUMAR**  
SOLIDWORKS CEO  
R&D Vice President



C-DYTXESVM27

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## Solidworks Mechanical Design – Associate Level Certification Course (CSWA)

**Date:** 16<sup>th</sup> June 2021 – 23<sup>rd</sup> July 2021

**Title -** Solidworks mechanical design - associate level certification Course Supported by : Adonix, Mumbai ( Reseller of Dassault Systems SOLIDWORKS Corporation)

### Course Benefits

- Students can appear in an online exam and get a certificate on their name from Dassault System.
- 6 hrs training session from Dassault System.
- Access to more than 400+ training videos from Dassault System.
- 15+hrs of training session from PHCET faculty experts (Prof. Amar Jadhav & Prof. K.S.Anish)
- E-certificate of Participation to all participants

### Course Outcomes:

- Understand basic concepts of part modelling, assembly and drafting
- Internationally recognized certification exam (dassault systems).
- Making students industry ready for placements through certifications.

**Course Coordinators -** Prof. Amar Jadhav (aajadhav@mes.ac.in) & Prof. K.S.Anish (ksanish@mes.ac.in).

**Course Charges:** Rs. 2000/- per student.

**Duration :** 45 days

- 3 sessions (total 6 hrs ) + 400 online videos by addonix
- 15+ hrs of Solidworks sessions by PHCET Faculty (Solidworks command, practice sessions doubt clearing sessions)

**Eligibility:** Any student with no/basic knowledge of Solidworks software can enroll.

### Registration Process:

- On first come first serve basis (25 students will be shortlisted)
- Remaining 15 students will be in waiting list & given chance if from shortlisted students anyone opts out/ fails to pay fees on specified date.

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**Certification:** Solidworks mechanical associate certification (CSWA) - if students appear & score more than 70% in the examination conducted by Dassault Systems.

**Description:** SOLIDWORKS Certifications are a benchmark to measure your knowledge and competency with SOLIDWORKS software. A certification helps you stand out from the crowd and showcases your expertise to businesses and professionals alike—a valuable asset in a competitive job market. The CSWA certification is proof of your SOLIDWORKS® expertise with cutting-edge skills that businesses seek out and reward. This is a globally recognized certificate offered by Dassault Systems after passing the exam conducted by them. The exam consists of topics like Drafting Competencies, Basic Part Creation and Modification, Intermediate Part Creation and Modification, Advanced Part Creation and Modification, Assembly Creation. In all there are 14 questions. Exam duration is of 3 hours and passing percentage 70%.

The training was conducted for 30 days from 5-6 pm which also included training conducted by experts from Dassault Systems. In total more than 25 practice problems were solved in the sessions and also tips for examination was conducted. Both trainer have qualified the exam before taking training.

**Certificate Sample:**



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Rasayani, Tal. Khelepur  
Dist. Raigad, Pin-410 207



# CERTIFICATE

Dassault Systèmes confers upon  
**SANKET THORAT**  
the certificate for  
**Mechanical Design**



March 11 2022

Academic exam at Addonix Technologies Pvt. Ltd. - EDU

**Manish KUMAR**  
SOLIDWORKS CEO  
R&D Vice President



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**Four Days "Materials Camp" An Outreach Program of ASM  
International Materials Foundation, USA**

**Organized by**

**The Institute Innovation Council at The Pillai HOC College of Engineering &  
Technology, Rasayani**

**and**

**ASM International India Chapter**



**Organized by**



**Supported by**



**Material Camp of ASM During December 16-19, 2021**

**Drone Workshop on last day**

**Time 09:00 am to 05:00 pm**

**Venue- Innovation & research Centre, Ground Floor, Pillai HOC  
College of Engineering & Technology, Rasayani**

A handwritten signature in blue ink, appearing to read 'T. S. S. S.', is written over a horizontal line.

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Engineering and Technology,**

**Pillai's HOC Educational Campus  
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Four Days "Materials Camp" An Outreach Program of ASM International Materials Foundation USA

Organized by

The Institute Innovation Council at the Pillai HOC College of Engineering & Technology Rasayani and  
ASM International India Chapter



Organized by



Materials Camp of ASM during  
December 16-19, 2021  
Drone Workshop on last day  
Time: 9.00 am to 5.00 pm

Venue:

Innovation & Research Centre, Ground Floor  
Pillai HOC College of Engineering & Technology  
Rasayani

Supported by



Introduction:

- This program is an outreach program aimed to expose concepts of advanced materials in industries on the first three days followed by its applications for Drone making & flying on the last day.
- It will provide hands on expertise on Design, Assembly & Applications of Printed Circuit Boards and Sensors/3DPrinting of plastics besides Making, Shaping & Treating Steels, Mechanical & NDT for QC and sustainability issues
  - The students of Class XI and XII can participate in this program to get an opportunity to visit industries ,meet and network with students from other schools, faculty and representatives from Industries.
- The program will be conducted under the direction of Professors, Industry experts from SFA Mumbai Chapter and ASM international India Chapter, students from IIT Bombay and PHCET Rasayani
- The objective of this program is to excite and engage young minds to pursue career in Materials Engineering
- It will consist of short lectures and interactive lab sessions culminating in drone workshop , where students will be taught how to assemble a Palm-top Drone and learn to fly it using an App on their Smart phones , which they can download from internet
- Each team will be handed over the components of drone kit, which will be collected back at the end of the workshop
- All the participants should bring a fully charged Smart-phone along with chargers
- There will be a drone flying competition after the Materials camp and members of Top 2 teams will be awarded a certificate and a prize.
  - Every student will get a T-shirt & Backpack with ASM Logo besides the participation certificate on successful completion the Materials Camp and Drone workshop
- SELECTION PROCESS :
  - Each school will select four/six students who have basic knowledge of Physics, Chemistry, Maths and Strong interest in pursuing Career in Materials Engineering and manufacturing
  - These students should be asked to prepare PPTs (max. 3 slides) indicating why do they want to learn about materials along with different applications of Materials. The first slide should include the names of the students, Class & Name of the school with Address of the contact person
  - The PPTs should be sent to Professor R. C. Prasad by email (rcprasad@mes.ac.in) on or before Dec. 1, 2021
  - The selection of maximum 30 students from different schools will be intimated by Dec.05, 2021.
  - THIS IS A SPONSORED PROGRAM BY ASM INTERNATIONAL MATERIALS FOUNDATION, USA AND THE STUDENTS DO NOT HAVE TO BEAR ANY COST EXCEPT THEIR TO AND FRO TRAVELLING EXPENSES
  - LUNCH & EVENING SNACKS WILL BE PROVIDED TO THE STUDENTS AND THEIR ESCORTS/GUARDIANS BY THE ORGANIZERS WITHOUT ANY CHARGES
  - THIS IS A DAY CAMP / WORKSHOP AND SPONSORED STUDENTS MUST BE ACCOMPANIED BY SCHOOL ESCORTS/GUARDIANS AND FOLLOW ALL COVID PROTOCOLS ON ALL FOUR DAYS

For Further Information, please contact the following

Dr.R.C.Prasad, Vice chair, SFA, Mumbai  
Ex. Professor IIT Bombay  
Professor, Department of  
Mechanical Engineering PHCET Rasayani  
Mobile: 09839236812/8433883165

Mr. Sunil Singh Rajput  
Assistant Professor,  
Department of Mechanical Engg.  
PHCET, Rasayani  
Mobile:- 07276222267



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Four Days "Materials Camp" An Outreach Program of ASM International Materials Foundation USA

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and

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Organized by



Materials Camp of ASM during  
December 16-19, 2021  
Drone Workshop on last day  
Time: 9.00 am to 5.00 pm

Supported by



Venue:

Innovation & Research Centre, Ground Floor  
Pillai HOC College of Engineering & Technology  
Rasayani

Patrons:

1. Dr. K.M. Vasudevan Pillai, Chairman & CEO, MES
2. Mr. Pradeep Goyal, FASM & CMD, Pradeep Metals Ltd. Rabale, Mumbai
3. Mr. Sudhakar Bonde, Chairman, ASM International, India Chapter
4. Mr. T.S. Kathayat, COO, Welspun Corp. Ltd. Parel, Mumbai
5. Dr. K. Rajkumar, Director, IRMRA, Mumbai

Steering/ Program Monitoring Committee

1. Dr. Lata Menon, Deputy CEO, Rasayani Campus
2. Dr. Jagdish Bakal, Principal, PHCET, Rasayani
3. Prof. Munawira Kotyad Pillai, Member, IIC PHCET Rasayani
4. Dr. Vivek Singhal, Executive Director, ASM International, India Chapter
5. Mr. Suhas Sabnis, ASM International, India Chapter
6. Dr. R.C. Prasad, President, IIC PHCET Rasayani

Advisory Committee

1. Prof. Amar Mange, Principal, PHP Rasayani
2. Dr. G.V. Patil, Convener, IIC, PHCET Rasayani
3. Dr. B.K. Sarkar, IPR Activity Coordinator, ARIIA Coordinator, IIC, PHCET Rasayani
4. Dr. Mansi Subhedar, Vice President, IIC, PHCET Rasayani
5. Dr. M.D. Nadar, Coordinator, Innovation Activity
6. Dr. Shilpa Kewate, Startup Activity Coordinator, IIC, PHCET Rasayani
7. Dr. Divya Chirayil, NISP Coordinator, IIC, PHCET Rasayani
8. Prof. Raju Narwade, Internship Activity Coordinator, IIC, PHCET Rasayani
9. Prof. Karthik Nagrajan, Social Media Coordinator, IIC, PHCET Rasayani

Organizing Committee

1. Prof. Suhas Uthale, PHCET Rasayani
2. Prof. Amar Jadhav, PHCET Rasayani
3. Prof. Shashi Bhushan, PHCET Rasayani
4. Prof. Pratik Mhatre, PHCET Rasayani
5. Prof. Hemant Patil, PHCET Rasayani
6. Prof. Manoj Jadhav, PHCET Rasayani
7. Prof. K.S. Anish, PHCET Rasayani
8. Prof. Arjun Deshmukh, PHP Rasayani
9. Dr. Jayanta Behera, PHCASC Rasayani
10. Prof. Sunil Singh Rajput, PHCET Rasayani

For Further Information, please contact the following

Dr.R.C.Prasad

Ex. Professor IIT Bombay & President, IIC, PHCET Rasayani

Department of Mechanical Engg, PHCET Rasayani

Mobile: 09869236812/8433883165

Email: [prasadrc@mes.ac.in](mailto:prasadrc@mes.ac.in) / [rssppa@gmail.com](mailto:rssppa@gmail.com)



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# ASM MATERIALS CAMP

## PREFACE

*The Pandemic has transformed the teaching & learning ecosystem to digital mode. The students have been kept away from their practical classes for more than 2 years. This has resulted in deficiency in skills like critical thinking and problem solving apart from behavioral changes and structural shift in growing skill gap and talent shortfall. It is time now to go offline.*

*The four days offline ASM Materials Camp organized by the institute innovation council at the PHCET Rasayani is a joint program in association with ASM International Materials Foundation USA & ASM International India Chapter This is an outreach program designed to expose concepts of advanced materials and their applications in industries. Hands on experiments are planned on Design, Fabrication of PCBs, Sensors, 3D printing, Making Shaping & Treating of steels and their Structure property correlation (Mechanical, NDT, Microstructural) under the guidance of Professors, Industry Experts and students from IIT Bombay & PHCET Rasayani. Short lectures and interactive Lab Sessions will culminate in Drone Workshop on the last day*

*Concurrent with this Materials Camp an exhibition, startup idea competition and business plan is organized to excite young minds and to prepare them for a new evolved talent ecosystem for developing skills and continuous learning mindsets to meet the global challenges.*

*The students / faculty will present innovative ideas (idea competition) that will be weighed for their potential applications by industry experts. The start-up ideas of students / faculty members shall be exposed to investors and mentors to forge collaboration between the startups and business leaders through the business competition. Working together with business leaders, educators and mentors is expected to bring a structural shift in reimagining the skilling-up landscape and building the skill gap and talent shortfall.*

**Dr. R. C. Prasad**

**Convener & President IIC @ PHCET**



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# ASM INDIA CHAPTER

ASM International is a premier educational society of metallurgists, materials scientists and technologists. ASM International is an interactive resource of materials information, and a conduit for professionals to meet, interact and share ideas. A worldwide Network led by Members, guided by Member Needs, and fueled by Members Participation. ASM enables its members to keep abreast of the latest technological and marketing trends. It offers invaluable opportunities to interact and learn from fellow materials engineers across the country and around the world, thus helping to stay competitive and sharpen creative vision. ASM offers excellent networking link, giving an instant access to insights and wealth of information through its technical books, acclaimed handbooks, engineering software and CD-ROMS. ASM is the information sharing network for anyone who works with metals, alloys, composites, ceramics, polymers and electronic materials.

ASM International, India Chapter established in the year 1979, is one of the most active chapter in the world. It organizes technical courses on subjects like Welding, Metallurgy for the Non-metallurgist, Metal Forming, Heat Treatment, Stainless Steels, Non-ferrous Metals, Thermal Spraying etc. under the Continued Education Program for engineers and technocrats. Other activities include Conferences, Workshops and Exhibitions on recent developments in Materials Processing. Material Application Engineering, Heat Treatment, Equipment etc. at National and International levels.

In order to increase awareness on materials technology and to excite young student community in materials science and engineering careers, ASM has been conducting one-week Materials Camps at I.I.T. Bombay, Mumbai and M. S. University of Baroda, Vadodara for the students of 11th standard to expose students to materials technology through hands-on experimental work and Industry visits. Participation in these camps is free; breakfast, lunch, course materials etc. is given free to all the participating students. These camps are found to be highly effective as quite a few students have opted Materials Technology as one of the options while entering engineering stream.



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Pillai HOC College of  
Engineering and Technology.

Pillai's HOC Educational Campus  
Rassyan, Tal. Khelapur  
Dist. Raigad, Pin-410 207

You are cordially invited  
For the Inaugural Function of the ASM Materials Camp  
On Thursday, December 16, 2021 during 10:30 AM to 12:30 PM  
Venue: Conclave -1, First floor

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#### INAUGURAL PROGRAM SCHEDULE

Time	Session Details
10:30 AM	Welcome & Opening remarks by Prof. R. C. Prasad, Coordinator and Vice Chair, SFA Mumbai Chapter
10:35 AM	Presidential Address by Dr. Priam Pillai, COO, MES
10:40 AM	Address by Dr. J. W. Bakal, Principal, PHCET Rasayani
10:45 AM	Address by Mr. Sudhakar Bonde, Chairman ASM International, India Chapter
10:50 AM	Inaugural Address by the Chief Guest Mr. Pradeep Goyal, Founder Chairman & MD, Pradeep Metals Ltd.
11:05 AM	Invited Lecture by guest of honor Dr. Rajkumar Kasilingam, Director, IRMRA, Mumbai On "Overview of Rubber Industry - Challenges and Opportunity for Students"
11:20 AM	Invited Lecture by guest of honor Dr. Virendrakumar Gupta, Head R&D & Senior VP, Reliance Research, On "Polymers as a Revolutionary Material for the Mankind"
11:35 AM	Invited lecture by guest of honor Mr. Maruti Pawar, Managing Director, Amtronics Techno Pvt. Ltd. On "Secondary Steel Making"
11:50 AM	Invited lecture by guest of honor Commodore Dr. S. C. Mittal, Indian Navy On "Materials for Naval Applications"
12:05 PM	Invited lecture by guest of honor Prof. R.S. Shevagonkar, Ex. Director, IIT Delhi, Ex. Vice Chancellor, Pune & Bennett University On "Quality Technical Education: Industry – Academia Partnership"
12:20 PM	Vote of Thanks by Ms. Suma Lalit, PHCET, Rasayani
12:25 PM	Inauguration of the Exhibition at Research & Innovation Lab, Ground floor, PHCET
12:45 PM	Lunch Break

RSVP : Dr. R. C. Prasad  
Coordinator and Vice Chair, SFA  
Mumbai Chapter  
Email ID: rcprasad@mes.ac.in  
Mobile Number : 8433883165

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## Presidential Address by Dr. Priam Pillai

Chief Operating Officer  
Mahatma Education Society

**Biodata of the Speaker :** Professor Priam Pillai obtained BS in Mechanical Engineering & Materials Science and Engineering from the University of California, Berkeley, MS & PhD in Mechanical Engineering from MIT, USA. He established research centers in GIS & Remote Sensing, Instrumentation for characterization of Polymers and a Drone Application Centre at the PCE Panvel. Currently he is the Chief Operating Officer of the Mahatma Education Society.



### **Awards and Recognitions**

Recognized Post Graduate and PhD Guide

University of Mumbai

University of Mumbai, Academic Award (2012)

Outstanding Service Award (2010) Boston Police  
Department and District Attorneys Office

Soldier Design Contest: Gore Innovation Award  
Winner (2010)

National Science Foundation (NSF) Graduate  
Research Fellowship Winner (2006-2009)

MIT Harrington Fellowship Winner (2005)

Materials Science and Engineering Department  
Citation Winner (2004)

Intel Corporation Research Scholar (2004)

Intel Student Research Contest Finalist (2004)

### **News**



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# Mr. Pradeep Goyal

Founder Chairman & MD, Pradeep Metals Limited



- Pradeep Goyal was brought up in Mumbai in a family with a background of technical and social work.

He completed his B Tech in Metallurgical Engineering at IIT Kanpur in 1978, graduating with the First Rank. Awarded silver medal by the President of India.

Indian Institute of Metals awarded him the Best Metallurgist of the year.

He completed Masters in Metallurgy at the Massachusetts Institute of Technology, USA, with a full scholarship.

After a small stint of work in USA, returned to India in 1983 to start PRADEEP METALS LIMITED.

The company manufactures and exports machined forgings.

## PROFESSIONAL

- ☑ Trustee of ASM International USA for a term of three years (2005-2008).
- ☑ Fellow of ASM International and recipient of the Distinguished Life Membership Award.
- ☑ Conducting research in a novel manufacturing process to manufacture steel using microwaves.
- Potential to save 50% energy and reduce greenhouse gases by 50%. Awarded the
- - 6th CII Industrial Intellectual Property Awards 2020 for patent basket
- - "Best Patent Portfolio Award" by SME (Manufacturing / Engineering) for the year 2021

## SOCIAL

- ☑ Past Assistant Governor of Rotary International District 3141.
- ☑ Chairman of Ekal Abhiyan Trust, an NGO that runs over 100,000 single teacher schools in tribal areas of India, teaching 2.8 million children up to 3rd grade. Recently awarded the
- Gandhi Peace prize for the year 2017.

## BUSINESS – DIRECTORSHIPS/BOARD POSITIONS

- ☑ UPL Limited
- ☑ Hind Rectifiers Limited
- ☑ IIT Bombay Research Park
- ☑ Technology Development Board, GOI
- ☑ Triton EV Technologies Pvt. Ltd.
- ☑ Nami Capital Pvt. Ltd.
- ☑ Janakalyan Sahakari Bank Limited (Former Vice Chairman)
- ☑ National Institute of Advanced Manufacturing Technology (NIAMT) - (Formerly known as NIFFT)
- ☑ Indian Institute of Technology Kanpur, Board of Governors



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## " Overview of Rubber Industry - Challenges and Opportunity for Students“

**Dr. Kasilingam Rajkumar**

Director, Indian Rubber Manufacturers Research Association, Thane

**Biodata of the Speaker :** Dr. Kasilingam Rajkumar is a Rubber Technologist from IIT Kharagpur, with excellent academic record through out the career along with 20 + years of rich experience in the field of Research & Development, Testing, Training and Consultancy services on Polymer / Rubber Technology and Currently, working as, Director, at Indian Rubber Manufacturers Research Association [IRMRA], aff. to Min. of Com. & Industry, GoI, Thane, and responsible for over all operations of IRMRA. My recently added Management Degree [MBA] in Operational Management and Doctoral Degree [PhD] in the emerging field of Polymer / Rubber Nanocomposites are added feather in my career to take any challenging leadership career in scientific and technological research and associated activities. Under my leadership, we have completed several sponsored and product development projects at IRMRA which includes evaluation of chemicals and additives in Rubber formulations, Industrial consultancy projects for MSME sectors, critical product development for defence and nuclear sectors. During my tenure of 17 years, at IRMRA, I was instrumental for the growth of IRMRA's services by acquiring key quality credentials to the organization like ISO 9001 certifications, NABL accreditations, DGMS, BIS & CEMILAC recognitions etc. Several initiatives are taken to expand its activities for business enhancement like ISO 17020 accreditation,, finalizing MoU with SARPOL, finalizing projects for Chennai center etc.



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## “Secondary Steel Making”

### Mr. Maruti Pawar

Managing Director  
**Amtronics Techno Pvt. Ltd.**  
(ISO 9001-2015 Certified Company)

**Biodata of the Speaker :** Maruti Bapu Pawar, aged 57 years old, born in village in poor agriculturist family (DOB 08.08.1964). Due to not having financial support from parents, with the hard work and sincerity got a small job and completed education up to engineering from the salary income. Since 1984, worked in various companies for about 20 years in different posts - Supervisor to General Manager. During the period of service with various Company's, got experience in various fields like process automation, Steel Plants MSS Converter working, Maintenance work, Electricals, Instruments etc. After getting sufficient experience, being qualified and hardworking nature, from the year 2004, decided to start own activity. At the beginning, started consultancy services, repairing work, etc. Slowly got purchase orders from Companies to supply parts to various manufacturing units. Afterwards, got purchase orders from manufacturing units to assemble a full unit and get the said unit in running condition and start production process.



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# “Quality Technical Education: Industry-academia Partnership”

**Raghunath K. Shevgaonkar**

former Director of IIT Delhi (2011 to 2015) and  
former Vice Chancellor of University of Pune

**Biodata of the Speaker :** 1985 Doctor of Philosophy (Ph.D.) in Electrical Engineering from I. I. T., Bombay/ (Indian Institute of Astrophysics/Raman Research Institute, Bangalore) on Maximum Entropy Restoration of Astronomical Images.  
1977 Master of Technology (M.Tech) in Electrical Engineering from IIT, Kanpur with specialization in Electromagnetics and Optical fibres.  
1975 Bachelor of Engineering (BE) in Electronics Engineering from Jiwaji University, Gwalior. **Gold Medalist.**  
2008 Executive Program, Kellogg School of Business, University of North Western, USA



## **Awards and Honours**

**IEEE William Sayle Award for Academic Leadership 2013**

**IETE Ram Lal Wadhwa Award 2012**

**IEEE UG Teaching Award 2011**

**VASVIK Award for IT and Communication 2009**

**IETE - CEOT -94 Awards** for outstanding contribution in the field of Photonics and Opto-electronics

**Fellow IEEE**

**Fellow Indian National Academy of Engineering (INAE)**

**Fellow National Academy of Science, India (FNASc)**

**Fellow Institution of Engineers**

**Fellow Institution of Electronics and Telecommunication Engineers**

**Fellow Optical Society of India**

**Fellow Maharashtra Academy of Science**

**Excellence in Teaching Award 2004 IIT, Bombay**

**Top Management Consortium Award 2010 for Academic Excellence**

**Dewang Mehta Educational Leadership Award**

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## 3D printing - a new way of making things

**Dr. Guruprasad Rao,**

Director & Mentor (Leadership Team), Imaginarium India Pvt. Ltd.

**Biodata of the Speaker :** Dr Guruprasad Rao is a Director & Mentor (Leadership Team) at Imaginarium India Pvt Ltd., India's leading 3D printing company. His current focus is on DfAM for Metal 3D printing 3D printing Medical Applications, Skill Development besides Technology mentoring and partnerships across domains. Dr Rao is a technocrat with over 30 years of experience encompassing Industry & Academia. He holds BE (Mech) with PG in Tool Engineering from GTTC , M Des in Product Design from IISc, Bengaluru and PhD from IIT Bombay. For his terminal degree, he worked on Medical applications of 3D Printing. His industrial assignments include Titan, Tanishq, Crompton Greaves and presently at Imaginarium. He joined Imaginarium as CEO and is presently designated as Mentor - Director. He has taught design at IISc, NIFT, JSSATE and NTTF. He was Professor & Head, Project Office IICD, Jaipur. He also teaches courses on Emerging technology and its impact at SPJMR and KJ Somaiya Business Schools. He is also a mentor at KIIT-TBI, Bhubaneshwar and guides start-ups on design and technology. Dr Rao is associated with many industry bodies such as CII / FICCI / NASSCOM /BIS / IAMF / Atal Innovation Mission. As CII Conference Chairman, he successfully led CII 3D Printing Conference 2019, Mumbai as Conference Chairman. Presently he is a part CII National Committee on Design.



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## INTELLIGENT PROCESS AND METHODS FOR CASEIN DETERMINATION IN COW-MILK ONLY

**Patent Application no:**  
**202121042117**  
**Status: Filed**

**Principal Investigator:** Dr. Archana Bhagwat  
Student Name: 1. Sushiti Sawant

**CO-Principal Investigator:** Dr. Vishakha Telgote  
2. Krutika Malkar  
3. Abhishek Ingole

### ABSTRACT

Our invention Intelligent Process and Methods for Casein Determination in Cow Cow-milk only is to the substance of casein in cow-milk is dictated by more than two-estimations of infrared absorbance in a cow-milk test by infrared spectrometry prior and then afterward a partition of the casein. The casein content is determined by utilization of absorbance information recorded during the any two absorbance estimations. The new strategy is extensive quicker than the known wet-substance techniques. For example: the typical wet compound reference technique for casein assurance in cow-milk utilizing a "Advanced Kjeldahl nitrogen" assurance of the cow-milk test, then, at that point a cogulation of the cow-milk, lastly an Advanced Kjeldahl nitrogen assurance of the filtrate. Further the new invented technique gives a more dependable precision than the realize assurance utilizing a solitary infrared investigation of a cow-milk test. The imaginative technique comprises in isolating unpasteurized cow-milk in a separator, wherein a skimmed cow-milk and fats are isolated. Said invented technique is described in that it comprises in purifying said skimmed cow-milk in a pasteurizer still up in the air temperature, in cooling said cow-milk and passing on it to a transitional equilibrium tank from which the cow-milk is provided to a miniature sifting layer type channel for partitioning it into casein and whey proteins, in providing the isolated casein protein to a film type ultrafiltration-defiltration channel, wherein the concentrated item is moved to a drier for drying, and in cooling and pressing the in this way delivered water-solvent casein flour.

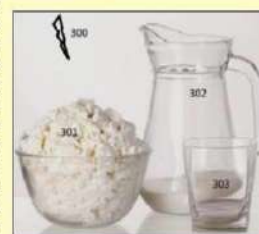
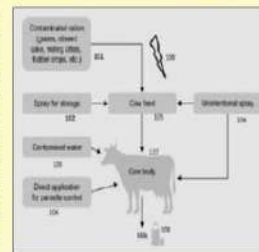
### PROCESS AND METHOD



### RESEARCH OUTCOMES /CLAIMS

1. Our invention Intelligent Process and Methods for Casein Determination in Cow Cow-milk only is to a the substance of casein in cow-milk is dictated by more than two-estimations of infrared absorbance in a cow-milk test by infrared spectrometry prior and then afterward a partition of the casein. The casein content is determined by utilization of absorbance information recorded during the any two absorbance estimations. The new strategy is extensive quicker than the known wet-substance techniques. For example: the typical wet compound reference technique for casein assurance in cow-milk utilizing a "Advanced Kjeldahl nitrogen" assurance of the cow-milk test, then, at that point a cogulation of the cow-milk, lastly an Advanced Kjeldahl nitrogen assurance of the filtrate. Further the new invented technique gives a more dependable precision than the realize assurance utilizing a solitary infrared investigation of a cow-milk test. The imaginative technique comprises in isolating unpasteurized cow-milk in a separator, wherein a skimmed cow-milk and fats are isolated. Said invented technique is described in that it comprises in purifying said skimmed cow-milk in a pasteurizer still up in the air temperature, in cooling said cow-milk and passing on it to a transitional equilibrium tank from which the cow-milk is provided to a miniature sifting layer type channel for partitioning it into casein and whey proteins, in providing the isolated casein protein to a film type ultrafiltration-defiltration channel, wherein the concentrated item is moved to a drier for drying, and in cooling and pressing the in this way delivered water-solvent casein flour.

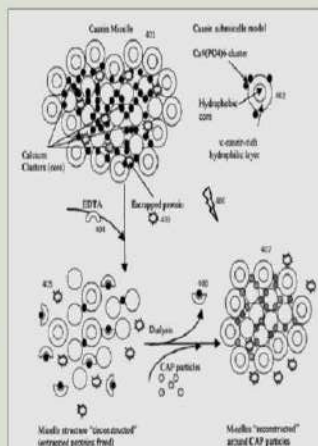
### RESEARCH DIAGRAM



### RESEARCH OBJECTIVES

1. The objective of the invention is to provide a Intelligent Process and Methods for Casein Determination in Cow Cow-milk only is to a the substance of casein in cow-milk is dictated by more than two-estimations of infrared absorbance in a cow-milk test by infrared spectrometry prior and then afterward a partition of the casein.
2. To provide casein content is determined by utilization of absorbance information recorded during the any two absorbance estimations. The new strategy is extensive quicker than the known wet-substance techniques.
3. To provide a invented technique is described in that it comprises in purifying said skimmed cow-milk in a pasteurizer still up in the air temperature, in cooling said cow-milk and passing on it to a transitional equilibrium tank from which the cow-milk is provided to a miniature sifting layer type channel for partitioning it into casein and whey proteins, in providing the isolated casein protein to a film type ultrafiltration-defiltration channel, wherein the concentrated item is moved to a drier for drying.

### CASEIN COW-MILK STRUCTURE



### REFERENCES

1. Ms. Krutika Mahendra Malkar, Mr. Abhishek Jeevan Ingole, Ms. Sushiti Satyawan Sawant, Dr. Vishakha Telgote, Dr. Archana Bhagwat, "Intelligent Process and Methods for Casein Determination in Cow-milk only" MAHATMA EDUCATION SOCIETY'S PILLAI HOC COLLEGE OF ARTS, SCIENCE AND COMMERCE RASAYANI TALUKA KHALAPUR DISTRICT RAIGAD MAHARASHTRA 410207, INDIA, Patent no: 202121040919, date: 09-09-2021, 2021, Patent office India.
2. <https://patentsearch.gov.in/PatentSearch/View/56/56/Search/ApplicationStatus>
3. <https://iprindia.gov.in/other-publications/Item-Part-1-Part-2-Part-3>
4. <https://www.ipso.int/patents/copen/202121040919/>
5. Ms. Krutika Mahendra Malkar, Mr. Abhishek Jeevan Ingole, Ms. Sushiti Satyawan Sawant, Dr. Vishakha Telgote, Dr. Archana Bhagwat, "Intelligent Process and Methods for Casein Determination in Cow-milk only" MAHATMA EDUCATION SOCIETY'S PILLAI HOC COLLEGE OF ARTS, SCIENCE AND COMMERCE RASAYANI TALUKA KHALAPUR DISTRICT RAIGAD MAHARASHTRA 410207, INDIA, Patent no: 202121040919, date: 09-09-2021, 2021, Patent office India.

Sawant

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# Device to Detect the Fruit and vegetable order and natural product (Apple) Disease

PI: Dr. Jayanta K Behera  
Co-PI: Dr. Sapana Chilte

Patent Application  
202121047457

Status: Filed

## ABSTRACT

Our development "Device to Detect the Fruit and vegetable order and natural product (Apple) Disease" is pictures are a significant wellspring of information and data in the horticultural sciences. The usage of picture getting ready procedures has striking implications for the assessment of country errands. Like Fruit and vegetable gathering is one of the critical applications that can be utilized in supermarkets to thus perceive such regular items or vegetables purchased by customers and to choose the fitting expense and Quality for the produce. Getting ready close by is the major fundamental for this kind obviously of activity which is all things considered achieved by the customers having practically no expert data. We investigated different strategies utilized in tending to products of the soil characterization and in perceiving organic product (apple) sickness issues. We overviewed picture handling approaches utilized for organic product sickness identification, division and order. We likewise thought about the presentation of cutting edge techniques under two situations, i.e., products of the soil arrangement and natural product sickness grouping. The techniques studied in this innovation can recognize among various types of foods grown from the ground infections that are exceptionally similar in shading and surface.

## RESEARCH OBJECTIVES

The objective of the invention is to provide a development "Device to Detect the Fruit and vegetable order and natural product (Apple) Disease" is pictures are a significant wellspring of information and data in the horticultural sciences.

The other objective of the invention is to provide a utilization of picture preparing strategies has remarkable ramifications for the examination of rural tasks.

The other objective of the invention is to provide a Like Fruit and vegetable grouping is one of the significant applications that can be used in grocery stores to consequently recognize the sorts of natural products or vegetables bought by clients and to decide the fitting cost and Quality for the produce.

The other objective of the invention is to provide a Preparing nearby is the fundamental essential for this sort of course of action which is by and large brought about by the clients having almost no master information. We investigated different strategies utilized in tending to products of the soil characterization and in perceiving organic product (apple) sickness issues.

The other objective of the invention is to provide a We overviewed picture handling approaches utilized for organic product sickness identification, division and order.

The other objective of the invention is to provide a likewise think about the presentation of cutting edge techniques under two situations, i.e., products of the soil arrangement and natural product sickness grouping.

## RESEARCH DIAGRAM

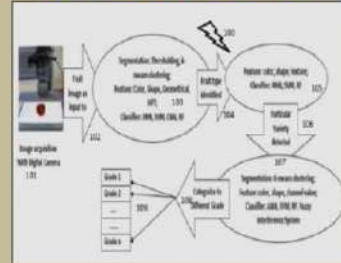


FIG.1: Device to Detect the Fruit and Vegetable Classification and fruit (Apple) Disease Flow Chart.

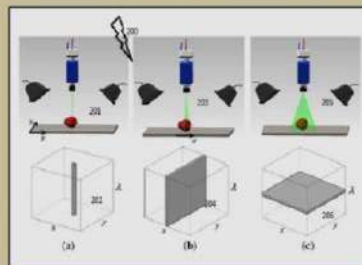


FIG.2: Device to Detect the Fruit and Vegetable Classification and fruit (Apple) Disease Block Diagram.

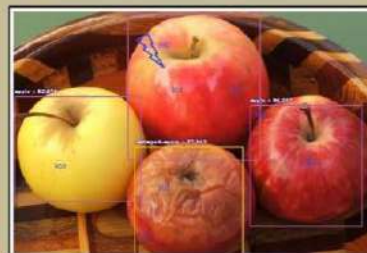


FIG.3: Device to Detect the Fruit and Vegetable Classification and fruit (Apple) Disease.

## RESEARCH OUTCOMES/CLAIMS

Our development "Device to Detect the Fruit and vegetable order and natural product (Apple) Disease" is pictures are a critical wellspring of data and information in the green sciences. The usage of picture getting ready methodologies has exceptional consequences for the assessment of provincial undertakings. Like Fruit and vegetable gathering is one of the critical applications that can be utilized in supermarkets to thus perceive such normal items or vegetables purchased by customers and to choose the fitting expense and Quality for the produce. Preparing nearby is the fundamental essential for this sort of course of action which is by and large brought about by the clients having almost no master information. We investigated different strategies utilized in tending to products of the soil characterization and in perceiving organic product (apple) sickness issues. We overviewed picture handling approaches utilized for organic product sickness identification, division and order. We likewise thought about the presentation of cutting edge techniques under two situations, i.e., products of the soil arrangement and natural product sickness grouping. The techniques studied in this innovation can recognize among various types of foods grown from the ground infections that are exceptionally similar in shading and surface.

1. According to claim1# the invention is to a development "Device to Detect the Fruit and vegetable order and natural product (Apple) Disease" is pictures are a significant wellspring of information and data in the horticultural sciences.

2. According to claim1, 2, 3 # the invention is to a Preparing nearby is the fundamental essential for this sort of course of action which is by and large brought about by the clients having almost no master information. We investigated different strategies utilized in tending to products of the soil characterization and in perceiving organic product (apple) sickness issues.

3. According to claim1, 2, 3, 4# the invention is to a We overviewed picture handling approaches utilized for organic product sickness identification, division and order.

4. According to claim1, 2, 3, 4# the invention is to likewise think about the presentation of cutting edge techniques under two situations, i.e., products of the soil arrangement and natural product sickness grouping.

5. The techniques studied in this innovation can recognize among various types of foods grown from the ground infections that are exceptionally similar in shading and surface.

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Rasayani.

*Pillai*

DEPARTMENT OF CIVIL ENGINEERING



**"Sustainable Sandwich Composite Circular Manhole Cover  
Designed for Pedestrian Networks"**

Patent Application No. 202121052897



Mrs. Sonam P. Bhopatrao

Applicants: Mrs. Sonam P. Bhopatrao, Dr. Shilpa Kewate.

Dr. Shilpa Kewate

**Novelty**

- Bamboo has been used as a substitute material in different structures, but it is used first time in a circular manhole cover. RGC manhole covers are being in danger of stealing as it has good scrap value in the black market which is a cause of many accidents and health problem. Bamboo reinforced manhole cover can be a solution to this problem as it has zero scrap value and the load-carrying capacity of this product is within the permissible limit as per IS: 2000(kt. 9.3)

**Mission:**

- Use an environmentally friendly product for creating a sustainable livelihood for farmers.

**Mission:**

- To create employment in the rural area and generate an alternate source of income for farmers.

**Values:**

- Innovative product, create employment, make Atmanirbhar Bharat.

**Applications**

- This type of manhole cover comes under the category of LD 2.5 and it is suitable for pedestrian networks and for low-traffic areas.

Low traffic area

Pathways

Gardens & Parks

Residential area

**Objective**

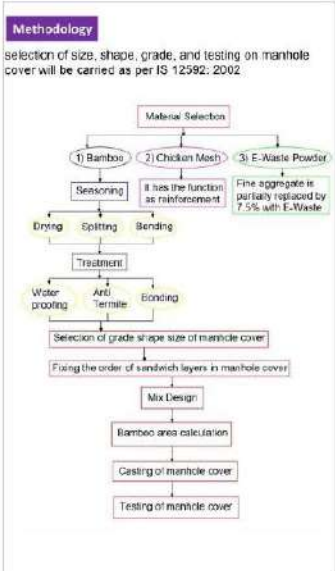
- To investigate the feasibility of bamboo as a replacement to steel reinforcement with an approach towards sustainable development in a manhole cover.

**Materials**

Bamboo Reinforcement

Chicken Mesh

E-Waste Powder



**Product details**

Dimension of proposed product

Sustainable outcome

- Grade of a manhole cover selected is LD-2.5
- Design mix used is M30
- Fine aggregate is partially replaced with E-Waste Powder by 7.6%
- Steel reinforcement is replaced with Bamboo.
- Chicken mesh is added to both sides of bamboo reinforcement which will impart more strength.

**Treatments on bamboos**

Sikadur 22 Gel



**Problem Statement**

- The construction sector contributes an extensive amount of carbon footprint from the manufacturing process of steel and cement.
- Due to abundant non-renewable resources used for steel manufacturing, steel prices are rising day by day.
- As steel-reinforced manhole cover and mild steel manhole cover has a good resale value, this manhole cover is in danger of being stolen, which may cause accidents due to open holes left on the road.

**We claim**

- The non-renewable materials such as steel are being replaced with bamboo which has the potential of getting similar results as steel reinforcement in the concrete manhole cover.
- According to claim 1# the application of bamboo reinforcement in manhole cover will achieve the desired strength of light-duty manhole cover of  $\geq 25\text{KN}$ .
- According to claim 1, 2# the invention is to the bamboo reinforcement, the durability of manhole cover will increase as it overcomes the problem of corrosion of steel reinforcement.
- According to claim 1, 2, 3# the invention is to the Bamboo reinforcement in manhole cover the cost can be reduced as compared to steel reinforced manhole cover.
- According to claim 1, 2, 4# the invention is to the carbon footprint emission can be reduced using bamboo reinforcement in a manhole cover.

**Conclusion**

- This newly developed sustainable sandwich composite circular manhole cover will have a good impact on cost and environmental aspects.

*Sonal*

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### About us

Established in 1958, as a small scale R & D Institute, has now become an internationally well known Centre of Excellence both for non-tyre & tyre sectors in our country.

At present, **IRMRA** is under jurisdiction of Dept. of Industrial Policy & Promotion, Ministry of Commerce & Industry, Govt. of India, New Delhi.

In the last 60 years, with the help of state-of-the-art facilities created with the financial assistance granted by Ministry of Commerce & Industry, Govt. of India and expertise developed by our talented scientists, **IRMRA** has rendered remarkable service to rubber & allied Industries such as polymer, paints, chemicals, textile, etc. in India.

**IRMRA** is well known for its expertise in the fields of Testing and Investigations, Research and Products / Compound development, Training & Manpower Development and Consultancy Services, and has diversified its activities in the new sophisticated areas such as Nano and Latex Technologies as well as Rubber Engineering.

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# About OHT FASTCOMP PRIVATE LIMITED

(Formerly OM HEAT TREATMENT PVT LTD)

From our inception, we at M/s OHT FASTCOMP PRIVATE LIMITED (Formerly OM HEAT TREATMENT PVT LTD) have been a closely held family business clinging to our values of TRUST, INTEGRITY and being CUSTOMER CENTRIC.

Three decades ago, we began our journey by providing heat treatment services to critical engine components like crankshaft and machining of piston pins and piston. Our founder Mr. S.B. Gupta has had 40 years' experience in machining shop and SPM designing. With his expertise and direction, OHT FASTCOMP has diversified in critical components and has pioneered the manufacturing of cold forged components.

#### Manufacturing Facilities

Our manufacturing facilities have an area of 300,000 sq. feet spread across 2 plants located in the state of Maharashtra, India. Both plants are equipped with state of the art machines along with Scada based processes for quality control. We at OHT FASTCOMP are geared with a customer-oriented approach where each requirement is carefully considered and achieved ensuring quality and reliability.

#### Our People

- Our excellent and competent team is responsible for our success. We have attained a leading position in the industry because of our holistic approach towards the manufacturing, Quality control and Human Resource Development.
- *Today, we are a leading supplier across India in the segment of Automobile, Electrical, Consumer Appliances, Construction.*



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# MAHATMA EDUCATION SOCIETY

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## INSTITUTIONS CONDUCTED

### SCHOOLS

- (S.S.C. PROGRAMME)**
- Chembur English Pre-Primary & Primary School - Chembur
  - Chembur English High School - Chembur
  - Chembur Marathi Madhyamik Shala - Chembur
  - Powal Marathi Madhyamik Shala - Powal
  - Mahatma School of Academics and Sports - Khanda Colony, New Panvel (Pre-Primary, Primary & Secondary, English & Marathi Media)
  - HOC International School - Rasayani (English & Marathi Media)
- (CBSE PROGRAMME)**
- Mahatma International School - Khanda Colony, New Panvel
  - HOC International School - Rasayani

### JUNIOR COLLEGES

- Chembur English Junior College - Chembur
- Mahatma Night Junior College - Chembur
- Mahatma School of Academics & Sports, Junior College of Arts, Science & Commerce - Khanda Colony, New Panvel
- HOC Junior College - Rasayani (Junior College of Arts, Commerce, Science with Vocational)

### TEACHERS' TRAINING INSTITUTIONS

D.T.Ed. B.Ed. B.P.Ed. M.Ed. Ph.D.

- Approved by National Council for Teacher Education (NCTE) (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- Mahatma Junior College of Education (D.T.Ed.) - Chembur (English & Marathi Media)
  - Pillai College of Education & Research (B.Ed.), Chembur Re-Accredited 'A' Grade by NAAC
  - Pillai College of Education & Research (D.Ed.), Accredited 'A' Grade by NAAC - Khanda Colony, New Panvel
  - Pillai HOC College of Education & Research (B. Ed), Rasayani
  - Vidyadhiraja College of Physical Education & Research (B.P.Ed), Khanda Colony, New Panvel
  - Pillai College of Education & Research (M.Ed.), Chembur
  - Pillai College of Education & Research (M.Ed.), Accredited 'A' Grade by NAAC - Khanda Colony, New Panvel
  - Pillai College of Education & Research (Ph.D Centre), Khanda Colony, New Panvel

### INTERNATIONAL SCHOOLS & INTERNATIONAL JUNIOR COLLEGES

- (CIPP / IGCSE/ICSE/IB SCHOOLS) 'AS' / 'A' level and 'IB' Programme
- Dr. Pillai Global Academy - Gorai - New Panvel

### POLYTECHNIC (3-Year Diploma Programme)

- AICTE Approved, Recognized by Govt. of Maharashtra & Affiliated to MSBTE
- Pillai HOC Polytechnic - Rasayani
- Diploma in Computer Engineering  
Diploma in Electronics & Tele-communication Engineering  
Diploma in Mechanical Engineering  
Diploma in Civil Engineering

### DEGREE COLLEGES

#### Bachelor and Master

- (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- Mahatma Night Degree College of Arts & Commerce - Chembur
  - Pillai College of Arts, Commerce & Science - New Panvel Re-Accredited 'A' Grade by NAAC
  - B.Com.
  - B.Com. (Accounting & Finance)
  - B.Com. (Financial Markets)
  - B.M.S.
  - B.M.M.
  - B. Sc. (I.T.)
  - B. Sc. (Computer Science)
  - B.Sc. (Biotechnology)
  - M.Sc. (I.T.)
  - M.Sc. (Biotechnology)
  - M.Com. (Business Management)
  - M.Com. (Accounting & Finance)
  - Pillai HOC College of Arts, Science & Commerce - Rasayani
  - B.Com.
  - B.M.S.
  - B.Sc. (I.T.)
  - B.Sc. (Computer Science)
  - B. Com. (Accounting & Finance)
  - B.M.H.
  - B.Sc. (Maths, Chemistry, Biology & Physics)
  - B.A. (English Ancillary, History & Economics)

### ARCHITECTURE

#### Bachelor and Master

- (Approved by the Council of Architecture and AICTE) (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- Pillai College of Architecture - New Panvel
  - Pillai HOC College of Architecture - Rasayani (B.Arch. 5-year degree course) **M.A.R.C.H. (Urban Design)**
  - Pillai College of Architecture - New Panvel
  - Ph.D.

### MANAGEMENT COURSE

#### MMS

- (Approved by AICTE) (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- NBA Accredited 'A' Grade by DTE, Govt. of Maharashtra
- Pillai Institute Of Management Studies & Research - New Panvel
- (MMS: 2-year Post-Graduate Course) Executive MBA
  - Pillai HOC Institute Of Management Studies & Research - Rasayani (MMS: 2-year Post-Graduate Course)

### ENGINEERING COURSE

#### Bachelor, Master & PhD

(Approved by AICTE) (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)

NBA Accredited

- Pillai College of Engineering - New Panvel
- B. E. in Information Technology
- B. E. in Computer Engineering
- B. E. in Electronics Engineering
- B. E. in Mechanical Engineering
- B. E. in Electronics
- Tele-communication Engineering
- B. E. in Automobile Engineering
- M. E. in Information Technology
- M. E. in Computer Engineering
- M. E. in Electronics Engineering
- M. E. in Mechanical Engineering (CAD/CAM, Robotics)
- M. E. in Mechanical Engineering (Thermal)

#### PhD (Technology) Computer Engineering Mechanical Engineering Information Technology

- Pillai HOC College of Engineering & Technology, Rasayani Accredited 'A' Grade by NAAC
- B.E. in Mechanical Engineering
- B.E. in Electronics & Telecommunication Engineering
- B.E. in Automobile Engineering
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- B.E. in Computer Engineering
- B.E. in Civil Engineering
- B.E. in Electrical Engineering
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- M.E. in Electronics & Telecommunication Engineering
- M.E. in Computer Engineering
- M.E. in Civil Engineering (Construction & Management)

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## **Mahatma Education Society**

The Mahatma Education Society (MES) embarked upon its mission of 'Education of All' with Chembur English School in the year 1970. The mahatma Education Society is proof of a vision linked irrevocably to national goals. Born in a time when education was deemed service, it set about bringing social and economic change through the proactive personal development of every child that came into its fold. The vision, dedication, global outlook, tenacious struggle and undaunted spirit of Dr. K. M. Vasudevan Pillai (Founder, secretary and CEO) and Dr. Daphne Pillai (Joint Secretary and Rector), the Trust grew from a single school into a multi-institution, multi-location group delivering quality education at all levels.

Today MES owns and manages over 48 institutions spread across six elegant campuses at Borivali, Chembur, Powai, New Panvel(W), New Panvel(E) and Rasayani. It manages educational Institutions' from pre-primary to post-graduation. It comprises of schools, international schools, degree colleges, night colleges, Management Institutions, Engineering colleges, Architecture colleges, colleges of Education (including Physical education) and polytechnic Institutions. Popularly known as the Pillai Group of Institutions, this education major has its own teacher training institutes, which allow it to define its own standards and to achieve 100% results unfailingly, The group has more than 35,000 students, 2,000 teachers and 1500 members of support staff.

It does so through a highly motivated faculty, a learning environment powered with the latest technologies, a spirit of innovation that sees it reach for the highest standards of accreditation in its field, and an approach that recognizes the sharing of knowledge remains the finest manifestation of a unified world. The Pillai Group is credited with several "firsts" in its field.

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# Society for Failure Analysis

[Registration No. 97/2008/HYDERABAD]



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The Society for Failure Analysis was established in the year 2006 with the patronage from many eminent experts with a mission to reduce failures that are estimated to cost 3-4% of GDP in a developing country.

## Aims & Objectives of SFA

- Promote, encourage and develop growth of "Art and Science of Failure Analysis".
- Stimulate interest in compilation of database for effective identification of root causes of failures and their mitigation.
- To serve as a common forum for individuals, organizations and industries interested to investigate root cause of failures.
- Establish liaison with Government, academic and research institutions, commercial bodies and individuals on methodologies of failure analysis and render help.
- Collaborate with appropriate international organizations for the promotion of common objectives.
- Train personnel to conduct systematic failure analysis.
- Identify and recommend areas for research and development in the country, to prevent failures.

In order to fulfill the above objectives, the society organises lectures, workshops, clinics, conferences, seminars, colloquia and courses related to failure analysis at different regional chapters spread across the country and networks with professional bodies, in addition to bringing out periodic newsletters.



For the first time, the Theme-Symposium on Failure Analysis is being jointly conducted by The Society for Failure Analysis and The Indian Institute of Metals during the NMD-ATM 2014. For further details about the society, kindly see the web page: [www.sfaindia.org](http://www.sfaindia.org).

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Organized by  
The Institute Innovation Council at The Pillai HOC College of Engineering & Technology, Rasayani  
and  
ASM International India Chapter**



Day 1 : 16 December,2021	Program itinerary
9:30 AM - 10:30 AM	Students registration & Breakfast
10:30 AM - 11:30 AM	Inaugural Program
11:30AM –12:30 PM	Exhibition
12:30 PM – 1:30 PM	Lunch Break
1:30 PM – 4:30 PM	Visit to business idea camp/Innovational/ Entrepreneurship Pavilion/Networking
4:30 PM – 5:00 PM	Evening Tea
Day 2 : 17 December,2021	Program itinerary
9:00 AM - 9:15 AM	Breakfast
9:15 AM – 10:00 AM	Lecture
10:00 AM – 1:00 PM	Hands on lab exp. On welding / Metellography & Heat treatment.
1:00 PM – 2:00 PM	Lunch Break
2:00 PM – 4:45 PM	Hands on lab exp. On welding / Metellography & Heat treatment.
4:45 PM – 5:15 PM	Evening Tea
Day 3: 18 December,2021	Program itinerary
9:00 AM - 9:15 AM	Breakfast
9:15 AM – 10:00 AM	Lecture
10:00 AM – 1:00 PM	Hands on lab exp. On CNC & 3D printing & IoT
1:00 PM – 2:00 PM	Lunch Break
2:00 PM – 4:45 P	Hands on lab exp. On CNC & 3D printing & IoT
4:45 PM – 5:15 PM	Evening Tea
Day 4: 19 December,2021	Program itinerary
8:00 AM - 8:15 AM	Breakfast
8:30 AM-9:30 AM	Inaugural Program
9:30AM – 10:30 AM	Introduction to quadrotors and multirotor
10:30 AM – 10:45 AM	Introduction to palm and – Top drone Kit
10:45 AM – 11:45 AM	Palm Top-Drone assembly
11:45 AM – 12:15 PM	Safety instruction and drone flight testing
12:15 PM - 1:15 PM	Lunch break and battery charging
1:15 PM-2:15 PM	Drone practice session
2:15PM – 3:15 PM	Drone flying competition: Qualifier Round
3:15 PM – 3:45 PM	Tea break & Battery charging
3:45 PM – 4:30 PM	Drone flying competition : Final round
4:30 PM – 5:00 PM	Distribution of certificates and closing ceremony

Swara

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# " Polymers as a Revolutionary Material for the Mankind"

## Dr. Virendra Kumar Gupta

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Reliance Corporate Park, Navi Mumbai 400 701 India  
Email: [Virendrakumar.gupta@ril.com](mailto:Virendrakumar.gupta@ril.com); Mobile: +919998965284

**Biodata of the Speaker :** Dr Virendra Kumar Gupta is currently Head, R&D Polymer & Senior Vice President, Reliance Industries Limited, Navi Mumbai. Before joining Reliance Industries Limited, he worked at the Indian Petrochemicals Corporation Limited & Gharda Chemicals Limited, India. Dr Gupta has received his PhD in Chemistry from Banaras Hindu University, Varanasi and worked at University of Alabama at Birmingham, USA

He has 40-year research experience in the areas of CO<sub>2</sub> fixation, organic/ inorganic polymers & catalysis and product technology development. He is an inventor/co-inventor of 150 patents and successfully commercialized 25 technologies in polyolefins & polysulfones products and processes. He also has 70 research publications in peer-reviewed journals and 75 invited and contributed presentations in international & national conferences. His significant & high impact technology development includes commercialization of High-Performance Ziegler Natta catalysts to produce polyolefin first time in India. He is a recipient of VASVIK award and 20 technology and product development awards including PC Ray awards for Development of Indigenous Technology by Indian Chemical Council.

He is also members of various industry and professional advisory committees. He is chairman of Industry Advisory Board (IAB) of the Polymer Science Program of Somaiya Vidyavihar University, Vice President, Society of Polymer Science India – Mumbai Chapter and Executive Council Members of Polymer Processing Academy & Asian Polymer Association. He also served as Executive Council Member, Central University of Haryana and Honorary Faculty at IIT, Roorkee.



Virendra Kumar Gupta: Ethical, R&D-Polymer Synthesis and Catalysts



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## **“ Materials for Naval Applications”**

### **Commodore (Dr) Satish Chandra Mittal**

M-802, Jasmine, Jalvayu Defence Enclave Phase I, Plot 20, Sector -20, Vashi,  
Navi Mumbai- 410210; Phone +919969184721/022-41615047  
Email: [mittal\\_scm@hotmail.com](mailto:mittal_scm@hotmail.com); DOB 02-05-1963

- An engineering doctorate degree with sound academic credentials in **various engineering disciplines** and varied and rich professional experience of over 34 years, in the delivery of maritime engineering projects beginning with conceptualisation. These included port and harbour, ship building and repairs major project delivery. The responsibilities have included Ship Operations, Marine Infrastructure Development- Project Conceptualisation, Consultancy, DPR, Project Sanction, Environmental & Other Clearances, Tendering, Contracting using FIDIC & other forms, Project Co-ordination/Monitoring, Testing/ trials and Dispute resolution through Conciliation/Arbitration.
- **Salient Projects** (approx. Rs 8000 crores) steered included the Construction & Associated Works of Dry Dock and Wharves at Mumbai, consultancy for Dry Dock construction at Kochi, Hydraulic dock blocks for ship berthing, Jetty at Porbandar, Okha & Karanja, Additional Ship Berthing facilities at Mumbai, Capital Dredging of Mumbai Harbour and Navy Bay Development, Development of hydro pneumatic fender system for alongside berthing of aircraft carrier ships at Mumbai and Karwar.
- **Core Competencies include Engineering Solutions**, Infrastructure Project Management from concept to commissioning, Contract Administration, Dispute Resolution Through Arbitration and other Court Processes
- **Education**
- **Five Years B Tech (Engg), IIT – BHU, Varanasi, First Class, 1985**
- Six months Course in Ship/Submarine Construction, Indian Navy School, Visakhapatnam, 1986
- Two years Post Graduate Diploma (Naval Construction), IIT Delhi, First Class, 1988
- Six month course Graduate Hull Technologist, Tallinn Shipyard (Estonia), 1989
- **PhD (IDP Corrosion science & Engineering) IIT Bombay 1995.** Topic “Studies of Hydrogen Embrittlement Behaviour of Fe-Mn-Al Austenitic Steel”.
- Six months Certificate Course in Computing, IGNOU, New Delhi, 1997
- Three year course, **Masters in Marketing Management**, Jarnalal Bajaj Institute of Management Studies, Bombay University, Mumbai, 2003.
- **Three years Law Course (LLB), KC College, Mumbai University, 2017. Enrolled as an advocate with Bar Council of Maharashtra & Goa Roll No: MAH/1857/2019**
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# SV-Calculator : Scientific Voice Calculator

Principal Investigator: Dr. Amit Verma CO-Principal Investigator : Dr. Babita Panda and Ms. Neethumol K G

Student Name: 1. Roshni Singh, 2. Prerna Tupe

Patent Application no:  
202121043253  
Status: Filed

## Abstract

Our invention VBI- Calculator: Voice Based Intelligent Calculator is a Base (No)<sub>n</sub> convert into a [Base (No)<sub>n+1</sub> Or Base (No)<sub>n-1</sub>] battery fueled hand-held number cruncher for performing Number system converter, mathematical and logarithmic capacities. The scales are graduated in hexadecimal base numbers and decimal base numbers for use in making traditional math and logarithmic activities in both hexadecimal and decimal bases and for changing over between voice based users inputs defined based. An electronic adding machine or microchip arrangement of the sort ideally having console input and a visual presentation is executed with a semiconductor chip having a hexadecimal/paired coded decimal configuration number-crunching unit for performing number-crunching procedure on numeric information inputted by the console further, the framework ideally incorporates an information, a location register receptive to the information, a guidance word memory for putting away various guidance words and addressable because of the location put away in the location register, and guidance word decoder rationale for interpreting guidance words yielded from the guidance word memory and for controlling the number-crunching unit accordingly thereto. A minimized electronic number cruncher involving a screen, electronic circuits, a mouthpiece, voice acknowledgment circuits which are replaceable relying on the setting of the verbal information to be gotten by the mini-computer and the language where the information is given.

## RESEARCH OBJECTIVES

- The objective of the invention is to provide a further article in the achievement of the chief object of the development to enlist the outcomes in both the paired and octal frameworks.
- The other objective of the invention is to provide a further article in the achievement of the chief item to enter either parallel or octal qualities into the machine.
- The other objective of the invention is to provide a counter register of a working out machine esteems numerated either in the twofold, Octal or decimal framework.
- The other objective of the invention is to provide a e-empower section into a computing machine of a multiplier factor in either the twofold, octal or decimal arrangement of numeration.
- The other objective of the invention is to provide a specifically condition the division system of an ascertaining machine, by a solitary manual stroke, to begin and afterward to stop the division activity after remainder finishing in every one of a majority of orders.
- The other objective of the invention is to provide benefits of the current creation will become obvious from the accompanying standard.
- According to claim 1# the invention is to a VBI- Calculator: Voice Based Intelligent Calculator is a Base (No)<sub>n</sub> convert into a [Base (No)<sub>n+1</sub> Or Base (No)<sub>n-1</sub>] battery fueled hand-held number cruncher for performing Number system converter, mathematical and logarithmic capacities.
- The other objective of the invention is to provide an electronic adding machine or microchip arrangement of the sort ideally having console input and a visual presentation is executed with a semiconductor chip having a hexadecimal/paired coded decimal configuration number-crunching unit for performing number-crunching procedure on numeric information.
- The other objective of the invention is to provide a memory for putting away various guidance words and addressable because of the location put away in the location register, and guidance word decoder rationale for interpreting guidance words yielded from the guidance word memory and for controlling the number-crunching unit accordingly thereto.
- The other objective of the invention is to provide a minimized electronic number cruncher involving a screen, electronic circuits, a mouthpiece, voice acknowledgment circuits which are replaceable relying on the setting of the verbal information to be gotten by the mini-computer and the language where the information is given.

## RESEARCH BRIEF DESCRIPTION OF THE DIAGRAM

FIG.1: EV-Calculator: Scientific Voice Calculator, Flow Chart.

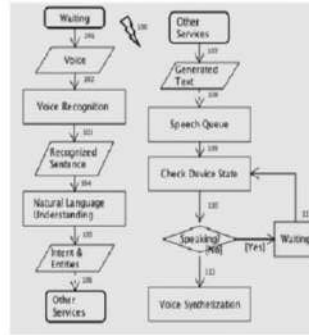


FIG.2: SV-Calculator: Scientific Voice Calculator, Block Diagram

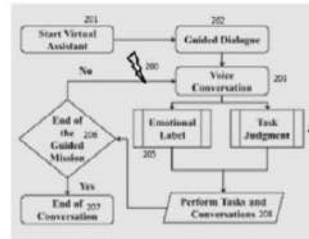


FIG.3: SV-Calculator: Scientific Voice Calculator



## RESEARCH OUT COME /CLAIMS

- Our invention SV-Calculator: Scientific Voice Calculator is a Base (No)<sub>n</sub> convert into a [Base (No)<sub>n+1</sub> Or Base (No)<sub>n-1</sub>] battery fueled hand-held number cruncher for performing Number system converter, mathematical and logarithmic capacities. The scales are graduated in hexadecimal base numbers and decimal base numbers for use in making traditional math and logarithmic activities in both hexadecimal and decimal bases and for changing over between voice based users inputs defined based. An electronic adding machine or microchip arrangement of the sort ideally having console input and a visual presentation is executed with a semiconductor chip having a hexadecimal/paired coded decimal configuration number-crunching unit for performing number-crunching procedure on numeric information inputted by the console further, the framework ideally incorporates an information, a location register receptive to the information, a guidance word memory for putting away various guidance words and addressable because of the location put away in the location register, and guidance word decoder rationale for interpreting guidance words yielded from the guidance word memory and for controlling the number-crunching unit accordingly thereto. A minimized electronic number cruncher involving a screen, electronic circuits, a mouthpiece, voice acknowledgment circuits which are replaceable relying on the setting of the verbal information to be gotten by the mini-computer and the language where the information is given.
- According to claim 1# the invention is to a SV-Calculator: Scientific Voice Calculator is a Base (No)<sub>n</sub> convert into a [Base (No)<sub>n+1</sub> Or Base (No)<sub>n-1</sub>] battery fueled hand-held number cruncher for performing Number system converter, mathematical and logarithmic capacities.
- According to claim 1,2,3# the invention is to a scales are graduated in hexadecimal base numbers and decimal base numbers for use in making traditional math and logarithmic activities in both hexadecimal and decimal bases and for changing over between voice based users inputs defined based.

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# SMART CONSTRUCTION SAFETY HELMET

Category : Engineering & Technology  
Level : PG  
MADE BY : VIKAS BURESH RAJU  
NARVADE, Dr. G.R. PATIL

## ABSTRACT

Accidents on-site are most commonly the result of carelessness or a lack of adequate safety procedures and facilities, inflicting serious injury to workers and, in some circumstances, culminating in death due to a lack of real-time monitoring of accidents on-site. Thus, the proposed paper is concerned with the integration of a standard safety helmet with various sensors such as an infrared sensor, a DS18B20 temperature sensor, a sound sensor, an MQ-3 gas sensor, and an MQ-135 smoke sensor, all of which are used to detect distinct parameters of working labourers such as drowsiness, body temperature, sound, gas leakage, and smoke concentration.

## OBJECTIVE

- To establish an economical approach for manufacturing of smart construction helmets with multifunctional features.
- To strictly adhere to the safety protocols and to prevent the laziness, and alcoholism when operating on-site.
- To limit the exploitation of construction workers lives, health and safety.
- To test the efficiency of this smart helmet against the conventional smart helmet.
- To monitor and manage the health and safety of construction workers.
- Spreading awareness of this life saving technologically advanced smart construction helmet among the construction workers.

## INTRODUCTION

The term 'accident' is a scary word that describes an unexpected and imperceptible event that occurred without an apparent cause typically resulting in damage or injury. From Civil Engineering perspective accidents mostly occur on-site due to heedlessness or insufficient safety procedures and facilities, causing serious harm to staff and sometimes resulting in death due to a lack of real-time monitoring of accidents on site. So, to avoid such probability of accidents we have developed a smart construction safety helmet that will not only monitor the factors causing accidents but also will automatically manage and deduct the salary of the workers if they avoid the safety measures. This smart helmet is composed of several parts, including an Arduino, a protective helmet, multiple sensors and a face shield. The majority of the sensors are attached to the helmet, but two of them, eye-blink and alcohol sensors, are attached to a face shield that is connected to the helmet.



Figure 1: Smart construction safety helmet

## DESIGN AND WORKING METHODOLOGY

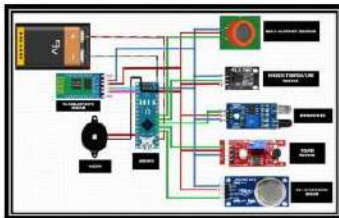


Figure 2: Circuit diagram of smart construction safety helmet

In compliance with the initiative whenever the laborer or worker will put on the smart helmet, it will automatically detect various features like attendance, temperature, sound, alcohol & drowsiness with the help of various sensors like smoke sensor, alcohol sensor, eye-blink sensor, sound sensor, temperature sensor and attendance sensor as all these sensors are embedded in the smart helmet which is controlled and connected to a Bluetooth Arduino which will transfer all the global data to main core system or computer via Bluetooth or internet.

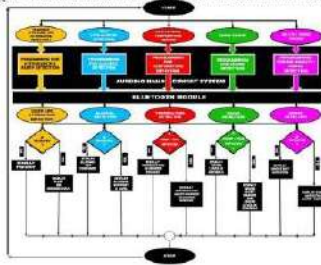


Figure 3: Working methodology of smart construction safety helmet

When a worker puts on this smart helmet, various sensors installed in the helmet trigger at the same time, processing their inputs. First, the infrared sensor scans the person's presence, which is then followed by an eye-blink sensor and an alcohol sensor which are attached on face shield of the helmet that sense the individual features including drowsiness and whether or not the worker is alcoholic or not, resulting in a safety and risk monitoring system, and the helmet is programmed in such a way that it deducts & manages the worker's salary if the worker is found sleeping/alcoholic on site, which is then supplemented by a sound sensor, a smoke sensor, and a temperature sensor, which detects the sound and smoke levels of the worker's surrounding area, as well as the worker's temperature respectively, and thus serves as a health monitoring device. All of this data is then transferred by Bluetooth Arduino to the project manager's phone, allowing him or her to track and control everything. Even the snap circuit electronics wearers if found drowsy or alcoholic during working hours.

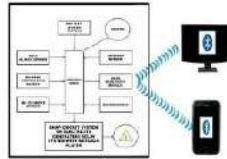


Figure 4: Block diagram of working of smart construction safety helmet

This proposes a smart construction helmet, which is a technologically advanced device that acts as an accident detection system, attendance monitoring system, safety & health monitoring system, and salary management system that project managers use for accident prevention, monitoring worker attendance, managing worker salaries and monitoring a worker's health and their surrounding environmental conditions. The helmet is embedded with an Arduino circuit and various sensors which helps the project managers to know and monitor the surrounding conditions of worker's environments and also to monitor and manage their salary.

## RESULTS FROM MOBILE AND COMPUTER SCREEN



Figure 5: Smart phone interface of supervisor or manager

When a labourer or worker puts on the smart helmet, data of various parameters and risks, such as drowsiness, temperature, sound, gas leakage, and smoke concentration, are generated by their distinct sensing sensors, such as infrared sensor, DS18B20 Temperature sensor, Sound sensor, MQ-3 Gas sensor, and MQ-135 Smoke sensor, and this unsynchronized and jumbled data is transferred on to the Arduino main via circuit system. The Arduino main serves as the primary processing unit in the smart helmet system. It gathers data from all sensors and generates warning signals depending on the coding that has previously been put into its program by managers and coders. It produces warning and alerting messages by analyzing data from its sensors. Data is provided clearly and helpfully so that the supervisor may evaluate the data generated by each worker. Based on the data, Arduino can determine if there is an alerting event, which leads Arduino to generate an alarming message informing the manager/supervisor of the likelihood of danger to the wearer. All of this data is wirelessly transferred to a manager's or supervisor's smartphone and computer screen within a 10-meter Bluetooth range.



Figure 6: Laptop or computer of supervisor or manager

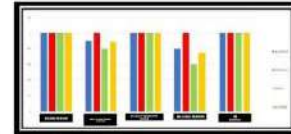


Figure 7: Performance metrics of smart construction safety helmet

## CONCLUSION

- The Arduino Uno was successfully integrated with the safety helmet, along with several sensors, throughout this study to generate a modified version.
- This system is very efficient since these sensors when combined with Arduino, provide a multitude of all-around functions that increase safety by wirelessly transferring real-time data from the sensors to the construction manager's mobile device through Bluetooth.
- Management (managers and supervisors) can send out warning signs to decontaminate low danger on-site situations.
- Case studies have demonstrated the usefulness and precision of several sensors, including their ability to start cases of alcohol, smoking, stress, drowsiness, and body temperature.

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DEPARTMENT OF CIVIL ENGINEERING  
**ECO-FRIENDLY POLYPROPYLENE PAVER BLOCK WITH  
SWAPPABLE ANTI SKID FILM**



**Patent Application no.- 202121046356**

**Applicants**



Gaurav G. Mishra



Akash S. Yadav



Dr. Shilpa P. Kewate



Pankaj K. Mahale



Sneha S. Musale

**Novelty -**

- unique design with a swappable anti-skid film
- no need of replacing the whole paver block due to the color fading of upper layer or due to wear & tear
- Eco-friendly in nature, as the recycled material used in the manufacturing

**Applications**



- gardens, pedestrian and cycle way etc.
- non-traffic and light traffic road.
- near moisture zones such as swimming pool, approach towards waterfall and river ghats

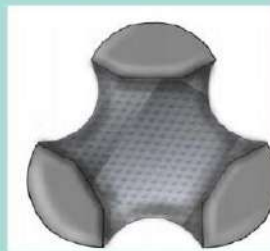
**Material**

Polypropylene      Crushed Sand (VSI)      Fly Ash



**Objectives**

- To increase the wear & tear resistance of the paver blocks.
- To increase the service life of paver blocks
- To provide pedestrians with better safety features.
- To prevent the growth of algae and lichen on the paver blocks when in contact to moisture.
- To replace the existing paver block with newly developed product for sustainable environment.



**Results**

According to IS 15658:2006

Water absorption (should be less than 0.5%)

• Water absorption Test

IDENTIFICATION	PERCENTAGE WATER ABS.	AVG WATER ABS. (%)
1	0.33	0.11
2	0	
3	0	

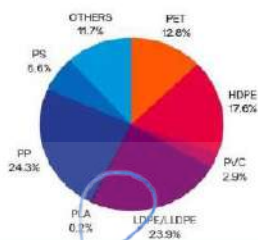
According to IS 15658:2006

Compressive strength (in between 15 N/mm<sup>2</sup> to 35 N/mm<sup>2</sup>)

• Compression Test

IDENTIFICATION	AREA (mm <sup>2</sup> )	LOAD (N)	COMPRESSIVE STRENGTH (N/mm <sup>2</sup> )	AVG COMP. STRENGTH (N/mm <sup>2</sup> )
1	34540	1000x10 <sup>3</sup>	28.95	28.81
2	33790	1000x10 <sup>3</sup>	29.60	
3	33170	525x10 <sup>3</sup>	27.89	

**PLASTIC WASTE (2021% OF TOTAL IN MSW)**



**Conclusions**

- The compressive strength of paver blocks shows enhanced result for replacement of sand by 16 to 17% of polypropylene.
- The proportion (1:1.41:0.21) (Ratio of P.P: crush sand: Fly Ash) is found to be the best proportion.
- newly developed paver block design for non-traffic and traffic zone for satisfactory result.
- In water absorption test, plastic paver blocks were found to absorb minimal percentage of water, which makes them good in water absorption.



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HEX-GRID WITH A COMBINATION OF CELLULAR LIGHTWEIGHT CONCRETE AND PAPERCRETE TO CONSTRUCT HIGH STRENGTH LIGHTWEIGHT PARTITION WALLS

AIR WALL

SAY HELLO TO THE FUTURE OF BUILDING CONSTRUCTION

Novelty

- The hex grid technology, which combines two distinct types of concrete in the inner core of the wall, will help it achieve a high level of strength and good quality at an affordable cost.
- We are replacing the use of natural sources with recycled materials and making our product more sustainable. Alternatively it will reduce waste of landfills.

Materials



Aim & Objectives

- To get a partition wall that is light in weight as well as has relatively high strength.
- To introduce a new form of concrete in the market which is light in weight.
- To compare the results of various tests on concrete with the traditional concrete.
- To find out the compressive strength of the combined concrete wall made up of CLC and Papercrete.
- To find out the efficiency of hex grid in the partition walls on the application of load.
- To make it economically feasible and sustainable by using recycled newspapers and hex grid technology.

Conclusion

- Small airspaces and recycled newspapers are naturally occurring resources that can be used to replace steel and sand with reinforced concrete hex grid (inspired from Beehive).
- The Hex grid technology will help the wall panels to cut the dead load in half.

Expected outcomes

- This wall will have the following properties required for a good partition wall:
  - Privacy concerning the sight and sound
  - Material is light in weight, uniform and durable with high strength
  - Fire heat and dampness are resistant and strong to support sanitary fittings as well as heavy fixtures
  - Easy to construct and economical with good coherence

Hex Grid technology has the geometry of a honeycomb, which allows the minimization of the amount of used material to reach minimal material cost and minimal weight. Also, it will provide strength in tension, and high out-of-plane compression properties in a main-made honeycomb structure because they have an array of hollow cells formed between the vertical walls.

Applications



air-wall



HEX GRID



MEET OUR TEAM



Vision

Air-Wall will provide customers with an end-to-end solution, thus participating in realizing their dream homes and lifestyles.

Mission

To create the most up-to-date technologies in the field and adhere to strict deadlines without sacrificing quality.

Values

Interiors, Renovation or New Construction

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# Automatic Air Fill in Bike, Scooty and Car Tyres

Principal Investigator: Dr. Gajendra V. Patil  
Student Name: 1. Gaurav S. Patil.

CO-Principal Investigator: Dr. M.D. Nadar and Mr. Hernant Patil  
2. Pranav A. Gawand. 3. Sagar D. Tate 4. Yash H. Hansora

Patent Application no:  
202121042117  
Status: Filed

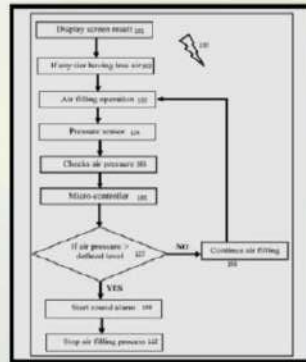
## ABSTRACT

Our invention *Automatic Air Fill in Bike, Scooty and Car Tyres* is a Point of this programmable kit research show that a drop in Tyre pressure by only a couple of PSI can bring about the decrease mileage. Our invention and effectively carries out the utilization of a versatile blower that will supply air to every one of the four Tyres through hoses and a revolving joint fixed between the wheel axle and wheel center point at each wheel. The revolving joints viably permit air to be directed to the Tyres without the tangling of hoses (max 60 RPM). A programmed vacuum apparatus for vehicle wheel Tyres, particularly those without tubes, uses an air cylinder with a chamber fixed on an edge which empowers its cylinder plate to contact and be moved by the inside Tyre surface progressively by the wheel pivot compacting air into the Tyre chamber until the pressing factor develops adequate and the cylinder pole no longer contacts the inside Tyre surface. Then, at that point a cylinder plate of a pressing factor check cylinder is lifted up making an electric association with cut the power from the blower and the cylinder pole recuperates its unique position.

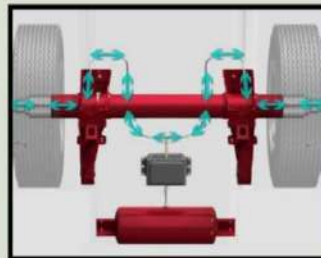
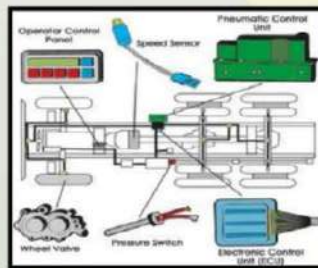
## RESEARCH OBJECTIVES

1. The objective of the invention is to provide the invention is to our invention Automatic Air Fill in Bike, Scooty and Car Tyres is a Point of this examination show that a drop in Tyre pressure by only a couple of PSI can bring about the decrease mileage.
2. The objective of the invention is to provide a plan proposes and effectively carries out the utilization of a versatile blower that will supply air to every one of the four Tyres through hoses and a revolving joint fixed between the wheel axle and wheel center point at each wheel and also the revolving joints viably permit air to be directed to the Tyres without the tangling of hoses.
3. The objective of the invention is to provide a programmed vacuum apparatus for vehicle wheel Tyres, particularly those without tubes, uses an air cylinder with a chamber fixed on an edge which empowers its cylinder plate to contact and be moved by the inside Tyre surface progressively by the wheel pivot compacting air into the Tyre chamber until the pressing factor develops adequate and the cylinder pole no longer contacts the inside Tyre surface.
4. The objective of the invention is to provide a then that point a cylinder plate of a pressing factor check cylinder is lifted up making an electric association with cut the power from

## FLOW CHART



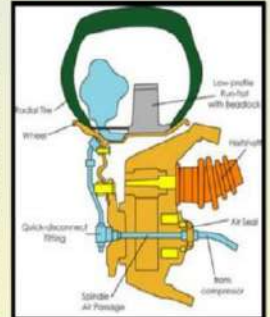
## WORKING OF SYSTEM



## RESEARCH OUT COME / CLAIMS

1. Our invention Automatic Air Fill in Bike, Scooty and Car Tyres is a Point of this examination show that a drop in Tyre pressure by only a couple of PSI can bring about the decrease mileage. Our plan proposes and effectively carries out the utilization of a versatile blower that will supply air to every one of the four Tyres through hoses and a revolving joint fixed between the wheel axle and wheel center point at each wheel. The revolving joints viably permit air to be directed to the Tyres without the tangling of hoses. A programmed vacuum apparatus for vehicle wheel Tyres, particularly those without tubes, uses an air cylinder with a chamber fixed on an edge which empowers its cylinder plate to contact and be moved by the inside Tyre surface progressively by the wheel pivot compacting air into the Tyre chamber until the pressing factor develops adequate and the cylinder pole no longer contacts the inside Tyre surface.
2. According to claim 1, 2# the invention is to an our invention Automatic Air Fill in Bike, Scooty and Car Tyres is a Point of this examination show that a drop in Tyre pressure by only a couple of PSI can bring about the decrease mileage.
3. According to claim 1, 2# the invention is to an plan proposes and effectively carries out the utilization of a versatile blower that will supply air to every one of the four Tyres through hoses and a revolving joint fixed between the wheel axle and wheel center point at each wheel and also the revolving joints viably permit air to be directed to the Tyres without the tangling of hoses.
4. According to claim 1, 2, 3# the invention is to an programmed vacuum apparatus for vehicle wheel Tyres, particularly those without tubes, uses an air cylinder with a chamber fixed on an edge which empowers its cylinder plate to contact and be moved by the inside Tyre surface progressively by the wheel pivot compacting air into the Tyre chamber until the pressing factor develops adequate and the cylinder pole no longer contacts the inside Tyre surface.
5. According to claim 1, 2, 3 # the invention is to a Then, at that point a cylinder plate of a pressing factor check cylinder is lifted up making an electric association with cut the power from the blower and the cylinder pole recuperates its unique position.

## WORKING OF SYSTEM



## DISPLAY SCREEN RESULT



## REFERENCES

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# About Pradeep Metals Limited



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The production plant is integrated with state-of-the-art facilities for design, die tooling, laboratory testing, cutting, forging, heat-treating, and machining.

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### **ASM Materials Camp- 2022**

Event Date: 16<sup>th</sup> to 19<sup>th</sup> December 2021

Department: Mechanical Engineering

Mode of Conduct: Physical

Theme: Interaction with an Industry experts

Organizers: Dr. R.C. Prasad, Dr. G. V. Patil & Mr. Sunilsing Rajput

Speakers: **Various resource persons**

No of Students Participated: 45

No of Faculty Participated: 12

Social Media Link:

Description: The four days offline ASM Materials Camp organized by the institute innovation council at the PHCET Rasayani is a joint program in association with ASM International Materials Foundation USA & ASM International India Chapter This is an outreach program designed to expose concepts of advanced materials and their applications in industries. Hands on experiments are planned on Design, Fabrication of PCBs, Sensors, 3D printing, Making Shaping & Treating of steels and their Structure property correlation (Mechanical, NDT , Microstructural) under the guidance of Professors, Industry Experts and students from IIT Bombay & PHCET Rasayani. Short lectures and interactive Lab Sessions will culminate in Drone Workshop on the last day.

Session started with welcoming of chief guest, all eminent speakers, faculties and school students. During this camp, students went through the various innovative / prototype ideas developed. Students also got hands on experience on Welding, 3D printing of sample objects, metallography, CNC machining and Internet of things. ASM Materials camp ended with vote of thanks by program co-coordinator followed by certificate distribution to all participants. Event was sponsored by ASM India chapter for the purpose of developing skills like critical thinking and problem solving apart from behavioral changes and structural shift in growing skill.

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**Four Days "Materials Camp" An Outreach Program of ASM  
International Materials Foundation, USA**

**Organized by**

**The Institute Innovation Council at The Pillai HOC College of Engineering &  
Technology, Rasayani  
and  
ASM International India Chapter**



**Organized by**



**Supported by**



**Material Camp of ASM During December 16-19, 2021  
Drone Workshop on last day**

**Time 09:00 am to 05:00 pm**

**Venue- Innovation & research Centre, Ground Floor, Pillai HOC  
College of Engineering & Technology, Rasayani**

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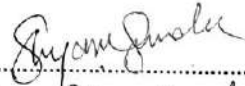
**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan. 21<sup>st</sup> titled " NDE of Composites- Trends and Advances" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Shyamsunder M.
2.	Bank account number	771050012564
3.	Bank name	HDFC Bank
4.	Bank branch address	IT PARK, BANGALORE
5.	Branch IFSC code	HDFC0000077
6.	Mobile number	9880508266
7.	PAN	AOVPS7416M

Signature: 

Name: Dr. Shyamsunder M

Designation: Chairman

Affiliation: NCB-ISNT



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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan. 21<sup>st</sup> titled "Processing and Properties of Metal Foams" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	M. Ramji
2.	Bank account number	30980078568
3.	Bank name	State Bank of India
4.	Bank branch address	IIT Hyderabad
5.	Branch IFSC code	SBIN0014182
6.	Mobile number	9490130175
7.	PAN	

Signature: .....  .....

Name: Dr. Ramji Manoharan

Designation: .Professor

Affiliation: IIT Hyderabad

  
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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan. 22<sup>nd</sup> titled "Fracture Toughness Testing & Integrity Assessment of Composites Across Multiple Length Scales " for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Nagamani Jaya Balila
2.	Bank account number	10175395856
3.	Bank name	SBI
4.	Bank branch address	IIT Powai
5.	Branch IFSC code	SBIN0001109
6.	Mobile number	9986401896
7.	PAN	ASGPB2359B

Signature: .....

Name: ....Nagamani Jaya Balila

Designation: ...Assistant Professor...

Affiliation: IITB

  
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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.22<sup>nd</sup> titled " Fatigue and fracture of composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. C.M.Manjunatha
2.	Bank account number	10461095959
3.	Bank name	State bank of India (SBI)
4.	Bank branch address	NAL branch, Kodihalli PO, Vimanapura Bangalore 560017
5.	Branch IFSC code	SBIN0004815
6.	Mobile number	080-25086300 / 6301
7.	PAN	AELPM6496H

Signature: 

Name: CM Manjunatha

Designation: Chief Scientist

Affiliation: CSIR-NAL, Bangalore-17

  
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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated March.19<sup>th</sup> titled "Fatigue and fracture of composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 15March to 20March 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	GajendraPatil
2.	Bank account number	67802220155
3.	Bank name	State Bank of India
4.	Bank branch address	Kharghar
5.	Branch IFSC code	SBIN0071073
6.	Mobile number	9224281153
7.	PAN	

Signature: 

Name: Dr. Gajendra Patil

Designation: Professor & Head of Dept.

Affiliation: PHCET, Rasayani

  
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**Pillai HOC College of Engineering & Technology, Rasayani****RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.23<sup>rd</sup> titled "3D printing of functionally graded materials- an overview" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Guruprasad Rao (GURUPRASAD KUPPU RAO) ✓
2.	Bank account number	108010100065344
3.	Bank name	Axis Bank Ltd
4.	Bank branch address	Mulund West - Mumbai
5.	Branch IFSC code	UTIB0000108
6.	Mobile number	9930069776
7.	PAN	ABDPG5043R

Signature: 

Name: GURUPRASAD RAO

Designation: Director &amp; Mentor

Affiliation:

Imagharim India  
Pvt Ltd,  
MUMBAI  
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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.23<sup>rd</sup> titled "Failure analysis of polymer matrix composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Praveer Verma
2.	Bank account number	10918035697
3.	Bank name	STATE BANK OF INDIA
4.	Bank branch address	DMSRDE, KANPUR,
5.	Branch IFSC code	SBIN0007199
6.	Mobile number	
7.	PAN	

  
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Signature: 

Name: Dr. Praveer Verma

Designation: Scientist

Affiliation: DMSRDE, Kanpur



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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.23<sup>rd</sup> titled "Fatigue and fracture of composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Ram Chandra Prasad
2.	Bank account number	52142180010736
3.	Bank name	Canara Bank
4.	Bank branch address	Khaire, Patalganga
5.	Branch IFSC code	CNRB0000033
6.	Mobile number	9819377021
7.	PAN	

Signature: 

Name: Dr.R.C.Prasad

Designation: Professor

Affiliation: PHCET, Rasayani

  
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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov. 21<sup>st</sup> titled "3D printing of polymers & polymer composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Ravi Babu
2.	Bank account number	6518459894
3.	Bank name	Indian Bank
4.	Bank branch address	Alagappa college campus
5.	Branch IFSC code	IDIB000A008
6.	Mobile number	8300826339
7.	PAN	



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Signature: .....  .....

Name: Dr. Ravi Babu

Designation: Scientist

Affiliation: CECRI, Tamilnadu



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**RECEIPT**

Received a sum of Rs. 5,000/- (Rupees three thousands only) on account of Honorarium for working as a Coordinator during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Ram Chandra Prasad
2.	Bank account number	52142180010736
3.	Bank name	Canara Bank
4.	Bank branch address	Khaire, Patalganga
5.	Branch IFSC code	CNRB0000033
6.	Mobile number	9819377021
7.	PAN	

Signature:



Name: Dr.R.C.Prasad

Designation: Professor

Affiliation: PHCET, Rasayani



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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for working as a Lab attendant during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Mr. Sunilsing Rajput
2.	Bank account number	52142180003781
3.	Bank name	Canara Bank
4.	Bank branch address	Khaire, Patalganga
5.	Branch IFSC code	CNRB0000033
6.	Mobile number	7276222267
7.	PAN	

Signature: 

Name: Sunilsing Rajput

Affiliation: PHCET, Rasayani



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# Gavdevi Cable Network

House No-792, At. Post, Nere, Tal- Panvel, Dist- Raigad.  
Mob. 9322684466, 8779169647

Receipt No :

Date : 23/3/2021

Name : Sunilsing Rajput.....

User ID: Sing203.....

The Sum of Rupees : .....

Package: 50./mbps..1 month

Payment in Cheque/ Cash:.....

.....  
Cheque No: .....

Bank:.....

Date:.....

Inst :	
Pack:	1000
Total:	1000

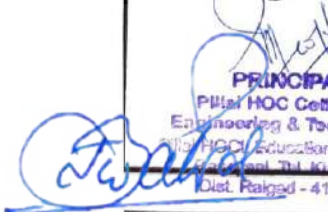
Package Renew Date 18/1/2021

expir: 17/2/2021

Authorized Signature



For Gavdevi Cable Network

  
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## “Advance Polymers & Composites for High Performance Applications”

**Dr. Virendra Kumar Gupta**

Reliance Research and Development Centre, Reliance Industries Limited,

Reliance Corporate Park, Navi Mumbai 400 701 India

Email: [Virendrakumar.gupta@ril.com](mailto:Virendrakumar.gupta@ril.com); Mobile: +919998965284

**Abstract :** Significant growth in agriculture, automobiles, infrastructure, retail, aerospace, defense and other sectors is expected to propel the demand of polymeric materials from 380 million tons in 2020 to ~ 1,100 million ton by 2050. The exponential growth in the fundamental understanding of chemical, physical and engineering aspects of polymerization process and products offer high possibility to design advanced polymeric materials for sustainable growth replacing traditional materials.

Materials development is currently moving at high pace both in academia and industry due to their diverse commercial potential and beneficial merit for the society at large. The present talk will cover high performance polymeric materials based on olefins, diolefins, renewable materials and others reactive monomers and its applications in different growth sectors.

**Biodata of the Speaker :** Dr Virendra Kumar Gupta is currently Head, R&D Polymer & Senior Vice President, Reliance Industries Limited, Navi Mumbai. Before joining Reliance Industries Limited, he worked at the Indian Petrochemicals Corporation Limited & Gharda Chemicals Limited, India. Dr Gupta has received his PhD in Chemistry from Banaras Hindu University, Varanasi and worked at University of Alabama at Birmingham, USA

He has 40-year research experience in the areas of CO<sub>2</sub> fixation, organic/ inorganic polymers & catalysis and product technology development. He is an inventor/co-inventor of 150 patents and successfully commercialized 25 technologies in polyolefins & polysulfones products and processes. He also has 70 research publications in peer-reviewed journals and 75 invited and contributed presentations in international & national conferences. His significant & high impact technology development includes commercialization of High-Performance Ziegler Natta catalysts to produce polyolefin first time in India. He is a recipient of VASVIK award and 20 technology and product development awards including PC Ray awards for Development of Indigenous Technology by Indian Chemical Council.

He is also members of various industry and professional advisory committees. He is chairman of Industry Advisory Board (IAB) of the Polymer Science Program of Somaiya Vidyavihar University, Vice President, Society of Polymer Science India – Mumbai Chapter and Executive Council Members of Polymer Processing Academy & Asian Polymer Association. He also served as Executive Council Member, Central University of Haryana and Honorary Faculty at IIT, Roorkee.



Virendra Kumar Gupta: Head, R&D Polymer Synthesis and Catalysis

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## **Advances in Polymer Technology- Nanotechnology**

**Dr. Kasilingam Rajkumar**

Director, Indian Rubber Manufacturers Research Association, Thane

**Abstract :** For the past 10 years, polymer nanocomposites are the dominating field in polymer science and technology. The interest in polymer nanocomposites is due to the reinforcement effect of nanofillers, better mechanical properties, thermal stability and barrier properties. Nanotechnology emerged to improve the physical properties of traditional materials at the molecular level without affecting the processing. Different types of nano-fillers based on their dimension are discussed with emphasis on advantages of nano-composites over conventional composites. Various nano-fillers used in polymer such as Layered Silicates : Nano clay, carbon based: graphene, Nanotubes, Spherical Particles : Silica, Polyhedral Oligomeric Silsesquioxanes and Bionanofillers and problems with nano-fillers with the strategies to overcome are discussed in detail. Various processing techniques of nano-filler in polymer matrix and their application are given in detail. The topic is concluded with Future Outlook, Challenges and Opportunities with respect to polymer nano-composites.

**Biodata of the Speaker :** Dr. Kasilingam Rajkumar is a Rubber Technologist from IIT Kharagpur, with excellent academic record through out the career along with 20 + years of rich experience in the field of Research & Development, Testing, Training and Consultancy services on Polymer / Rubber Technology and Currently, working as, Director, at Indian Rubber Manufacturers Research Association [IRMRA], aff. to Min. of Com. & Industry, GoI, Thane, and responsible for over all operations of IRMRA. My recently added Management Degree [MBA] in Operational Management and Doctoral Degree [PhD] in the emerging field of Polymer / Rubber Nanocomposites are added feather in my career to take any challenging leadership career in scientific and technological research and associated activities. Under my leadership, we have completed several sponsored and product development projects at IRMRA which includes evaluation of chemicals and additives in Rubber formulations, Industrial consultancy projects for MSME sectors, critical product development for defence and nuclear sectors. During my tenure of 17 years, at IRMRA, I was instrumental for the growth of IRMRA's services by acquiring key quality credentials to the organization like ISO 9001 certifications, NABL accreditations, DGMS, BIS & CEMILAC recognitions etc. Several initiatives are taken to expand its activities for business enhancement like ISO 17020 accreditation,, finalizing MoU with SARPOL, finalizing projects for Chennai center etc.



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**Biodata of the Speaker :** Dr. Dattaji K. Shinde has obtained B. E. (Mechanical) from Government College of Engineering Aurangabad Maharashtra (2000), M. Tech. (Design Engineering) from Indian Institute of Technology, Delhi (Jan 2002). He has obtained Ph D in Nanoengineering at Joint School of Nanoscience and Nanoengineering, North Carolina A & T State University Greensboro NC, USA in December 2014. Also, he was Postdoctoral Scholar at North Carolina A and T State University USA during 1<sup>st</sup> January to 31<sup>st</sup> June 2015. He has worked as Graduate Research Assistant in Nanoengineering department (Aug. 2011- Dec. 2014). He is visiting Professor at Department of Mechanical and Material Science, University of North Carolina, Charlotte NC USA (2018-19).



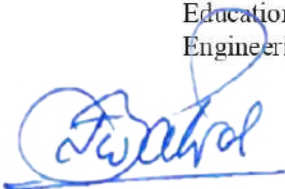
Currently, he is Associate Professor of Production Engineering Department and is Former Head of Production Engineering Department, VJTI Mumbai. The additional portfolios handling at VJTI Mumbai are MHRD's Institutions Innovation Council President, Start-up and E-Cell Coordinator, AISHE Convener, ARIIA Nodal officer, SAMPE International Student VJTI Mumbai Chapter and SAMPE International Professional Chapter President. Dr. Shinde has 18 years of rich experience in teaching, research, industry and consultancy.

Collaborative research with Imperial College of London Material Engineering Department U. K, University of Malaysia, Pahang, Malaysia and Rice University, USA Texas A and M University USA, North Carolina A and T state University USA. He has visited many universities of USA such as Michigan University, Georgia Tech University, Duke University, South Carolina State University, Texas State University for collaborative research and currently working on many joint research projects on Nanotechnology in materials and Manufacturing. He is working as editorial board of world Academy of Science Engineering and Technology USA (WASET).

He has published three international journal paper and 67 international and national journals and conferences papers in peer reviewed proceeding in area of Nanotechnology, nanomaterials, manufacturing, nanocomposites and advanced composite materials. His area of interest is nanotechnology, nanomaterial, nanocomposite, advanced composite materials, design engineering, finite element analysis micro/nanofabrication, value engineering, lean manufacturing, and project management.

Dr. Shinde is lifetime member of ASME (USA), SAMPE (USA), WASET, SAE India, ISTE (India), and AMSI SAVE International USA.

He is recipient of Dr. Wadaran L. Kennedy Scholar Award for 2012-2013 form North Carolina A&T State University, recipient of Graduate Research Assistantship award from North Carolina A&T State University from August 2011 to Dec. 2014. Recipient of Scholarly Accomplishments and Excellence in Academic Performance Award, Division of Student Affair and International Student and Scholar's office, North Carolina A and T State University, NC 2012. Dr. Dattaji Shinde has awarded Best Dronacharaya Award for Innovative product Smart Navigation Band in the National level Entrepreneurship Generation –Y competition Hunar 2.0 organized by Jaro Education for 2018-19. Also working as Board Studies Member for K K Wagh College of Engineering Nasik for from 2018-19.



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- **Title:** Effect of Electrospun Nanofibers and Carbon Nanotubes on the Properties of Polymeric Composite and its Failure Analysis.
- **Speaker:** Dr Dattaji Shinde, Associate Professor and Former Head of Production Engineering, VJTI, Mumbai India.
- High specific modulus and strength are the most desired properties of the material for the structural applications and since composite materials exhibit these properties during last decade; these materials have gained significant increase in usage for the applications ranging from automotive, defense, aerospace, recreation and shipbuilding etc. The major cause of failures in these composite laminates is due to delaminations. Nanoengineered beams were fabricated by interleaving non-woven Tetra Ethyl Orthosilicate (TEOS) electrospun nanofibers (ENFs) between the laminated fiberglass composites to improve the flexural properties. In addition, interlaminar shear strength (ILSS) of fiber reinforced polymer composite is an important property for most of the structural applications. Matrix modification is an effective method used to improve the interlaminar shear strength of composite. EPON 862/w epoxy system was modified using Tetraethyl orthosilicate (TEOS) electrospun nanofibers (ENFs) which were produced using electrospinning method. The ILSS of the Glass Fiber Reinforced Polymeric Composites (GFRP) was investigated. The study shows that introduction of TEOS ENFs in the epoxy resin enhanced the ILSS of GFRP by 15% with 0.6% wt. fraction of TEOS ENFs.
- A Polymer can enhance its properties by addition of a very small weight percentage of micro or nanomaterials which can tailor of polymer. The multiwall carbon nanotubes (MWCNTs) were added in percentage ranging from 0.1 to 0.3% by weight in acrylonitrile butadiene styrene (ABS) and a spool in the form of material was prepared for 3-D printing with the help of an extrusion machine. Characterization of multiwall carbon nanotubes into ABS based nanocomposite. The samples were printed as per the ASTM D638 and ISO 178 standards using dual extruder 3-D printer by fused deposition modelling (FDM). The tensile test results in an increase in strength by 21.61% while the flexural test results a decrease in strength by 15.13. Further an electrical conductivity test was performed on nanocomposites with weight percentage of multiwall carbon nanotubes, and have shown significant increase in electrical conductivity with the addition of multiwall carbon nanotubes.
- Electrospinning is the most widely utilized method to create nanofibers because of the direct setup, the capacity to mass-deliver consistent nanofibers from different polymers, and the ability to produce ultrathin fibers with controllable diameters. Smooth and much arranged ultrafine Polyacrylonitrile (PAN) nanofibers with diameters going from submicron to nanometer were delivered utilizing Electrospinning technique. The effect of electrospinning processing parameter on the morphology of electrospun PAN nanofibers were investigated. The nanofibers were heat treated for carbonization to examine the changes in properties and composition to make for electrical application. The average diameter of the PAN fiber observed 365nm and 280nm for flat plat and rotating drum collector respectively. The four probe strategy was utilized to inspect the electrical conductivity of the nanofibers and the electrical conductivity is significantly improved with increase in oxidation temperature exposed.
- The progressive failure of the laminated fiberglass nanocomposite was analyzed using stiffness degradation method using ANSYS. Further Molecular dynamic simulation of polymeric nanocomposite was carried out validate the experimental result of mechanical characterization using J-OCTA software.



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# TWO WEEKS AICTE APPROVED CERTIFICATE STTP

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

<p><b>Organized by</b></p>    <p><b>PHCET</b> PILLAIHOC COLLEGE OF ENGINEERING &amp; TECHNOLOGY PHCET, Rasayani</p> <p><b>AICTE</b> All India Council of Technical Education AICTE, INDIA</p>	<p><b>Supported by</b></p>    <p><b>SFA</b> Mumbai Chapter</p> <p><b>S-EINDIA</b> Society of Automotive Engineers INDIA</p> <p><b>ASM</b> INTERNATIONAL INDIA CHAPTER</p>
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Date	Time	Program Itinerary
19/01/2021	09:30 to 10:40 AM	<b>Dr. Ashok Johari, Pediatric Spine Surgeon</b> Implants in Spine Surgery: Spine bio-mechanics & Spine Patahlogy
	10:40 to 11:50 AM	<b>Dr. Shantanu C. Prabhune, AGM, L&amp;T Mumbai</b> Processing Composites at L&T Defence : An Industry Perspective
	11:50 to 01:00 PM	<b>Shri. Kashinath Deodhar, Group Director, ARDE, DRDO</b> R&D innovation on Hybrid Carbon-Glass Epoxy Gun Barrel for shoulder fired launcher
	01:00 to 02:10 PM	<b>Prof. Chandra Sekher Yerramalli, Department of Aerospace Engineering, IIT Bombay</b> Challenges in Design Manufacturing of Composites
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>



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## “Composites at L&T Defence – An Industry perspective”

**Mr. Shantanu Prabhune**

Assistant General Manager, L&T Mumbai

**Abstract :** Composite materials have a rich history over the last 60 years. Globally and domestically the consumption of composites has been on a growth trajectory due to the benefits experienced by users in their products. Use of composites has provided functionally superior products with commercial advantages. High strength to weight ratio, high specific modulus, better electromagnetic, acoustic, thermal and ballistic performance has enabled composites to make inroads in several sectors. Composite material processing enables to make complex shapes. Industry has to setup the required infrastructure to manufacture composites. Larsen and Toubro Limited (L&T) has been manufacturing composite products for the past two decades through its Advanced Centre of Composites. L&T has successfully delivered several products of composite materials to Indian and International customers. The talk would present L&T’s journey and capabilities in the field of composites and provide an industry perspective on the ecosystem and value chain existing in composites in India.

**Biodata of the Speaker :** Mr. Shantanu Prabhune, Assistant General Manager, L&T, Mumbai

Mr. Shantanu Prabhune is currently working as an Assistant General Manager, L&T, Mumbai. He is involved in the development of Products using Composite Materials. He has also worked in L&T Mumbai as a Manager, Technology and Product Development in the area of Product Development using Composite Materials in Material selection, Material Vendor Selection, Material qualification at coupon level, 3D Designing using NX 6 and FE Analysis using ANSYS 13.0. He has also coordinated the manufacturing of the prototype of the product under development.

He has worked as a R&D Engineer at Weber Aircraft from Jul 2007 to Jan 2009 in the field of Concept Development for New Premium class economy seats for Commercial aircraft and Design of Commercial Aircraft Seat using Pro-E Wildfire.

He has worked as a Piping Engineer at UHDE India Ltd from Aug 2002 – Jul 2004 in the area of 3D Layout design of The Piping Network in Chemical industry and Stress analysis.

Mr. Shantanu Prabhune has completed his Masters in Aerospace Engineering from Texas A&M University and Bachelor of Engineering from University of Mumbai.



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## “R&D innovation on Hybrid Carbon-Glass Epoxy Gun Barrel for shoulder fired launcher ”

**Mr. Kashinath Deodhar,**

Group Director, ARDE, DRDO

**Abstract :** A Light Weight, Shoulder Fired, Man-portable, Anti-Tank, Anti-Bunker, an effective Infantry Weapon was required urgently by Indian Army for high-altitude mountain warfare at Drass, Butalik and Kargil sector.

Indian Army was having 84 mm RL Mk-II weapon in service known as a rocket launcher. Which was very heavy, and difficult to handle and operate at high altitudes.

First time in the country, Gun Barrel of an infantry weapon, 84 mm Light Weight Launcher (LWL) was developed with state-of-the-art hybrid composite gun barrel to withstand an instantaneous firing chamber pressure of 90 MPa and successfully test fired directly on "Enemy" during kargil war before proving it in our field trials.

The use of "high specific strength" and "high specific modulus of carbon-epoxy composites hybridised with Glass for making tailor made properties using "Filament winding" and "autoclave" process, the 84 mm LWL Gun Barrel were successfully developed by "hoop over wound on thin steel liner with rifled bore.

The stringent QA QC tests and latest techniques like low frequency Ultrasonic PET C-Scan test and Acoustic Emission Technique (AET) was also developed as NDT and Hydraulic pressure tests on coupons to ensure quality, safety and reliability.

In the lecture, I will be covering a brief Introduction of Weapon-Ammunition System, Composites, The case study of 84mm LWL, destructive and NDT tests. Various field trials conducted to know a System engineering approach and development cycle of a weapon system.

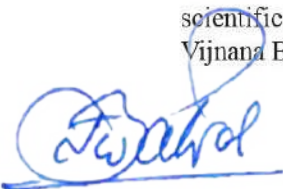
**Biodata of the Speaker :** Mr. Kashinath Deodhar is currently working as the Group Director, ARDE, DRDO, Pune.

He completed his part-time BE (Mech) degree from Cusrow Wadia Inst. of Technology Pune.

Completed ME (Mech) with specialization in Advanced Weapon Technology and passed in first class with distinction. Carrying out Doctoral research in the field of Weapons from defence University Awarded with commendation in 1999 and 2005 at National level Recipient of Lab **Scientist of the year 2006** Award.



Heading emergency escape system for pilot division and till now research work carried out on various weapon systems viz. Air Defence Gun, Tank Gun, and Artillery Gun System etc. Rocket Launcher, PINAKA System etc. Specialization in Design & Development of ordnance, servo control System, composite material technology etc. Stayed months together with the soldiers/troops at sensitive areas at LOC in various terrains as in Pokharan deserts where temperature is above 48 degrees centigrade in summer and at Leh in Himalayan ranges where subzero temperatures are around 40 degrees centigrade in hard winter. Recently PINAKA Team Award for Productionization of Indigenously developed Canopy Severance System Awarded to team led by Deodhar. Apart from office duties interested to build up a confidence in society through scientific approach and working as Honorary Vice President, Paschim Maharashtra Prant unit of Vijnana Bharati, an all India organization known as Swadeshi Science movement of Bharat.



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## Challenges in Design & Manufacture of Composites

**Dr. Chandra Sekher Yerramalli**

Professor

Department of Aerospace Engineering, Indian Institute of Technology Bombay, Mumbai 400076 INDIA

**Abstract :** Composite materials have been touted as the most advanced materials and as one of the solutions to many of the problems faced in Aerospace and other engineering fields. The key advantages as mentioned often in the literature are their light weight and high strength and stiffness along with the aspect of tailorability. These are important reasons for the significant increase in the usage of composite materials in structural load bearing members in many fields of engineering. However, along with these advantages, there are also certain caveats that need to be mentioned. The tailorability aspect is beneficial if the corresponding manufacturing and design processes are well developed to take advantage. While fabricating a composite wind blade, one would be creating the material in-situ in the shape of the wind blade aerodynamic surface. Thus, the material layup and manufacturing process is inextricably linked to the shape of the structure. This aspect is different from the conventional metal structures and needs to be appreciated by the designer and the manufacturer. This linkage between the inherent material configuration and the structural shape lead to challenges in design and manufacturing of composites and will be discussed in the presentation.

**Biodata of the Speaker :** Prof. Chandra Sekher Yerramalli is currently working as an Associate Professor in the Aerospace Engineering department at IIT Bombay. Prior to joining IIT Bombay in 2015, Prof. Chandra worked in Industry for 10 years. Prof. Chandra obtained his PhD in Aerospace Engineering from the University of Michigan at Ann Arbor in US. His research interests are broadly in the areas of environmental damage modeling in composite materials, fatigue modeling of composites under combined loading, ballistic response of fiber composites with applications to wind turbine blades and aerospace vehicles and components. Prof. Chandra has published around 40 Journal and International conference publications and has filed/received 15 patents.



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# TWO WEEKS AICTE APPROVED CERTIFICATE STTP

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

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Date	Time	Program Itinerary
20/01/2021	09:30 to 10:40 AM	<b>Prof. Shankar Sastri, Christopher I. Byrnes Professor of Engineering, Washington University in St. Louis, USA</b> Biomimetic Approach to the Development of Damage Tolerant Ceramic Composites
	10:40 to 11:50 AM	<b>Dr. Divya Padmanabhan Professor, PCE Panvel</b> Materials Development for Implants and Prosthesis
	11:50 to 01:00 PM	<b>Mr. Satyanarayan Joddabge Founder, Joddabge Associates</b> Plastic Moulding Processes and Industrial Applications
	01:00 to 02:10 PM	<b>Mr. Rimzath B., DIAB, Sweden</b> Fabrication of Sandwich Composites and it's Applications
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>



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# BIOMIMETIC APPROACH TO THE DEVELOPMENT OF DAMAGE TOLERANT CERAMIC COMPOSITES

**Dr. Shankar M. L. Sastry**

Mechanical Engineering and Materials Science Department  
Washington University in St. Louis  
St. Louis, MO. 63130, U.S.A

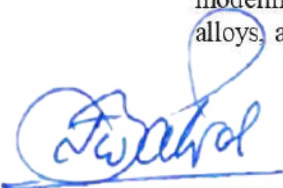
**Abstract :** Fracture toughness of conventionally processed ceramics is not adequate for their use in structural applications. We discuss in this presentation a combined nano grain and ductile phase toughening approach which successfully replicates nacre structure to produce high strength damage tolerant ceramics. In this approach, nano ceramics particles are coated with a 1-5 nm ductile phase layer using electroless plating and are consolidated using spark plasma sintering (SPS) process to produce high-density compacts with the preservation of nano structure.. Fracture toughness is increased as a result of the formation of unbroken ductile-phase ligaments bridging the crack wake and delaying the catastrophic fracture. Strength and hardness are preserved due to the retention of nanograin and nanophase microstructures.

**Biodata of the Speaker :** Dr. Shankar M.L. Sastry is Currently Christopher Byrnes Professor of Engineering in the Department of Mechanical Engineering and Materials Science, at Washington University in St. Louis, Missouri, U.S.A. Transition of fundamental research to commercialization has been a common thread running through Dr. Sastry's forty six year research career in a federal research laboratory, a premier aerospace industry, and a world renowned educational institution. The vast amount of combined research experience both as a fundamental researcher and applied researcher in academic as well as industrial setting has been a valuable asset to working effectively as a teacher and researcher.



Upon completion of doctoral degree, Dr. Sastry was part of a research team at Air Force Materials Laboratory working on the development of light weight titanium aluminides for high temperature applications. He carried out fundamental studies of the phase transformations and room and elevated temperature deformation of  $Ti_3Al$  and  $TiAl$  based intermetallics with the objectives of determining the causes of limited ductility of these materials and identifying the methods of improving the damage tolerance of the intermetallics. The titanium aluminides have now transitioned from R & D to commercial applications.

Afer two years at Air Force Materials Laboratory Dr. Sastry joined McDonnell Douglas Research Laboratories (MDRL) in 1977. He started as a research scientist and moved up to chief scientist and program director of Metals and Composites department. He procured contract research and development (CRAD) funding from the United States Air Force and Navy, NASA, and NSF and led and managed a team of materials researchers in the development of low density high modulus Al-Li and Ti-Al-B alloys and composites for aircraft structural applications, advanced processing methods for near-net shape fabrication of Al and Ti alloys, modeling and experimental validation of corrosion, fatigue and fracture of aircraft structural alloys, and advanced non destructive testing and evaluation techniques.



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**Biodata of Dr. Shankar M.L. Sastry, continued from the last page.**

Several of the research projects transitioned from R & D to commercialization in relatively short time and consistently received superior ratings from the government independent research and development (IRAD) evaluation team as well as from the McDonnell Douglas divisional companies. In recognition of my contributions, Dr. Sastry received a highly coveted McDonnell Douglas Fellow award in 1990.

In 1991, Dr. Sastry started his academic career as a professor in the department of Mechanical Engineering and Materials Science at Washington University in St. Louis. The very first year, he put together a team of interdisciplinary researchers from physics, chemistry, and engineering and procured the first NSF grant on Novel Methods of Synthesis of Nanocrystalline Materials. The NSF funding served as a key seed grant and has led to several successful research programs on nanocrystalline materials at Washington University. In addition he procured funding from the United States Army, Air Force, Navy, and NASA and carried out to successful completion research in advanced composite solders, high temperature intermetallics, advanced processing methods for microstructural refinement and mechanical property improvements, and titanium-hydrogen interactions.. Dr. Sastry has authored authored over 150 publications in peer reviewed journals, edited two books, and has four patents. Dr. Sastry has taught graduate courses in Mechanical Behavior of Materials, Materials Selection in Engineering Design, Materials Characterization Techniques, Ceramics, Plastic Deformation of Metals, Powder Metallurgy, and undergraduate courses in Materials Science and Materials Engineering.



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## **Materials development for Implants and prosthesis**

**Dr. Divya Padmanabhan**

Professor and Head of Automobile Department  
Pillai College of Engineering, Panvel

### **Abstract :**

There has been a huge interest in new materials with improved properties and longer life for implants and prosthesis. Many technologies have been tried and tested for synthesis of new materials. Developments in different types of biomaterials for various types of implants have been discussed here. A few testing methods for these implants are also being covered in this talk. Powder injection moulding (PIM) - a near net shape process requiring no secondary operations is a preferred route as compared to conventional manufacturing processes like casting, forging and machining as the latter often result in poor mechanical properties as compared to PIM. Intricate, small or medium sized complex shapes are easily achieved through PIM and due to these advantages, the process can be used to fabricate medical implants and devices.

### **Biodata of the Speaker :** Dr. Divya Padmanabhan

-B.E (VNIT,Nagpur),M.Tech and PhD(IIT Bombay)  
Overall experience in Research and Academics-23 years  
Member of Syllabus Revision Committee( 2012,2016 and 2019) for  
Mechanical and Automobile Engg under Mumbai University  
Handled and assisted 4 funded projects (PI and Co-PI)  
25 Publications in International/National Conferences and Journals  
Areas of research/interest: Powder Injection Moulding, Ceramic Synthesis  
and Processing, Composites, Polymer membranes, coatings.  
Guided 15 Masters students and 50 + undergraduate graduates, PhDs  
under supervision currently -2  
Life Member of ISTE,SFA and IIRS  
Currently Head of Automobile Engineering at Mahatma Education  
Society's Pillai College of Engineering, Navi Mumbai



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## Plastic Moulding Processes and Industrial Applications

Satyanarayan Joddabge

Founder & Director

Joddabge Associates

### Abstract :

1. History of plastic moulding
2. Types of plastic mouldings
3. Commodity vs Engineering plastics
4. Popular mouldings in India
5. Injection moulding in detail
6. Blow moulding in detail
7. Blow plus Injection moulding factory setup

- **Biodata of the Speaker :** Satyanarayan Joddabge
- Location : Pune – India
- Education : Electronics Engineering , PGDM (Business Management , Personal Management & Industrial Relations , Materials Management , Sales & Marketing Management)
- Company : Joddabge Associates
- Designation : Founder & Director
- Field of Experience : Plastic Moulded article Manufacturing
- Overseas Experience : Tanzania, Kenya and Saudi Arabia
- Association with PHCET: Mentor for Engineering students



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## **Fabrication of Sandwich Composites and it's Applications**

**Mr. Rimzath B**

DIAB, Sweden

**Abstract :** Why sandwich composites? With sandwich composites you can:

- Decrease weight and increase strength
- Save fuel cost or increase payload
- Reduce lifecycle cost
- Lower your carbon footprint
- Enjoy more design freedom

What is sandwich composite? The concept is cleverly simple. Two thin, strong and stiff materials are separated by a lightweight core. The result is a strong and durable product that provides mechanical properties at much lower weight than traditional monolithic materials, such as single skin FRP, wood, steel or aluminum. Sandwich composite materials also allow designers to engineer with extreme optimization to their loading requirements. A sandwich solution can be tailored to avoid over-engineering, saving weight and increasing performance. By choosing the appropriate fibers, resin and core you can create a product that has, for example, high thermal insulation, tailored mechanical behavior and fire resistance.

### **Biodata of the Speaker : Mr. Rimzath B**

DIAB, Sweden, Technical Manager India / Middle East

Mr. Rimzath Ali graduated from B.Tech (Polymer Technology), MBA Production and has 18 years' experience in Composites Engineering and infusion process, working largely in the wind & Marine segment industry mobilising plant work forces and controlling build production and quality assurance procedures. His role in CCG India sees him travelling extensively in the region and Middle East for supporting new designs and processes for a wide range of client needs, as well as educating staff and implementing new application and techniques. Rimzath has done a lot of infusion training & has excellent raw materials and process knowledge.

He has won JEC ASIA & ICERP innovation award in composite process



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## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

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Date	Time	Program Itinerary
21/01/2021	09:30 to 10:40 AM	<b>Prof. Shridhar Yarlagadda, University of Delaware, USA</b> Crashworthy Design of Composites for Automotive Applications
	10:40 to 11:50 AM	<b>Mr. Suhas Uthale, Department of Mechanical, Engineering, PHCET Rasayani</b> Mechanical characterization of woven fabric hybrid nanocomposite its failure analysis using FEM
	11:50 to 01:00 PM	<b>Dr. Manmohan Das Goel, Professor, VNIT Nagpur</b> Processing and Properties of Metal Foams
	01:00 to 02:10 PM	<b>Dr. Shyamsunder M., Former Principal Scientist, GE Research Former Senior Scientist, IGCAR, Kalpakkam</b> Chairman, National Certification Board, ISNT NDE of Composites – Trends and Advances
	02:10 to 03:00 PM	<b>Dr. Ramji Manoharan, Department of Mechanical &amp; Aerospace Engineering</b> Adhesively Bonded Joints in Composite Structure
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>



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## “Crashworthy Design of Composites for Automotive Applications ”

**Prof. Shridhar Yarlagadda,**

Assistant Director for Research, Center for Composite Materials  
University of Delaware, USA

**Abstract :** Carbon Fiber reinforced plastic (CFRP) material is becoming one of the preferred solutions for vehicles to achieve overall weight reduction in order to meet fuel economy and emission standards while maintaining safety requirements. Carbon fiber thermoplastic composites offer several advantages compared to metallic alternatives, including higher levels of ductility and specific energy absorption, rapid processing, and recyclability and reuse. The objective of this study was to investigate the computational tools for the design, optimization and manufacture of carbon fiber thermoplastic materials for vehicle sideframe structures (e.g., B-pillar) subjected to high-velocity side-impact crash loading, and to investigate and demonstrate the appropriateness of simulative methods and tools to adequately predict behavior relevant for the assessment of vehicle safety.

In this study, CFRP intensive vehicle components were designed, manufactured, and tested. The project team investigated thermoplastic carbon fiber reinforced materials for vehicle sideframe structures, created requirements, and defined assessment strategies. The design of the B-pillar was followed by the manufacturing and testing of a prototype and validation of the predictive engineering tools. This study demonstrated that the carbon fiber thermoplastic B-pillar offered 60 percent weight savings over the metallic baseline and satisfied the side-impact crash requirements. Also, the dynamic impact and crush response of the B-pillar was adequately modeled using computational tools.

**Biodata of the Speaker :** Dr. Yarlagadda is the Assistant Director for Research at the University of Delaware Center for Composite Materials (UD-CCM) and Research Professor in Electrical and Computer Engineering at the University of Delaware. Dr. Yarlagadda holds a Ph.D. in Aerospace Engineering from The Pennsylvania State University. Founded in 1974 within the University of Delaware’s College of Engineering, the Center for Composite Materials (CCM) is an internationally recognized, interdisciplinary center of excellence for composites research and education. Dr. Yarlagadda has 7 awarded patents and over 80 publications in scientific journals and technical conference proceedings. Research interests include composite manufacturing, material characterization, process-microstructure-property relationships and multifunctional composite materials. Dr. Yarlagadda is a core member of the UD-CCM team that developed the Tailored Universal Feedstock for Forming (TuFF) technology, winner of the 2019 ACE award for unsurpassed innovation and 2020 SAMPE Delmonte award.

A handwritten signature in blue ink, appearing to read 'S. Yarlagadda'.

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## **“Mechanical characterization of woven fabric hybrid nanocomposite its failure analysis using FEM”**

**Suhas Uthale**

**Assistant Professor, Department of Mechanical Engineering, PHCET, Rasayani**

**Abstract :** With the advancement and continuing integration of composite materials and technology in today's modern industries, research in this field is becoming more and more significant. Polymeric hybrid nanocomposites, due to improved mechanical and thermal properties, are becoming an essential element in major technologies. Because of their anisotropic nature it is difficult to fully predict their mechanical characteristics and behavior, especially if they are produced with complicated architectures. Development of a realistic theory of describing the structure and behavior of materials is highly dependent on accurate modeling and simulation techniques. The present study aims at preparation of neat sample of epoxy resin with hardener by using VARTM method with different curing cycles and experimental tests have been conducted to evaluate the validity of the finite element method. It is recognized that there is a good agreement between the computational and experimental results. An experimental study has been carried out to investigate tensile strength of carbon fibre, glass fibre and basalt fibre - reinforced epoxy composites.

### **Biodata of the Speaker:**

BE in Mechanical Engineering from RIT, Sangli

M Tech in machine design from VJTI, Mumbai

Pursuing PhD in composite materials at VJTI, Mumbai

Currently working as Assistant Professor at PHCET, Rasayani

14 Years of teaching and 10 years of industrial experience. Worked with Mahindra Tractor, Mumbai.

Published two international conference papers in peer reviewed proceedings in the area of composites.

Lifetime member of ISTE, ISHRE

Area of interest is advanced composite material, design engineering and finite element analysis.



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## “Processing and Properties of Metal Foams”

**Manmohan Dass Goel**

Assistant Prof.

Department of Applied Mechanics, Visvesvaraya National Institute of Technology  
(VNIT), Nagpur – 440 010, India

**Abstract :** Metal foams have a number of advantages over polymer foams including higher operating temperatures, consistent properties over the time and an absence of noxious fumes during decomposition. They are generally isotropic, can be recycled and are cost effective in long run. Many metal foams can be stiffer and stronger than polymer foams and these can be tailored as per their application. Other desirable characteristics include increased energy absorption, sound damping, electromagnetic wave absorption and non-combustibility. While metal foams are not widely utilized currently, commercial interest is growing quickly as manufacturing methods improve the quality and consistency of the foam. This, in combination with an increased understanding of their mechanical behaviour, could lead to more extensive use. These metallic foams are smart option for various applications, wherein they are used as sandwich cores in structural application, packaging along with blast-resistant structures/components. Further, deformation of metal foams under high rate of loading is a complex phenomenon due to the effects of various parameters involved therein. Herein, primary focus will be on processing of the aluminium foams and their dynamic behaviour at the high rate of loading. The major focus will be on experimental investigation of metal foams using split Hopkinson pressure bar (SHPB).

**Biodata of the Speaker:** **Dr. Manmohan Dass Goel** completed his bachelor of engineering from Yeshwantrao Chavan College of Engineering (YCCE), Nagpur under the then Nagpur University in 2000. He was awarded **three gold medals** by Nagpur University for academic excellence. He completed Master of Technology (M. Tech.) in offshore engineering from Indian Institute of Technology (IIT) Bombay, Mumbai in year 2003. After He joined CSIR-AMPRI Bhopal as scientist. He completed his Ph. D. from Department of Civil Engineering, Indian Institute of Technology (IIT) Delhi and University of Federal Armed Forces, Munich, Germany under German Academic Exchange Service (DAAD) Sandwich Fellowship in year 2013. The topic of his doctoral research was "**Blast Response of Structures and Its Mitigation Using Advanced Lightweight Materials**"



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**Biodata of the Speaker: Dr. Manmohan Dass Goel, continued from the last page.**

He has many awards to his credits. He was awarded **Surendranath Mukherjee Memorial Medal** for best research paper by Institution of Engineers (India) in year 2009. He has been selected **Young Ambassador** by German Academic Exchange Services (DAAD) for consecutively for two years. His doctoral thesis has been awarded as the best thesis by the Indian National Academy of Engineering under "**Innovative Student Project Award 2013**" at doctoral level in Civil Engineering discipline. He has been awarded "**CSIR Young Scientist Awards-2014**" in Engineering Sciences by CSIR. He is recipient of "**Young Engineer Award**" from Institution of Engineers (India) in 2014. He has been nominated as "**DAAD Research Ambassador**" by German Academic Exchange Services (DAAD). He is also recipient of "**Young Associate**", **Maharashtra Academy of Sciences, Maharashtra** in year 2015.

His paper has been awarded **IGS-HEICO Biennial Award- 2017** by Indian Geotechnical Society (IGS), India as a best paper on "Rock Mechanics" published in Indian Geotechnical Journal through Indian Geotechnical Society (IGS). He has been **interviewed by Rajya Sabha TV** under popular science program "**Eureka**" in recognition of contribution to the R&D in Engineering Sciences. He has been a **Senate Member of ACSIR** (Academy of Scientific & Innovative Research) CSIR, Delhi. He is life members of several professional societies. He is an active reviewer for many international and national journals. He has published **more than 125 papers** in SCI, Scopus Indexed Journals and various International and national conferences. He has completed **more than 15 R&D projects** funded from different organizations like DST, DRDO, CSIR.

Currently he is serving as **Assistant Professor, Department of Applied Mechanics, Visvesvaraya National Institute of Technology (VNIT), Nagpur** since 2016. Prior to this, he served **CSIR-AMPRI Bhopal** and **CSIR-National Environmental Engineering Research Institute (NEERI) Nagpur, India as a Scientist**. His areas of research interest include blast analysis, blast resistant structures, lightweight materials, composite structures, low, medium and high strain rate material characterization and computational mechanics. He is looking forward to contribute in the broader areas of structural protection systems used against blast and impact loading.



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# NDE and Inspection of Composites - Trends and Advances

**Dr. Shyamsunder Mandayam**

Former Principal Scientist, GE Research, Bangalore

Former Senior Scientist, IGCAR, Department of Atomic Energy, Kalpakkam

Chairman, National Certification Board, ISNT

**Abstract :** The engineering industry has seen an increasing adoption of composites as a material of choice in the last few decades. Newer applications are being discovered for composites given its attractive properties, cost, availability and the concurrent benefits. Significant strides have been made in the development, advancement and deployment of polymer matrix composites (PMC), ceramic matrix composites (CMC) and metal matrix composites (MMC) in industries ranging from aerospace, automotive, oil & gas, renewable energy, healthcare, transportation, and several others. Industry demands for increases utilization has also resulted in enabling design of complex and larger shapes and parts as well as hybrid structures combining composites and metallic materials. Irrespective of the type of industry using composites in their components and structures, the primary requirement of assuring quality of the composite part during the manufacturing and assembly stage and the subsequent step of assuring its integrity and life during installation and in-service is a very critical pre-requisite. This is primarily accomplished through use of several Nondestructive Evaluation (NDE) and Inspection methodologies including basic techniques like Ultrasound, Radiography, etc. However the increasing complexity of the material and the size of the parts combined with higher demands on capability for defect detection and characterization including incipient damage has resulted in the development of several new inspection techniques including Shearography, Microwave, Terahertz, micro/nano-CT, positron annihilation, Flash Infrared imaging, Air Coupled UT, etc. The continued and increasing demand for safety, reliability and productivity combined with the usage of newer materials and manufacturing processes, innovative and complex designs of components and structures for higher efficiencies, has also brought in increased adoption of automation in the industrial inspection world. This presentation will highlight the various NDE techniques currently in extensive use for composite inspection by the industry and highlight the trends being observed in newer and advanced techniques including automation and use of modern approaches like Signal and Image Processing, Artificial Intelligence/Machine Learning and Robotics which are showing good promise and are being developed by R&D labs to meet the needs of industrial inspection.

**Biodata of the Speaker :** **Dr. Shyamsunder Mandayam** is the Chairman, National Certification Board -Indian Society of Nondestructive Testing (ISNT), worked as Principal Scientist at GE Global Research for 20+ years and Senior Scientific Officer @IGCAR, Kalpakkam for 16 years, Certified Lean Six Sigma Black Belt, TRIZ Level 3 expert, ASNT Level 3. Worked extensively in the development of new NDE / Inspection techniques, driving the vision and prepared roadmaps for next generation technologies in NDE for metallic and non-metallic materials (composites) related to aerospace, energy, renewables and oil and gas industries.



Worked on Eddy current array sensors, POD, Nonlinear ultrasound, Positron annihilation, Microwave and Terahertz NDE, Pipeline inspection, Automation, Robotics and Lifting of components. Currently pioneering the adoption of digital transformation to NDE and Inspection. He has 10 patents and 150+ papers in various journals, books and proceedings and delivered 70+ invited talks. Received several prestigious awards like National NDT award for R&D, GE India's RRD Tata award for excellence award to name a few. He is a Honorary Fellow of ISNT.



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# TWO WEEKS AICTE APPROVED CERTIFICATE STTP

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

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Date	Time	Program Itinerary
22/01/2021	09:45 to 10:40 AM	<b>Prof. Ramesh Talreja, Tenneco Professor, AAAS Science and Technology Policy Fellow, Joint Faculty in: Aerospace, Materials Science &amp; Engineering, TEXAS A&amp;M UNIVERSITY, USA</b> Damage, Fatigue and Failure of Composite Materials: A Physical Modeling Approach
	10:40 to 11:50 AM	<b>Prof. Jaya B. Nagamani, Department of Metallurgical Engineering and Materials Science, IIT Bombay</b> Fracture Toughness Testing & Integrity Assessment of Composites Across Multiple Length Scales
	11:50 to 01:00 PM	<b>Dr. G.V. Patil, Professor &amp; Head Dept. of Mechanical Engineering, PHCET Rasayani</b> Characterization And Development of Mechanical Properties of Biocompatible Material
	01:00 to 02:10 PM	<b>Dr. C. M. Manjunatha, Chief Scientist, NAL Bangalore</b> Fatigue and Fracture of Composites
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>



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## “Damage, Fatigue and Failure of Composite Materials: A Physical Modeling Approach”

**Dr. Ramesh Talreja**

Tenneco Professor of Engineering  
Department of Aerospace Engineering  
Department of Materials Science and Engineering  
Texas A&M University, College Station, Texas 77843, USA

**Abstract :** This presentation will review the mechanisms underlying the failure behavior of fiber reinforced composite materials under static and cyclic loading with focus on polymer matrix composites (PMCs). Rather than describe the design methodologies based on phenomenological approaches that are common in industry practice today, the presentation will emphasize mechanisms based approaches. Only such approaches are likely to allow harnessing the full potential of PMCs in applications within aerospace, automotive and energy fields where lightweight and high performance capabilities are key to success. The features of composite materials, such as heterogeneous microstructure and anisotropy in response to mechanical loading, necessitate proper terminology and definitions of terms such as damage and fracture. These terms will be accordingly described to remove misconceptions that arise from usage that is the legacy of metals. Proper energy based criteria for failure at different scales, from microstructural to the structure scales, will be described. Finally, the role of manufacturing induced defects in influencing performance and thereby allowing cost/performance trade-off will be discussed.

**Biodata of the Speaker :** Dr. Ramesh Talreja is currently a AAAS Science and Technology Policy Fellow placed in the DOE Water Power Technologies Office.

In his permanent position, Dr. Talreja is a Tenneco Professor in the Department of Aerospace Engineering and in the Department of Materials Science and Engineering at Texas A&M University. Prior to that, 1991-2001, he was a professor of aerospace engineering at Georgia Institute of Technology. His research is in composite materials that he began at the Technical University of Denmark where he earned his PhD in Solid Mechanics in 1974 and was endowed with a Doctor of Technical Sciences degree in 1985 on his collected works on fatigue and damage mechanics of composites. His recent work has focused on the effects of manufacturing defects on the performance of advanced composites. He is the recipient of the 2013 ICCM Scala Award, and World Fellow and Life Member of ICCM. The American Society for Composites selected him for the 2017 Outstanding Researcher Award.



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## **“Fracture Toughness Testing & Integrity Assessment of Composites Across Multiple Length Scales”**

**Dr. Jaya Nagamani**

Assistant Professor

Metallurgical Engineering and Materials Science Department  
Indian Institute of Technology Bombay  
Powai, Mumbai 400076

**Abstract :** Assessment of structural integrity of composites requires predictive tools from modelling to be developed. Macro-scale modelling of composites relies on continuum behaviour. In order to model fracture behavior of composites, properties of constituent materials and their interface needs to be precisely known. Micromechanical testing offers a suite of such capabilities and testing techniques through which composites can be modelled using a bottom up approach. Improvements in mechanical integrity of composite structures can be brought about by topology optimization, which also can achieve unique directional properties. This again requires modelling with micromechanical properties as input. Our group is working on design and development of length scale compatible fracture testing geometries through finite element modelling and experiments that will aid in measurement of properties of constituent phases and their interfaces at the length scale of their application. Examples of these techniques in certain multi-phase composite materials and alloys will be shown.

**Biodata of the Speaker :** Nagamani Jaya Balila is an Assistant Professor at the Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay since October 2016. She did her PhD in Materials Engineering from the Indian Institute of Science Bangalore and her post-doctoral research at the Department of Structure and Nano-/Micro-mechanics of Materials, Max Planck Institut fuer Eisenforschung, Duesseldorf. Her current areas of research are in fracture mechanics at multiple length scales and design of materials with improved damage tolerance. She has more than 20 publications and 3 review articles in the field of microscale fracture mechanics and is a frequent reviewer of several journals including Acta Materialia and Scripta Materialia for which she has won the best reviewer awards in 2015 and 2019. She has been an invited speaker in many international conferences and also been an organiser of symposiums in them. She is currently leading a group of 5 PhD students, 3 Masters students, 4 Bachelor students while having guided more than 5 Masters students and 4 Bachelors students in their thesis.

A handwritten signature in blue ink, appearing to read 'Jaya', written over a horizontal line.

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## Characterization And Development of Mechanical Properties of Biocompatible Material

Dr. Gajendra V. Patil

Professor and Head, Mechanical Engineering Department  
Pillai HOC college of Engineering and Technology

**Abstract :** Femoral fractures are among the most common major injuries that an orthopaedic surgeon will be required to treat. During fracture treatment of femur bone the biomaterials are used for fracture healing. Bone implants are costlier and biomedical field facing problems related structural strength. This study presents an alternative composite for bone implants. Blend preparation and required wire diameter is challenge in rapid manufacturing. In this study the commercially available biocompatible materials like PA12, zirconium, chitin and chitosan are selected to characterize mechanical properties. A study presented to develop a novel low-cost porous polymer biocompatible material. This study investigates the processing of blends of biocompatible material using Fused deposition modelling (FDM) technique.

**Biodata of the Speaker :** Dr. Gajendra V. Patil is currently professor in the Mechanical Engineering Department at Pillai HOC College of engineering and Technology. He earned his doctorate in Mechanical Engineering from Veermata Jijabai Technological Institute (VJTI) in March, 2018. His title of thesis is Flow-induced vibration analysis of heat exchanger tubes. He has total 18 years of experience out of which 14 years 8 Months Mumbai University, approved experience in teaching and research, at a level of Assistant Professor and Lecturer. He is also approved Post Graduate teacher recognized by University of Mumbai. He has published his research in technical peer reviewed international publications like Taylor and Francis, Springer and Elsevier Procedia. He got chance to work as a reviewer for Springer publication (Journal of Mechanical science and Technology) which is cited by SCI and SCOPUS index, also he contributed full chapter in one of the well known Science and Technology, open access book "Advances in Heat Exchanger" which is indexed in the Book Citation Index.



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## Fracture and Fatigue Behaviour of Polymer Composites

**Dr. C. M. Manjunatha**

Structural Integrity Division  
CSIR-National Aerospace Laboratories  
Bangalore 560017, India

**Abstract :** Fiber reinforced polymer (FRP) composites are widely used in engineering structures such as airframe, wind turbine etc., due to their high specific strength and stiffness. Such composite structures are subjected to various types of constant and variable amplitude fatigue loads in service. For damage tolerance and durability of such structures, the composites should possess high fracture toughness and fatigue resistance. Engineering FRP composites consists of carbon or glass fibers reinforced in a thermosetting epoxy polymer. Polymer epoxy, being relatively brittle, exhibit poor resistance to crack initiation and growth affecting the overall fatigue and fracture resistance of composite. In this presentation, fracture and fatigue behavior of FRP composites including failure mechanisms are described in detail. Methodologies used in fatigue life estimation of composites under service loads are dealt with in detail. Further, recent advances in fatigue life enhancement of composites by addition of nano fillers in epoxy matrix are explained with examples.

**Biodata of the Speaker :** Dr. CM Manjunatha is currently Chief Scientist and Head, Structural Integrity Division, CSIR-National Aerospace Laboratories, Bangalore, India.

He obtained his B.E. (NITK) in 1988, M.E. (IISc.), in 1991 and Ph.D. (Cambridge Univ., UK) in 1995. He was a post-doctoral fellow at Imperial College, London, UK in 2008

He has over 20 years of experience and specialized in mechanical testing and evaluation of aerospace materials, damage tolerance evaluation, full scale static and fatigue tests, life extension of aging aircraft, polymer composites, nanocomposites etc. He has executed over 50 sponsored and research projects related to HANSA, SARAS, LCA, MiG-21 BiS, MiG-29, Rustum-II, Dhruv, etc

He is a recipient of Gold medal for first rank in B.E. (1988), Cambridge-Nehru Scholarship (1991), ORS award from CVCP London (1991-1994) and UKIERI research fellowship (2008). He was awarded NAL outstanding award for project execution: 2013 and Best innovation award: 2017

He has over 150 publications to his credit in international journals, conferences and seminars.



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Date	Time	Program Itinerary
23/01/2021	09:30 to 10:40 AM	<b>Dr. Guruprasad Rao, Director &amp; Mentor (Leadership Team)</b> <b>Imaginarium India Pvt. Ltd.</b> 3D printing of Functionally: Overview
	10:40 to 11:50 AM	<b>Dr. Ravi Babu, CECRI, Tamilnadu</b> 3D printing of Polymers & Polymer Composites
	11:50 to 01:00 PM	<b>Dr. Praveer Verma, Scientist F, DMSRDE, Kanpur</b> Failure Analysis of Polymer Matrix Composites
	01:00 to 02:10 PM	<b>Dr. R. C. Prasad, Professor, PHCET, Rasayani</b> Fracture toughness and failure analysis of composites
	02:00 to 03:00 PM	<b>Concluding Remarks by Session</b> <b>Chairman and Feedback</b>



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## 3D printing of Functionally Graded Materials- an Overview

**Dr. Guruprasad Rao,**

Director & Mentor (Leadership Team), Imaginarium India Pvt. Ltd.

**Abstract :** The development of functionally graded materials has potential applications in Hi-Tech industry. 3D printing provides the new technology for synthesizing of soft organic phases based on polymers and hard inorganic phases through selective heat melting for fabricating functionally graded structures. Fibres can be deposited according to the strength requirements using 3D printing. The composite 3D printing market is expected to be worth billions of dollars in coming next 10 years. In this presentation the development of technology and machines at Imaginarium shall be illustrated.

**Biodata of the Speaker :** Dr Guruprasad Rao is a Director & Mentor (Leadership Team) at Imaginarium India Pvt Ltd., India's leading 3D printing company. His current focus is on DfAM for Metal 3D printing 3D printing Medical Applications, Skill Development besides Technology mentoring and partnerships across domains. Dr Rao is a technocrat with over 30 years of experience encompassing Industry & Academia. He holds BE (Mech) with PG in Tool Engineering from GTTC , M Des in Product Design from IISc, Bengaluru and PhD from IIT Bombay. For his terminal degree, he worked on Medical applications of 3D Printing. His industrial assignments include Titan, Tanishq, Crompton Greaves and presently at Imaginarium. He joined Imaginarium as CEO and is presently designated as Mentor - Director. He has taught design at IISc, NIFT, JSSATE and NTTF. He was Professor & Head, Project Office IICD, Jaipur. He also teaches courses on Emerging technology and its impact at SPJIMR and KJ Somaiya Business Schools. He is also a mentor at KIIT-TBI, Bhubaneshwar and guides start-ups on design and technology. Dr Rao is associated with many industry bodies such as CII / FICCI / NASSCOM /BIS / IAMF / Atal Innovation Mission. As CII Conference Chairman, he successfully led CII 3D Printing Conference 2019, Mumbai as Conference Chairman. Presently he is a part CII National Committee on Design.



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## 3D Printing of Polymers & Polymer Composites

Dr. V. RAVI BABU

SCIENTIST , CSIR-Central Electrochemical Research Institute  
Karaikudi, Tamil Nadu, India 686560

**Abstract :** 3D printing also known as "Additive Manufacturing (AM)" technique offers the unique advantage for fabricating complex structures via computer aided design (CAD). 3D printing allows for the fabrication of customized objects with a great level of geometrical complexity at reduced fabrication time and cheaper cost. In the case of conventional techniques used for polymer processing, high degree of supply chain management and large work force or machinery are required. In order to overcome the limitations associated with conventional processing techniques, 3D printing emerged as a potential technology for processing of polymers. Owing to the intrinsically limited mechanical and functional characteristics of 3D printed neat polymer parts, there is adequate necessity for development of polymer composites for high performance applications. 3D polymer printing presents potential to be utilized for wide variety of applications like tissue engineering, energy storage devices and aerospace engineering etc. The manufacturing sectors with very high prospects for 3D printing include aerospace as well as automobile production industries. The potential for fuel savings due to even more lighter parts manufactured through 3D printing is the most attractive benefit for the aerospace as well as automobile industry. Furthermore, 3D printed components for aerospace has the potential to decrease decommissioning-related CO<sub>2</sub> emissions. Polymers of natural and synthetic origin are widely being used in tissue engineering. Biodegradation is one of the important features for natural polymers. Modern 3D printing allows for fabricating complex multicellular tissue/organ due to their ability to use multiple print heads loaded with different cell lines. 3D printing acts as a versatile tool for design of next-generation energy storage devices in order to meet emerging requirements in the field of flexible electronics.

**Biodata of the Speaker :** Dr. V. RAVI BABU is currently working as Scientist, CECRI, Karaikudi (Since March 2017 to Till date).  
Technical Officer, Centre for Biopolymer Science and Technology, A Unit of CIPET, Kochi, India (April 2015 to March 2017).  
Lecturer, PRIST University, Thanjavur, India (June 2009 to May 2010).

He has completed his **Ph.D** Chemical Engineering, from Indian Institute of Technology Guwahati, India, **M.Tech** Chemical Engineering (Plant design), from National Institute of Technology Trichy, India and B. Tech. (Chemical Engineering), Jawaharlal Nehru Technological University Hyderabad, India.



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## Failure Analysis of Polymer Matrix Composites

**Dr. PRAVEER VERMA**

Sc. "F", DMSRDE, KANPUR

**Abstract :** PMCs with application on the technological system frontiers by about the end of last century have progressively moved from functionally non critical to most critical structural units, driven by the data accumulated on its performance as non-critical functional units and the basic feature of the material of high specific strength with the flexibility to the design the components as per the actual system requirement and thus dictating orientation and volume fraction or mass, which can be kept minimum thereby possessing the cutting edge feature over the isotropic conventional materials which pays in huge volumes in various concerned sectors, thus the technology is near its maturation and therefore the likely various failure modes and their remedial measures need to be addressed more widely at this time with a view to build up more and more type of systems with advantages of mass savings with inherent better dynamic mechanical and electrochemical properties etc. , thus, succeeding in higher and more reliable service life of the system. The talk deals mainly with the various failure modes of PMCs and their prominent causes right from component forming till their replacement as a result of a flaw during inspection, it is interesting that no unscheduled replacement have taken place during orator's functioning at inspection level for more than a decade.

**Biodata of the Speaker :** B. Tech. (HBTU), M. Tech. (IIT, DELHI) - Centre for material science & technology-1990 .

More than 20 technology day award from hal and technology driven awards/honors from cemilac & dmsrde, drdo & indian air force.

More than 150 publications largely pertaining to airworthiness, failure analysis of aeronautical stores, including rubbers, PMCs, glazing plastics, FOL items etc.

His areas of interest include endeavour for making our country technologically completely self reliant with cutting edge combat capabilities & guiding budding engineers and scientists, for brighter country's technological advancement & prosperity.



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- B.Sc. (Computer Science)
- B.Sc. (Biotechnology)
- M.Sc. (I.T.)
- M.Sc. (Biotechnology)
- M.Com. (Business Management)
- M.Com. (Accounting & Finance)
- Pillai HOC College of Arts, Science & Commerce - Rasayani
- B.Com.
- B.M.S.
- B.Sc. (I.T.)
- B.Sc. (Computer Science)
- B.Com. (Accounting & Finance)
- B.M.M.
- B.Sc. (Maths, Chemistry, Biology & Physics)
- B.A. (English Ancillary, History & Economics)

### ARCHITECTURE

#### Bachelor and Master

- (Approved by the Council of Architecture and AICTE)
- (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- Pillai College of Architecture - New Panvel
- Pillai HOC College of Architecture - Rasayani (B.Arch. 3-year degree course)
- MARCH (Urban Design)
- Pillai College of Architecture - New Panvel
- Ph.D.

### MANAGEMENT COURSE

#### MMS

- (Approved by AICTE)
- (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- NBA Accredited 'A' Grade by DTE, Govt. of Maharashtra
- Pillai Institute Of Management Studies & Research - New Panvel
- Executive MBA
- Pillai HOC Institute Of Management Studies & Research - Rasayani (MMS: 2-year Post-Graduate Course)

### ENGINEERING COURSE

#### Bachelor, Master & PhD

(Approved by AICTE) (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)

NBA Accredited

- Pillai College of Engineering - New Panvel
- B.E. in Information Technology
- B.E. in Computer Engineering
- B.E. in Electronics Engineering
- B.E. in Mechanical Engineering
- B.E. in Electronics
- Tele-communication Engineering
- B.E. in Automobile Engineering
- M.E. in Information Technology
- M.E. in Computer Engineering
- M.E. in Electronics Engineering (CAD/CAM, Robotics)
- M.E. in Mechanical Engineering (Thermal)

#### PhD (Technology)

Computer Engineering  
Mechanical Engineering  
Information Technology

- Pillai HOC College of Engineering & Technology, Rasayani

Accredited 'A' Grade by NAAC

- B.E. in Mechanical Engineering
- B.E. in Electronics & Telecommunication Engineering
- B.E. in Automobile Engineering
- B.E. in Information Technology
- B.E. in Computer Engineering
- B.E. in Civil Engineering
- B.E. in Electrical Engineering
- M.E. in Mechanical Engineering (Machine Design)
- M.E. in Electronics & Telecommunication Engineering
- M.E. in Computer Engineering
- M.E. in Civil Engineering (Construction & Management)

#### PhD (Technology)

Civil Engineering  
Computer Engineering

### EXECUTIVE SPORTS MANAGEMENT

- PILLAI / FIFA / CIES EXECUTIVE PROGRAMME IN SPORTS MANAGEMENT

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*Dr. K. M. Vasudevan Pillai*

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**COMPLETION REPORT OF THE AQIS-STTP ON “ COMPOSITES: FRACTURE TOUGHNESS,NDE AND FAILURE ANALYSIS”**

The Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology was granted approval to conduct Short Term Training Program ( STTP ) under AQIS 2019-20 during the financial year 2020-21 vide Ref.No.:34-66/442/FDC/STTP/Policy-1/2019-20 dated 10 August 2020 on “ Composites: Fracture Toughness, NDE & Failure Analysis “

The Director Faculty Development Cell of the AICTE vide their Drawing & Disbursing officer sanctioned payment of Rs.2,99,667/-for conducting STTP under Head 601.15(a)STTP Plan.

The grant in aid was released to the PHCET R&D Account No.:52142200086666, SYNB 000524 IFSC code at Khaira, Patalganga Branch. The original STTP was residential program of 6 days duration with minimum 40 participants.

However, due to pandemic of COVID-19 the Institute was allowed to conduct STTPs through online mode with the stipulated conditions (Reference : Letter of Col. B.Venkat, Director (FDC) dated 14 September 2020).

The institute conducted 3 STTPs on the same topic in multiples of Rs. 93,000/- within the total grant received by it.

The 3 STTPs were conducted during November 17-22, 2020, January 18-23, 2021 and March 15-20, 2021. The highlight of all the 3 STTPs has been the participation of leading professional societies in the country like Society for Automotive Engineering, Western Region, Institution of Engineers, Maharashtra Region, ASM International India Chapter, Society for Failure Analysis, Mumbai Chapter, Indian Society for Remote Sensing, Mumbai Chapter, Materials Recycling Association of India and the Indian Rubber Manufacturers Research Association, Mumbai. Their involvement immensely benefited participants and allowed them to interact with industries related to the subject matter of the STTPs. All the 3 STTPs covered processing of Polymers, Polymer Blends & Composites, and their mechanical and Non-destructive characterisation to ensure quality assured industrial products. This was followed by case studies of failures in different industrial sectors and ways and means to prevent such failures. The STTPs also covered advanced manufacturing processes like additive manufacturing and 3D printing. The lectures were delivered by the industry experts, faculty from NITs and IITs as well as leading foreign universities. The applications of Polymers, composites and NDE for medical applications were also covered by eminent speakers. The details are given in the Proceedings and the program schedule.

The entire program was monitored by duly constituted Program Monitoring Committee as per directives of the AICTE. The committee members held several meetings through the Zoom link and brought the program to a successful conclusion. Under the guidance of members of the PMC the grant in aid was adjusted against the expenditure as per the guidelines of the AICTE and the remaining balance amount refunded to the member secretary AICTE, New Delhi on the bank details provided to us.



Prof. R.C. Prasad,  
Coordinator/ Member Secretary



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**Pillai HOC College of Engineering & Technology, Rasayani**  
 Dept. Of Mechanical Engineering  
 AQIS STTP -2 (18th January 2021 to 23rd January 2021)

Sr. No.	Name	Department	Designation	Name of Institute/ Industry
1	Dr.P.Muthupriya	Civil Engineering	Professor and Head	Dr. N.G.P. Institute of Technology
2	UVARAJ VILASRAO MANE	Mechanical	LECTURER	BHARATI VIDYAPEETH IOT KHARGHAR
3	Mr. Mohan Gopal Gosavi	MMS	HOD	Rajendra Mane College of Engineering & Technology, Ambav
4	Ashish Hulle	Textiles	Assistant Professor	D.K.T.E. Society's Textile and Engineering Institute, Ichalkaranji
5	Vinay Khatod	Mechanical Engineering	Assistant Professor	Government Engineering College
6	Rakesh Ramchandra Kolhapure	Mechanical	Assistant Professor	DKTES TEI Ichalkaranji
7	DINESH RAMESH SALUNKE	MECHANICAL	ASSISTANT PROFESSOR	RMD SINHGAD SCHOOL O ENGINEERING
8	Pillai	Design	Trainee Engineer	MIDC
9	Vikrant Dattatray Nichit	Mechanical	Assistant Professor	K.K.Wagh Institute of Engineering Education & Research
10	Prashant Kalidas kavale	Mechanical	Assistant Professor	K.K.Wagh Institute of Engineering Education & Research
11	Patil Nivrutti Vishram	Mechanical	Assistant Professor	K. K. Wagh Institute Of Engineering Education And Research
12	Vaibhav Vijay Khond	Mechanical Engineering	Assistant Professor	K. K. Wagh Institute of Engineering Education and Research, Nashik
13	PARDESHI MOHANSING RAMESHSING	Mechanical	Assistant Professor	K.K.WAGH INSTITUTE OF ENGINEERING EDUCATION AND RESEARCH NASHIK
14	Girish Chandrakant Mekalke	Mechanical	Asst. Prof.	DKTES TEI
15	Amruta Satish Jondhale	Instrumentation & Control Engg	Assistant Professor	Pravara Rural Engineering College
16	SUMANTA PANDA	mechanical engineering	associate professor	veer suendra sai university of technology
17	Patil Kunal Bharat	Mechanical	Student	HOC Pillai College of Engineering
18	MOHAMMED WASIM KHAN	AUTOMOBILE	ASST PROF	THEEM COE
19	Prashant Laxman Pandit	Mechanical	Assistant Professor	PES College of Engineering
20	Vilas Karbhari Patil	Mechanical Engineering	Assistant Professor	K.K.Wagh I.E.E.&R
21	Jhanbux Manek Variava	Mechanical	Assistant Professor	GEC, Daman
22	v a kamble	mech	asst prof	dkte

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23	Laxman B. Abhang	Mechanical Engineering	Professor	Pravara Rural Engineering College, Loni
24	Dr. Prakash S Shinde	Mechanical Engineering	Assistant Professor	College of Engineering Pune
25	JIBIN NOBLE	MECHANICAL ENGINEERING	ASST. PROFESSOR	RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY
26	Dr. B. Latha	Physics	Assistant Professor	Rajalakshmi Engineering College(Autonomous)
27	SURRYA PRAKASH D	Mechanical Engineering	Associate Professor	Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology
28	Mahendra Ganpat Deshmukh	Mechanical	Lecturer	ATES, Faculty of Polytechnic, Akole, Ahmednagar
29	Zakir Sajid Ansari	MECHANICAL	Assistant Professor	Anjuman-Islam's Kalsekar Technical Campus
30	Nikhil Rajendra Kadam	Mechanical	Research Scholar	BITS Pilani Goa Campus
31	Prajakta Jagtap	Mechanical	Student	SRES COE Kopergaon
32	Dr. Govind prabhakar Kamble	Mathematics	Associate professor	P. E. S. College of Engineering
33	Dr Prashant Bhanudas Kushare	Mechanical	Professor	K K Wagh Institute of Engineering Education and Research
34	Mrs. Vrushali S. Takate	Instrumentation And Control Engineering	Assistant Professor	Pravara Rural Engineering College, Loni
35	Dr. Bhoopesh Chaudhari	Electrical Engineering	Professor	P. E. S. College of Engineering
36	Kapil Deo Gupta	LLDPE Mechanical	Assistant General Manager	Reliance Industries Ltd
37	Ganesh D. Shrigandhi	Mechanical Engineering	Assistant Professor	MIT WPU
38	Prathamesh Preetam Choughule	Mechanical Engineering	Assistant Professor	New Horizon institute of technology and management, Thane
39	Sakshi Tyagi	Mechanical engineering	Assistant Professor	Haldia Institute of Technology
40	Dr. Dhobe Milind M.	Mechanical Engineering	Associate Professor	PES College of Engineering
41	Prathamesh Preetam Choughule	Mechanical Engineering	Assistant Professor	New Horizon institute of technology and management, Thane
42	Gajanan P Nagre	Mechanical	Lecturer	MGM's polytechnic
43	Pankaj Krishnath Jadhav	Mechanical engineering	Assistant Professor	A P SHAH INSTITUTE OF TECHNOLOGY
44	Dr. Dhobe M. M.	Mechanical Engineering	Associate professor	PES College of Engineering
45	Sachin Shivaji Kanawade	ME	Lecturer	ATES, FACULTY OF POLYTECHNIC, AKOLE
46	Gajanan Bhosale	Mech Engg	I/C Principal	Yashwantrao Bhonsale Polytechnic, sawantwadi
47	Dr. S. Solomon Raj	Mechanical Engineering	Associate Professor	Chaitanya Bharathi Institute of Technology(A)
48	Saurabh Sanjay Sirsikar	Automobile	Assistant Professor	PHCET
49	Ganesh Gangadhar Gade	Mechanical	HOD	ATES, FOP, Akole
50	Pratap sopan shivsharan	Mechanical	Assistant professor	AVCDE
51	SONAWANE MANOJ SAYAJI	Mechanical engineering	Assistant professor	K. K. Wagh institute of engineering education and research, Nashik
52	KRANTI KUMAR DHIRUW	Mechanical Engineering	Assistant professor	Government Engineering college
53	KAMLESH YUVRAJ PATIL	mechanical	Asst. Prof.	Godavari College of engineering, Jalgaon
54	Ashfaq Rafiq Jamkhandikar	Mechanical	Lecturer	A I A R. Kalsekar Polytechnic

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**PMC REPORT OF THE AQIS-STTP ON “ COMPOSITES: FRACTURE TOUGHNESS,NDEAND FAILURE ANALYSIS”**

The Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology was granted approval to conduct Short Term Training Program ( STTP ) under AQIS 2019-20 during the financial year 2020-21 vide Ref.No.:34-66/442/FDC/STTP/Policy-1/2019-20 dated 10 August 2020 on “ Composites: Fracture Toughness, NDE & Failure Analysis “

The Director Faculty Faculty Development Cell of the AICTE vide their Drawing & Disbursing officer sanctioned payment of Rs.2,99,667/-for conducting STTP under Head 601.15(a)STTP Plan.

The grant in aid was released to the PHCET R&D Account No.:52142200086666, SYNB 000524 IFSC code at Khaira, Patalganga Branch. The original STTP was residential program of 6 days duration with minimum 40 participants. However, due to pandemic of COVID-19 the Institute was allowed to conduct STTPs through online mode with the stipulated conditions (Reference : Letter of Col. B.Venkat, Director (FDC) dated 14 September 2020). The institute conducted 3 STTPs on the same topic in multiples of Rs. 93,000/- within the total grant received by it.

The 3 STTPs were conducted during November 17-22, 2020, January 18-23, 2021 and March 15-20, 2021. The highlight of all the 3 STTPs has been the participation of leading professional societies in the country like Society for Automotive Engineering, Western Region, Institution of Engineers, Maharashtra Region, ASM International India Chapter, Society for Failure Analysis, Mumbai Chapter, Indian Society for Remote Sensing, Mumbai Chapter, Materials Recycling Association of India and the Indian Rubber Manufacturers Research Association, Mumbai. Their involvement immensely benefited participants and allowed them to interact with industries related to the subject matter of the STTPs.

All the 3 STTPs covered processing of Polymers, Polymer Blends & Composites, and their mechanical and Non-destructive characterization to ensure quality assured industrial products. This was followed by case studies of failures in different industrial sectors and ways and means to prevent such failures. The STTPs also covered advanced manufacturing processes like additive manufacturing and 3D printing. The lectures were delivered by the industry experts, faculty from NITs and IITs as well as leading foreign universities. The applications of Polymers, composites and NDE for medical applications were also covered by eminent speakers. The details are given in the Proceedings and the program schedule.

The entire program was monitored by duly constituted Program Monitoring Committee as per directives of the AICTE. The committee members held several meetings through the Zoom link and brought the program to a successful conclusion. Under the guidance of members of the PMC the grant in aid was adjusted against the expenditure as per the guidelines of the AICTE and the remaining balance amount Rs. 45,997.00 refunded through NEFT (UTR No. PO932101078573 dated 3.4.2021 SBIN0050203- KHIRE-PTLGNG-branch) to the member secretary AICTE, New Delhi on the bank details provided to us.

**PMC Committee Members**



Prof. R.C. Prasad,

Coordinator/ Member  
Secretary



Dr. G.V. Patil

Member



Dr. S.S. Pawar

Member



Dr. T.J. Mathew

Chairman and  
Principal, PHCET,  
Rasayani



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**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.18<sup>th</sup> titled "Processing and Speciality Thermoplastics" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Prakash Trivedi
2.	Bank account number	23710016063
3.	Bank name	Standard chartered Bank
4.	Bank branch address	Andheri Kanakia Branch
5.	Branch IFSC code	SCBL0036056
6.	Mobile number	9820283881
7.	PAN	

Signature:   
Name: Dr. Prakash Trivedi  
Designation: General Manager  
Affiliation: Chordq chemicals

  
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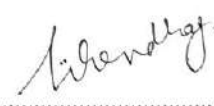
**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.18<sup>th</sup> titled "Advanced Polymers & Composites for high performance plastics" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Virendrakumar Gupta
2.	Bank account number	005201006412
3.	Bank name	ICICI Bank
4.	Bank branch address	Surat Athwalines
5.	Branch IFSC code	ICIC0000052
6.	Mobile number	9998965284
7.	PAN	

Signature:   
Name: Dr. Virendrakumar Gupta  
Designation: Head R&D  
Affiliation: Reliance Research  
Mumbai

  
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**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.18<sup>th</sup> titled "Advances in Polymer Technology, Nanotechnology" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr.RajkumarKasilingam
2.	Bank account number	188701001294
3.	Bank name	ICICI Bank
4.	Bank branch address	Wagale Industrial estate Thane, Mumbai
5.	Branch IFSC code	ICIC001887
6.	Mobile number	8655095342
7.	PAN	

  
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Dist. Raigad - 410 207.

Signature: 

Name: Dr. Rajkumar K.

Designation: Director

Affiliation: IRMRA, Mumbai



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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.18<sup>th</sup> titled " FEM of Nano Engineered Composites & its Molecular Dynamics" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Dattaji Shinde
2.	Bank account number	10538307244
3.	Bank name	State Bank of India
4.	Bank branch address	VJTI Matunga
5.	Branch IFSC code	SBIN0011075
6.	*Mobile number	7045809459
7.	PAN	BAKPS3688F

Signature: 

Name: Dr Dattaji K Shinde

Designation: Associate Professor Production Department

Affiliation: VJTI Mumbai

  
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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.19<sup>th</sup> titled " Processing Composites at L& T Defence: An Industry Perspective" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Shantanu Prabhune
2.	Bank account number	002601041127
3.	Bank name	ICICI Bank
4.	Bank branch address	Kailash Plaza, Plot 355, Vallabh Baug Lane, Opp Odeon Cinema, Ghatkopar (E), Mumbai
5.	Branch IFSC code	ICIC0000026
6.	Mobile number	9930695359
7.	PAN	AJQPP1629P

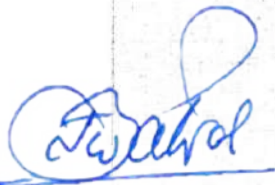
Signature: 

Name: Shantanu C. Prabhune

Designation: Asst. Gen. Manager

Affiliation: Larsen and Toubro Ltd

  
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**Pillai HOC College of Engineering & Technology, Rasayani**


**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.19<sup>th</sup> titled "R&D innovation on Hybrid Carbon-Glass epoxy gun barrel for shoulder fired launcher " for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Shri KashinathDeodhar
2.	Bank account number	60376670935
3.	Bank name	Bank of Maharashtra
4.	Bank branch address	Pune, Shanivar Peth
5.	Branch IFSC code	MAH00000675
6.	Mobile number	9881253425
7.	PAN	

  
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Dist. Raigad - 410 207.

Signature:   
Name: Mr. Kashinath Deodhar  
Designation: Group Director

Affiliation: ARDE, DRPO



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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.19<sup>th</sup> titled "Challenges in design & manufacturing of composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Chandra Sekhar Yerramalli
2.	Bank account number	2724118000025
3.	Bank name	Canara bank
4.	Bank branch address	I I T POWAI BRANCH,, BANK & CAFETERIA BUILDING,, OPP.KRESIT, I I T POWAI, State: MAHARASHTRA
5.	Branch IFSC code	CNRB0002724
6.	Mobile number	9819768104
7.	PAN	AAFY6145D

Signature: 

Name: Chandra S Yerramalli

Designation: Assoc Professor

Affiliation: IIT Bombay



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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.20<sup>th</sup> titled "Fabrication of Sandwich Composites and it's applications" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Divya MV Padmanabhan
2.	Bank account number	165110100014161
3.	Bank name	Andhra Bank
4.	Bank branch address	ANDB0001651
5.	Branch IFSC code	Panvel
6.	Mobile number	9322839587
7.	PAN	

Signature: 

Name: Divya MV Padmanabhan

Designation: Professor

Affiliation: PCE Panvel

  
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Rasayani, Tal. Khelapur  
Dist. Raigad, Pin-410 207

Mahatma Education Society's

**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan. 20<sup>th</sup> titled " Plastic Moulding Processes and Industrial Applications" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Mr. Satyanarayan Joddabge
2.	Bank account number	0886104000052960
3.	Bank name	IDBI BANK
4.	Bank branch address	Chakan-Pune Branch- (Sol -886)
5.	Branch IFSC code	IBKL0000886
6.	Mobile number	9763361277
7.	PAN	AIZPJ6365L

Name: Satyanarayan Joddabge

Designation: Founder & Director

Affiliation: Joddabge Associates



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Rasayani, Tal. Khalapur  
Dist. Raigad, Pin-410 207

Mahatma Education Society's

**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan.20<sup>th</sup> titled " Fabrication of Sandwich Composites and it's applications" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Diab Core Materials Pvt Ltd
2.	Bank account number	9711826374
3.	Bank name	Kotak Mahindra Bank
4.	Branch IFSC code	KKBK0000462
5.	Bank branch address	Teynampet Branch
6.	Mobile number	9566058323
7.	PAN	AACCD6441K

Signature: 

Name: B. RIMZATH ALI

Designation: Technical Manager

Affiliation: DIAB CORE MATERAILS PVT LTD

  
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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan. 21<sup>st</sup> titled "Mechanical Characterisation of Neat Epoxy and Its failure analysis using FEA" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18January to 23January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Suhas Ananda Uthale
2.	Bank account number	32432416126
3.	Bank name	State Bank of India
4.	Bank branch address	CBD Belapur (Konkan Branch)
5.	Branch IFSC code	SBIN0006240
6.	Mobile number	9870427915
7.	PAN	

Signature: 

Name: Suhas Ananda Uthale

Designation: .Asst. Professor

Affiliation: PHCET, Rasayani



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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Jan. 21<sup>st</sup> titled "Processing and Properties of Metal Foams" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 18 January to 23 January 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Manmohan Das Goel
2.	Bank account number	30082017787
3.	Bank name	SBI
4.	Bank branch address	NEERI Nagpur
5.	Branch IFSC code	SBIN0004224
6.	Mobile number	7722043252
7.	PAN	AJQPG1959H

  
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Manmohan Dass Goel  
Assistant Prof.,  
VNIT Nagpur

डॉ. एम. डी. गोयल  
Dr. M. D. Goel  
सहायक प्राध्यापक/Assistant Professor  
अनुप्रयुक्त यंत्रशास्त्र विभाग  
Department of Applied Mechanics  
वि.स.टी.सं. नागपुर / V.N.I.T. Nagpur-440010.



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Dist. Raigad, Pin-410 207

Name of the Institute: Pillai HOC College of Engineering & Technology, Rasayani

UTILISATION CERTIFICATE FOR THE FINANCIAL YEAR 2020-21.

Name of the Scheme under which the amount was sanctioned under the Short Term Training Program (STTP) under AQIS during financial year 2020-21

(to be submitted separately for each sanction order)

Sl. No	AICTE Sanction Order/Letter No. & Date under which the amount was sanctioned	Amount (Rs.)	
	Ref. No. 34-66/442/FDC/STTP/Policy-1/2019-2020 Dated: 10 <sup>th</sup> Aug 2020	Rs 2,99,667/- (Rupees Two Lac Ninety Nine Thousand Six Hundred and Sixty Six Only)	Certified that out of Grant-in-Aid of Rs 2,99,667/- (Rupees Two Lac Ninety Nine Thousand Six Hundred and Sixty Six Only) sanctioned by the AICTE during the financial year 2020-21 in favour of Pillai HOC College of Engineering & Technology, Rasayani. as per letter mentioned in column 2 and Rs.202232/- on account of unspent balance of previous year, Rs.72000/- has been utilized for the purpose for which it was sanctioned and the balance of Rs. 130232/- remained unutilized at the end of the second session.

Certified that I have satisfied myself that the conditions on which the amount was sanctioned have been duly fulfilled and that I have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned.

Kinds of checks exercised:-

1. Audited Annual Accounts of the Institute
2. Receipt and Payment account
3. Periodical Progress Reports.

Signature of Chartered Accountant

Name of Chartered Accountant

Membership No.: 234002

Full Address with Seal M9, LANE 3, SECTOR-9, CBD BELAPUR

UDIN: 21234002AAAAA19087

31/03/2021

Signature of the Finance Officer

Name & Designation

Name of the Finance Officer

Full Address with Seal

(Govt. Aided/University & wherever applicable)

Place:

Date: 31/03/2021

Signature of Head of the Institute

Name & Designation

Full Address with Seal

**PRINCIPAL**  
Pillai HOC College of  
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Pillai HOC Educational Campus,  
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Dist. Palghat - 410 207.

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Dist. Palghat, Pin-410 207

Annexure-B

RECEIPT AND PAYMENT ACCOUNT-2<sup>ND</sup> SESSION

Sl. No.	Receipt	Amount (Rs.)	Amount (Rs.)	Sl. No.	Payments	Amount (Rs.)	Amount (Rs.)
1	To Opening Balance	2,02,232/-	2,02,232/-	1	Honorarium to experts	21 * 3000/- each	63000/-
				2	Honorarium to Coordinator	5000/-	5000/-
				3	Lab attendant	3000/-	3000/-
				4	Miscellaneous (i) Broadband Connection	1000/-	1000/-
					<b>Closing Balance</b>		1,30,232/-
	<b>Grand Total</b>		2,02,232/-		<b>Grant Total</b>		2,02,232/-

Signature of Chartered Accountant

Name of Chartered Accountant  
SUSANNA CHERIAN

Membership No.: 234002

Full Address with Seal M9, LANE-3, SECTOR-9,  
CBD BELAPUR,

UDIN 21234002AAAAA19087  
31/03/2021

Signature of the Finance Officer

Name & Designation Sheena Nair

Name of Finance Officer: Sheena Nair

Full Address with Seal  
(Govt. Aided University & wherever applicable)

Signature of Head of the Institute

Name & Designation

Full Address with Seal

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Dist. Raigad - 410 207.

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Dist. Raigad, Pin-410 207





Annexure -I

## SHORT TERM TRAINING PROGRAM

### FEED BACK FORM

1. AICTE File No. & Date of Offer Letter : 34-66/442/FDC/STTP/Policy-1/2019-20  
Date: 10 AUG 2020
2. Name of the Coordinator : Dr. Ram Prasad
3. Name and Address of the Institution : Mahatma Education Society's Pillai HOC College of Engineering & Technology, Rasayani, Pillai HOCL Educational Campus, HOC Colony, Rasayani via Parvel, Dist: Raigad, Pin-410206
4. Title of the Faculty Development Programme : Composites: Fracture Toughness, NDE and Failure Analysis
5. Dates : STTP-1 November 17 to 22, 2020  
STTP-2 January 18 to 23, 2021  
STTP-3 March 15 to 20, 2021
6. Venue : Online mode (Zoom)
7. Total No. of participants proposed and actually attended  
Proposed  Attended 161
8. No. and date of the offer letter

Letter No.	Date
34-66/442/FDC/STTP/Policy-1/2019-20	10 AUG 2020

9. Total amount sanctioned : Rs. 299667/-

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10. No. and date of Sanction letter:

Letter No.	Date	Grant Released
34-66/442/FDC/STTP/Policy-1/2019-20	10 AUG 2020	299667/-

11. Total expenditure incurred in Conducting the Faculty Development Programme: Rs. 253670/-

12. Grant received from various agencies other than AICTE for this Faculty Development Programme

Sl. No.	Name of Agency	Grant Received
Nil	Nil	Nil
	Total	Nil

13. Details of internal revenue if any generated by the Institution/Department on account of this Programme:

14. Briefly mention about the technological/ academic/or any other benefit generated by conducting this programme with respect to a) the institution, b) the faculty; c) students; d) industry/society.

The 3 STTPs were conducted during November 17-22, 2020, January 18-23, 2021 and March 15-20, 2021. The highlight of all the 3 STTPs has been the participation of leading professional societies in the country like Society for Automotive Engineering, Western Region, Institution of Engineers, Maharashtra Region, ASM International India Chapter, Society for Failure Analysis, Mumbai Chapter, Indian Society for Remote Sensing, Mumbai Chapter, Materials Recycling Association of India and the Indian Rubber Manufacturers Research Association, Mumbai. Their involvement immensely benefited participants and allowed them to interact with industries related to the subject matter of the STTPs. All the 3 STTPs covered processing of Polymers, Polymer Blends & Composites, and their mechanical and Non-destructive characterisation to ensure quality assured industrial products. This was followed by case studies of failures in different industrial sectors and ways and means to prevent such failures. The STTPs also covered advanced manufacturing processes like additive manufacturing and 3D printing. The lectures were delivered by the industry experts, faculty from NITs and IITs as well as leading foreign universities. The applications of Polymers, composites and NDE for medical applications were also covered by eminent speakers.

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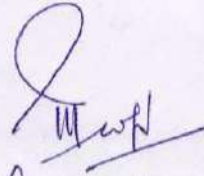
Pillai's HOC Educational Campus  
Rassyan, Tal. Khelapur  
Dist. Raigad, Pin-410 207

15. The soft as well as hard copy of the detailed study material/proceedings of the programme must be furnished to the Council.: Proceedings of the programme is attached



Prof. R.C. Prasad

Name & Signature of Coordinator



Dr. Mathew Joseph

Name & Signature of Head of Institute

with seal



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PROCEEDINGS OF ONE WEEK AICTE APPROVED  
CERTIFICATE SHORT TERM TRAINING PROGRAM

ON

**COMPOSITES : FRACTURE TOUGHNESS,  
NDE & FAILURE ANALYSIS**

**DURING JANUARY 18 - 23, 2021**

Organized by

DEPARTMENT OF MECHANICAL ENGINEERING  
PILLAI HOC COLLEGE OF ENGINEERING AND TECHNOLOGY, RASAYANI

Supported by



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# STTP - CFTNDFA 2020

Two weeks AICTE approved certificate short term training program on "Composites: Fracture Toughness, NDE and Failure Analysis" is organized by Department of Mechanical Engineering, Pillai HOC College of Engineering and Technology, Rasayani and is supported by the Society for Failure Analysis Mumbai Chapter, ASM International India Chapter, SAE India, ISRS Mumbai Chapter and IRMRA Mumbai. The objective of this Short Term Training Program is to provide basic understanding of synthesis, fracture toughness evaluation using fracture mechanics concepts, defects detection using NDT, understand the modes and mechanisms of fracture and for analysis offailures.

The eminent speakers of the workshop are from reputed academic institutes, research establishments and industries having worked extensively in different aspects of composites. The list of speakers along with patrons, advisory and organising committee members is given below.

## Patrons

1. Dr. K. M. Vasudevan Pillai, Chairman & CEO MES
2. Mr. T. S. Kathayat, President, Welspun Corp. Ltd., Parel, Mumbai
3. Dr. N. Eswara Prasad, Director, DMSRDE
4. Dr. K. Rajkumar, Director, IRMRA, Mumbai

## Advisory Committee

1. Dr. Priam Pillai, COO, MES
2. Mr. Franav Pillai, DCEO, MES
3. Dr. S. Joshi, Principal, PCE Panvel
4. Dr. Pragnesh Shah, PCE Panvel
5. Dr. Mathew T. Joseph, Principal PHCET
6. Dr. H.M. Raje, Chairman, Institute of Engineers, Mah. State Centre
7. Dr. Manoranjan Patri, Director, NMRL, Mumbai
8. Mr. Kashinath Deodhar, Group Director, ARDE, DRDO
9. Dr. Makarand Joshi, R&DE, DRDO, Pune
10. Dr. Sashi Kanta Panigrahi, DIAT, Pune
11. Prof. Raghu Prakash, IIT Madras
12. Mr. Samresh Changdar, GE India Pvt. Ltd. Pune
13. Dr. Mangesh V. Joshi, MD & CEO, Sanrachana Pvt. Ltd. Mumbai
14. Mr. Atul Bakare, Addl. Director, CEMILAC, Nashik
15. Dr. Ishtiaq Khan, Tata Technologies Pune
16. Mr. Shantanu C Prabhune, L&T Powai Mumbai
17. Mr. Sudhakar Bonde, Chairman, ASM International India Chapter
18. Mr. Sandeep Rege, Secretary ASM & DGM Mahindra & Mahindra
19. Dr. G. S. Prabhu, MD, Fine Finish Organics Pvt. Ltd., Taloja, Mumbai
20. Mr. Rimzath B., DIAB Group, Sweden
21. Mr. Sudhir B. Vaidya, Manager, SAE WESTERN INDIA GROUP



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### **Organizing committee**

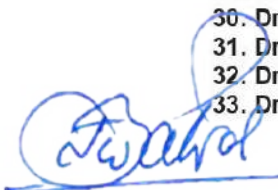
1. Dr. Divya Padmanabhan, PCE Panvel
2. Dr. T. Tambushkar, PCE Panvel
3. Dr. Viswajit Panda, PCE Panvel
4. Dr. M. D. Nadar, PHCET Rasayani
5. Mr. Suhas Uthale, PHCET Rasayani
6. Mr. Amar Arun Jadhav, PHCET Rasayani
7. Mr. Saurabh Sirsikar, PHCET Rasayani
8. Mr. Shashi Bhushan, PHCET Rasayani
9. Mr. Kartik Nagarajan, PHCET Rasayani
10. Dr. Ajit Bhandakkar, Secretary, SFA Mumbai Chapter

### **Steering/Program monitoring committee AQIP STTP:**

1. Dr. Mathew T. Joseph, Principal : Chairman
2. Dr. R. C. Prasad, Coordinator & Member Secretary
3. Dr. G. V. Patil, Head Mech. Engg. Dept. : Member
4. Dr. S. Pawar, Head Automobile Engg. Dept. : Member
5. Dr. Priam Pillai, COO of MES : Member as a Subject Expert

### **List of Speakers**

1. Prof. R.C. Prasad, PHCET, RASAYANI
2. Dr. Rajkumar Kasilingam Director, IRMRA Mumbai
3. Shri. Shantanu C. Prabhune, L&T Mumbai
4. Prof. Shridhar Yarlagadda, University of Delaware, USA
5. Dr. Prakash D. Trivedi, Gharda Chemicals Mumbai
6. Prof. Biswajit Panda, PIIT Panvel
7. Dr. Virendra Kumar Gupta, Head R&D & Senior VP, Reliance Research, Mumbai
8. Shri. Kashinath Deodhar, Group Director, ARDE, DRDO
9. Prof. Ramesh Talreja, tenneco Prof. TEXAS A&M University, USA
10. Dr. Debdatta Ratna, Scientist, NMRL Ambernath
11. Dr. Dinesh Singh Thakur, Professor, DIAT, Pune
12. Dr. Ajit Bhandakkar, Chief of Lab, HAL, AURDC, Nashik
13. Mr. Rimzath B, DIAB, Sweden
14. Prof. Shankar Shastri, Washington University in St. Louis, USA
15. Dr. C.M. Manjunatha, Scientist, NAL Bangalore
16. Dr. Shyamsunder, Former Principal Scientist, GE Research, Bangalore
17. Dr. Raghu Prakash, IIT Madras
18. Dr. Ravi Babu, CECRI
19. Dr. Dattaji K. Shinde, Professor VJTI, Matunga, Mumbai
20. Prof. S.K. Panigrahi, DIAT, Pune
21. Prof. Chandra Sekher Yerramalli, IIT Bombay
22. Shri. Praveer Verma, DMSRDE, Kanpur
23. Dr. P.J. Guruprasad, Professor, IIT Bombay
24. Dr. Guruprasad Rao, Director, Imaginarium India Pvt. Ltd.
25. Dr. Atul Bakare, Addl. Director, CEMILAC, Nashik
26. Shri. Samaresh Changdar, GE India Pvt Ltd., Pune
27. Prof. Nagmani Jaya Balia, Dept. of MEMS, IIT Bombay
28. Dr. Mangesh V. Joshi, CEO, Sanrachana Structural Strengthening Pvt. Ltd., Thane
29. Dr. G.S. Prabhu, Managing Director, Fine Finish, Taloja
30. Dr. Sumanda Bandyopadhyay, SABIC, Bangalore
31. Dr. Pooja Manoj Katkar, D.K.T.E.S Textile & Engineering Institute, Ichalkaranji
32. Dr. Divya Padmanabhan, PCE, Panvel
33. Dr. G.V. Patil, PHCET, Rasayani



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# STTP - CFTNDFA 2020

## P R E F A C E

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Composites are engineered materials consisting of a matrix and reinforcement that is separated by an interface. Composite can be tailored to have desired properties. The light weight, corrosion resistant and tough composites are considered a major break-through that has revolutionized their use in many critical applications in automobile, aerospace, defense and marine industries. It therefore becomes imperative to produce defect free composites for critical applications. Detecting defects using NDT is, however, highly challenging job due to its anisotropic and complex failure modes. The extensive work carried out in academic and research institutes has brought India at the threshold of new era. This two days National Workshop planned at Pillai College of Engineering will facilitate interaction amongst government, universities and fast growing manufacturing sectors. Collaborative effort for low cost fabrication of composites will encourage investment and boost Indian Economy. The applications of composites in different sectors will have a dramatic impact on gross National product and employment opportunities in our country.

**Professor R.C. Prasad**  
**Convener of the STTP**

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4

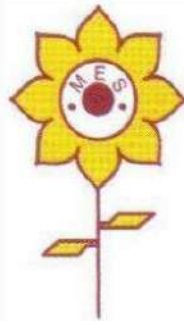
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**DR. K. M. Vasudevan  
Pillai Chairman & C. E.  
O Mahatma Education  
Society**



**DR. Daphne  
Pillai  
Secretary  
Mahatma Education Society**

## **Mahatma Education Society**

The Mahatma Education Society (MES) embarked upon its mission of 'Education of All' with Chembur English School in the year 1970. The Mahatma Education Society is proof of a vision linked irrevocably to national goals. Born in a time when education was deemed service, it set about bringing social and economic change through the proactive personal development of every child that came into its fold. The vision, dedication, global outlook, tenacious struggle and undaunted spirit of Dr. K. M. Vasudevan Pillai (Founder, secretary and CEO) and Dr. Daphne Pillai (Joint Secretary and Rector), the Trust grew from a single school into a multi-institution, multi-location group delivering quality education at all levels.

Today MES owns and manages over 48 institutions spread across six elegant campuses at Borivali, Chembur, Powai, New Panvel(W), New Panvel(E) and Rasayani. It manages educational Institutions' from pre-primary to post-graduation. It comprises of schools, international schools, degree colleges, night colleges, Management Institutions, Engineering colleges, Architecture colleges, colleges of Education (including Physical education) and polytechnic Institutions. Popularly known as the Pillai Group of Institutions, this education major has its own teacher training institutes, which allow it to define its own standards and to achieve 100% results unfailingly, The group has more than 35,000 students, 2,000 teachers and 1500 members of support staff.

It does so through a highly motivated faculty, a learning environment powered with the latest technologies, a spirit of innovation that sees it reach for the highest standards of accreditation in its field, and an approach that recognizes the sharing of knowledge remains the finest manifestation of a unified world. The Pillai Group is credited with several "firsts" in its field.

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PHCET Motto:  
**Vidya Karmasu Kaushalam**  
Knowledge is Excellence at Work

## Principal's Message

We live in unprecedented times with unprecedented problems. Hitherto unknown problems need hitherto unknown solutions. 'Thinking out of the box' is a cliché. However, at no other time in our history have we needed it more. Genuine problem solving requires 'thoughts sans frontier'. What is the role of academia in it? What is the role of PHCET in it? Known methods, solutions and strategies are no longer valid. We in PHCET have been looking at new alternatives and strategies as well as to involve different partners to make our service more relevant, contemporary and forward looking. Evaluating the Employability, Creating a 'Value Add Metric', mentoring of students and faculty by Industry experts, etc., are some of the new initiatives.

Established in 2009 and affiliated to Mumbai University, PHCET offers specializations in seven areas of engineering. And also provides excellent facilities, infrastructure and high quality education on an extremely safe and highly quality conscious, beautiful and verdant campus for a fraction of the cost one would normally have to pay. It is also a matter of pride for us to inform our readers that PHCET is accredited with an 'A' Grade in 2019 by NAAC (National Assessment and Accreditation Council); UG programs in Computer and Mechanical Engineering are accredited two times each by NBA (National Board of Accreditation); PHCET is the winner of the 'First Best of the Work Place Safety Awards' in 2019 from Bombay Chamber of Commerce and Industry (BCCI) and also the winner of the 'Performance Excellence Trophy' from Indian Merchants Chamber Ramkrishna Bajaj National Quality Award (RBNQA) in December 2019. PHCET has a manufacturing centre started in January 2020 from design to manufacture of Printed Circuit Board (PCB). This centre is for training students to become employable and also become entrepreneurs. Mumbai University has appointed PHCET as a Lead Cluster College for conducting the University examinations. We look forward with hopes and aspirations to a great year ahead as it unfolds and wish all our readers a Very Happy New Year 2021 and all the blessings it brings. It is also time for the academia to look at the realities around us anew. In difficult times it is the academia that has to rise up and show the way. In that spirit PHCET has organized an all India STTP in January 18-23, 2021 on 'COMPOSITES: FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS', which is a very relevant and contemporary theme. The galaxy of the eminent resource persons from different parts of the world and the enthusiastic participants have made the effort worthwhile and gave enormous satisfaction to the organizers. I compliment the coordinator of the STTP Prof. R.C. Prasad and his team for the splendid job in pursuance of the PHCET Motto: 'Vidya Karmasu Kaushalam'.

**PRINCIPAL**

Mahatma Education Society's  
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Pillai's HOC Educational Campus  
Rassyan, Tal. Khelapur  
Dist. Raigad, Pin-410 207



# Society for Failure Analysis

[Registration No. 97/2008/HYDERABAD]



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#### Contact Us at:

[sfa-india@gmail.com](mailto:sfa-india@gmail.com)

[bjana02@yahoo.co.in](mailto:bjana02@yahoo.co.in)

Website: [www.sfaindia.com](http://www.sfaindia.com)

The Society for Failure Analysis was established in the year 2006 with the patronage from many eminent experts with a mission to reduce failures that are estimated to cost 3-4% of GDP in a developing country.

#### Aims & Objectives of SFA

- Promote, encourage and develop growth of "Art and Science of Failure Analysis".
- Stimulate interest in compilation of database for effective identification of root causes of failures and their mitigation.
- To serve as a common forum for individuals, organizations and industries interested to investigate root cause of failures.
- Establish liaison with Government, academic and research institutions, commercial bodies and individuals on methodologies of failure analysis and render help.
- Collaborate with appropriate international organizations for the promotion of common objectives.
- Train personnel to conduct systematic failure analysis.
- Identify and recommend areas for research and development in the country, to prevent failures.

In order to fulfil the above objectives, the society organises lectures, workshops, clinics, conferences, seminars, colloquia and courses related to failure analysis at different regional chapters spread across the country and networks with professional bodies, in addition to bringing out periodic newsletters.



For the first time, the Theme-Symposium on Failure Analysis is being jointly conducted by The Society for Failure Analysis and The Indian Institute of Metals during the NMD-ATM 2014. For further details about the society, kindly see the web page: [www.sfaindia.org](http://www.sfaindia.org).

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# ASM INDIA CHAPTER

ASM International is a premier educational society of metallurgists, materials scientists and technologists. ASM International is an interactive resource of materials information, and a conduit for professionals to meet, interact and share ideas. A worldwide Network led by Members, guided by Member Needs, and fueled by Members Participation. ASM enables its members to keep abreast of the latest technological and marketing trends. It offers invaluable opportunities to interact and learn from fellow materials engineers across the country and around the world, thus helping to stay competitive and sharpen creative vision. ASM offers excellent networking link, giving an instant access to insights and wealth of information through its technical books, acclaimed handbooks, engineering software and CD-ROMS. ASM is the information sharing network for anyone who works with metals, alloys, composites, ceramics, polymers and electronic materials.

ASM International, India Chapter established in the year 1979, is one of the most active chapter in the world. It organizes technical courses on subjects like Welding, Metallurgy for the Non-metallurgist, Metal Forming, Heat Treatment, Stainless Steels, Non-ferrous Metals, Thermal Spraying etc. under the Continued Education Program for engineers and technocrats. Other activities include Conferences, Workshops and Exhibitions on recent developments in Materials Processing. Material Application Engineering, Heat Treatment, Equipment etc. at National and International levels.

In order to increase awareness on materials technology and to excite young student community in materials science and engineering careers, ASM has been conducting one-week Materials Camps at I.I.T. Bombay, Mumbai and M. S. University of Baroda, Vadodara for the students of 11th standard to expose students to materials technology through hands-on experimental work and Industry visits. Participation in these camps is free; breakfast, lunch, course materials etc. is given free to all the participating students. These camps are found to be highly effective as quite a few students have opted Materials Technology as one of the options while entering engineering stream.



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The Society of Automotive Engineers India (SAEINDIA), Western Section, Pune, is a vibrant premier professional society, having substantial following in the Indian automobile industry, involved in serving the Mobility Engineering Community engaged in design, manufacture and service of self-propelled vehicles and systems that move in land, sea, air and space. Its vision is to continuously enrich knowledge base of practitioners in mobility industry and institutions in the service of humanity. SAEINDIA is India's leading resource for mobility technology. As an individual member driven society of mobility practitioners, the ownership of SAEINDIA wrests with its members who are Individuals from the mobility community, which includes Engineers Executives from Industry, Government Officials, Academics and Students.

SAEINDIA is a Platform where all Engineers & Officers from Automotive Industries network with each other, share their ideas, improving technical knowledge and thereby build strong relations. This also helps them in their managerial roles in their respective fields and industry.

A handwritten signature in blue ink, appearing to read 'S. J. Jadhav', is written over a horizontal line.

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You are cordially invited  
for the Inaugural Function of the AQIP-STTP on  
Composites : Fracture Toughness, NDE and Failure Analysis  
on Monday, Jan 18, 2021 During 9:00 AM to 10:15 AM

Organised By



INAUGURAL PROGRAM SCHEDULE

Time	Session Details
9:00 AM	Welcome & Opening remarks by Prof. R.C. Prasad, Coordinator and Vice Chair, SFA Mumbai Chapter
9:05 AM	Presidential Address by Dr. Lata Menon, Deputy CEO, Rasayani Campus
9:15 AM	Address by Dr. Mathew T. J., Principal PHCET
9:20 AM	Address by Dr. H.M. Raje, Chairman, Institution of Engineers, Maharashtra State Centre
9:25 AM	Address by Mr. Sudhakar Bonde, Chairman ASM International, India Chapter
9:35 AM	Address by Dr. S.S. Pawar, Professor and Head of Automobile, on activities of SAE at PHCET
9:37 AM	Address by Mr. Sanjay Nibhande, Deputy Director ARAI Chakan, Chairman SAE Western Region
9:47 AM	Address by Dr. Rajkumar Kasilingam, Director, IRMRA, Mumbai
09:57 - 10:15 AM	Inaugural Lecture by Dr. B.K. Nayak, Consultant and Head Ophthalmology, Hinduja Hospital ON "Overview of Various Implants Materials Used in Ophthalmology"
10:15 AM	Vote of Thanks by Dr. G.V. Patil, Professor & Head, Dept. of Mechanical Engineering, PHCET
10:20- 11:20	Session I

Supported By



RVSP : Dr. R. C. Prasad  
Coordinator and Vice Chair, SFA  
Mumbai Chapter Email ID :  
rcprasad@mes.ac.in  
Mobile Number : 8433883165

























Link for joining the Inaugural Function : <https://us02web.zoom.us/j/3276544466?pwd=12345>

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**AICTE APPROVED STTP ON " COMPOSITES: FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS**

STTP - 2 : SCHEDULE							
		Host for the event: Prof. R.C. Prasad				Co-host: Dr. G.V. Patil, Sunilising Rajput & Ameya More	
Session	Time	Day 1 - 18th Jan 2021	Day 2 - 19th Jan 2021	Day 3 - 20th Jan 2021	Day 4 - 21st Jan 2021	Day 5 - 22nd Jan 2021	Day 6 - 23rd Jan 2021
	9:00 am to 9:30 am	INAUGURAL FUNCTION					
Session 1	9:30 am to 10:40 am	<p>Dr. Prakash D.Trivedi, Gharda Chemicals Mumbai Processing and Properties of High Performance Plastics</p> 	<p>Dr. Debdatta Ratna, Scientist-F, NMRL Amhermath Polymer Matrix Composites for Naval Applications</p> 	<p>Prof. Shankar Sastri, Christopher i. Bymes Professor of Engineering, Washington University in St. Louis, USA Biomimetic Approach to the Development of Damage Tolerant Ceramic Composites</p> 	<p>Prof. Shridhar Yarlagadda, University of Delaware, USA Crashworthy Design of Composites for Automotive Applications</p> 	<p>Prof. Ramesh Talreja, Tenuco Professor, AAAS Science and Technology Policy Fellow, JointFacultyIn: Aerospace,MaterialsScience&amp;Engineering, TEXAS A&amp;M UNIVERSITY, USA Damage, Fatigue and Failure of Composite Materials: A Physical Modeling Approach</p> 	<p>Dr. Guruprasad Rao, Director &amp; Mentor (Leadership Team) Imaginarium India Pvt. Ltd. 3D printing of Functionally Graded Materials- an Overview</p> 
Session 2	10:40 am to 11:50 am	<p>Dr. Virendra Kumar Gupta, Head R&amp;D &amp; Senior VP, Reliance Research, Mumbai Advanced Polymers &amp; Composites for high performance Applications</p> 	<p>Dr. Shantanu C. Prabhune, AGM, L&amp;T Mumbai Processing Composites at L&amp;T Defence : An Industry Perspective.</p> 	<p>Dr. Divya Padmanabhan Professor, PCE Panvel Materials Development for Implants and Prosthesis</p> 	<p>Dr. Ranji Manoharan Department of Mechanical &amp; Aerospace Engineering Adhesively Bonded Joints in Composite Structure</p> 	<p>Prof. Jaya B. Nagamani Department of Metallurgical Engineering and Materials Science, IIT Bombay Fracture Toughness Testing &amp; Integrity Assessment of Composites Across Multiple Length Scales</p> 	<p>Dr. Ravi Babu, CECRI, Taminadu 3D printing of Polymers &amp; Polymer Composites</p> 
Session 3	11:50 am to 01:00 pm	<p>Dr. Rajkumar Kasilingam, Director, IRMRA Mumbai Advances in Polymer Technology, Nanotechnology</p> 	<p>Shri. Kashinath Deodhar, Group Director, ARDE, DRDO R&amp;D Innovation on Hybrid Carbon-Glass Epoxy Gun Barrel for shoulder fired launcher</p> 	<p>Mr. Satyanarayan Joddabge Founder, Joddabge Associates Plastic Moulding Processes and Industrial Applications</p> 	<p>Dr. Manmohan Das Goel, Professor, VNIT Nagpur Processing and Properties of Metal Foams</p> 	<p>Dr. S. K. Panigrahi, Professor, DIAT, Pune Fracture Mechanics &amp; Computational Methods for Damage Assessment in Composite for Defense Applications</p> 	<p>Dr. Praveer Verma, Scientist-F, DMSRDE, Kanpur Failure Analysis of Polymer Matrix Composites</p> 
Session 4	1:00 pm to 2:10 pm	<p>Dr. Dattaji K. Shinde, Professor VJTI, Matunga, Mumbai FEM of Nano engineered Composites &amp; its Molecular Dynamics</p> 	<p>Prof. Chandra Sekher Yerramalli, Department of Aerospace Engineering, IIT Bombay Challenges in Design &amp; Manufacturing of Composites</p> 	<p>Mr. Rimzath B., DIAB, Sweden Fabrication of Sandwich Composites and it's Applications</p> 	<p>Dr. Shyamsunder M., Former Principal Scientist, GE Research Former Senior Scientist, IGCAR, Kalpakkam Chairman, National Certification Board, ISNT NDE of Composites - Trends and Advances</p> 	<p>Dr. C. M. Manjunatha, Chief Scientist, NAL Bangalore Fatigue and Fracture of Composites</p> 	<p>Dr. R. C. Prasad, Professor, PHCET, Rasayani Fracture toughness and failure analysis of composites</p> 
Session 4	2:10 pm to 3:00 pm	Concluding Remarks by Session Chairman and Feedback	Concluding Remarks by Session Chairman and Feedback	Concluding Remarks by Session Chairman and Feedback	Concluding Remarks by Session Chairman and Feedback	QUIZ TEST	VALEDICTORY FUNCTION



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# TWO WEEKS AICTE APPROVED CERTIFICATE STTP

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

<p><b>Organized by</b></p>    <p><b>PHCET</b> PILAIHOC COLLEGE OF ENGINEERING &amp; TECHNOLOGY PHCET, Rasayani</p> <p><b>AICTE</b> All India Council of Technical Education INDIA</p>	<p><b>Supported by</b></p>    <p><b>SFA</b> Mumbai Chapter</p> <p><b>S-EINDIA</b> Society of Automotive Engineers INDIA</p> <p><b>ASM</b> INTERNATIONAL INDIA CHAPTER</p>
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Date	Time	Program Itinerary
18/01/2021	09:00 to 09:45 AM	Inauguration
	09:45 to 10:40 AM	<b>Dr. Prakash D.Trivedi, Gharda Chemicals Mumbai</b> Processing and Properties of High Performance Plastics
	10:40 to 11:50 AM	<b>Dr. Virendra Kumar Gupta,</b> <b>Head R&amp;D &amp; Senior VP, Reliance Research, Mumbai</b> Advanced Polymers & Composites for high performance Applications
	11:50 to 01:00 PM	<b>Dr. Rajkumar Kasilingam, Director, IRMRA Mumbai</b> Advances in Polymer Technology, Nanotechnology
	01:00 to 02:10 PM	<b>Dr. Dattaji K. Shinde, Professor VJTI, Matunga, Mumbai</b> FEM of Nano engineered Composites & its Molecular Dynamics
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>



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## “PROCESSING AND PROPERTIES OF HIGH-PERFORMANCE PLASTICS”

**Dr. PRAKASH TRIVEDI**

Gharda Chemicals Mumbai

**Abstract :** High performance or Specialty Thermoplastics (STP) are becoming more important in last few years because of their unique properties, which are needed for such application fields as Medical, Aerospace, Transports, Oil/Gas Fields and general engineering.

Their uniqueness rests in their resistance to high temperature, chemicals, radiation, wear and tear and such properties. They show very high mechanical properties at normal and at higher temperatures as compared to engineering plastics.

Interestingly, they can be processed nearly similarly as engineering plastics, except at higher temperatures and with superior wear and corrosion resistant screws and barrels. The 3D Printing is the latest processing which has made these STP both attractive and important in the world of plastics today.

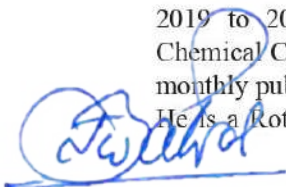
**Biodata of the Speaker :** Dr. Prakash Trivedi obtained his M.Sc. in chemistry working at UDCT, now ICT, Univ. of Bombay, Mumbai, India, in 1970 and PH.D. in polymer science at Dept. of Polymer Science, The University of Akron, Ohio, USA, in 1977 with Prof. J. P. Kennedy as his guide. He worked, starting 1974, in Firestone Central Research in Akron and returned to India in 1978. He then worked with IPCL at Vadodara, NOCIL, Rishiroop Polymer and Apar Oil at Mumbai from 1978 till 1990. He started Pace Polymer Technology Pvt. Ltd. and thereafter helped develop polymer business for PES, PSU, PPSU, two novel Polysulfone block copolymers, and their monomers and electrophilic PEEK from concept to commercialization for Gharda Chemicals Ltd. Mumbai, from 1990 to 2006 . Once, this business was sold to Solvay in 2006, he joined Solvay as Managing Director of Solvay Specialities India Pvt. Ltd. till 2009 and there after he was member of Solvay's Advanced Technology Group, Brussels, till he retired in June 2011. He consults now with Gharda Chemicals for developing & marketing PEK, ABPBI & PEKK and their compounds and products. All of these specialty polymers were developed and commercialized for the first time in India and in Asia and some for the first time, even in the World! Additionally, he has developed Bio-Polyamides for Chembond Chemicals, India, which are now getting commercialized.



Dr. Trivedi has about sixteen patents granted and six more patents are awaiting grant in Indian and abroad and more than ninety papers and presentations in National & International conferences. He has coauthored "PVC Technology" with Mr. Arvind Athalye. He is currently writing a Book on Specialty Plastics. He is also an author of six books of fiction and two full-length plays in Gujarati.

Dr. Trivedi is a member of American Chemical Society since 1972 & of Society of Plastics Engineers, USA. He is a life member, Fellow and ex-Chairman of Indian Plastics Institute. He is life member of UDCT Alumni Association and was awarded Distinguished Alumnus award by UDCT Alumni Association. He is nominated as Adjunct Professor for ICT from 2019 to 2021. He was a member of managing committee of Indian Chemical Council (ICC) and is presently Hon. Editor of Chemical News, a monthly published by ICC.

He is a Rotarian since 1988, and is Chairman of Govardhanram Tripathi



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Annexure -I

## SHORT TERM TRAINING PROGRAM

### FEED BACK FORM

1. AICTE File No. & Date of Offer Letter : 34-66/442/FDC/STTP/Policy-1/2019-20  
Date: 10 AUG 2020
2. Name of the Coordinator : Dr. Ram Prasad
3. Name and Address of the Institution : Mahatma Education Society's Pillai HOC College of Engineering & Technology, Rasayani, Pillai HOCL Educational Campus, HOC Colony, Rasayani via Parvel, Dist: Raigad, Pin-410206
4. Title of the Faculty Development Programme : Composites: Fracture Toughness, NDE and Failure Analysis
5. Dates : STTP-1 November 17 to 22, 2020  
STTP-2 January 18 to 23, 2021  
STTP-3 March 15 to 20, 2021
6. Venue : Online mode (Zoom)
7. Total No. of participants proposed and actually attended  
Proposed  Attended 161
8. No. and date of the offer letter

Letter No.	Date
34-66/442/FDC/STTP/Policy-1/2019-20	10 AUG 2020

9. Total amount sanctioned : Rs. 299667/-

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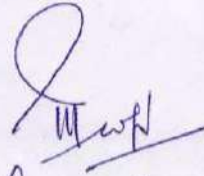
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15. The soft as well as hard copy of the detailed study material/proceedings of the programme must be furnished to the Council.: Proceedings of the programme is attached



Prof. R.C. Prasad

Name & Signature of Coordinator



Dr. Mathew Joseph

Name & Signature of Head of Institute

with seal



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ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS



Date	Time	Program Itinerary
18/01/2021	09:00 to 09:45 AM	Inauguration
	09:45 to 10:40 AM	<b>Dr. Atul Kumar Raja/ Dr. Prakash D.Trivedi , Gharda Chemicals Mumbai</b> High Performance Plastics for Composites
	10:40 to 11:50 AM	<b>Dr. Virendra Kumar Gupta, Head R&amp;D &amp; Senior VP, Reliance Research, Mumbai</b> Advanced Polymers & Composites for high performance Applications
	11:50 to 01:00 PM	<b>Dr. R.C. Prasad/Mr. Sunil Singh Rajput</b> Technological Innovation & Value Addition through Recycling & Failure Analysis
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>

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Date	Time	Program Itinerary
20/01/2021	09:30 to 10:40 AM	<b>Dr. Himanshu Pathak, Assistant Professor, School of Engineering Indian Institute of Technology, Mandi</b> Computational modeling of composite materials: Fracture and Mean field Homogenisation study
	10:40 to 11:50 AM	<b>Dr. Dattaji K. Shinde, Professor VJTI, Matunga, Mumbai</b> FEM of Nano engineered Composites & its Molecular Dynamics
	11:50 to 01:00 PM	<b>Mr. Satyanarayan Joddabge Founder, Joddabge Associates</b> Plastic Moulding Processes and Industrial Applications
	01:00 to 02:10 PM	<b>Mr. Rimzath B., DIAB, Sweden</b> Fabrication of Sandwich Composites and it's Applications
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>



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## Plastic Moulding Processes and Industrial Applications

Satyanarayan Joddabge

Founder & Director

**Joddabge Associates**

### Abstract :

1. History of plastic moulding
2. Types of plastic mouldings
3. Commodity vs Engineering plastics
4. Popular mouldings in India
5. Injection moulding in detail
6. Blow moulding in detail
7. Blow plus Injection moulding factory setup

- **Biodata of the Speaker :** Satyanarayan Joddabge
- Location : Pune – India
- Education : Electronics Engineering , PGDM (Business Management , Personal Management & Industrial Relations , Materials Management , Sales & Marketing Management)
- Company : Joddabge Associates
- Designation : Founder & Director
- Field of Experience : Plastic Moulded article Manufacturing
- Overseas Experience : Tanzania, Kenya and Saudi Arabia
- Association with PHCET: Mentor for Engineering students



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**Biodata of the Speaker: Dr. Manmohan Dass Goel, continued from the last page.**

He has many awards to his credits. He was awarded **Surendranath Mukherjee Memorial Medal** for best research paper by Institution of Engineers (India) in year 2009. He has been selected **Young Ambassador** by German Academic Exchange Services (DAAD) for consecutively for two years. His doctoral thesis has been awarded as the best thesis by the Indian National Academy of Engineering under "**Innovative Student Project Award 2013**" at doctoral level in Civil Engineering discipline. He has been awarded "**CSIR Young Scientist Awards-2014**" in Engineering Sciences by CSIR. He is recipient of "**Young Engineer Award**" from Institution of Engineers (India) in 2014. He has been nominated as "**DAAD Research Ambassador**" by German Academic Exchange Services (DAAD). He is also recipient of "**Young Associate**", **Maharashtra Academy of Sciences, Maharashtra** in year 2015.

His paper has been awarded **IGS-HEICO Biennial Award- 2017** by Indian Geotechnical Society (IGS), India as a best paper on "Rock Mechanics" published in Indian Geotechnical Journal through Indian Geotechnical Society (IGS). He has been **interviewed by Rajya Sabha TV** under popular science program "**Eureka**" in recognition of contribution to the R&D in Engineering Sciences. He has been a **Senate Member of ACSIR** (Academy of Scientific & Innovative Research) CSIR, Delhi. He is life members of several professional societies. He is an active reviewer for many international and national journals. He has published **more than 125 papers** in SCI, Scopus Indexed Journals and various International and national conferences. He has completed **more than 15 R&D projects** funded from different organizations like DST, DRDO, CSIR.

Currently he is serving as **Assistant Professor, Department of Applied Mechanics, Visvesvaraya National Institute of Technology (VNIT), Nagpur** since 2016. Prior to this, he served **CSIR-AMPRI Bhopal** and **CSIR-National Environmental Engineering Research Institute (NEERI) Nagpur, India as a Scientist**. His areas of research interest include blast analysis, blast resistant structures, lightweight materials, composite structures, low, medium and high strain rate material characterization and computational mechanics. He is looking forward to contribute in the broader areas of structural protection systems used against blast and impact loading.



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# NDE and Inspection of Composites - Trends and Advances

**Dr. Shyamsunder Mandayam**

Former Principal Scientist, GE Research, Bangalore

Former Senior Scientist, IGCAR, Department of Atomic Energy, Kalpakkam

Chairman, National Certification Board, ISNT

**Abstract :** The engineering industry has seen an increasing adoption of composites as a material of choice in the last few decades. Newer applications are being discovered for composites given its attractive properties, cost, availability and the concurrent benefits. Significant strides have been made in the development, advancement and deployment of polymer matrix composites (PMC), ceramic matrix composites (CMC) and metal matrix composites (MMC) in industries ranging from aerospace, automotive, oil & gas, renewable energy, healthcare, transportation, and several others. Industry demands for increases utilization has also resulted in enabling design of complex and larger shapes and parts as well as hybrid structures combining composites and metallic materials. Irrespective of the type of industry using composites in their components and structures, the primary requirement of assuring quality of the composite part during the manufacturing and assembly stage and the subsequent step of assuring its integrity and life during installation and in-service is a very critical pre-requisite. This is primarily accomplished through use of several Nondestructive Evaluation (NDE) and Inspection methodologies including basic techniques like Ultrasound, Radiography, etc. However the increasing complexity of the material and the size of the parts combined with higher demands on capability for defect detection and characterization including incipient damage has resulted in the development of several new inspection techniques including Shearography, Microwave, Terahertz, micro/nano-CT, positron annihilation, Flash Infrared imaging, Air Coupled UT, etc. The continued and increasing demand for safety, reliability and productivity combined with the usage of newer materials and manufacturing processes, innovative and complex designs of components and structures for higher efficiencies, has also brought in increased adoption of automation in the industrial inspection world. This presentation will highlight the various NDE techniques currently in extensive use for composite inspection by the industry and highlight the trends being observed in newer and advanced techniques including automation and use of modern approaches like Signal and Image Processing, Artificial Intelligence/Machine Learning and Robotics which are showing good promise and are being developed by R&D labs to meet the needs of industrial inspection.

**Biodata of the Speaker :** **Dr. Shyamsunder Mandayam** is the Chairman, National Certification Board -Indian Society of Nondestructive Testing (ISNT), worked as Principal Scientist at GE Global Research for 20+ years and Senior Scientific Officer @IGCAR, Kalpakkam for 16 years, Certified Lean Six Sigma Black Belt, TRIZ Level 3 expert, ASNT Level 3. Worked extensively in the development of new NDE / Inspection techniques, driving the vision and prepared roadmaps for next generation technologies in NDE for metallic and non-metallic materials (composites) related to aerospace, energy, renewables and oil and gas industries.



Worked on Eddy current array sensors, POD, Nonlinear ultrasound, Positron annihilation, Microwave and Terahertz NDE, Pipeline inspection, Automation, Robotics and Lifting of components. Currently pioneering the adoption of digital transformation to NDE and Inspection. He has 10 patents and 150+ papers in various journals, books and proceedings and delivered 70+ invited talks. Received several prestigious awards like National NDT award for R&D, GE India's R&D Data award for excellence award to name a few. He is a Honorary Fellow of ISNT.



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# TWO WEEKS AICTE APPROVED CERTIFICATE STTP

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

<p><b>Organized by</b></p>    <p><b>PHCET</b> PILLAIHOC COLLEGE OF ENGINEERING &amp; TECHNOLOGY PHCET, Rasayani</p> <p><b>AICTE</b> All India Council of Technical Education AICTE, INDIA</p>	<p><b>Supported by</b></p>     <p><b>SFA</b> Mumbai Chapter</p> <p><b>S&amp;E INDIA</b> Society of Automotive Engineers INDIA</p> <p><b>ASM</b> INTERNATIONAL INDIA CHAPTER</p>
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Date	Time	Program Itinerary
22/01/2021	09:45 to 10:40 AM	<b>Prof. P. J. Guruprasad, Department of Aerospace Engineering, IIT Bombay</b> Analysis of interlaminar cracking of composite laminates
	10:40 to 11:50 AM	<b>Prof. Jaya B. Nagamani, Department of Metallurgical Engineering and Materials Science, IIT Bombay</b> Fracture Toughness Testing & Integrity Assessment of Composites Across Multiple Length Scales
	11:50 to 01:00 PM	<b>Dr. Sunny Zafar, Assistant Professor, School of Engineering Indian Institute of Technology, Mandi</b> Manufacturing of polymer composites using microwave energy
	01:00 to 02:10 PM	<b>Dr. C. M. Manjunatha, Chief Scientist, NAL Bangalore</b> Fatigue and Fracture of Composites
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>



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## Fracture and Fatigue Behaviour of Polymer Composites

**Dr. C. M. Manjunatha**

Structural Integrity Division  
CSIR-National Aerospace Laboratories  
Bangalore 560017, India

**Abstract :** Fiber reinforced polymer (FRP) composites are widely used in engineering structures such as airframe, wind turbine etc., due to their high specific strength and stiffness. Such composite structures are subjected to various types of constant and variable amplitude fatigue loads in service. For damage tolerance and durability of such structures, the composites should possess high fracture toughness and fatigue resistance. Engineering FRP composites consists of carbon or glass fibers reinforced in a thermosetting epoxy polymer. Polymer epoxy, being relatively brittle, exhibit poor resistance to crack initiation and growth affecting the overall fatigue and fracture resistance of composite. In this presentation, fracture and fatigue behavior of FRP composites including failure mechanisms are described in detail. Methodologies used in fatigue life estimation of composites under service loads are dealt with in detail. Further, recent advances in fatigue life enhancement of composites by addition of nano fillers in epoxy matrix are explained with examples.

**Biodata of the Speaker :** Dr. CM Manjunatha is currently Chief Scientist and Head, Structural Integrity Division, CSIR-National Aerospace Laboratories, Bangalore, India.

He obtained his B.E. (NITK) in 1988, M.E. (IISc.), in 1991 and Ph.D. (Cambridge Univ., UK) in 1995. He was a post-doctoral fellow at Imperial College, London, UK in 2008

He has over 20 years of experience and specialized in mechanical testing and evaluation of aerospace materials, damage tolerance evaluation, full scale static and fatigue tests, life extension of aging aircraft, polymer composites, nanocomposites etc. He has executed over 50 sponsored and research projects related to HANSA, SARAS, LCA, MiG-21 BiS, MiG-29, Rustum-II, Dhruv, etc

He is a recipient of Gold medal for first rank in B.E. (1988), Cambridge-Nehru Scholarship (1991), ORS award from CVCP London (1991-1994) and UKIERI research fellowship (2008). He was awarded NAL outstanding award for project execution: 2013 and Best innovation award: 2017

He has over 150 publications to his credit in international journals, conferences and seminars.



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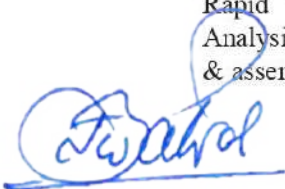
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## Development of Rapid Tooling for Investment Casting using Fused Deposition Modeling Process

Dr A. S. Rao,  
VJTI, Mumbai

**Abstract :** Rapid prototyping has revolutionized the way products are designed and manufactured today. It enables rapid launch of new products and makes small volume products viable, by reducing cycle time, number of design iterations and testing trials on the product. Rapid tooling is one of the prominent applications of rapid prototyping. Rapid tooling is implemented in investment casting to reduce the high tooling cost and lead time involved in it by traditional methods. When customized single part, small and medium quantity production are required then rapid tooling is the best option that can be used in investment casting. Rapid tooling is a collection of direct and indirect methods for quickly producing tools. For the development of direct and indirect tooling using 'Fused Deposition Modeling (FDM)' method of rapid prototyping is a promising technology using polymer as a raw material. However, the main limitation of FDM process is 'high surface roughness' which keeps it away from tooling applications.

**Biodata of the Speaker :** Dr. A.S. Rao is Working as "Assistant Professor" from December, 2010 to till date in Mechanical Engineering Department, Veermata Jijbai Technological Institute, Mumbai. He is Working as "Lab-in-charge" from December, 2010 to till date for Technical Excellence Centre in Mechanical Engineering Department, Veermata Jijbai Technological Institute, Mumbai. He Worked as Faculty Coordinator July, 2008 to December, 2010 for development of Technical Excellence Centre and CCF-II Lab in Mechanical Engineering Department, Veermata Jijbai Technological Institute, Mumbai. He also Worked as Faculty/Lecturer from from January, 2000 to November, 2010 in Mechanical Engineering Department, Veermata Jijbai Technological Institute, Mumbai. His main areas of research interest is Manufacturing and Characterization of polymeric and metallic materials using rapid prototyping machine. Rapid manufacturing and Characterization of special metallic alloys using CNC machine. Development of new components applying Reverse Engineering techniques using Coordinate Measuring Machine and Rapid Manufacturing equipment. Development of bio-compatible polymeric materials used in medical applications. Additive Manufacturing (3D printing) of Rapid Tooling for Industrial applications. Finite Element Analysis of structures, polymers and metallic 3D printed parts & assemblies.



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- Chembur English High School - Chembur
- Chembur Marathi Madhyamik Shala - Chembur
- Powai Marathi Madhyamik Shala - Powai
- Mahatma School of Academics and Sports - Khanda Colony, New Panvel (Pre-Primary, Primary & Secondary English & Marathi Media)
- HOC International School - Rasayani (English & Marathi Media)

#### (CBSE PROGRAMME)

- Mahatma International School Khanda Colony, New Panvel
- HOC International School - Rasayani

### JUNIOR COLLEGES

- Chembur English Junior College - Chembur
- Mahatma Night Junior College - Chembur
- Mahatma School of Academics & Sports Junior College of Arts, Science & Commerce Khanda Colony, New Panvel
- HOC Junior College - Rasayani (Junior College of Arts, Commerce, Science with Vocational)

### TEACHERS' TRAINING INSTITUTIONS

D.T.Ed. B.Ed. B.P.Ed. M.Ed. Ph.D.

- Approved by National Council for Teacher Education (NCTE) (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- Mahatma Junior College of Education (D.T.Ed.) - Chembur (English & Marathi Media)
- Pillai College of Education & Research (B.Ed.), Chembur Re-Accredited 'A' Grade by NAAC
- Pillai College of Education & Research (B.Ed.), Accredited 'A' Grade by NAAC Khanda Colony, New Panvel
- Pillai HOC College of Education & Research (B. Ed), Rasayani
- Vidyadhiraja College of Physical Education & Research (B.P.Ed), Khanda Colony, New Panvel
- Pillai College of Education & Research (M.Ed.), Chembur
- Pillai College of Education & Research (M.Ed.), Accredited 'A' Grade by NAAC Khanda Colony, New Panvel
- Pillai College of Education & Research (Ph.D Centre), Khanda Colony, New Panvel

### INTERNATIONAL SCHOOLS & INTERNATIONAL JUNIOR COLLEGES

(CIPP / IGCSE / ICSE / IB SCHOOLS) AS / 'A' level and 'IB' Programme

- DR. PILLAI GLOBAL ACADEMY - Gorai
- New Panvel

### POLYTECHNIC (3-Year Diploma Programme)

- AICTE Approved, Recognised by Govt. of Maharashtra & Affiliated to MSBTE
  - Pillai HOC Polytechnic - Rasayani
- Diploma in Computer Engineering  
Diploma in Electronics & Tele-communication Engineering  
Diploma in Mechanical Engineering  
Diploma in Civil Engineering

### DEGREE COLLEGES

#### Bachelor and Master

- (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- Mahatma Night Degree College of Arts & Commerce - Chembur
- Pillai College of Arts, Commerce & Science - New Panvel Re-Accredited 'A' Grade by NAAC
- B.Com.
- B.Com. (Accounting & Finance)
- B.Com. (Financial Markets)
- B.M.S.
- B.M.M.
- B.Sc. (I.T.)
- B.Sc. (Computer Science)
- B.Sc. (Biotechnology)
- M.Sc. (I.T.)
- M.Sc. (Biotechnology)
- M.Com. (Business Management)
- M.Com. (Accounting & Finance)
- Pillai HOC College of Arts, Science & Commerce - Rasayani
- B.Com.
- B.M.S.
- B.Sc. (I.T.)
- B.Sc. (Computer Science)
- B.Com. (Accounting & Finance)
- B.M.M.
- B.Sc. (Maths, Chemistry, Biology & Physics)
- B.A. (English Ancillary, History & Economics)

### ARCHITECTURE

#### Bachelor and Master

- (Approved by the Council of Architecture and AICTE)
- (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- Pillai College of Architecture - New Panvel
- Pillai HOC College of Architecture - Rasayani (B.Arch. 3-year degree course)
- MARCH (Urban Design)
- Pillai College of Architecture - New Panvel
- Ph.D.

### MANAGEMENT COURSE

#### MMS

- (Approved by AICTE)
- (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)
- NBA Accredited 'A' Grade by DTE, Govt. of Maharashtra
- Pillai Institute Of Management Studies & Research - New Panvel
- Executive MBA
- Pillai HOC Institute Of Management Studies & Research - Rasayani (MMS: 2-year Post-Graduate Course)

### ENGINEERING COURSE

#### Bachelor, Master & PhD

(Approved by AICTE) (Affiliated to the University of Mumbai & Recognised by Govt. of Maharashtra.)

NBA Accredited

- Pillai College of Engineering - New Panvel
- B.E. in Information Technology
- B.E. in Computer Engineering
- B.E. in Electronics Engineering
- B.E. in Mechanical Engineering
- B.E. in Electronics
- Tele-communication Engineering
- B.E. in Automobile Engineering
- M.E. in Information Technology
- M.E. in Computer Engineering
- M.E. in Electronics Engineering (CAD/CAM, Robotics)
- M.E. in Mechanical Engineering (Thermal)

#### PhD (Technology)

Computer Engineering  
Mechanical Engineering  
Information Technology

- Pillai HOC College of Engineering & Technology, Rasayani

Accredited 'A' Grade by NAAC

- B.E. in Mechanical Engineering
- B.E. in Electronics & Telecommunication Engineering
- B.E. in Automobile Engineering
- B.E. in Information Technology
- B.E. in Computer Engineering
- B.E. in Civil Engineering
- B.E. in Electrical Engineering
- M.E. in Mechanical Engineering (Machine Design)
- M.E. in Electronics & Telecommunication Engineering
- M.E. in Computer Engineering
- M.E. in Civil Engineering (Construction & Management)

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Computer Engineering

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*Dr. K. M. Vasudevan Pillai*

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23	Varsha Dnyandeo Ghogare	Mechanical Engg	Assistant Prof.	Sinhgad College of Engg
24	Salti ranjan bhuyan	Mechanical	Lecturer	Government polytechnic gajapati
25	SIVA P V	Mechanical Engineering	Assistant Professor	J N N INSTITUTE OF ENGINEERING
26	Dr. Radhakrishnan P M	Mechanical Engineering	Faculty in CAD and 3D Printing	CUSAT
27	Rajesh kumar sahu	Mechanical	Lecture	Mahavir institute of engineering & technology
28	Yogesh Eshwar Mangulkar	Mechanical Engineering	Assistant Professor	DIEMS AURANGABAD
29	AMAR BAR MOHANTY	MECHANICAL ENGINEERING	LAB ASSISTANT	GOVT. POLYTECHNIC GAJAPATI
30	Prashant Kumar	Mechanical Engineering	Assistant Professor	Jaipur Engineering College
31	Shital V. Patel	Mechanical Engineering	Assistant Professor	Bharati Vidyapeeth College of Engineering
32	R Hariharan	Mechanical Engineering	Assistant Professor	Bharath Institute of Higher Education and Research
33	Swagat Dwibedi	Mechanical Engineering	Assistant Professor	VSSUT, Burla
34	Suneel Kumar	Mechanical engineering	Asst. Prof.	Malwa institute of technology & management
35	Dr. S. Om Prakash	Mechanical Engineering	Associate Professor	Rama University
36	Mr.N.SRINIVASAN	Mechanical Engineering	Assistant Professor	Narasu's Sarathy Institute of technology
37	Krishna Nand Yadav	Mechanical engineering	Assistant professor	SREAT COLLEGE OF ENGINEERING AND MANAGEMENT, VARANASI I.I.P
38	C.Vinothkumar	Mechanical Engineering	Assistant Professor	SSM Institute of Engineering and Technology
39	DEVARAJAN M M	MECHATRONICS ENGINEERING	ASSISTANT PROFESSOR	THIAGARAJAR COLLEGE OF ENGINEERING
40	Saranya	Mechanical Engineering	Assistant AP	Vell
41	SABARISH RAJAGOPALAN	Mechanical Engineering	Assistant Professor	Bharath Institute of Higher Education and Research
42	Snehlata Pandey	Mechanical Engineering	Lecturer	Shri Ramswaroop Memorial University
43	C.Shoba	Mechanical Engineering	Assistant Professor	University college of Engineering Arni
44	DHAKSHINAA MOORTHY J P	Mechanical	BE	UCEA
45	JATIN SAMRA	Mechanical engineering	Assistant professor	Jaipur Engineering College
46	N.LENINRAKESH	MECHANICAL ENGINEERING	Assistant Professor	BRARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH
47	A.MURUGAn	Mechanical Engineering	Assistant Professor	SRM Institute of Science and Technology
48	MAHESH N. PADIA	MECHANICAL ENGINEERING	I/C HOD	VIDHYADEEP INSTITUTE OF ENGINEERING & TECH

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**PMC REPORT OF THE AQIS-STTP ON “ COMPOSITES: FRACTURE TOUGHNESS,NDEAND FAILURE ANALYSIS”**

The Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology was granted approval to conduct Short Term Training Program ( STTP ) under AQIS 2019-20 during the financial year 2020-21 vide Ref.No.:34-66/442/FDC/STTP/Policy-1/2019-20 dated 10 August 2020 on “ Composites: Fracture Toughness, NDE & Failure Analysis “

The Director Faculty Faculty Development Cell of the AICTE vide their Drawing & Disbursing officer sanctioned payment of Rs.2,99,667/-for conducting STTP under Head 601.15(a)STTP Plan.

The grant in aid was released to the PHCET R&D Account No.:52142200086666, SYNB 000524 IFSC code at Khaira, Patalganga Branch. The original STTP was residential program of 6 days duration with minimum 40 participants. However, due to pandemic of COVID-19 the Institute was allowed to conduct STTPs through online mode with the stipulated conditions (Reference : Letter of Col. B.Venkat, Director (FDC) dated 14 September 2020). The institute conducted 3 STTPs on the same topic in multiples of Rs. 93,000/- within the total grant received by it.

The 3 STTPs were conducted during November 17-22, 2020, January 18-23, 2021 and March 15-20, 2021. The highlight of all the 3 STTPs has been the participation of leading professional societies in the country like Society for Automotive Engineering, Western Region, Institution of Engineers, Maharashtra Region, ASM International India Chapter, Society for Failure Analysis, Mumbai Chapter, Indian Society for Remote Sensing, Mumbai Chapter, Materials Recycling Association of India and the Indian Rubber Manufacturers Research Association, Mumbai. Their involvement immensely benefited participants and allowed them to interact with industries related to the subject matter of the STTPs.

All the 3 STTPs covered processing of Polymers, Polymer Blends & Composites, and their mechanical and Non-destructive characterization to ensure quality assured industrial products. This was followed by case studies of failures in different industrial sectors and ways and means to prevent such failures. The STTPs also covered advanced manufacturing processes like additive manufacturing and 3D printing. The lectures were delivered by the industry experts, faculty from NITs and IITs as well as leading foreign universities. The applications of Polymers, composites and NDE for medical applications were also covered by eminent speakers. The details are given in the Proceedings and the program schedule.

The entire program was monitored by duly constituted Program Monitoring Committee as per directives of the AICTE. The committee members held several meetings through the Zoom link and brought the program to a successful conclusion. Under the guidance of members of the PMC the grant in aid was adjusted against the expenditure as per the guidelines of the AICTE and the remaining balance amount Rs. 45,997.00 refunded through NEFT (UTR No. PO932101078573 dated 3.4.2021 SBIN0050203- KHIRE-PTLGNG-branch) to the member secretary AICTE, New Delhi on the bank details provided to us.

**PMC Committee Members**



Prof. R.C. Prasad,

Coordinator/ Member  
Secretary



Dr. G.V. Patil

Member



Dr. S.S. Pawar

Member



Dr. T.J. Mathew

Chairman and  
Principal, PHCET,  
Rasayani



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Annexure-A

Name of the Institute: Pillai HOC College of Engineering & Technology, Rasayani

**UTILISATION CERTIFICATE FOR THE FINANCIAL YEAR 2020-21**

Name of the Scheme under which the amount was sanctioned under the **Short Term Training Program (STTP) under AQIS during financial year 2020-21**

(to be submitted separately for each sanction order)

Sl. No	AICTE Sanction Order/Letter No. & Date under which the amount was sanctioned	Amount (Rs.)	
	Ref. No. 34-66/442/FDC/STTP/Policy-1/2019-2020 Dated: 10 <sup>th</sup> Aug 2020	Rs 2,99,667/- (Rupees Two Lac Ninety Nine Thousand Six Hundred and Sixty Six Only)	Certified that out of Grant-in-Aid of Rs 2,99,667/- (Rupees Two Lac Ninety Nine Thousand Six Hundred and Sixty Six Only) sanctioned by the AICTE during the financial year 2020-21 in favour of Pillai HOC College of Engineering & Technology, Rasayani. as per letter mentioned in column 2 and Rs.130232/- on account of unspent balance of previous year, Rs.84235/- has been utilized for the purpose for which it was sanctioned and the balance of Rs. 45997/- remained unutilized at the end of the third and final session.

Certified that I have satisfied myself that the conditions on which the amount was sanctioned have been duly fulfilled and that I have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned.

**Kinds of checks exercised:-**

1. Audited Annual Accounts of the Institute
2. Receipt and Payment account
3. Periodical Progress Reports.

Signature of Chartered Accountant

Name of Chartered Accountant

Membership No.:

Full Address with Seal

UDIN: 21234002AAAAAJ6532

Signature of the Finance Officer

Name & Designation

Name of the Finance Officer

Full Address with Seal

(Govt. Aided/University & wherever applicable)

Place:

Date: 31/03/2021

Signature of Head of the Institute

Name & Designation

Full Address with Seal

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RECEIPT AND PAYMENT ACCOUNT - 3<sup>RD</sup> SESSION

Sl. No.	Receipt	Amount (Rs.)	Amount (Rs.)	Sl. No.	Payments	Amount (Rs.)	Amount (Rs.)
1	To Opening Balance	1,30,232/-	1,30,232/-	1	Honarium to experts	23* 3000/- each	69000/-
				2	Honararium to Coordinator	5000	5000 -
				3	Lab attendant	3000	3000 -
				4	Miscellaneous (i) Printing of the proceedings	6325/-	6325 -
				5	Miscellaneous (ii) Broadband Connection	1000/-	1000 -
					<b>Closing Balance</b>		45997 -
	<b>Grand Total</b>		1,30,232/-		<b>Grant Total</b>		1,30,232 -

Signature of Chartered Accountant

SUSANNA CHERIAN

Name of Chartered Accountant

Membership No.: 234002

Full Address with Seal

UDIN 21234002AAA AJ6532

31/03/2021

Signature of the Finance Officer

Name &amp; Designation

Name of Finance Officer:

Full Address with Seal

(Govt. Aided University &amp; wherever applicable)

Signature of Head of the Institute

Name &amp; Designation

Full Address with Seal

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10. No. and date of Sanction letter:

Letter No.	Date	Grant Released
34-66/442/FDC/STTP/Policy-1/2019-20	10 AUG 2020	299667/-

11. Total expenditure incurred in Conducting the Faculty Development Programme: Rs. 253670/-

12. Grant received from various agencies other than AICTE for this Faculty Development Programme

Sl. No.	Name of Agency	Grant Received
Nil	Nil	Nil
	Total	Nil

13. Details of internal revenue if any generated by the Institution/Department on account of this Programme:

14. Briefly mention about the technological/ academic/or any other benefit generated by conducting this programme with respect to a) the institution, b) the faculty; c) students; d) industry/society.

The 3 STTPs were conducted during November 17-22, 2020, January 18-23, 2021 and March 15-20, 2021. The highlight of all the 3 STTPs has been the participation of leading professional societies in the country like Society for Automotive Engineering, Western Region, Institution of Engineers, Maharashtra Region, ASM International India Chapter, Society for Failure Analysis, Mumbai Chapter, Indian Society for Remote Sensing, Mumbai Chapter, Materials Recycling Association of India and the Indian Rubber Manufacturers Research Association, Mumbai. Their involvement immensely benefited participants and allowed them to interact with industries related to the subject matter of the STTPs. All the 3 STTPs covered processing of Polymers, Polymer Blends & Composites, and their mechanical and Non-destructive characterisation to ensure quality assured industrial products. This was followed by case studies of failures in different industrial sectors and ways and means to prevent such failures. The STTPs also covered advanced manufacturing processes like additive manufacturing and 3D printing. The lectures were delivered by the industry experts, faculty from NITs and IITs as well as leading foreign universities. The applications of Polymers, composites and NDE for medical applications were also covered by eminent speakers.

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Rassyan, Tal. Khelapur  
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ONE WEEK AICTE APPROVED CERTIFICATE SHORT TERM  
TRAINING PROGRAM

ON

**COMPOSITES : FRACTURE TOUGHNESS,  
NDE & FAILURE ANALYSIS**

**DURING MARCH 15 - 20, 2021**

Organized by

DEPARTMENT OF MECHANICAL ENGINEERING  
PILLAI HOC COLLEGE OF ENGINEERING AND TECHNOLOGY, RASAYANI

Supported by



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# STTP - CFTNDFA 2020

Two weeks AICTE approved certificate short term training program on "Composites: Fracture Toughness, NDE and Failure Analysis" is organized by Department of Mechanical Engineering, Pillai HOC College of Engineering and Technology, Rasayani and is supported by the Society for Failure Analysis Mumbai Chapter, ASM International India Chapter, SAE India, ISRS Mumbai Chapter and IRMRA Mumbai. The objective of this Short Term Training Program is to provide basic understanding of synthesis, fracture toughness evaluation using fracture mechanics concepts, defects detection using NDT, understand the modes and mechanisms of fracture and for analysis offailures.

The eminent speakers of the workshop are from reputed academic institutes, research establishments and industries having worked extensively in different aspects of composites. The list of speakers along with patrons, advisory and organising committee members is given below.

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12. Mr. Samresh Changdar, GE India Pvt. Ltd. Pune
13. Dr. Mangesh V. Joshi, MD & CEO, Sanrachana Pvt. Ltd. Mumbai
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18. Mr. Sandeep Rege, Secretary ASM & DGM Mahindra & Mahindra
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### Organizing committee

1. Dr. Divya Padmanabhan, PCE Panvel
2. Dr. T. Tambushkar, PCE Panvel
3. Dr. Viswajit Panda, PCE Panvel
4. Dr. M. D. Nadar, PHCET Rasayani
5. Mr. Suhas Uthale, PHCET Rasayani
6. Mr. Amar Arun Jadhav, PHCET Rasayani
7. Mr. Sunilsing Rajput
8. Dr. Ajit Bhandakkar, Secretary, SFA Mumbai Chapter

### Steering/Program monitoring committee AQIP STTP:

1. Dr. Mathew T. Joseph, Principal : Chairman
2. Dr. R. C. Prasad, Coordinator & Member Secretary
3. Dr. G. V. Patil, Head Mech. Engg. Dept. : Member
4. Dr. S. Pawar, Head Automobile Engg. Dept. : Member
5. Dr. Priam Pillai, COO of MES : Member as a Subject Expert

### List of Speakers

1. Prof. R.C. Prasad, PHCET, RASAYANI
2. Dr. Rajkumar Kasilingam Director, IRMRA Mumbai
3. Shri. Shantanu C. Prabhune, L&T Mumbai
4. Prof. Shridhar Yarlagadda, University of Delaware, USA
5. Dr. Prakash D.Trivedi, Gharda Chemicals Mumbai
6. Prof. Biswajit Panda, PIIT Panvel
7. Dr. Virendra Kumar Gupta, Head R&D & Senior VP, Reliance Research, Mumbai
8. Shri. Kashinath Deodhar, Group Director, ARDE, DRDO
9. Prof. Ramesh Talreja, tenneco Prof. TEXAS A&M University, USA
10. Dr. Debdatta Ratna, Scientist, NMRL Ambernath
11. Dr. Dineshsingh Thakur, rofessor, DIAT, Pune
12. Dr. Ajit Bhandakkar, Chief of Lab, HAL, AURDC, Nashik
13. Mr. Rimzath B, DIAB, Sweden
14. Prof. Shankar Shastry, Washington University in St. Louis, USA
15. Dr. C.M. Manjunatha, Scientist, NAL Bangalore
16. Dr. Shyamsunder, Former Principal Scientist, GE Research, Bangalore
17. Dr. Raghur Prakash, IIT Madras
18. Dr. Ravi Babu, CECRI
19. Dr. Dattaji K. Shinde, Professor VJTI, Matunga, Mumbai
20. Prof. S.K. Panigrahi, DIAT, Pune
21. Prof. Chandra Sekher Yerramalli, IIT Bombay
22. Shri. Praveer Verma, DMSRDE, Kanpur
23. Dr. P.J. Guruprasad, Professor, IIT Bombay
24. Dr. Guruprasad Rao, Director, Imaginarium India Pvt. Ltd.
25. Dr. Atul Bakare, Addl. Director, CEMILAC, Nashik
26. Shri. Samaresh Changdar, GE India Pvt Ltd., Pune
27. Prof. Nagmani Jaya Balia, Dept. of MEMS, IIT Bombay
28. Dr. Mangesh V. Joshi, CEO, Sanrachana Structural Strengthening Pvt. Ltd., Thane
29. Dr. G.S. Prabhu, Managing Director, Fine Finish, Talaja
30. Dr. Sumanda Bandyopadhyay, SABIC, Bangalore
31. Dr. Pooja Manoj Katkar, D.K.T.E.S Textile & Engineering Institute, Ichalkaranji
32. Dr. Divya Padmanabhan, PCE, Panvel
33. Dr. G.V. Patil, PHCET, Rasayani



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# STTP - CFTNDFA 2020

## P R E F A C E

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Composites are engineered materials consisting of a matrix and reinforcement that is separated by an interface. Composite can be tailored to have desired properties. The light weight, corrosion resistant and tough composites are considered a major break-through that has revolutionized their use in many critical applications in automobile, aerospace, defense and marine industries. It therefore becomes imperative to produce defect free composites for critical applications. Detecting defects using NDT is, however, highly challenging job due to its anisotropic and complex failure modes. The extensive work carried out in academic and research institutes has brought India at the threshold of new era. This two days National Workshop planned at Pillai College of Engineering will facilitate interaction amongst government, universities and fast growing manufacturing sectors. Collaborative effort for low cost fabrication of composites will encourage investment and boost Indian Economy. The applications of composites in different sectors will have a dramatic impact on gross National product and employment opportunities in our country.

**Professor R.C. Prasad**  
**Convener of the STTP**

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**DR. K. M. Vasudevan  
Pillai Chairman & C. E.  
O Mahatma Education  
Society**



**DR. Daphne  
Pillai  
Secretary  
Mahatma Education Society**

## **Mahatma Education Society**

The Mahatma Education Society (MES) embarked upon its mission of 'Education of All' with Chembur English School in the year 1970. The Mahatma Education Society is proof of a vision linked irrevocably to national goals. Born in a time when education was deemed service, it set about bringing social and economic change through the proactive personal development of every child that came into its fold. The vision, dedication, global outlook, tenacious struggle and undaunted spirit of Dr. K. M. Vasudevan Pillai (Founder, secretary and CEO) and Dr. Daphne Pillai (Joint Secretary and Rector), the Trust grew from a single school into a multi-institution, multi-location group delivering quality education at all levels.

Today MES owns and manages over 48 institutions spread across six elegant campuses at Borivali, Chembur, Powai, New Panvel(W), New Panvel(E) and Rasayani. It manages educational Institutions' from pre-primary to post-graduation. It comprises of schools, international schools, degree colleges, night colleges, Management Institutions, Engineering colleges, Architecture colleges, colleges of Education (including Physical education) and polytechnic Institutions. Popularly known as the Pillai Group of Institutions, this education major has its own teacher training institutes, which allow it to define its own standards and to achieve 100% results unfailingly, The group has more than 35,000 students, 2,000 teachers and 1500 members of support staff.

It does so through a highly motivated faculty, a learning environment powered with the latest technologies, a spirit of innovation that sees it reach for the highest standards of accreditation in its field, and an approach that recognizes the sharing of knowledge remains the finest manifestation of a unified world. The Pillai Group is credited with several "firsts" in its field.

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PHCET Motto:  
**Vidya Karmasu Kaushalam**  
Knowledge is Excellence at Work

## Principal's Message

We live in unprecedented times with unprecedented problems. Hitherto unknown problems need hitherto unknown solutions. 'Thinking out of the box' is a cliché. However, at no other time in our history have we needed it more. Genuine problem solving requires 'thoughts sans frontier'. What is the role of academia in it? What is the role of PHCET in it? Known methods, solutions and strategies are no longer valid. We in PHCET have been looking at new alternatives and strategies as well as to involve different partners to make our service more relevant, contemporary and forward looking. Evaluating the Employability, Creating a 'Value Add Metric', mentoring of students and faculty by Industry experts, etc., are some of the new initiatives.

Established in 2009 and affiliated to Mumbai University, PHCET offers specializations in seven areas of engineering. And also provides excellent facilities, infrastructure and high quality education on an extremely safe and highly quality conscious, beautiful and verdant campus for a fraction of the cost one would normally have to pay. It is also a matter of pride for us to inform our readers that PHCET is accredited with an 'A' Grade in 2019 by NAAC (National Assessment and Accreditation Council); UG programs in Computer and Mechanical Engineering are accredited two times each by NBA (National Board of Accreditation); PHCET is the winner of the 'First Best of the Work Place Safety Awards' in 2019 from Bombay Chamber of Commerce and Industry (BCCI) and also the winner of the 'Performance Excellence Trophy' from Indian Merchants Chamber Ramkrishna Bajaj National Quality Award (RBNQA) in December 2019. PHCET has a manufacturing centre started in January 2020 from design to manufacture of Printed Circuit Board (PCB). This centre is for training students to become employable and also become entrepreneurs. Mumbai University has appointed PHCET as a Lead Cluster College for conducting the University examinations. Despite the great hopes for 2021 nothing much has changed. It is also time for the academia to look at the realities around us anew. In difficult times it is the academia that has to rise up and show the way. In that spirit PHCET has organized an all India STTP in March 15-20, 2021 on 'COMPOSITES: FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS', which is a very relevant and contemporary theme. The galaxy of the eminent resource persons from different parts of the world and the enthusiastic participants have made the effort worthwhile and gave enormous satisfaction to the organizers. I compliment the coordinator of the STTP Prof. R.C. Prasad and his team for the splendid job in pursuance of the PHCET Motto: 'Vidya Karmasu Kaushalam'.

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# Society for Failure Analysis

[Registration No. 97/2008/HYDERABAD]



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#### Contact Us at:

[sfa-india@gmail.com](mailto:sfa-india@gmail.com)

[bjana02@yahoo.co.in](mailto:bjana02@yahoo.co.in)

Website: [www.sfaindia.com](http://www.sfaindia.com)

The Society for Failure Analysis was established in the year 2006 with the patronage from many eminent experts with a mission to reduce failures that are estimated to cost 3-4% of GDP in a developing country.

#### Aims & Objectives of SFA

- Promote, encourage and develop growth of "Art and Science of Failure Analysis".
- Stimulate interest in compilation of database for effective identification of root causes of failures and their mitigation.
- To serve as a common forum for individuals, organizations and industries interested to investigate root cause of failures.
- Establish liaison with Government, academic and research institutions, commercial bodies and individuals on methodologies of failure analysis and render help.
- Collaborate with appropriate international organizations for the promotion of common objectives.
- Train personnel to conduct systematic failure analysis.
- Identify and recommend areas for research and development in the country, to prevent failures.

In order to fulfil the above objectives, the society organises lectures, workshops, clinics, conferences, seminars, colloquia and courses related to failure analysis at different regional chapters spread across the country and networks with professional bodies, in addition to bringing out periodic newsletters.



For the first time, the Theme-Symposium on Failure Analysis is being jointly conducted by The Society for Failure Analysis and The Indian Institute of Metals during the NMD-ATM 2014. For further details about the society, kindly see the web page: [www.sfaindia.org](http://www.sfaindia.org).

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# ASM INDIA CHAPTER

ASM International is a premier educational society of metallurgists, materials scientists and technologists. ASM International is an interactive resource of materials information, and a conduit for professionals to meet, interact and share ideas. A worldwide Network led by Members, guided by Member Needs, and fueled by Members Participation. ASM enables its members to keep abreast of the latest technological and marketing trends. It offers invaluable opportunities to interact and learn from fellow materials engineers across the country and around the world, thus helping to stay competitive and sharpen creative vision. ASM offers excellent networking link, giving an instant access to insights and wealth of information through its technical books, acclaimed handbooks, engineering software and CD-ROMS. ASM is the information sharing network for anyone who works with metals, alloys, composites, ceramics, polymers and electronic materials.

ASM International, India Chapter established in the year 1979, is one of the most active chapter in the world. It organizes technical courses on subjects like Welding, Metallurgy for the Non-metallurgist, Metal Forming, Heat Treatment, Stainless Steels, Non-ferrous Metals, Thermal Spraying etc. under the Continued Education Program for engineers and technocrats. Other activities include Conferences, Workshops and Exhibitions on recent developments in Materials Processing. Material Application Engineering, Heat Treatment, Equipment etc. at National and International levels.

In order to increase awareness on materials technology and to excite young student community in materials science and engineering careers, ASM has been conducting one-week Materials Camps at I.I.T. Bombay, Mumbai and M. S. University of Baroda, Vadodara for the students of 11th standard to expose students to materials technology through hands-on experimental work and Industry visits. Participation in these camps is free; breakfast, lunch, course materials etc. is given free to all the participating students. These camps are found to be highly effective as quite a few students have opted Materials Technology as one of the options while entering engineering stream.



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The Society of Automotive Engineers India (SAEINDIA), Western Section, Pune, is a vibrant premier professional society, having substantial following in the Indian automobile industry, involved in serving the Mobility Engineering Community engaged in design, manufacture and service of self-propelled vehicles and systems that move in land, sea, air and space. Its vision is to continuously enrich knowledge base of practitioners in mobility industry and institutions in the service of humanity. SAEINDIA is India's leading resource for mobility technology. As an individual member driven society of mobility practitioners, the ownership of SAEINDIA wrests with its members who are Individuals from the mobility community, which includes Engineers Executives from Industry, Government Officials, Academics and Students.

SAEINDIA is a Platform where all Engineers & Officers from Automotive Industries network with each other, share their ideas, improving technical knowledge and thereby build strong relations. This also helps them in their managerial roles in their respective fields and industry.

A handwritten signature in blue ink, appearing to read 'S. J. Jadhav', is written over a horizontal line.

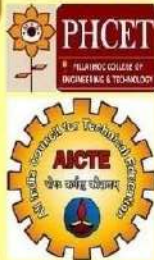
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You are cordially invited  
for the Inaugural Function of the AQIP-STTP on  
Composites : Fracture Toughness, NDE and Failure Analysis  
on Monday, March 15, 2021 During 9:00 AM to 10:00 AM

Organised By



Supported By



#### INAUGURAL PROGRAM SCHEDULE

Time	Session Details
9:00 AM	Welcome & Opening remarks by Prof. R.C. Prasad, Coordinator and Vice Chair, SFA Mumbai Chapter
9:05 AM	Presidential Address by Dr. Lata Menon, Deputy CEO, Rasayani Campus
9:15 AM	Address by Dr. Mathew T. J., Principal, PHCET
9:20 AM	Address by Dr. H.M. Raje, Chairman, Institution of Engineers, Maharashtra State Centre
9:25 AM	Address by Mr. Sudhakar Bonde, Chairman ASM International, India Chapter
9:30 AM	Address by Mr. Sanjay Nibhonde, Deputy Director ARAI Chakan, Chairman SAE Western Region
9:35 AM	Address by Dr. Rajkumar Kasilingam, Director, IRMRA, Mumbai
9:40 AM	Address by Dr. Sameer Joshi, Chairman, Plastic Committee, MRAL
9:45 to 10:00 AM	Inaugural Lecture by Mr. Subodh Sharma, COO, Tina Rubber and Infrastructure Ltd. On "Circular Economy and Sustainability through recycling of Tyres"
10:00 to 10:15 AM	Inaugural Lecture by Mr. Ulhas Parlikar, Global Consultant, Waste Management, AFR & Co-processing On "Circular Economy and Sustainability through recycling of Plastics"
10:15 AM	Vote of Thanks by Dr. G.V. Patil, Professor & Head, Dept. of Mechanical Engineering, PHCET
10:15-11:30 AM	Session I

























RVSP : Dr. R. C. Prasad  
Coordinator and Vice Chair, SFA  
Mumbai Chapter  
Email ID: rprasad@mas.ac.in  
Mobile Number : 8433883165

Link for joining the Inaugural Function: <https://us02web.zoom.us/j/32765444657?pwd=12345>

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AICTE APPROVED STTP ON "COMPOSITES: FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS"							
STTP - 3: SCHEDULE		Host for the event: Prof.R.C.Prasad			Co-host: Dr. G.V. Patil, Sunilising Rajput & Armeya More		
Session	Time	Day 1 - 15th March 2021	Day 2 - 16th March 2021	Day 3 - 17th March 2021	Day 4 - 18th March 2021	Day 5 - 19th March 2021	Day 6 - 20th March 2021
	9:00 am	INAUGURAL FUNCTION					
Session 1	9:30 am to 10:30 am	<p>Dr. Atul Kumar Rajai/ Dr. Prakash D. Trivedi, Gharda Chemicals Mumbai</p> <p>High Performance Plastics for Composites</p> 	<p>Dr. Debdatta Ratna, Scientist-F, NMRL Ambernath</p> <p>Polymer Matrix Composites for Naval Applications</p> 	<p>Dr. Sunny Zahir, Assistant Professor, School of Engineering Indian Institute of Technology, Mandi</p> <p>Manufacturing of polymer composites using microwave energy</p> 	<p>Dr. Ranji Manoharan, Department of Mechanical &amp; Aerospace Engineering</p> <p>Achively Bonded Joints in Composite Structure</p> 	<p>Prof. P. J. Gururao, Department of Aerospace Engineering, IIT Bombay</p> <p>Analysis of Interlaminar cracking of composite laminates</p> 	<p>Dr. Guruprasad Rao, Director &amp; Mentor (Leadership Team) Imaginarium India Pvt. Ltd.</p> <p>3D printing of Functionally Graded Materials- an Overview</p> 
Session 2	10:30 am to 11:50 am	<p>Dr. Virendra Kumar Gupta, Head R&amp;D &amp; Senior VP, Reliance Research, Mumbai</p> <p>Advanced Polymers &amp; Composites for high performance Applications</p> 	<p>Dr. Shantanu C. Prabhu, AGM, L&amp;T Mumbai</p> <p>Processing Composites at L&amp;T Defence : An industry Perspective.</p> 	<p>Dr. Dattaji K. Shinde, Professor VJTI, Matunga, Mumbai</p> <p>FEM of Nano engineered Composites &amp; its Molecular Dynamics</p> 	<p>Siba Mihapatra Professor (HAG) Department of Mechanical Engineering NIT, Rourkela</p> <p>Parametric Appraisal of Mechanical and Wear Behaviour of FDM build Parts</p> 	<p>Prof. Jaya B. Naganeni, Department of Metallurgical Engineering and Materials Science, IIT Bombay</p> <p>Fracture Toughness Testing &amp; Integrity Assessment of Composites Across Multiple Length Scales</p> 	<p>Dr. A.S. Rao, Assistant Professor, VJTI, Matunga Mumbai</p> <p>3D Printing</p> 
Session 3	11:50 am to 01:00 pm	<p>Dr. Bharat Kappote/ Dr. Rajkumar Kasilingam, IRMRA Mumbai</p> <p>Testing of Tyres and Reinforced rubber Materials for Durability Assessment</p> 	<p>Shri. Kashinath Deodhar, Group Director, ARDE, DRDO</p> <p>R&amp;D innovation on Hybrid Carbon-Glass Epoxy Gun Barrel for shoulder fired launcher</p> 	<p>Mr. Satyanarayan Joddabge, Founder, Joddabge Associates</p> <p>Plastic Moulding Processes and Industrial Applications</p> 	<p>Dr. Manmohan Das Gost, Professor, VNIT Nagpur</p> <p>Processing and Properties of Metal Foams</p> 	<p>Dr. Himanshu Pathak, Assistant Professor, School of Engineering Indian Institute of Technology, Mandi</p> <p>Computational modeling of composite materials: Fracture and Mean field Homogenisation study.</p> 	<p>Dr. Praveer Verma, Scientist-F, DMSRDE, Kanpur</p> <p>Failure Analysis of Polymer Matrix Composites</p> 
Session 4	1:00 pm to 2:30 pm	<p>Dr. R.C. Prasad/ Mr. Sunilising Rajput</p> <p>Technological Innovation &amp; Value Addition through Recycling &amp; Failure Analysis</p> 	<p>Prof. Chandrasekhar Yerramalli, Department of Aerospace Engineering, IIT Bombay</p> <p>Challenges in Design &amp; Manufacturing of Composites</p> 	<p>Mr. Rimzath D., DIAB, Sweden</p> <p>Fabrication of Sandwich Composites and it's Applications</p> 	<p>Dr. Shyamunder M., Former Principal Scientist, GE Research</p> <p>Former Senior Scientist, IGCAR, Kalpakam</p> <p>Chairman, National Certification Board, ISNT</p> <p>NDE of Composites - Trends and Advances</p> 	<p>Dr. C. M. Manjunatha, Chief Scientist, NAL Bangalore</p> <p>Fatigue and Fracture of Composites</p> 	<p>Visit to Virtual Lab &amp; QUIZ TEST</p> 
Session 4	2:10 pm to 3:00 pm	Remarks by Session Chairman:					VALEDICTORY FUNCTION



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## “PROCESSING AND PROPERTIES OF HIGH-PERFORMANCE PLASTICS”

**Dr. PRAKASH TRIVEDI**

Gharda Chemicals Mumbai

**Abstract :** High performance or Specialty Thermoplastics (STP) are becoming more important in last few years because of their unique properties, which are needed for such application fields as Medical, Aerospace, Transports, Oil/Gas Fields and general engineering.

Their uniqueness rests in their resistance to high temperature, chemicals, radiation, wear and tear and such properties. They show very high mechanical properties at normal and at higher temperatures as compared to engineering plastics.

Interestingly, they can be processed nearly similarly as engineering plastics, except at higher temperatures and with superior wear and corrosion resistant screws and barrels. The 3D Printing is the latest processing which has made these STP both attractive and important in the world of plastics today.

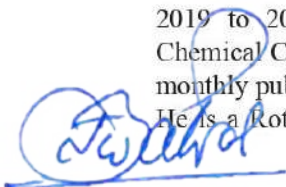
**Biodata of the Speaker :** Dr. Prakash Trivedi obtained his M.Sc. in chemistry working at UDCT, now ICT, Univ. of Bombay, Mumbai, India, in 1970 and PH.D. in polymer science at Dept. of Polymer Science, The University of Akron, Ohio, USA, in 1977 with Prof. J. P. Kennedy as his guide. He worked, starting 1974, in Firestone Central Research in Akron and returned to India in 1978. He then worked with IPCL at Vadodara, NOCIL, Rishiroop Polymer and Apar Oil at Mumbai from 1978 till 1990. He started Pace Polymer Technology Pvt. Ltd. and thereafter helped develop polymer business for PES, PSU, PPSU, two novel Polysulfone block copolymers, and their monomers and electrophilic PEEK from concept to commercialization for Gharda Chemicals Ltd. Mumbai, from 1990 to 2006 . Once, this business was sold to Solvay in 2006, he joined Solvay as Managing Director of Solvay Specialities India Pvt. Ltd. till 2009 and there after he was member of Solvay's Advanced Technology Group, Brussels, till he retired in June 2011. He consults now with Gharda Chemicals for developing & marketing PEK, ABPBI & PEKK and their compounds and products. All of these specialty polymers were developed and commercialized for the first time in India and in Asia and some for the first time, even in the World! Additionally, he has developed Bio-Polyamides for Chembond Chemicals, India, which are now getting commercialized.



Dr. Trivedi has about sixteen patents granted and six more patents are awaiting grant in Indian and abroad and more than ninety papers and presentations in National & International conferences. He has coauthored "PVC Technology" with Mr. Arvind Athalye. He is currently writing a Book on Specialty Plastics. He is also an author of six books of fiction and two full-length plays in Gujarati.

Dr. Trivedi is a member of American Chemical Society since 1972 & of Society of Plastics Engineers, USA. He is a life member, Fellow and ex-Chairman of Indian Plastics Institute. He is life member of UDCT Alumni Association and was awarded Distinguished Alumnus award by UDCT Alumni Association. He is nominated as Adjunct Professor for ICT from 2019 to 2021. He was a member of managing committee of Indian Chemical Council (ICC) and is presently Hon. Editor of Chemical News, a monthly published by ICC.

He is a Rotarian since 1988, and is Chairman of Govardhanram Tripathi



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## “Advance Polymers & Composites for High Performance Applications”

**Dr. Virendra Kumar Gupta**

Reliance Research and Development Centre, Reliance Industries Limited,

Reliance Corporate Park, Navi Mumbai 400 701 India

Email: [Virendrakumar.gupta@ril.com](mailto:Virendrakumar.gupta@ril.com); Mobile: +919998965284

**Abstract :** Significant growth in agriculture, automobiles, infrastructure, retail, aerospace, defense and other sectors is expected to propel the demand of polymeric materials from 380 million tons in 2020 to ~ 1,100 million ton by 2050. The exponential growth in the fundamental understanding of chemical, physical and engineering aspects of polymerization process and products offer high possibility to design advanced polymeric materials for sustainable growth replacing traditional materials.

Materials development is currently moving at high pace both in academia and industry due to their diverse commercial potential and beneficial merit for the society at large. The present talk will cover high performance polymeric materials based on olefins, diolefins, renewable materials and others reactive monomers and its applications in different growth sectors.

**Biodata of the Speaker :** Dr Virendra Kumar Gupta is currently Head, R&D Polymer & Senior Vice President, Reliance Industries Limited, Navi Mumbai. Before joining Reliance Industries Limited, he worked at the Indian Petrochemicals Corporation Limited & Gharda Chemicals Limited, India. Dr Gupta has received his PhD in Chemistry from Banaras Hindu University, Varanasi and worked at University of Alabama at Birmingham, USA

He has 40-year research experience in the areas of CO<sub>2</sub> fixation, organic/ inorganic polymers & catalysis and product technology development. He is an inventor/co-inventor of 150 patents and successfully commercialized 25 technologies in polyolefins & polysulfones products and processes. He also has 70 research publications in peer-reviewed journals and 75 invited and contributed presentations in international & national conferences. His significant & high impact technology development includes commercialization of High-Performance Ziegler Natta catalysts to produce polyolefin first time in India. He is a recipient of VASVIK award and 20 technology and product development awards including PC Ray awards for Development of Indigenous Technology by Indian Chemical Council.

He is also members of various industry and professional advisory committees. He is chairman of Industry Advisory Board (IAB) of the Polymer Science Program of Somaiya Vidyavihar University, Vice President, Society of Polymer Science India – Mumbai Chapter and Executive Council Members of Polymer Processing Academy & Asian Polymer Association. He also served as Executive Council Member, Central University of Haryana and Honorary Faculty at IIT, Roorkee.



Virendra Kumar Gupta: Head, R&D Polymer Synthesis and Catalysts

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Date	Time	Program Itinerary
19/01/2021	09:30 to 10:40 AM	<b>Dr. Debdatta Ratna, Scientist-F, NMRL Ambernath</b> Polymer Matrix Composites for Naval Applications
	10:40 to 11:50 AM	<b>Dr. Shantanu C. Prabhune, AGM, L&amp;T Mumbai</b> Processing Composites at L&T Defence : An Industry Perspective
	11:50 to 01:00 PM	<b>Shri. Kashinath Deodhar, Group Director, ARDE, DRDO</b> R&D innovation on Hybrid Carbon-Glass Epoxy Gun Barrel for shoulder fired launcher
	01:00 to 02:10 PM	<b>Prof. Chandra Sekher Yerramalli, Department of Aerospace Engineering, IIT Bombay</b> Challenges in Design Manufacturing of Composites
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>



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## Polymer Matrix Composites for Naval Applications

**Dr. Debdatta Ratna**

Sc F, Head Directorate of polymer Science and technology  
Naval Materials Research Laboratory, Shil Badlapur Road, Anandanagar P.O.,  
Addl. Ambernath (E), Thane District, Maharashtra - 421 506, India  
Tel : 0251-2623 110/2623036. 9766619055 Email : [ratnad29@hotmail.com](mailto:ratnad29@hotmail.com)

**Abstract :** Over the last three decades, the use of PMCs, especially fibre-reinforced plastic (FRP) composites, has increased tremendously and this dramatic growth is expected to continue in the future. The composites possess many useful properties like high specific stiffness and strength, dimensional stability, adequate electrical properties and excellent corrosion resistance. The implications are easy transportability, high payload for vehicle, low stress for rotating parts, high ranges for rockets and missiles, which make them attractive for both the civil and defense applications. The composite industries are dominated by thermoset resins. This is because of their availability, relative ease of processing, lower cost of capital equipment for processing and low material cost. Since thermosetting resins are available in oligomeric or monomeric low-viscosity liquid forms, they have excellent flow properties to facilitate resin impregnation of fiber bundles and proper wetting of the fiber surface by the resin. They are characterized by a crosslinking reaction or curing, which converts those into a three-dimensional (3D) network form (insoluble, infusible). Because of the crosslinked structure, thermoset composites offer better creep properties and environmental stress cracking resistance compared to many thermoplastics e.g. polycarbonate. However, thermosets composites are in general known to highly susceptible to internal damage caused by a low velocity impact due inherent brittleness of thermoset resins. The various ways to improve damage tolerance of a composite and the composite based products developed for naval applications will be deliberated in the present lecture

**Biodata of the Speaker :** Dr. Ratna, Sc "F" is heading the Directorate of Polymer Science and Technology of Naval Materials Research Laboratory (NMRL) (Defence research and development organization-DRDO), Ambernath. He did his M. Tech in Materials Science & Engineering and Doctorate in Polymer Science from Indian Institute of Technology, Kharagpur. He was a visiting scientist to Monash University, Australia on BOYSCAST Fellowship in 2000, sponsored by DST, India. He was also a visiting scientist to Technical University, Kaiserslautern, Germany on a prestigious Alexander von Humboldt Fellowship from 2006 to 2008. Dr. Ratna has been working at NMRL for the last 26 years and developed several products for Indian Navy, some of them are already inducted. He has published more than 95 papers in reputed international journals and three books. Most recent book on "Polymers for vibration damping applications" has been published by ELSEVIER in 2020. He is a reviewer related to research paper/book/project proposal for several Publishers, research grant councils (Hongkong and Czech Republic), National Science Foundation (USA). He is the recipient of Institute silver Medal (IIT Kharagpur), Indian Paint association award, Thermal analysis award (TA Instrument, UK), Technology day Medal (DRDO), , Lab Technology Group Award (2016), Fifth (2015) and Seventh National Award (2017) on Technology innovation from Ministry of Chemicals and Fertilizers, Govt of India.



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## “Composites at L&T Defence – An Industry perspective”

**Mr. Shantanu Prabhune**

Assistant General Manager, L&T Mumbai

**Abstract :** Composite materials have a rich history over the last 60 years. Globally and domestically the consumption of composites has been on a growth trajectory due to the benefits experienced by users in their products. Use of composites has provided functionally superior products with commercial advantages. High strength to weight ratio, high specific modulus, better electromagnetic, acoustic, thermal and ballistic performance has enabled composites to make inroads in several sectors. Composite material processing enables to make complex shapes. Industry has to setup the required infrastructure to manufacture composites. Larsen and Toubro Limited (L&T) has been manufacturing composite products for the past two decades through its Advanced Centre of Composites. L&T has successfully delivered several products of composite materials to Indian and International customers. The talk would present L&T’s journey and capabilities in the field of composites and provide an industry perspective on the ecosystem and value chain existing in composites in India.

**Biodata of the Speaker :** Mr. Shantanu Prabhune, Assistant General Manager, L&T, Mumbai

Mr. Shantanu Prabhune is currently working as an Assistant General Manager, L&T, Mumbai. He is involved in the development of Products using Composite Materials. He has also worked in L&T Mumbai as a Manager, Technology and Product Development in the area of Product Development using Composite Materials in Material selection, Material Vendor Selection, Material qualification at coupon level, 3D Designing using NX 6 and FE Analysis using ANSYS 13.0. He has also coordinated the manufacturing of the prototype of the product under development.

He has worked as a R&D Engineer at Weber Aircraft from Jul 2007 to Jan 2009 in the field of Concept Development for New Premium class economy seats for Commercial aircraft and Design of Commercial Aircraft Seat using Pro-E Wildfire.

He has worked as a Piping Engineer at UHDE India Ltd from Aug 2002 – Jul 2004 in the area of 3D Layout design of The Piping Network in Chemical industry and Stress analysis.

Mr. Shantanu Prabhune has completed his Masters in Aerospace Engineering from Texas A&M University and Bachelor of Engineering from University of Mumbai.



A handwritten signature in blue ink, appearing to read 'S. Prabhune', written in a cursive style.

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## “R&D innovation on Hybrid Carbon-Glass Epoxy Gun Barrel for shoulder fired launcher ”

**Mr. Kashinath Deodhar,**

Group Director, ARDE, DRDO

**Abstract :** A Light Weight, Shoulder Fired, Man-portable, Anti-Tank, Anti-Bunker, an effective Infantry Weapon was required urgently by Indian Army for high-altitude mountain warfare at Drass, Butalik and Kargil sector.

Indian Army was having 84 mm RL Mk-II weapon in service known as a rocket launcher. Which was very heavy, and difficult to handle and operate at high altitudes.

First time in the country, Gun Barrel of an infantry weapon, 84 mm Light Weight Launcher (LWL) was developed with state-of-the-art hybrid composite gun barrel to withstand an instantaneous firing chamber pressure of 90 MPa and successfully test fired directly on "Enemy" during kargil war before proving it in our field trials.

The use of "high specific strength" and "high specific modulus of carbon-epoxy composites hybridised with Glass for making tailor made properties using "Filament winding" and "autoclave" process, the 84 mm LWL Gun Barrel were successfully developed by "hoop over wound on thin steel liner with rifled bore.

The stringent QA QC tests and latest techniques like low frequency Ultrasonic PET C-Scan test and Acoustic Emission Technique (AET) was also developed as NDT and Hydraulic pressure tests on coupons to ensure quality, safety and reliability.

In the lecture, I will be covering a brief Introduction of Weapon-Ammunition System, Composites, The case study of 84mm LWL, destructive and NDT tests. Various field trials conducted to know a System engineering approach and development cycle of a weapon system.

**Biodata of the Speaker :** Mr. Kashinath Deodhar is currently working as the Group Director, ARDE, DRDO, Pune. He completed his part-time BE (Mech) degree from Cusrow Wadia Inst. of Technology Pune.

Completed ME (Mech) with specialization in Advanced Weapon Technology and passed in first class with distinction. Carrying out Doctoral research in the field of Weapons from defence University Awarded with commendation in 1999 and 2005 at National level Recipient of Lab **Scientist of the year 2006** Award.



Heading emergency escape system for pilot division and till now research work carried out on various weapon systems viz. Air Defence Gun, Tank Gun, and Artillery Gun System etc. Rocket Launcher, PINAKA System etc. Specialization in Design & Development of ordnance, servo control System, composite material technology etc. Stayed months together with the soldiers/troops at sensitive areas at LOC in various terrains as in Pokharan deserts where temperature is above 48 degrees centigrade in summer and at Leh in Himalayan ranges where subzero temperatures are around 40 degrees centigrade in hard winter. Recently PINAKA Team Award for Productionization of Indigenously developed Canopy Severance System Awarded to team led by Deodhar. Apart from office duties interested to build up a confidence in society through scientific approach and working as Honorary Vice President, Paschim Maharashtra Prant unit of Vijnana Bharati, an all India organization known as Swadeshi Science movement of Bharat.

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## Challenges in Design & Manufacture of Composites

**Dr. Chandra Sekher Yerramalli**

Professor

Department of Aerospace Engineering, Indian Institute of Technology Bombay, Mumbai 400076 INDIA

**Abstract :** Composite materials have been touted as the most advanced materials and as one of the solutions to many of the problems faced in Aerospace and other engineering fields. The key advantages as mentioned often in the literature are their light weight and high strength and stiffness along with the aspect of tailorability. These are important reasons for the significant increase in the usage of composite materials in structural load bearing members in many fields of engineering. However, along with these advantages, there are also certain caveats that need to be mentioned. The tailorability aspect is beneficial if the corresponding manufacturing and design processes are well developed to take advantage. While fabricating a composite wind blade, one would be creating the material in-situ in the shape of the wind blade aerodynamic surface. Thus, the material layup and manufacturing process is inextricably linked to the shape of the structure. This aspect is different from the conventional metal structures and needs to be appreciated by the designer and the manufacturer. This linkage between the inherent material configuration and the structural shape lead to challenges in design and manufacturing of composites and will be discussed in the presentation.

**Biodata of the Speaker :** Prof. Chandra Sekher Yerramalli is currently working as an Associate Professor in the Aerospace Engineering department at IIT Bombay. Prior to joining IIT Bombay in 2015, Prof. Chandra worked in Industry for 10 years. Prof. Chandra obtained his PhD in Aerospace Engineering from the University of Michigan at Ann Arbor in US. His research interests are broadly in the areas of environmental damage modeling in composite materials, fatigue modeling of composites under combined loading, ballistic response of fiber composites with applications to wind turbine blades and aerospace vehicles and components. Prof. Chandra has published around 40 Journal and International conference publications and has filed/received 15 patents.



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## **“Computational modeling of composite materials: Fracture and Mean field Homogenisation study”**

**Dr. Himanshu Pathak**

Assistant Professor, School of Engineering  
Indian Institute of Technology Mandi

**Abstract :** Composite materials exhibits higher specific strength and stiffness; hence extensively used in various industrial and engineering applications such as aerospace, armored and automobile etc. Multiple voids and cracks were generated during material processing techniques, which interact with each other and affects the service performance of composite material components. This talk encompasses an efficient and robust numerical technique to model fracture phenomenon in composite material domain. Mesh independent computational approach namely “extended finite element method (XFEM)” and “meshfree-method” is discussed in details for fracture modeling in composite materials. Numerical implementation of these computational methods will be discussed for different materials domain like orthotropic material, functionally graded material and piezo-electric smart material. In second part of the talk, mean field (MF) homogenization technique is discussed to predict material properties of composite materials. The technique is well established to compute thermo-mechanical, thermal or electrical properties of a composite as a function of its microstructure morphology, i.e., inclusion shape, orientation, volume/mass fraction, and per-phase material behaviour.

**Biodata of the Speaker :** Dr. Himanshu Pathak is working as an assistant professor at Indian Institute of Technology (IIT) Mandi, Mandi, Himachal Pradesh, India since August 2016. Dr Pathak has expertise on mesh independent computational methodology (like XFEM and meshfree methods), multi-scale modelling, solid mechanics, fracture and fatigue analyses of composite materials etc. Dr. Pathak has published more than sixty research articles in international reputed journals and conference proceedings and supervising 4 Ph.D. and 3 M.S. students. According to Scopus database, he has h factor 11. Dr. Pathak has given invited talks in the international workshops, conferences, colloquium etc., has taught mechanical design and robotics related courses. He has external funded research projects with value of ₹ 2.50 crore from different funding agencies like DRDO, SERB, DST, IOCL etc

A handwritten signature in blue ink, appearing to read 'S. Pathak', written in a cursive style.

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**Biodata of the Speaker :** Dr. Dattaji K. Shinde has obtained B. E. (Mechanical) from Government College of Engineering Aurangabad Maharashtra (2000), M. Tech. (Design Engineering) from Indian Institute of Technology, Delhi (Jan 2002). He has obtained Ph D in Nanoengineering at Joint School of Nanoscience and Nanoengineering, North Carolina A & T State University Greensboro NC, USA in December 2014. Also, he was Postdoctoral Scholar at North Carolina A and T State University USA during 1<sup>st</sup> January to 31<sup>st</sup> June 2015. He has worked as Graduate Research Assistant in Nanoengineering department (Aug. 2011- Dec. 2014). He is visiting Professor at Department of Mechanical and Material Science, University of North Carolina, Charlotte NC USA (2018-19).



Currently, he is Associate Professor of Production Engineering Department and is Former Head of Production Engineering Department, VJTI Mumbai. The additional portfolios handling at VJTI Mumbai are MHRD's Institutions Innovation Council President, Start-up and E-Cell Coordinator, AISHE Convener, ARIIA Nodal officer, SAMPE International Student VJTI Mumbai Chapter and SAMPE International Professional Chapter President. Dr. Shinde has 18 years of rich experience in teaching, research, industry and consultancy.

Collaborative research with Imperial College of London Material Engineering Department U. K, University of Malaysia, Pahang, Malaysia and Rice University, USA Texas A and M University USA, North Carolina A and T state University USA. He has visited many universities of USA such as Michigan University, Georgia Tech University, Duke University, South Carolina State University, Texas State University for collaborative research and currently working on many joint research projects on Nanotechnology in materials and Manufacturing. He is working as editorial board of world Academy of Science Engineering and Technology USA (WASET).

He has published three international journal paper and 67 international and national journals and conferences papers in peer reviewed proceeding in area of Nanotechnology, nanomaterials, manufacturing, nanocomposites and advanced composite materials. His area of interest is nanotechnology, nanomaterial, nanocomposite, advanced composite materials, design engineering, finite element analysis micro/nanofabrication, value engineering, lean manufacturing, and project management.

Dr. Shinde is lifetime member of ASME (USA), SAMPE (USA), WASET, SAE India, ISTE (India), and AMSI SAVE International USA.

He is recipient of Dr. Wadaran L. Kennedy Scholar Award for 2012-2013 form North Carolina A&T State University, recipient of Graduate Research Assistantship award from North Carolina A&T State University from August 2011 to Dec. 2014. Recipient of Scholarly Accomplishments and Excellence in Academic Performance Award, Division of Student Affair and International Student and Scholar's office, North Carolina A and T State University, NC 2012. Dr. Dattaji Shinde has awarded Best Dronacharya Award for Innovative product Smart Navigation Band in the National level Entrepreneurship Generation -Y competition Hunar 2.0 organized by Jaro Education for 2018-19. Also working as Board Studies Member for K K Wagh College of Engineering Nasik for from 2018-19.



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- **Title:** Effect of Electrospun Nanofibers and Carbon Nanotubes on the Properties of Polymeric Composite and its Failure Analysis.
- **Speaker:** Dr Dattaji Shinde, Associate Professor and Former Head of Production Engineering, VJTI, Mumbai India.
- High specific modulus and strength are the most desired properties of the material for the structural applications and since composite materials exhibit these properties during last decade; these materials have gained significant increase in usage for the applications ranging from automotive, defense, aerospace, recreation and shipbuilding etc. The major cause of failures in these composite laminates is due to delaminations. Nanoengineered beams were fabricated by interleaving non-woven Tetra Ethyl Orthosilicate (TEOS) electrospun nanofibers (ENFs) between the laminated fiberglass composites to improve the flexural properties. In addition, interlaminar shear strength (ILSS) of fiber reinforced polymer composite is an important property for most of the structural applications. Matrix modification is an effective method used to improve the interlaminar shear strength of composite. EPON 862/w epoxy system was modified using Tetraethyl orthosilicate (TEOS) electrospun nanofibers (ENFs) which were produced using electrospinning method. The ILSS of the Glass Fiber Reinforced Polymeric Composites (GFRP) was investigated. The study shows that introduction of TEOS ENFs in the epoxy resin enhanced the ILSS of GFRP by 15% with 0.6% wt. fraction of TEOS ENFs.
- A Polymer can enhance its properties by addition of a very small weight percentage of micro or nanomaterials which can tailor of polymer. The multiwall carbon nanotubes (MWCNTs) were added in percentage ranging from 0.1 to 0.3% by weight in acrylonitrile butadiene styrene (ABS) and a spool in the form of material was prepared for 3-D printing with the help of an extrusion machine. Characterization of multiwall carbon nanotubes into ABS based nanocomposite. The samples were printed as per the ASTM D638 and ISO 178 standards using dual extruder 3-D printer by fused deposition modelling (FDM). The tensile test results in an increase in strength by 21.61% while the flexural test results a decrease in strength by 15.13. Further an electrical conductivity test was performed on nanocomposites with weight percentage of multiwall carbon nanotubes, and have shown significant increase in electrical conductivity with the addition of multiwall carbon nanotubes.
- Electrospinning is the most widely utilized method to create nanofibers because of the direct setup, the capacity to mass-deliver consistent nanofibers from different polymers, and the ability to produce ultrathin fibers with controllable diameters. Smooth and much arranged ultrafine Polyacrylonitrile (PAN) nanofibers with diameters going from submicron to nanometer were delivered utilizing Electrospinning technique. The effect of electrospinning processing parameter on the morphology of electrospun PAN nanofibers were investigated. The nanofibers were heat treated for carbonization to examine the changes in properties and composition to make for electrical application. The average diameter of the PAN fiber observed 365nm and 280nm for flat plat and rotating drum collector respectively. The four probe strategy was utilized to inspect the electrical conductivity of the nanofibers and the electrical conductivity is significantly improved with increase in oxidation temperature exposed.
- The progressive failure of the laminated fibreglass nanocomposite was analyzed using stiffness degradation method using ANSYS. Further Molecular dynamic simulation of polymeric nanocomposite was carried out validate the experimental result of mechanical characterization using J-OCTA software.



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## **Fabrication of Sandwich Composites and its Applications**

**Mr Rimzath B**

DIAB, Sweden

**Abstract :** Why sandwich composites? With sandwich composites you can:

- Decrease weight and increase strength
- Save fuel cost or increase payload
- Reduce lifecycle cost
- Lower your carbon footprint
- Enjoy more design freedom

What is sandwich composite? The concept is cleverly simple. Two thin, strong and stiff materials are separated by a lightweight core. The result is a strong and durable product that provides mechanical properties at much lower weight than traditional monolithic materials, such as single skin FRP, wood, steel or aluminum. Sandwich composite materials also allow designers to engineer with extreme optimization to their loading requirements. A sandwich solution can be tailored to avoid over-engineering, saving weight and increasing performance. By choosing the appropriate fibers, resin and core you can create a product that has, for example, high thermal insulation, tailored mechanical behavior and fire resistance.

### **Biodata of the Speaker : Mr: Rimzath B**

DIAB, Sweden, Technical Manager India / Middle East

Mr. Rimzath Ali graduated from B.Tech (Polymer Technology), MBA Production and has 18 years' experience in Composites Engineering and infusion process, working largely in the wind & Marine segment industry mobilising plant work forces and controlling build production and quality assurance procedures. His role in CCG India sees him travelling extensively in the region and Middle East for supporting new designs and processes for a wide range of client needs, as well as educating staff and implementing new application and techniques. Rimzath has done a lot of infusion training & has excellent raw materials and process knowledge.

He has won JEC ASIA & ICERP innovation award in composite process



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# TWO WEEKS AICTE APPROVED CERTIFICATE STTP

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

Organized by	Supported by
   <p><b>PHCET</b> PILLAIHOC COLLEGE OF ENGINEERING &amp; TECHNOLOGY PHCET, Rasayani</p> <p><b>AICTE</b> All India Council of Technical Education INDIA</p>	    <p><b>SFA</b> Mumbai Chapter</p> <p><b>S&amp;E INDIA</b> Society of Automotive Engineers INDIA</p> <p><b>ASM</b> INTERNATIONAL INDIA CHAPTER</p>

Date	Time	Program Itinerary
21/01/2021	09:30 to 10:40 AM	<b>Dr. Ramji Manoharan, Department of Mechanical &amp; Aerospace Engineering</b> Adhesively Bonded Joints in Composite Structure
	10:40 to 11:50 AM	<b>Siba Mahapatra Professor (HAG) Department of Mechanical Engineering NIT, Rourkela</b> Parametric Appraisal of Mechanical and Wear Behaviour of FDM build Parts
	11:50 to 01:00 PM	<b>Dr. Manmohan Das Goel, Professor, VNIT Nagpur</b> Processing and Properties of Metal Foams
	01:00 to 02:10 PM	<b>Dr. Shyamsunder M., Former Principal Scientist, GE Research Former Senior Scientist, IGCAR, Kalpakkam</b> Chairman, National Certification Board, ISNT NDE of Composites – Trends and Advances
	02:00 to 03:00 PM	<b>Concluding Remarks by Session Chairman and Feedback</b>



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## “Processing and Properties of Metal Foams”

**Manmohan Dass Goel**

Assistant Prof.

Department of Applied Mechanics, Visvesvaraya National Institute of Technology  
(VNIT), Nagpur – 440 010, India

**Abstract :** Metal foams have a number of advantages over polymer foams including higher operating temperatures, consistent properties over the time and an absence of noxious fumes during decomposition. They are generally isotropic, can be recycled and are cost effective in long run. Many metal foams can be stiffer and stronger than polymer foams and these can be tailored as per their application. Other desirable characteristics include increased energy absorption, sound damping, electromagnetic wave absorption and non-combustibility. While metal foams are not widely utilized currently, commercial interest is growing quickly as manufacturing methods improve the quality and consistency of the foam. This, in combination with an increased understanding of their mechanical behaviour, could lead to more extensive use. These metallic foams are smart option for various applications, wherein they are used as sandwich cores in structural application, packaging along with blast-resistant structures/components. Further, deformation of metal foams under high rate of loading is a complex phenomenon due to the effects of various parameters involved therein. Herein, primary focus will be on processing of the aluminium foams and their dynamic behaviour at the high rate of loading. The major focus will be on experimental investigation of metal foams using split Hopkinson pressure bar (SHPB).

**Biodata of the Speaker:** **Dr. Manmohan Dass Goel** completed his bachelor of engineering from Yeshwantrao Chavan College of Engineering (YCCE), Nagpur under the then Nagpur University in 2000. He was awarded **three gold medals** by Nagpur University for academic excellence. He completed Master of Technology (M. Tech.) in offshore engineering from Indian Institute of Technology (IIT) Bombay, Mumbai in year 2003. After He joined CSIR-AMPRI Bhopal as scientist. He completed his Ph. D. from Department of Civil Engineering, Indian Institute of Technology (IIT) Delhi and University of Federal Armed Forces, Munich, Germany under German Academic Exchange Service (DAAD) Sandwich Fellowship in year 2013. The topic of his doctoral research was "**Blast Response of Structures and Its Mitigation Using Advanced Lightweight Materials**"



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## Analysis of interlaminar cracking of composite laminates

Dr. P. J. Guruprasad

Professor

Department of Aerospace Engineering, Indian Institute of Technology Bombay, Mumbai 400076 INDIA

**Abstract :** Delamination is one among many modes of failure observed in laminated composites. Regions close to the free edge of laminates have complex stress state, including interlaminar stress. These stress components lead to laminas separating from each other. In this talk, a general understanding of interlaminar stress in laminated composites will be first presented. Subsequently, possible approximate analytical solutions to estimate interlaminar stress near the free edge and the notion of boundary-layer region will be discussed. As an application, estimating interlaminar stress in pre-twisted composite strips that have potential application in helicopter flexbeams will be demonstrated. Finally, possible techniques to model other modes of damage in fiber reinforced composite materials and textile composites will be shown.

**Biography Speaker:** Dr. P. J. Guruprasad is an Associate Professor in the Dept. of Aerospace Engineering at IIT Bombay. He obtained his B.E. in Mechanical Eng. from B. M. S. College of Engineering, Bengaluru; M.Sc (Eng) in Aerospace Eng. from IISc, Bengaluru; and Ph.D. in Aerospace Eng. from Texas A&M University, USA. Subsequently, he was a Post Doctoral Fellow in Centre des Materiaux at Ecole des Mines de Paris, Paris. His research interests fall within the broad area of mechanics of materials.



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## **“Fracture Toughness Testing & Integrity Assessment of Composites Across Multiple Length Scales”**

**Dr. Jaya Nagamani**

Assistant Professor

Metallurgical Engineering and Materials Science Department  
Indian Institute of Technology Bombay  
Powai, Mumbai 400076

**Abstract :** Assessment of structural integrity of composites requires predictive tools from modelling to be developed. Macro-scale modelling of composites relies on continuum behaviour. In order to model fracture behavior of composites, properties of constituent materials and their interface needs to be precisely known. Micromechanical testing offers a suite of such capabilities and testing techniques through which composites can be modelled using a bottom up approach. Improvements in mechanical integrity of composite structures can be brought about by topology optimization, which also can achieve unique directional properties. This again requires modelling with micromechanical properties as input. Our group is working on design and development of length scale compatible fracture testing geometries through finite element modelling and experiments that will aid in measurement of properties of constituent phases and their interfaces at the length scale of their application. Examples of these techniques in certain multi-phase composite materials and alloys will be shown.

**Biodata of the Speaker :** Nagamani Jaya Balila is an Assistant Professor at the Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay since October 2016. She did her PhD in Materials Engineering from the Indian Institute of Science Bangalore and her post-doctoral research at the Department of Structure and Nano-/Micro-mechanics of Materials, Max Planck Institut fuer Eisenforschung, Duesseldorf. Her current areas of research are in fracture mechanics at multiple length scales and design of materials with improved damage tolerance. She has more than 20 publications and 3 review articles in the field of microscale fracture mechanics and is a frequent reviewer of several journals including Acta Materialia and Scripta Materialia for which she has won the best reviewer awards in 2015 and 2019. She has been an invited speaker in many international conferences and also been an organiser of symposiums in them. She is currently leading a group of 5 PhD students, 3 Masters students, 4 Bachelor students while having guided more than 5 Masters students and 4 Bachelors students in their thesis.

A handwritten signature in blue ink, appearing to read 'Jaya', written in a cursive style.

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## **“Manufacturing of polymer composites using microwave energy”**

**Dr. Sunny Zafar**

Faculty of Mechanical Engineering  
Indian Institute of Technology Mandi

**Abstract :** Composite manufacturing industry is looking for energy efficient and sustainable manufacturing solutions. In this talk, use of microwave energy will be discussed to manufacture polymer matrix composites (PMC) for various applications. Specific case studies will be discussed to show the potential of microwave based manufacturing processes for primary manufacturing of PMCs. The talk will also cover various challenges, copes and innovations possible in microwave based manufacturing processes..

- **Biodata of the Speaker :**
- Dr. Sunny Zafar is working as an Assistant Professor in IIT Mandi.
- PhD in Manufacturing Engineering from IIT Roorkee
- M.Tech in Welding Engineering from IIT Roorkee
- B.Tech in Mechanical Engineering from PTU, Jalandhar
- His research interest are broadly
- One patent
- ❖ Advanced Manufacturing Processes for Polymer Composites
- ❖ Microwave based Manufacturing Processes
- ❖ Product Design and Development
- ❖ Surface Engineering
- ❖ Experimental Tribology
- ❖ Mechanical Behaviour of Materials



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ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

<p><b>Organized by</b></p>    <p><b>PHCET</b> PILLAIHOC COLLEGE OF ENGINEERING &amp; TECHNOLOGY PHCET, Rasayani</p> <p><b>AICTE</b> All India Council of Technical Education AICTE, INDIA</p>	<p><b>Supported by</b></p>     <p><b>SFA</b> Mumbai Chapter</p> <p><b>S&amp;E INDIA</b> Society of Automotive Engineers INDIA</p> <p><b>ASM</b> INTERNATIONAL INDIA CHAPTER</p>
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Date	Time	Program Itinerary
23/01/2021	09:30 to 10:40 AM	<b>Dr. Guruprasad Rao, Director &amp; Mentor (Leadership Team)</b> <b>Imaginarium India Pvt. Ltd.</b> 3D printing of Functionally: Overview
	10:40 to 11:50 AM	<b>Dr. A.S. Rao, Assistant Professor, VJTI, Matunga Mumbai</b> 3D Printing
	11:50 to 01:00 PM	<b>Dr. Praveer Verma, Scientist F, DMSRDE, Kanpur</b> Failure Analysis of Polymer Matrix Composites
	01:00 to 02:10 PM	<b>Dr. Bharat Kapgate/Dr. Rajkumar Kasilingam, IRMRA Mumbai</b> Testing of Tyres and Reinforced rubber Materials for Durability Assessment
	02:00 to 03:00 PM	<b>Valedictory Function</b> <b>Talk by R. Sunder, Director, Instron Asia Centre of Excellence</b> <b>ITW-India (P) Ltd, Bangalore, India</b>



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## 3D printing of Functionally Graded Materials- an Overview

**Dr. Guruprasad Rao,**

Director & Mentor (Leadership Team), Imaginarium India Pvt. Ltd.

**Abstract :** The development of functionally graded materials has potential applications in Hi-Tech industry. 3D printing provides the new technology for synthesizing of soft organic phases based on polymers and hard inorganic phases through selective heat melting for fabricating functionally graded structures. Fibres can be deposited according to the strength requirements using 3D printing. The composite 3D printing market is expected to be worth billions of dollars in coming next 10 years. In this presentation the development of technology and machines at Imaginarium shall be illustrated.

**Biodata of the Speaker :** Dr Guruprasad Rao is a Director & Mentor (Leadership Team) at Imaginarium India Pvt Ltd., India's leading 3D printing company. His current focus is on DfAM for Metal 3D printing 3D printing Medical Applications, Skill Development besides Technology mentoring and partnerships across domains. Dr Rao is a technocrat with over 30 years of experience encompassing Industry & Academia. He holds BE (Mech) with PG in Tool Engineering from GTTC , M Des in Product Design from IISc, Bengaluru and PhD from IIT Bombay. For his terminal degree, he worked on Medical applications of 3D Printing. His industrial assignments include Titan, Tanishq, Crompton Greaves and presently at Imaginarium. He joined Imaginarium as CEO and is presently designated as Mentor - Director. He has taught design at IISc, NIFT, JSSATE and NTTF. He was Professor & Head, Project Office IICD, Jaipur. He also teaches courses on Emerging technology and its impact at SPJIMR and KJ Somaiya Business Schools. He is also a mentor at KIIT-TBI, Bhubaneshwar and guides start-ups on design and technology. Dr Rao is associated with many industry bodies such as CII / FICCI / NASSCOM /BIS / IAMF / Atal Innovation Mission. As CII Conference Chairman, he successfully led CII 3D Printing Conference 2019, Mumbai as Conference Chairman. Presently he is a part CII National Committee on Design.



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## Failure Analysis of Polymer Matrix Composites

**Dr. PRAVEER VERMA**

Sc. "F", DMSRDE, KANPUR

**Abstract :** PMCs with application on the technological system frontiers by about the end of last century have progressively moved from functionally non critical to most critical structural units, driven by the data accumulated on its performance as non-critical functional units and the basic feature of the material of high specific strength with the flexibility to the design the components as per the actual system requirement and thus dictating orientation and volume fraction or mass, which can be kept minimum thereby possessing the cutting edge feature over the isotropic conventional materials which pays in huge volumes in various concerned sectors, thus the technology is near its maturation and therefore the likely various failure modes and their remedial measures need to be addressed more widely at this time with a view to build up more and more type of systems with advantages of mass savings with inherent better dynamic mechanical and electrochemical properties etc. , thus, succeeding in higher and more reliable service life of the system. The talk deals mainly with the various failure modes of PMCs and their prominent causes right from component forming till their replacement as a result of a flaw during inspection, it is interesting that no unscheduled replacement have taken place during orator's functioning at inspection level for more than a decade.

**Biodata of the Speaker :** B. Tech. (HBTU), M. Tech. (IIT, DELHI) - Centre for material science & technology-1990 .

More than 20 technology day award from hal and technology driven awards/honors from cemilac & dmsrde, drdo & indian air force.

More than 150 publications largely pertaining to airworthiness, failure analysis of aeronautical stores, including rubbers, PMCs, glazing plastics, FOL items etc.

His areas of interest include endeavour for making our country technologically completely self reliant with cutting edge combat capabilities & guiding budding engineers and scientists, for brighter country's technological advancement & prosperity.



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## **Advances in Polymer Technology- Nanotechnology**

**Dr. Kasilingam Rajkumar**

Director, Indian Rubber Manufacturers Research Association, Thane

**Abstract :** For the past 10 years, polymer nanocomposites are the dominating field in polymer science and technology. The interest in polymer nanocomposites is due to the reinforcement effect of nanofillers, better mechanical properties, thermal stability and barrier properties. Nanotechnology emerged to improve the physical properties of traditional materials at the molecular level without affecting the processing. Different types of nano-fillers based on their dimension are discussed with emphasis on advantages of nano-composites over conventional composites. Various nano-fillers used in polymer such as Layered Silicates : Nano clay, carbon based: graphene, Nanotubes, Spherical Particles : Silica, Polyhedral Oligomeric Silsesquioxanes and Bionanofillers and problems with nano-fillers with the strategies to overcome are discussed in detail. Various processing techniques of nano-filler in polymer matrix and their application are given in detail. The topic is concluded with Future Outlook, Challenges and Opportunities with respect to polymer nano-composites.

**Biodata of the Speaker :** Dr. Kasilingam Rajkumar is a Rubber Technologist from IIT Kharagpur, with excellent academic record through out the career along with 20 + years of rich experience in the field of Research & Development, Testing, Training and Consultancy services on Polymer / Rubber Technology and Currently, working as, Director, at Indian Rubber Manufacturers Research Association [IRMRA], aff. to Min. of Com. & Industry, GoI, Thane, and responsible for over all operations of IRMRA. My recently added Management Degree [MBA] in Operational Management and Doctoral Degree [PhD] in the emerging field of Polymer / Rubber Nanocomposites are added feather in my career to take any challenging leadership career in scientific and technological research and associated activities. Under my leadership, we have completed several sponsored and product development projects at IRMRA which includes evaluation of chemicals and additives in Rubber formulations, Industrial consultancy projects for MSME sectors, critical product development for defence and nuclear sectors. During my tenure of 17 years, at IRMRA, I was instrumental for the growth of IRMRA's services by acquiring key quality credentials to the organization like ISO 9001 certifications, NABL accreditations, DGMS, BIS & CEMILAC recognitions etc. Several initiatives are taken to expand its activities for business enhancement like ISO 17020 accreditation,, finalizing MoU with SARPOL, finalizing projects for Chennai center etc.



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**COMPLETION REPORT OF THE AQIS-STTP ON “ COMPOSITES: FRACTURE TOUGHNESS,NDE AND FAILURE ANALYSIS”**

The Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology was granted approval to conduct Short Term Training Program ( STTP ) under AQIS 2019-20 during the financial year 2020-21 vide Ref.No.:34-66/442/FDC/STTP/Policy-1/2019-20 dated 10 August 2020 on “ Composites: Fracture Toughness, NDE & Failure Analysis “

The Director Faculty Development Cell of the AICTE vide their Drawing & Disbursing officer sanctioned payment of Rs.2,99,667/-for conducting STTP under Head 601.15(a)STTP Plan.

The grant in aid was released to the PHCET R&D Account No.:52142200086666, SYNB 000524 IFSC code at Khaira, Patalganga Branch. The original STTP was residential program of 6 days duration with minimum 40 participants.

However, due to pandemic of COVID-19 the Institute was allowed to conduct STTPs through online mode with the stipulated conditions (Reference : Letter of Col. B.Venkat, Director (FDC) dated 14 September 2020).

The institute conducted 3 STTPs on the same topic in multiples of Rs. 93,000/- within the total grant received by it.

The 3 STTPs were conducted during November 17-22, 2020, January 18-23, 2021 and March 15-20, 2021. The highlight of all the 3 STTPs has been the participation of leading professional societies in the country like Society for Automotive Engineering, Western Region, Institution of Engineers, Maharashtra Region, ASM International India Chapter, Society for Failure Analysis, Mumbai Chapter, Indian Society for Remote Sensing, Mumbai Chapter, Materials Recycling Association of India and the Indian Rubber Manufacturers Research Association, Mumbai. Their involvement immensely benefited participants and allowed them to interact with industries related to the subject matter of the STTPs. All the 3 STTPs covered processing of Polymers, Polymer Blends & Composites, and their mechanical and Non-destructive characterisation to ensure quality assured industrial products. This was followed by case studies of failures in different industrial sectors and ways and means to prevent such failures. The STTPs also covered advanced manufacturing processes like additive manufacturing and 3D printing. The lectures were delivered by the industry experts, faculty from NITs and IITs as well as leading foreign universities. The applications of Polymers, composites and NDE for medical applications were also covered by eminent speakers. The details are given in the Proceedings and the program schedule.

The entire program was monitored by duly constituted Program Monitoring Committee as per directives of the AICTE. The committee members held several meetings through the Zoom link and brought the program to a successful conclusion. Under the guidance of members of the PMC the grant in aid was adjusted against the expenditure as per the guidelines of the AICTE and the remaining balance amount refunded to the member secretary AICTE, New Delhi on the bank details provided to us.



Prof. R.C. Prasad,  
Coordinator/ Member Secretary



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**Mahatma Education Society's  
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Dept. Of Mechanical Engineering  
AQIS STTP -3 (15th March 2021 to 20th March 2021)

Sr. No.	Name	Department	Designation	Name of Institute/ Industry
1	b vijaykrishna	Mechanical engineering	assistant professor	institute of aeronautical engineering
2	RAMKRISHNA VASANT MIRAJKAR	Mechanical Engineering Department	Assistant Professor	Walchand COE Sangli
3	Pratik Dattatray Waghmare	Mechanical Engineering	Student	Pimpri Chinchwad College Of Engineering Pune
4	Ruchika Hire	Mechanical	Asst. Professor	RMD sinhgad school of engineering, warje, pune
5	Vetrivezhan Paramasivam	Mechanical Engineering	Assistant Professor	SRM Institute of Science and Technology
6	Amit Jivandhar Chougule	Mechanikal	Technical Assitant	Sharad Institute of Technology College Of Engineering, Yadrav
7	shalini	MECH	ASS	KOM
8	Dr Abhjit Sarkar	Mechanical engineering	Assistant professor	ISB&M COLLEGE OF ENGINEERING
9	ARUN V REJUS KUMAR	Mechanical Engineering	Assistant Professor	Bharath Institute of Higher Education and Research
10	DR.AVINASH SHIVAJIRAO CHAVANPATIL	MECHANICAL ENGG	PRINCIPAL	MANDAR EDUCATION SOCIETY'S RAJARAM SHINDE COLLEGE OF ENGG PEDHAMBRE
11	Chanchal Kumar Salode	Operation Management & Quantitative Techniques	Academic Associate	Indian Institute of Management Indore
12	Ansari Usama Shakeel Ahmed	Engineering Design	Research Scholar	Indian Institute Of Technology Madras
13	JONNALA SUBBA REDDY	MECHANICAL ENGINEERING	ASSOCIATE PROFESSOR	LAKIREDDY BALIREDDY COLLEGE OF ENGINEERING, MYLAVARAM
14	Keerthi Jonnala	CSE	Student	NIT Durgapur
15	Rachana Bajaj	Civil Engineering	Associate professor	RNTU
16	Dr. Sachin Ghalme	Mechanical Engineering	Associate Professor	Sandip Institute of Technology and Research Centre
17	Dr.A.Arun Negemiya	Mechanical Engineering	Assistant Professor	Sri Shakthi Institute of Engineering and Technology
18	upendra Sharan gupta	Mechanical Engg	Asst. Prof	SVVV indore
19	Arun Raj P V	Mechanical	Assistant Professor	SRMIST RAMAPURAM
20	CHHOWALA VIRAT D.	Mechanical	Student	Sarvajanik College Of Engineering And Technology, Surat
21	PRAJIT ASHOK MANE	MECHANICAL ENGINEERING	ASSISTANT PROFESSOR	SINHGAD ACADEMY OF ENGINEERING, KONDHWA, PUNE, MAHARASHTRA
22	Neelam Malhari Kamthe	Mechanical	Assistant Professor	Sinhgad College Of Engineering

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49	Mahendra singh	Mechanical Engineering	Research scholar	Nit agartala
50	P.VASANTHKUMAR	MECHANICAL ENGG	ASSISTANT PROFESSOR	SRM INSTITUTE OF SCIENCE AND TECHNOLOGY, RAMAPURAM
51	Dr. Arun K V	Mechanical Engineering	HoD, MED	Government engineering college, Haveri
52	Lokpriya Mohanrao Gaikwad	Mechanical Engineering	Assistant Professor	SIES Graduate School of technology
53	C A JAGADISH	Mechanical	Assistant Professor	Hindusthan College of Engineering and Technology
54	Dr K Selvakumar	Mechanical	Assistant Professor	Bharath Institute of Higher Education and Research
55	Rishikesh Malani	MBA	Assistant professor	Global Institute of Management



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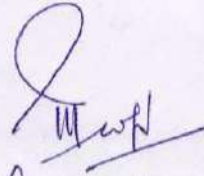
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15. The soft as well as hard copy of the detailed study material/proceedings of the programme must be furnished to the Council.: Proceedings of the programme is attached



Prof. R.C. Prasad

Name & Signature of Coordinator



Dr. Mathew Joseph

Name & Signature of Head of Institute

with seal



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# AQIS- STTP 2020

Three – One Week AICTE approved certificate short term training programs on “Composites: Fracture Toughness, NDE and Failure Analysis” are being organized by the Department of Mechanical Engineering, Pillai HOC College of Engineering and Technology, Rasayani. The program is supported by the Society for Failure Analysis Mumbai Chapter, ASM International India Chapter, SAE India, ISRS Mumbai Chapter and IRMRA Mumbai. The objective of these Short Term Training Programs is to provide basic understanding of synthesis, fracture toughness evaluation using fracture mechanics concepts, defects detection using NDT, understand the modes and mechanisms of fracture and for analysis offailures.

The eminent speakers of the workshop are from reputed academic institutes, research establishments and industries having worked extensively in different aspects of composites. The list of speakers along with patrons, advisory and organising committee members is given below.

## Patrons

1. Dr. K. M. Vasudevan Pillai, Chairman & CEOMES
2. Mr. T. S. Kathayat, President, Welspun Corp. Ltd., Parel, Mumbai
3. Dr. N. Eswara Prasad, Director, DMSRDE, Kanpur
4. Dr. K. Rajkumar, Director, IRMRA, Mumbai

## Advisory Committee

1. Dr. Priam Pillai, COO, MES
2. Mr. Franav Pillai, DCEO, MES
3. Dr. S. Joshi, Principal, PCE Panvel
4. Dr. Mathew T. Joseph, Principal PHCET
5. Dr. Manoranjan Patri, Director, NMRL, Mumbai
6. Mr. Kashinath Deodhar, Group Director, ARDE, DRDO
7. Dr. Makarand Joshi, R&DE, DRDO, Pune
8. Dr. Sashi Kanta Panigrahi, DIAT, Pune
9. Prof. Raghu Prakash, IIT Madras
10. Mr. Samresh Chandar, GE India Pvt. Ltd. Pune
11. Dr. Mangesh V. Joshi, MD & CEO, Sanrachana Pvt. Ltd. Mumbai
12. Mr. Atul Bakare, Addl. Director, CEMILAC, Nashik
13. Dr. Ishtiaq Khan, Tata Technologies Pune
14. Mr. Shantanu C. Prabhune, L&T Powai Mumbai
15. Mr. Sudhakar Bonde, Chairman, ASM International India Chapter
16. Mr. Sandeep Rege, Secretary ASM India chapter & DGM Mahindra & Mahindra, Mumbai
17. Dr. G. S. Prabhu, MD, Fine Finish Organics Pvt. Ltd., Taloja, Mumbai
18. Mr. Rimzath B., DIAB Group, Sweden
19. Mr. Sanjay Nibandhe, Deputy Director ARAI Chakan, Chairman SAE western Region



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### **Organizing committee**

1. Dr. Divya Padmanabhan, PCE Panvel
2. Dr. T. Tambushkar, PCE Panvel
3. Dr. Viswajit Panda, PCE Panvel
4. Dr. M. D. Nadar, PHCET Rasayani
5. Mr. Suhas Uthale, PHCET Rasayani
6. Mr. Amar Arun Jadhav, PHCET Rasayani
7. Mr. Saurabh Sirsikar, PHCET Rasayani
8. Mr. Shashi Bhushan, PHCET Rasayani
9. Mr. Ameya J. More, Amity University Mumbai
10. Mr. Karthik Nagarajan, PHCET Rasayani
11. Mr. Sunilsingh Rajput, PHCET Rasayani
12. Dr. Ajit Bhandakkar, Secretary, SFA Mumbai Chapter

### **Steering/Program monitoring committee AQIP STTP:**

1. Dr. Mathew T. Joseph, Principal : Chairman
2. Dr. R. C. Prasad, Coordinator & Member Secretary
3. Dr. G. V. Patil, Head Mech. Engg. Dept. : Member
4. Dr. S. Pawar, Head Automobile Engg. Dept. : Member
5. Dr. Priam Pillai, COO of MES : Member as a Subject Expert

### **List of Speakers**

1. Prof. R.C. Prasad, PHCET, RASAYANI
2. Dr. Rajkumar Kasilingam Director, IRMRA Mumbai
3. Dr. C. M. Manjunatha, Chief Scientist, NAL Bangalore
4. Dr. Raghu Prakash, IIT Madras
5. Shri. Kashinath Deodhar, Group Director, ARDE, DRDO, Pune
6. Mr. Shyamsunder, Chairman ISNT, former Principal Scientist GE Global Research Centre, Bangalore
7. Dr. Debdatta Ratna, Scientist, NMRL Ambarnath
8. Mr. Ajit Bhandakkar, Chief of Lab, HAL, AURDC, Nashik
9. Dr. Biswajit Panda, PCE, Panvel
10. Dr. Prakash D. Trivedi, Gharda Chemicals Mumbai
11. Mr. Shantanu C. Prabhune, L&T Mumbai
12. Prof. Chandra Sekher Yerramalli, IIT Bombay
13. Dr. S. K. Panigrahi, Professor, DIAT, Pune
14. Mr. Rimzath B, DIAB, Sweden
15. Dr. Virendra Kumar Gupta, Head R&D & Senior VP, Reliance Research, Mumbai
16. Dr. Dattaji K. Shinde, Professor, VJTI, Matunga, Mumbai
17. Dr. Anasuya Roy, Founder, CEO, Nanosafe Solutions Private Limited
18. Dr. Ravi Babu, CECRI, Tamilnadu
19. Dr. P. J. Guruprasad, Professor, IIT Bombay
20. Mr. Praveer Verma, DMSRDE, Kanpur



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The Society of Automotive Engineers India (SAEINDIA), Western Section, Pune, is a vibrant premier professional society, having substantial following in the Indian automobile industry, involved in serving the Mobility Engineering Community engaged in design, manufacture and service of self-propelled vehicles and systems that move in land, sea, air and space. Its vision is to continuously enrich knowledge base of practitioners in mobility industry and institutions in the service of humanity. SAEINDIA is India's leading resource for mobility technology. As an individual member driven society of mobility practitioners, the ownership of SAEINDIA wrests with its members who are Individuals from the mobility community, which includes Engineers Executives from Industry, Government Officials, Academics and Students.

SAEINDIA is a Platform where all Engineers & Officers from Automotive Industries network with each other, share their ideas, improving technical knowledge and thereby build strong relations. This also helps them in their managerial roles in their respective fields and industry.

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# ONE WEEK AICTE APPROVED CERTIFICATE STTP - 1

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS



### PROGRAM – ITINERARY FOR 22/11/2020

DATE	TIME	SPEAKER / Title of Presentation
22/11/2020	9:30 am to 11:00 am	Prof. Chandra Sekher Yerramalli, Department of Aerospace Engineering, IIT Bombay <b>Challenges in Design &amp; Manufacturing of Composites</b>
22/11/2020	11:00 am to 12:30 pm	Dr. Praveer Verma, Scientist-F, DMSRDE, Kanpur <b>Failure Analysis of Polymer Matrix Composites</b>
22/11/2020	1:30 pm to 3:00 pm	Prof. P. J. Guruprasad, Department of Aerospace Engineering, IIT Bombay <b>Analysis of interlaminar cracking of composite laminates</b>
22/11/2020	3:00 pm to 4:30 pm	Dr. Guruprasad Rao, Director & Mentor (Leadership Team) Imaginarium India Pvt. Ltd. <b>3D printing of Functionally Graded Materials- an Overview</b>
22/11/2020	4:30 pm to 5:00 pm	VALEDICTORY FUNCTION

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## Understanding of structure property relations in advanced polymer nano-composites

Dr. Biswajit Panda

Professor, Pillai College of Engineering, New Panvel Email: [bpanda@mes.ac.in](mailto:bpanda@mes.ac.in)

**Abstract :** The understanding of the basic physical relationships between nano-scale structural variables and the macroscale properties of polymer nanocomposites remains in its infancy. The primary objective is to ascertain the state of the art regarding the understanding and prediction of the macroscale properties of polymers reinforced with nanometer-sized solid inclusions over a wide temperature range. The addition of nanoparticles with large specific surface area to polymer matrices leads to amplification of a number of distinct molecular processes resulting from interactions between polymer chains of matrix phase and solid surfaces of inorganic filler. This results in a “non-classical” response of these systems to mechanical and electro-optical excitations when measured on the macroscale. Research on polymer nanocomposites formed from thermoplastic polymers and nanoparticles offers huge opportunities and wide range of applications.

**Biodata of the Speaker :** Dr Biswajit Panda is currently an Assistant Professor in Pillai College of Engineering, New Panvel with research interest in material science & technology. Dr Biswajit Panda completed his MSc from CSJM University, Kanpur, M.Tech in Corrosion Science & Technology from NIT Durgapur and PhD from Department of Metallurgical Engineering and Materials Science from IIT Bombay. He has around 14 years of research experience in the area of Polymer Blends and Nanocomposites involving conducting nanoparticles. He has published more than 20 research publications in peer – reviewed International and National journals and many invited and contributed presentations in international & national conferences. He is also reviewer of many International Journals. He is Editorial Board Member of A.R. Research Publications & Conference World. He has written around ten books on Engineering Chemistry for the Engineering students of Mumbai University. Dr Biswajit Panda received many awards from different organization; namely Young Scientist Grant Award from CSIR, Recognition from Research Scholar Forum of IIT Bombay etc.



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## Application of Composites in Fighter and Civilian Aircrafts

**Dr. Ajit Bhandakkar**

Chief Manager (Design Indigenisation) HAL, Nashik

Email: [ajitbhandakkar@gmail.com](mailto:ajitbhandakkar@gmail.com)

**Abstract :** Epoxy resin and epoxy glass fiber laminate composite are finding increasing applications in aerospace structural parts however it is normally brittle at room temperature and there is a need to improve their crack growth resistance and fracture toughness without significantly decreasing other mechanical properties, such as the flexural modulus and the tensile strength. Additions of particulate reinforcements to the epoxy resin and glass fiber laminate composite are reported to improve the Interlaminar shear strength and fracture toughness of the composites. In the present investigation epoxy resin and epoxy glass fiber reinforced laminate composite were reinforced with cenosphere fly ash and nano alumina. The effect of reinforcement on the mechanical properties of epoxy resin and epoxy glass fiber laminate composite were studied.

The Fracture toughness ( $K_{IC}$ ) and Interlaminar fracture toughness ( $G_{IC}$ ) which is a measure of resistance of crack growth is energy intensive. The increase in  $K_{IC}$  and  $G_{IC}$  after addition of cenosphere fly ash is attributed to severe plasticization of the resin matrix causing increased interplay fracture and featureless fracture of matrix. The fracture morphology and crack deflection/bridging were studied by scanning electron microscopy

**Key Words :** Fracture Toughness, Epoxy-Fly ash composites; Epoxy Glass fiber laminate, Interlaminar shear strength , Interlaminar fracture toughness

**Biodata of the Speaker :** **Dr. Ajit Bhandakkar** is currently working as the Chief Manager (Design Indigenisation) HAL, Nashik. He has completed his PhD in Material Science from IIT Bombay. His area of specialization is Failure Analysis, Material Development, Composites and corrosion effect on materials.

He has received Best M.Tech Thesis award in the year 2008 by NACE Gateway India Chapter

One patent on development of adhesive for aerospace.

Polished 25 papers in national and international journals.



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## **BIOMIMETIC APPROACH TO THE DEVELOPMENT OF DAMAGE TOLERANT CERAMIC COMPOSITES**

**Dr. Shankar M. L. Sastry**

Mechanical Engineering and Materials Science Department  
Washington University in St. Louis  
St. Louis, MO. 63'30, U.S.A

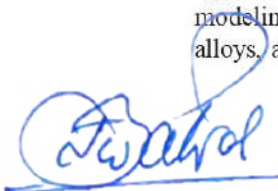
**Abstract :** Fracture toughness of conventionally processed ceramics is not adequate for their use in structural applications. We discuss in this presentation a combined nano grain and ductile phase toughening approach which successfully replicates nacre structure to produce high strength damage tolerant ceramics. In this approach, nano ceramics particles are coated with a 1-5 nm ductile phase layer using electroless plating and are consolidated using spark plasma sintering (SPS) process to produce high-density compacts with the preservation of nano structure.. Fracture toughness is increased as a result of the formation of unbroken ductile-phase ligaments bridging the crack wake and delaying the catastrophic fracture. Strength and hardness are preserved due to the retention of nanograin and nanophase microstructures.

**Biodata of the Speaker :** Dr. Shankar M.L. Sastry is Currently Christopher Byrnes Professor of Engineering in the Department of Mechanical Engineering and Materials Science, at Washington University in St. Louis, Missouri, U.S.A. Transition of fundamental research to commercialization has been a common thread running through Dr. Sastry's forty six year research career in a federal research laboratory, a premier aerospace industry, and a world renowned educational institution. The vast amount of combined research experience both as a fundamental researcher and applied researcher in academic as well as industrial setting has been a valuable asset to working effectively as a teacher and researcher.



Upon completion of doctoral degree, Dr. Sastry was part of a research team at Air Force Materials Laboratory working on the development of light weight titanium aluminides for high temperature applications. He carried out fundamental studies of the phase transformations and room and elevated temperature deformation of  $Ti_3Al$  and  $TiAl$  based intermetallics with the objectives of determining the causes of limited ductility of these materials and identifying the methods of improving the damage tolerance of the intermetallics. The titanium aluminides have now transitioned from R & D to commercial applications.

Afer two years at Air Force Materials Laboratory Dr. Sastry joined McDonnell Douglas Research Laboratories (MDRL) in 1977. He started as a research scientist and moved up to chief scientist and program director of Metals and Composites department. He procured contract research and development (CRAD) funding from the United States Air Force and Navy, NASA, and NSF and led and managed a team of materials researchers in the development of low density high modulus Al-Li and Ti-Al-B alloys and composites for aircraft structural applications, advanced processing methods for near-net shape fabrication of Al and Ti alloys, modeling and experimental validation of corrosion, fatigue and fracture of aircraft structural alloys, and advanced non destructive testing and evaluation techniques.



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**Biodata of Dr. Shankar M.L. Sastry, continued from the last page.**

Several of the research projects transitioned from R & D to commercialization in relatively short time and consistently received superior ratings from the government independent research and development (IRAD) evaluation team as well as from the McDonnell Douglas divisional companies. In recognition of my contributions, Dr. Sastry received a highly coveted McDonnell Douglas Fellow award in 1990.

In 1991, Dr. Sastry started his academic career as a professor in the department of Mechanical Engineering and Materials Science at Washington University in St. Louis. The very first year, he put together a team of interdisciplinary researchers from physics, chemistry, and engineering and procured the first NSF grant on Novel Methods of Synthesis of Nanocrystalline Materials. The NSF funding served as a key seed grant and has led to several successful research programs on nanocrystalline materials at Washington University. In addition he procured funding from the United States Army, Air Force, Navy, and NASA and carried out to successful completion research in advanced composite solders, high temperature intermetallics, advanced processing methods for microstructural refinement and mechanical property improvements, and titanium-hydrogen interactions.. Dr. Sastry has authored authored over 150 publications in peer reviewed journals, edited two books, and has four patents. Dr. Sastry has taught graduate courses in Mechanical Behavior of Materials, Materials Selection in Engineering Design, Materials Characterization Techniques, Ceramics, Plastic Deformation of Metals, Powder Metallurgy, and undergraduate courses in Materials Science and Materials Engineering.



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## Challenges in Design & Manufacture of Composites

**Dr. Chandra Sekher Yerramalli**

Professor

Department of Aerospace Engineering, Indian Institute of Technology Bombay, Mumbai 400076 INDIA

**Abstract :** Composite materials have been touted as the most advanced materials and as one of the solutions to many of the problems faced in Aerospace and other engineering fields. The key advantages as mentioned often in the literature are their light weight and high strength and stiffness along with the aspect of tailorability. These are important reasons for the significant increase in the usage of composite materials in structural load bearing members in many fields of engineering. However, along with these advantages, there are also certain caveats that need to be mentioned. The tailorability aspect is beneficial if the corresponding manufacturing and design processes are well developed to take advantage. While fabricating a composite wind blade, one would be creating the material in-situ in the shape of the wind blade aerodynamic surface. Thus, the material layup and manufacturing process is inextricably linked to the shape of the structure. This aspect is different from the conventional metal structures and needs to be appreciated by the designer and the manufacturer. This linkage between the inherent material configuration and the structural shape lead to challenges in design and manufacturing of composites and will be discussed in the presentation.

**Biodata of the Speaker :** Prof. Chandra Sekher Yerramalli is currently working as an Associate Professor in the Aerospace Engineering department at IIT Bombay. Prior to joining IIT Bombay in 2015, Prof. Chandra worked in Industry for 10 years. Prof. Chandra obtained his PhD in Aerospace Engineering from the University of Michigan at Ann Arbor in US. His research interests are broadly in the areas of environmental damage modeling in composite materials, fatigue modeling of composites under combined loading, ballistic response of fiber composites with applications to wind turbine blades and aerospace vehicles and components. Prof. Chandra has published around 40 Journal and International conference publications and has filed/received 15 patents.



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## 3D printing of Functionally Graded Materials- an Overview

**Dr. Guruprasad Rao,**

Director & Mentor (Leadership Team), Imaginarium India Pvt. Ltd.

**Abstract :** The development of functionally graded materials has potential applications in Hi-Tech industry. 3D printing provides the new technology for synthesizing of soft organic phases based on polymers and hard inorganic phases through selective heat melting for fabricating functionally graded structures. Fibres can be deposited according to the strength requirements using 3D printing. The composite 3D printing market is expected to be worth billions of dollars in coming next 10 years. In this presentation the development of technology and machines at Imaginarium shall be illustrated.

**Biodata of the Speaker :** Dr Guruprasad Rao is a Director & Mentor (Leadership Team) at Imaginarium India Pvt Ltd., India's leading 3D printing company. His current focus is on DfAM for Metal 3D printing 3D printing Medical Applications, Skill Development besides Technology mentoring and partnerships across domains. Dr Rao is a technocrat with over 30 years of experience encompassing Industry & Academia. He holds BE (Mech) with PG in Tool Engineering from GTTC , M Des in Product Design from IISc, Bengaluru and PhD from IIT Bombay. For his terminal degree, he worked on Medical applications of 3D Printing. His industrial assignments include Titan, Tanishq, Crompton Greaves and presently at Imaginarium. He joined Imaginarium as CEO and is presently designated as Mentor - Director. He has taught design at IISc, NIIT, JSSATE and NTTF. He was Professor & Head, Project Office IICD, Jaipur. He also teaches courses on Emerging technology and its impact at SPJIMR and KJ Somaiya Business Schools. He is also a mentor at KIIT-TBI, Bhubaneswar and guides start-ups on design and technology. Dr Rao is associated with many industry bodies such as CII / FICCI / NASSCOM /BIS / IAMF / Atal Innovation Mission. As CII Conference Chairman, he successfully led CII 3D Printing Conference 2019, Mumbai as Conference Chairman. Presently he is a part CII National Committee on Design.



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**COMPLETION REPORT OF THE AQIS-STTP ON “ COMPOSITES: FRACTURE TOUGHNESS,NDE AND FAILURE ANALYSIS”**

The Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology was granted approval to conduct Short Term Training Program ( STTP ) under AQIS 2019-20 during the financial year 2020-21 vide Ref.No.:34-66/442/FDC/STTP/Policy-1/2019-20 dated 10 August 2020 on “ Composites: Fracture Toughness, NDE & Failure Analysis “

The Director Faculty Development Cell of the AICTE vide their Drawing & Disbursing officer sanctioned payment of Rs.2,99,667/-for conducting STTP under Head 601.15(a)STTP Plan.

The grant in aid was released to the PHCET R&D Account No.:52142200086666, SYNB 000524 IFSC code at Khaira, Patalganga Branch. The original STTP was residential program of 6 days duration with minimum 40 participants.

However, due to pandemic of COVID-19 the Institute was allowed to conduct STTPs through online mode with the stipulated conditions (Reference : Letter of Col. B.Venkat, Director (FDC) dated 14 September 2020).

The institute conducted 3 STTPs on the same topic in multiples of Rs. 93,000/- within the total grant received by it.

The 3 STTPs were conducted during November 17-22, 2020, January 18-23, 2021 and March 15-20, 2021. The highlight of all the 3 STTPs has been the participation of leading professional societies in the country like Society for Automotive Engineering, Western Region, Institution of Engineers, Maharashtra Region, ASM International India Chapter, Society for Failure Analysis, Mumbai Chapter, Indian Society for Remote Sensing, Mumbai Chapter, Materials Recycling Association of India and the Indian Rubber Manufacturers Research Association, Mumbai. Their involvement immensely benefited participants and allowed them to interact with industries related to the subject matter of the STTPs. All the 3 STTPs covered processing of Polymers, Polymer Blends & Composites, and their mechanical and Non-destructive characterisation to ensure quality assured industrial products. This was followed by case studies of failures in different industrial sectors and ways and means to prevent such failures. The STTPs also covered advanced manufacturing processes like additive manufacturing and 3D printing. The lectures were delivered by the industry experts, faculty from NITs and IITs as well as leading foreign universities. The applications of Polymers, composites and NDE for medical applications were also covered by eminent speakers. The details are given in the Proceedings and the program schedule.

The entire program was monitored by duly constituted Program Monitoring Committee as per directives of the AICTE. The committee members held several meetings through the Zoom link and brought the program to a successful conclusion. Under the guidance of members of the PMC the grant in aid was adjusted against the expenditure as per the guidelines of the AICTE and the remaining balance amount refunded to the member secretary AICTE, New Delhi on the bank details provided to us.



Prof. R.C. Prasad,  
Coordinator/ Member Secretary



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 Dept. Of Mechanical Engineering  
 AQIS STTP -1 (17th November 2020 to 22nd November 2020)

Sr. No.	Name	Department	Designation	Name of Institute/ Industry
1	M A Gulbarga	Mechanical Engineering	Associate Professor	Theem college of engineering Boisar Maharashtra
2	VENKATESH DONEKAL	Mechanical engineering department	Professor	RAMAIAH INSTITUTE OF TECHNOLOGY
3	Balaji Ayyanar C Chinnappan	Mechanical Engineering	Assistant Professor	Coimbatore Institute of Technology
4	R.Prabhakaran	Mechanical Engineering	Assistant Professor	Ramco Institute of Technology
5	RAJESH GL	Mechanical Engineering	Assistant professor	KS Institute of Technology
6	Parandhaman B	Mechanical Engineering	Assistant Professor	Velammal Institute of Technology
7	DOMMETI KAMESWARA RAO	Mechanical Engineering	ASSISTANT PROFESSOR	MAHATMA GANDHI INSTITTUE OF TECHNOLOGY
8	Mr. Hemant Patil	Mechanical	Assistant Professor	PHCET
9	Chandrasekhar P	Mechanical Engineering	Assistant Professor	Loyola-ICAM College of Engineering and Technology
10	Venkateswaran N	MECHANICAL Engineering	Professor	RAJALAKSHMI ENGINEERING COLLEGE
11	Sanjeev Varshney	Mechanical Engineering	Asst. Professor	Inderprastha Engineering College
12	Ashwini Sayajirao Kadam	Mechanical	Assistant Professor	Pillai HOC College of Engineering and Technology, Rasayani
13	SUNITA KHANSOLE	Applied Chemistry	Assistant Professor	PHCET RASAYANI RAIGAD MUMBAI MAHARASHTRA
14	Dr.Ashok Mache	Mechanical Engineering	Associate Professor	Vishwakarma Institute of Information Technology Pune
15	Dr.R.Manonmani	chemistry	Assistant Professor	Rajalakshmi Engineering College
16	Bharath V	Mechanical Engineering	Research Scholar	Siddaganga Institute of Technology Tumkur-572103
17	Ajay A V Pillai	Mechanical Engineering	Assistant Professor	Pillai HOC College of Engineering and Technology, Rasayani, Maharashtra
18	Amar Arun Jadhav	Automobile Engineering	Assitant Professor	Pillai HOC College of Engineering and Technology
19	Dr. Manvendra Vashista	Applied Sciences and Humanities	Professor	Pillai HOC College of Engineering and Technology, Rasayani
20	Dr. P. Ramadevi	Chemistry	Associate Professor	Rajalakshmi Engineering College
21	Shambhu Kumar	Mechanical Engineering	Lecturer	New Government Polytechnic Palliputra, Palna-13
22	BALAJI RAJENDRAN	AERONAUTICAL ENGINEERING	ASSISTANT PROFESSOR (SS)	RAJALAKSHMI ENGINEERING COLLEGE
23	SARAVANAKUMAR K	AEROSPACE ENGINEERING	ASSISTANT PROFESSOR	SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
24	Mahendra Laxman Shelar	Mechanical Engg. Dept.	Assistant Professor	Thakur college of Engineering and Technology

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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.17<sup>th</sup> titled "Advances in Polymer Technology, Nanotechnology" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Rajkumar Kasilingam
2.	Bank account number	188701001294
3.	Bank name	ICICI Bank
4.	Bank branch address	Wagale industrial estate Thane Mumbai
5.	Branch IFSC code	ICICI 0001887
6.	Mobile number	8655095342
7.	PAN	



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Signature: .....

Name: Dr. Rajkumar Kasilingam

Designation: Director

Affiliation: IRMRA Mumbai



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Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Prakash Trivedi
2.	Bank account number	23710016063
3.	Bank name	Standard Chartered Bank
4.	Bank branch address	Andheri Kanakia Branch
5.	Branch IFSC code	SCBL0036056
6.	Mobile number	9820283881
7.	PAN	

Signature: .....

Name: Dr. Prakash Trivedi

Designation: General Manager

Affiliation: Gharda Chemicals



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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.19<sup>th</sup> titled "Polymer Matrix Composites for Naval applications" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Debdatta Ratna
2.	Bank account number	10844206225
3.	Bank name	SBI
4.	Bank branch address	Ambarnath
5.	Branch IFSC code	SBIIN0001040
6.	Mobile number	9766619055
7.	PAN	AAQPR9009L

Signature:   
08/11/21

Name: I

Designation: .....

Affiliation: .....



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डॉ. डी. रत्ना / Dr. D. Ratna  
वैज्ञानिक 'एफ' / Scientist 'F'  
विभागाध्यक्ष (वि.एन.टी.डी.) / HOD, PSTD  
वेदावधुत, सी.आर.डी.डी. / INMRL DRDO  
महानगर, सी.एम.डी.डी. / S.M. D.D. / M. D. D. / M. D. D.  
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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.19<sup>th</sup> titled " Fabrication of Sandwich Composites and it's applications" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Diab Core Materials Pvt Ltd
2.	Bank account number	9711826374
3.	Bank name	Kotak Mahindra Bank
4.	Branch IFSC code	KKBK0000462
5.	Bank branch address	Teynampet Branch
6.	Mobile number	9566058323
7.	PAN	AACCD6441K

Signature: 

Name: B.RIMZATH ALI

Designation: Technical Manager

Affiliation: DIAB CORE MATERAILS PVT LTD

  
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**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.22<sup>nd</sup> titled "Failure analysis of polymer matrix composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr.PraveerVerma
2.	Bank account number	10918035697
3.	Bank name	STATE BANK OF INDIA
4.	Bank branch address	DMSRDE, KANPUR,
5.	Branch IFSC code	SBIN0007199
6.	Mobile number	8604826002
7.	PAN	


Signature: .....

Name: Dr.PraveerVerma

Designation: Scientist

Affiliation: DMSRDE, Kanpur

  
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**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 5,000/- (Rupees three thousands only) on account of Honorary for working as a Coordinator during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Ram Chandra Prasad
2.	Bank account number	52142180010736
3.	Bank name	Canara Bank
4.	Bank branch address	Khaire, Patalganga
5.	Branch IFSC code	CNRB0000033
6.	Mobile number	9819377021
7.	PAN	

Signature: 

Name: Dr.R.C.Prasad

Designation: Professor

Affiliation: PHCET, Rasayani

  
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Annexure -I

## SHORT TERM TRAINING PROGRAM

### FEED BACK FORM

1. AICTE File No. & Date of Offer Letter : 34-66/442/FDC/STTP/Policy-1/2019-20  
Date: 10 AUG 2020
2. Name of the Coordinator : Dr. Ram Prasad
3. Name and Address of the Institution : Mahatma Education Society's Pillai HOC College of Engineering & Technology, Rasayani, Pillai HOCL Educational Campus, HOC Colony, Rasayani via Parvel, Dist: Raigad, Pin-410206
4. Title of the Faculty Development Programme : Composites: Fracture Toughness, NDE and Failure Analysis
5. Dates : STTP-1 November 17 to 22, 2020  
STTP-2 January 18 to 23, 2021  
STTP-3 March 15 to 20, 2021
6. Venue : Online mode (Zoom)
7. Total No. of participants proposed and actually attended  
Proposed  Attended 169
8. No. and date of the offer letter

Letter No.	Date
34-66/442/FDC/STTP/Policy-1/2019-20	10 AUG 2020

9. Total amount sanctioned : Rs. 299667/-

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10. No. and date of Sanction letter:

Letter No.	Date	Grant Released
34-66/442/FDC/STTP/Policy-1/2019-20	10 AUG 2020	299667/-

11. Total expenditure incurred in Conducting the Faculty Development Programme: Rs. 253670/-

12. Grant received from various agencies other than AICTE for this Faculty Development Programme

Sl. No.	Name of Agency	Grant Received
Nil	Nil	Nil
	Total	Nil

13. Details of internal revenue if any generated by the Institution/Department on account of this Programme:

14. Briefly mention about the technological/ academic/or any other benefit generated by conducting this programme with respect to a) the institution, b) the faculty; c) students; d) industry/society.

The 3 STTPs were conducted during November 17-22, 2020, January 18-23, 2021 and March 15-20, 2021. The highlight of all the 3 STTPs has been the participation of leading professional societies in the country like Society for Automotive Engineering, Western Region, Institution of Engineers, Maharashtra Region, ASM International India Chapter, Society for Failure Analysis, Mumbai Chapter, Indian Society for Remote Sensing, Mumbai Chapter, Materials Recycling Association of India and the Indian Rubber Manufacturers Research Association, Mumbai. Their involvement immensely benefited participants and allowed them to interact with industries related to the subject matter of the STTPs. All the 3 STTPs covered processing of Polymers, Polymer Blends & Composites, and their mechanical and Non-destructive characterisation to ensure quality assured industrial products. This was followed by case studies of failures in different industrial sectors and ways and means to prevent such failures. The STTPs also covered advanced manufacturing processes like additive manufacturing and 3D printing. The lectures were delivered by the industry experts, faculty from NITs and IITs as well as leading foreign universities. The applications of Polymers, composites and NDE for medical applications were also covered by eminent speakers.

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# AQIS- STTP 2020

## P R E F A C E

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Composites are engineered materials consisting of a matrix and reinforcement that is separated by an interface. Composite can be tailored to have desired properties. The light weight, corrosion resistant and tough composites are considered a major break-through that has revolutionized their use in many critical applications in automobile, aerospace, defense and marine industries. It therefore becomes imperative to produce defect free composites for critical applications. Detecting defects using NDT is, however, highly challenging job due to its anisotropic and complex failure modes. The extensive work carried out in academic and research institutes has brought India at the threshold of a new era. These Three Online AICTE Sponsored – One Week Short Term Training Programs planned at Pillai HOC College of Engineering and Technology, Rasayani will facilitate interaction amongst government, universities and fast growing manufacturing sectors. Collaborative effort for low cost fabrication of composites will encourage investment and boost Indian Economy. The applications of composites in different sectors will have a dramatic impact on gross National product and employment opportunities in our country.

**Professor R. C. Prasad**  
**Coordinator of the STTP**

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**PRINCIPAL**

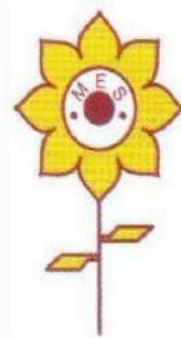
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**DR. K. M. Vasudevan  
Pillai Chairman & C. E.  
O Mahatma Education  
Society**



**DR. Daphne  
Pillai  
Secretary  
Mahatma Education Society**

## **Mahatma Education Society**

The Mahatma Education Society (MES) embarked upon its mission of 'Education of All' with Chembur English School in the year 1970. The Mahatma Education Society is proof of a vision linked irrevocably to national goals. Born in a time when education was deemed service, it set about bringing social and economic change through the proactive personal development of every child that came into its fold. The vision, dedication, global outlook, tenacious struggle and undaunted spirit of Dr. K. M. Vasudevan Pillai (Founder, secretary and CEO) and Dr. Daphne Pillai (Joint Secretary and Rector), the Trust grew from a single school into a multi-institution, multi-location group delivering quality education at all levels.

Today MES owns and manages over 48 institutions spread across six elegant campuses at Borivali, Chembur, Powai, New Panvel(W), New Panvel(E) and Rasayani. It manages educational Institutions' from pre-primary to post-graduation. It comprises of schools, international schools, degree colleges, night colleges, Management Institutions, Engineering colleges, Architecture colleges, colleges of Education (including Physical education) and polytechnic Institutions. Popularly known as the Pillai Group of Institutions, this education major has its own teacher training institutes, which allow it to define its own standards and to achieve 100% results unflinchingly, The group has more than 35,000 students, 2,000 teachers and 1500 members of support staff.

It does so through a highly motivated faculty, a learning environment powered with the latest technologies, a spirit of innovation that sees it reach for the highest standards of accreditation in its field, and an approach that recognizes the sharing of knowledge remains the finest manifestation of a unified world. The Pillai Group is credited with several "firsts" in its field.

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## Principal's Message

We live in unprecedented times with unprecedented problems. Hitherto unknown problems need hitherto unknown solutions. 'Thinking out of the box' is a cliché. However, at no other time in our history have we needed it more. Genuine problem solving requires 'thoughts sans frontier'. What is the role of academia in it? What is the role of PHCET in it? Known methods, solutions and strategies are no longer valid. We in PHCET have been looking at new alternatives and strategies as well as to involve different partners to make our service more relevant, contemporary and forward looking. Evaluating the Employability, Creating a 'Value Add Metric', mentoring of students and faculty by Industry experts, etc., are some of the new initiatives.

Established in 2009 and affiliated to Mumbai University, PHCET offers specializations in seven areas of engineering. And also provides excellent facilities, infrastructure and high quality education on an extremely safe and highly quality conscious, beautiful and verdant campus for a fraction of the cost one would normally have to pay. It is also a matter of pride for us to inform our readers that ***PHCET is accredited with an 'A' Grade in 2019 by NAAC (National Assessment and Accreditation Council); UG programs in Computer and Mechanical Engineering are accredited two times each by NBA (National Board of Accreditation); PHCET is the winner of the 'First Best of the Work Place Safety Awards' in 2019 from Bombay Chamber of Commerce and Industry (BCCI) and also the winner of the 'Performance Excellence Trophy' from Indian Merchants Chamber Ramkrishna Bajaj National Quality Award (RBNQA) in December 2019. PHCET has a manufacturing centre started in January 2020 from design to manufacture of Printed Circuit Board (PCB). This centre is for training students to become employable and also become entrepreneurs. Mumbai University has appointed PHCET as a Lead Cluster College for conducting the University examinations.***

We look forward to 2021 with hopes and aspirations. It is also time for the academia to look at the realities around us anew. In difficult times it is the academia that has to rise up and show the way. In that spirit PHCET has organized an all India STTP in November 17-22, 2020 on 'COMPOSITES: FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS', which is a very relevant and contemporary theme. The galaxy of the eminent resource persons from different parts of the world and the enthusiastic participants have made the effort worthwhile and gave enormous satisfaction to the organizers. I compliment the coordinator of the STTP Prof. R.C. Prasad and his team for the splendid job in pursuance of the PHCET Motto: 'Vidya Karmasu Kaushalam'.

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INDIAN INSTITUTE OF REMOTE SENSING  
Indian Space Research Organisation  
ISO 9001:2008



*Pillai*

## IIRS- PHCET COLLABORATION

**EDUCATION , TRAINING AND CAPACITY BUILDING IN SPREADING AWARENESS OF REMOTE SENSING , GIS AND GEOSPATIAL TECHNOLOGY IN A RURAL VILLAGES IN MAHARASHTRA THROUGH IIRS ISRO OUTREACH PROGRAM BY PILLAI HOC COLLEGE OF ENGINEERING AND TECHNOLOGY (PHCET)**

Globally the role of education in the field space science is rising up across various sectors and the need to spread awareness according at various levels and stages is the need of the hour. India is a country wherein the maximum youth population does their basics education in villages and later move to cities for higher education. Hence a sound awareness of geospatial technologies in terms of space science is vital for improving the capacity building. To fulfill the above-mentioned gap, Pillai HOC College of Engineering and Technology, PHCET at Rasayani a remote village in interior Maharashtra is teaching the rural children in schools and colleges across various villages the basics, importance and application of space science. PHCET is fulfilling this objective by being a Outreach Network Institute with the support of Indian Institute of Remote Sensing IIRS, Dehradun from July 2017. PHCET also under the umbrella of Indian Society of Remote Sensing ISRS Mumbai Chapter conducts various seminars, workshops, space science fair etc. to inculcate awareness of choosing space science as their carrier. Till date around 7,000 plus students have been taught for free at this IIRS Outreach Centre and about 60 plus courses in various domains like remote sensing, GIS, GNSS etc have been conducted. PHCET is planning to build a student's satellite in the coming years ahead under the guidance of Indian Space Research Organisation. Many students after competition of these outreach courses have gone to IIRS for internship and have done various recent project under the guidance of scientists of IIRS. This case study signifies that post rural school and college education these young students have developed interest to pursue the future education in the field of space science.

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# ASM INTERNATIONAL INDIA CHAPTER

ASM International is a premier educational society of metallurgists, materials scientists and technologists. ASM International is an interactive resource of materials information, and a conduit for professionals to meet, interact and share ideas. A worldwide Network led by Members, guided by Member Needs, and fueled by Members Participation. ASM enables its members to keep abreast of the latest technological and marketing trends. It offers invaluable opportunities to interact and learn from fellow materials engineers across the country and around the world, thus helping to stay competitive and sharpen creative vision. ASM offers excellent networking link, giving an instant access to insights and wealth of information through its technical books, acclaimed handbooks, engineering software and CD-ROMS. ASM is the information sharing network for anyone who works with metals, alloys, composites, ceramics, polymers and electronic materials.

ASM International, India Chapter established in the year 1979, is one of the most active chapter in the world. It organizes technical courses on subjects like Welding, Metallurgy for the Non-metallurgist, Metal Forming, Heat Treatment, Stainless Steels, Non-ferrous Metals, Thermal Spraying etc. under the Continued Education Program for engineers and technocrats. Other activities include Conferences, Workshops and Exhibitions on recent developments in Materials Processing, Material Application Engineering, Heat Treatment, Equipment etc. at National and International levels.

In order to increase awareness on materials technology and to excite young student community in materials science and engineering careers, ASM has been conducting one-week Materials Camps at I.I.T. Bombay, Mumbai and M. S. University of Baroda, Vadodara for the students of 11th standard to expose students to materials technology through hands-on experimental work and Industry visits. Participation in these camps is free; breakfast, lunch, course materials etc. is given free to all the participating students. These camps are found to be highly effective as quite a few students have opted Materials Technology as one of the options while entering engineering stream.

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AICTE APPROVED STTP ON "COMPOSITES: FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

STTP - 1 : SCHEDULE

Sl. No.	Day 1 - 01st Nov 2021	Day 2 - 02nd Nov 2021	Day 3 - 03rd Nov 2021	Day 4 - 04th Nov 2021	Day 5 - 05th Nov 2021
Session 1 1.30 pm to 1.45 pm	<p>Dr. R. C. Prasad, Professor, PHCET, Bapatla Advanced Composites for Automobiles, NDE &amp; Failure Analysis</p> 	<p>Dr. R. C. Prasad, Professor, PHCET, Bapatla Fracture toughness and failure analysis of composites</p> 	<p>Dr. R. C. Prasad, Professor, PHCET, Bapatla Fracture toughness and failure analysis of composites</p> 	<p>Dr. R. C. Prasad, Professor, PHCET, Bapatla Fracture toughness and failure analysis of composites</p> 	<p>Dr. R. C. Prasad, Professor, PHCET, Bapatla Fracture toughness and failure analysis of composites</p> 
Session 2 1.45 pm to 2.30 pm	<p>Dr. Anand K. V., Founder, CEO, Nanosolutions Private Limited Biomedical Textiles for Composites for Prosthetic Limbs for Amputees</p> 	<p>Dr. Anand K. V., Founder, CEO, Nanosolutions Private Limited Biomedical Textiles for Composites for Prosthetic Limbs for Amputees</p> 	<p>Dr. Anand K. V., Founder, CEO, Nanosolutions Private Limited Biomedical Textiles for Composites for Prosthetic Limbs for Amputees</p> 	<p>Dr. Anand K. V., Founder, CEO, Nanosolutions Private Limited Biomedical Textiles for Composites for Prosthetic Limbs for Amputees</p> 	<p>Dr. Anand K. V., Founder, CEO, Nanosolutions Private Limited Biomedical Textiles for Composites for Prosthetic Limbs for Amputees</p> 
Session 3 1.30 pm to 1.45 pm	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 
Session 4 3.45 pm to 4.30 pm	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 
Session 5 7.45 pm to 8.30 pm	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 	<p>Dr. Srinivasan Rajan, Director, IIRMR, Bangalore Advanced Polymer Composites for Aerospace Applications</p> 

LUNCH BREAK

*(Signature)*

# ONE WEEK AICTE APPROVED CERTIFICATE STTP - 1

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS



### PROGRAM – ITINERARY FOR 17/11/2020

DATE	TIME	SPEAKER / Title of Presentation
17/11/2020	9:30 am	INAUGURAL FUNCTION
17/11/2020	10:15 am to 10:45 am	Dr. Priam Pillai, Chief Operating Officer, MES <b>Inaugural Keynote Lecture</b>
17/11/2020	10:55 am to 11:45 am	Dr. R. C. Prasad, Professor, PHCET, Rasayani <b>An overview of the STTP on Composites : Fracture Toughness, NDE &amp; Failure Analysis</b>
17/11/2020	11:45 am to 12:30 pm	Dr. Anasuya Roy, Founder, CEO, Nanosafe Solutions Private Limited <b>Biomedical Textiles and its Composites as a Powerful Weapon for Combating Covid-19</b>
17/11/2020	1:30 pm to 3:00 pm	Dr. Rajkumar Kasilingam, Director, IRMRA Mumbai <b>Advances in Polymer Technology, Nanotechnology</b>
17/11/2020	3:00 pm to 4:30 pm	Dr. Shantanu C. Prabhune, L&T Mumbai <b>Processing Composites at L&amp;T Defence : An Industry Perspective</b>
17/11/2020	7:00 pm to 8:30 pm	Prof. Shridhar Yarlagadda, University of Delaware, USA <b>Crashworthy Design of Composites for Automotive Applications</b>

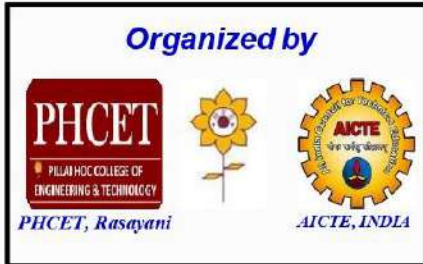
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# ONE WEEK AICTE APPROVED CERTIFICATE STTP - 1

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS



### PROGRAM – ITINERARY FOR 18/11/2020

DATE	TIME	SPEAKER / Title of Presentation
18/11/2020	9:30 am to 11:00 am	Dr. Prakash D.Trivedi, Gharda Chemicals Mumbai <b>Processing and Properties of High Performance Plastics</b>
18/11/2020	11:00 am to 12:30 pm	Dr. Biswajit Panda, Professor, PCE Panvel <b>Understanding of structure property relations in advanced polymer nano-composites</b>
18/11/2020	1:30 pm to 3:00 pm	Dr. Virendra Kumar Gupta, Head R&D & Senior VP, Reliance Research, Mumbai <b>Advanced Polymers &amp; Composites for high performance Applications</b>
18/11/2020	3:00 pm to 4:30 pm	Mr. Kashinath Deodhar, Group Director, ARDE, DRDO <b>R&amp;D innovation on Hybrid Carbon-Glass Epoxy Gun Barrel for shoulder fired launcher</b>
18/11/2020	7:00 pm to 8:30 pm	Prof. Ramesh Talreja, Tenneco Professor, AAAS Science and Technology Policy Fellow, Joint Faculty in: Aerospace, Materials Science & Engineering, TEXAS A&M UNIVERSITY, USA <b>Fatigue and Fracture of Composites</b>

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# ONE WEEK AICTE APPROVED CERTIFICATE STTP - 1

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS



### PROGRAM - ITINERARY FOR 19/11/2020

DATE	TIME	SPEAKER / Title of Presentation
19/11/2020	9:30 am to 11:00 am	Dr. Debdatta Ratna, Scientist-F, NMRL Ambernath <b>Polymer matrix composites for Naval Applications</b>
19/11/2020	11:00 am to 12:30 pm	Dr. Dineshsingh Thakur, Professor and Director, T & P PGC Chairman, Dept. of Mechanical Engineering Defence Institute of Advanced Technology, Pune <b>Mechanical Behaviour of Metal Matrix Composites</b>
19/11/2020	1:30 pm to 3:00 pm	Dr. Ajit Bhandakkar, Dy. General Manager (Indigenisation and Laboratory) HAL , AURDC Nasik <b>Application of Composites in Fighter and Civilian Aircrafts</b>
19/11/2020	3:00 pm to 4:30 pm	Mr. Rimzath B., DIAB, Sweden <b>Fabrication of Sandwich Composites and it's Applications</b>
19/11/2020	7:00 pm to 8:30 pm	Prof. Shankar Sastry, Christopher I. Byrnes Professor of Engineering, Washington University in St. Louis, USA <b>Fracture Resistant Bio Composites</b>

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# ONE WEEK AICTE APPROVED CERTIFICATE STTP - 1

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS



### PROGRAM – ITINERARY FOR 21/11/2020

DATE	TIME	SPEAKER / Title of Presentaion
21/11/2020	9:30 am to 11:00 am	Dr. Raghu Prakash, Professor, IIT Madras Thermography and Computed Tomography Applications in Composites
21/11/2020	11:00 am to 12:30 pm	Dr. Ravi Babu, CECRI, Tamilnadu 3D printing of Polymers & Polymer Composites
21/11/2020	1:30 pm to 3:00 pm	Dr. Dattaji K. Shinde, Professor, VJTI, Matunga, Mumbai Effect of Electrospun Nanofibers and Carbon Nanotubes on the Properties of Polymeric Composite as a Functional Materials
21/11/2020	3:00 pm to 4:30 pm	Dr. S. K. Panigrahi, Professor, DIAT, Pune Fracture Mechanics & Computational Methods for Damage Assessment in Composite for Defense Applications
21/11/2020	7:00 pm to 8:30 pm	QUIZ

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**Keynote Lecture during Inaugural Session on  
"Innovation in Design and Fabrication of Instruments  
for Testing Novel Materials"**

**Dr. Priam Pillai**

Chief Operating Officer  
Mahatma Education Society

**Abstract :** Mechanical Testing under Uniaxial & Biaxial stresses are vital for understanding the structure-property relationships and development of nanostructured novel materials for artificial muscles, biomedical devices, conducting polymers for sensors and energy storage devices. The development involves multidisciplinary approach including Sciences, Mechatronics & Computer Engineering. This presentation will cover new innovations in design, fabrication and development of compact, low cost equipment for testing plastics, rubbers, polymers and biological tissues that has gained significant importance in the recent past.

**Biodata of the Speaker :** Professor Priam Pillai obtained BS in Mechanical Engineering & Materials Science and Engineering from the University of California, Berkeley, MS & PhD in Mechanical Engineering from MIT, USA. He established research centers in GIS & Remote Sensing, Instrumentation for characterization of Polymers and a Drone Application Centre at the PCE Panvel. Currently he is the Chief Operating Officer of the Mahatma Education Society.



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## Can we win the COVID 19 war? Biomedical textiles and its composites as a powerful weapon for combating Covid-19

**Dr. Anasuya Roy**

Founder, Chief Executive Officer  
Nanosafe Solutions, IIT Delhi

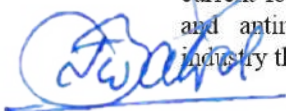
**Abstract :** The recent COVID-19 pandemic has created a massive scaled worldwide health threat, causing huge loss of lives, fear and detrimental impact to economic foundations of developed and developing countries. Till the time a potent vaccination protocol against the contagious virus is not clinically established, community mitigation control plays a critical factor for deciding containment of the disease in times of public health emergency. Since the community transmission of the virus is very high, implementation of biomedical textiles as a construing material for face masks and personal protective equipment (PPE) kits represent a form of 'source control' in front liners as well as in public settings. Needless to say, these are to be used in conjunction with social distancing and hand hygiene practices as per protocols laid by World Health Organization (WHO).

Universal masking for the general public is by far the most important tool to contain the spread of the virus. The SARS-CoV-2 virus causing COVID 19 pandemic is primarily transmitted through droplets generated when an infected person coughs or sneezes, or through droplets of saliva or discharge from the nose. With the emerging threat of COVID 19 crisis around the globe, there was a shortage of raw materials of nonwoven polypropylene to make the masks. N95 type masks are based on man-made non-woven polypropylene which is non-biodegradable and non-recyclable. The non-biodegradable nature of the mask furthers affects the environmental sustainability. Additionally, these are rarely discarded in biohazard bins unless used in a hospital setting. Without proper decontamination before disposal, masks create a pathway for pathogen transmission to other wearers and persons handling disposals. Therefore, there was a need to develop newer generation of masks based on innovative textile materials and their composites. Additionally, high performance functional attributes like antiviral and water repellent properties were incorporated in the second-generation mask for enhanced protection to the wearer. The development and commercialization of highly functional biomedical textiles and textile composites denotes a landmark in evolution of PPE garments in the global war waged against COVID-19. The question remains: can the application of such technical textiles influence a palpable change in the rate of transmission of the contagious virus in a positive aspect.

**Biodata of the Speaker :** Dr. Anasuya Roy is the Founder and CEO of Nanosafe Solutions, a healthcare technological startup incubated at IIT Delhi. She is a recipient of prestigious Biotechnology Ignition Grant, sponsored by BIRAC, the industry-research wing of Department of Biotechnology, GoI under which she transformed her doctoral research work into a commercially viable product. She completed her PhD from IIT Delhi in 2019 with doctoral dissertation on applications of nanotechnology in polymer systems for optimized antimicrobial and cytocompatible behavior. She completed her M.Tech in 2013 from IIT Delhi in collaboration with University of Stuttgart, Germany as a DAAD Exchange scholar. She has 13 publications in peer reviewed journals and 4 technology patents. Her current focus is on development of nanotechnology imbued antiviral and antimicrobial innovations suitable for textile and polymer industry that are ergonomic, safe and sustainable.



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## Advances in Polymer Technology- Nanotechnology

**Dr. Kasilingam Rajkumar**

Director, Indian Rubber Manufacturers Research Association, Thane

**Abstract :** For the past 10 years, polymer nanocomposites are the dominating field in polymer science and technology. The interest in polymer nanocomposites is due to the reinforcement effect of nanofillers, better mechanical properties, thermal stability and barrier properties. Nanotechnology emerged to improve the physical properties of traditional materials at the molecular level without affecting the processing. Different types of nano-fillers based on their dimension are discussed with emphasis on advantages of nano-composites over conventional composites. Various nano-fillers used in polymer such as Layered Silicates : Nano clay, carbon based: graphene, Nanotubes, Spherical Particles : Silica, Polyhedral Oligomeric Silsesquioxanes and Bionanofillers and problems with nano-fillers with the strategies to overcome are discussed in detail. Various processing techniques of nano-filler in polymer matrix and their application are given in detail. The topic is concluded with Future Outlook, Challenges and Opportunities with respect to polymer nano-composites.

**Biodata of the Speaker :** Dr. Kasilingam Rajkumar is a Rubber Technologist from IIT Kharagpur, with excellent academic record through out the career along with 20 + years of rich experience in the field of Research & Development, Testing, Training and Consultancy services on Polymer / Rubber Technology and Currently, working as, Director, at Indian Rubber Manufacturers Research Association [IRMRA], aff. to Min. of Com. & Industry, GoI, Thane, and responsible for over all operations of IRMRA. My recently added Management Degree [MBA] in Operational Management and Doctoral Degree [PhD] in the emerging field of Polymer / Rubber Nanocomposites are added feather in my career to take any challenging leadership career in scientific and technological research and associated activities. Under my leadership, we have completed several sponsored and product development projects at IRMRA which includes evaluation of chemicals and additives in Rubber formulations, Industrial consultancy projects for MSME sectors, critical product development for defence and nuclear sectors. During my tenure of 17 years, at IRMRA, I was instrumental for the growth of IRMRA's services by acquiring key quality credentials to the organization like ISO 9001 certifications, NABL accreditations, DGMS, BIS & CEMILAC recognitions etc. Several initiatives are taken to expand its activities for business enhancement like ISO 17020 accreditation,, finalizing MoU with SARPOL, finalizing projects for Chennai center etc.



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## “Composites at L&T Defence – An Industry perspective”

**Mr. Shantanu Prabhune**

Assistant General Manager, L&T Mumbai

**Abstract :** Composite materials have a rich history over the last 60 years. Globally and domestically the consumption of composites has been on a growth trajectory due to the benefits experienced by users in their products. Use of composites has provided functionally superior products with commercial advantages. High strength to weight ratio, high specific modulus, better electromagnetic, acoustic, thermal and ballistic performance has enabled composites to make inroads in several sectors. Composite material processing enables to make complex shapes. Industry has to setup the required infrastructure to manufacture composites. Larsen and Toubro Limited (L&T) has been manufacturing composite products for the past two decades through its Advanced Centre of Composites. L&T has successfully delivered several products of composite materials to Indian and International customers. The talk would present L&T’s journey and capabilities in the field of composites and provide an industry perspective on the ecosystem and value chain existing in composites in India.

**Biodata of the Speaker :** Mr. Shantanu Prabhune, Assistant General Manager, L&T, Mumbai

Mr. Shantanu Prabhune is currently working as an Assistant General Manager, L&T, Mumbai. He is involved in the development of Products using Composite Materials. He has also worked in L&T Mumbai as a Manager, Technology and Product Development in the area of Product Development using Composite Materials in Material selection, Material Vendor Selection, Material qualification at coupon level, 3D Designing using NX 6 and FE Analysis using ANSYS 13.0. He has also coordinated the manufacturing of the prototype of the product under development.

He has worked as a R&D Engineer at Weber Aircraft from Jul 2007 to Jan 2009 in the field of Concept Development for New Premium class economy seats for Commercial aircraft and Design of Commercial Aircraft Seat using Pro-E Wildfire.

He has worked as a Piping Engineer at UHDE India Ltd from Aug 2002 – Jul 2004 in the area of 3D Layout design of The Piping Network in Chemical industry and Stress analysis.

Mr. Shantanu Prabhune has completed his Masters in Aerospace Engineering from Texas A&M University and Bachelor of Engineering from University of Mumbai.



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## “Advance Polymers & Composites for High Performance Applications”

**Dr. Virendra Kumar Gupta**

Reliance Research and Development Centre, Reliance Industries Limited,

Reliance Corporate Park, Navi Mumbai 400 701 India

Email: [Virendrakumar.gupta@ril.com](mailto:Virendrakumar.gupta@ril.com); Mobile: +919998965284

**Abstract :** Significant growth in agriculture, automobiles, infrastructure, retail, aerospace, defense and other sectors is expected to propel the demand of polymeric materials from 380 million tons in 2020 to ~ 1,100 million ton by 2050. The exponential growth in the fundamental understanding of chemical, physical and engineering aspects of polymerization process and products offer high possibility to design advanced polymeric materials for sustainable growth replacing traditional materials.

Materials development is currently moving at high pace both in academia and industry due to their diverse commercial potential and beneficial merit for the society at large. The present talk will cover high performance polymeric materials based on olefins, diolefins, renewable materials and others reactive monomers and its applications in different growth sectors.

**Biodata of the Speaker :** Dr Virendra Kumar Gupta is currently Head, R&D Polymer & Senior Vice President, Reliance Industries Limited, Navi Mumbai. Before joining Reliance Industries Limited, he worked at the Indian Petrochemicals Corporation Limited & Gharda Chemicals Limited, India. Dr Gupta has received his PhD in Chemistry from Banaras Hindu University, Varanasi and worked at University of Alabama at Birmingham, USA

He has 40-year research experience in the areas of CO<sub>2</sub> fixation, organic/ inorganic polymers & catalysis and product technology development. He is an inventor/co-inventor of 150 patents and successfully commercialized 25 technologies in polyolefins & polysulfones products and processes. He also has 70 research publications in peer-reviewed journals and 75 invited and contributed presentations in international & national conferences. His significant & high impact technology development includes commercialization of High-Performance Ziegler Natta catalysts to produce polyolefin first time in India. He is a recipient of VASVIK award and 20 technology and product development awards including PC Ray awards for Development of Indigenous Technology by Indian Chemical Council.

He is also members of various industry and professional advisory committees. He is chairman of Industry Advisory Board (IAB) of the Polymer Science Program of Somaiya Vidyavihar University, Vice President, Society of Polymer Science India – Mumbai Chapter and Executive Council Members of Polymer Processing Academy & Asian Polymer Association. He also served as Executive Council Member, Central University of Haryana and Honorary Faculty at IIT, Roorkee.



Virendra Kumar Gupta, Head, R&D Polymer Synthesis and Catalysis



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## “R&D innovation on Hybrid Carbon-Glass Epoxy Gun Barrel for shoulder fired launcher ”

**Mr. Kashinath Deodhar,**

Group Director, ARDE, DRDO

**Abstract :** A Light Weight, Shoulder Fired, Man-portable, Anti-Tank, Anti-Bunker, an effective Infantry Weapon was required urgently by Indian Army for high-altitude mountain warfare at Drass, Butalik and Kargil sector.

Indian Army was having 84 mm RL Mk-II weapon in service known as a rocket launcher. Which was very heavy, and difficult to handle and operate at high altitudes.

First time in the country, Gun Barrel of an infantry weapon, 84 mm Light Weight Launcher (LWL) was developed with state-of-the-art hybrid composite gun barrel to withstand an instantaneous firing chamber pressure of 90 MPa and successfully test fired directly on "Enemy" during kargil war before proving it in our field trials.

The use of "high specific strength" and "high specific modulus of carbon-epoxy composites hybridised with Glass for making tailor made properties using "Filament winding" and "auto-clave" process, the 84 mm LWL Gun Barrel were successfully developed by "hoop over wound on thin steel liner with rifled bore.

The stringent QA QC tests and latest techniques like low frequency Ultrasonic PET C-Scan test and Acoustic Emission Technique (AET) was also developed as NDT and Hydraulic pressure tests on coupons to ensure quality, safety and reliability.

In the lecture, I will be covering a brief Introduction of Weapon-Ammunition System, Composites, The case study of 84mm LWL, destructive and NDT tests. Various field trials conducted to know a System engineering approach and development cycle of a weapon system.

**Biodata of the Speaker :** Mr. Kashinath Deodhar is currently working as the Group Director, ARDE, DRDO, Pune.

He completed his part-time BE (Mech) degree from Cusrow Wadia Inst. of Technology Pune.

Completed ME (Mech) with specialization in Advanced Weapon Technology and passed in first class with distinction. Carrying out

Doctoral research in the field of Weapons from defence University Awarded with commendation in 1999 and 2005 at National level

Recipient of Lab **Scientist of the year 2006** Award.

Heading emergency escape system for pilot division and till now research work carried out on various weapon systems viz. Air Defence Gun, Tank Gun, and Artillery Gun System etc. Rocket Launcher, PINAKA System etc. Specialization in Design & Development of ordnance, servo control System, composite material technology etc. Stayed months together with the soldiers/troops at sensitive areas at LOC in various terrains as in Pokharan deserts where temperature is above 48 degrees centigrade in summer and at Leh in Himalayan ranges where subzero temperatures are around 40 degrees centigrade in hard winter. Recently PINAKA Team Award for Productionization of Indigenously developed Canopy Severance System Awarded to team led by Deodhar. Apart from office duties interested to build up a confidence in society through scientific approach and working as Honorary Vice President, Paschim Maharashtra Prant unit of Vijnana Bharati, an all India organization known as Swadeshi Science movement of Bharat.



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## “Damage, Fatigue and Failure of Composite Materials: A Physical Modeling Approach”

**Dr. Ramesh Talreja**

Tenneco Professor of Engineering  
Department of Aerospace Engineering  
Department of Materials Science and Engineering  
Texas A&M University, College Station, Texas 77843, USA

**Abstract :** This presentation will review the mechanisms underlying the failure behavior of fiber reinforced composite materials under static and cyclic loading with focus on polymer matrix composites (PMCs). Rather than describe the design methodologies based on phenomenological approaches that are common in industry practice today, the presentation will emphasize mechanisms based approaches. Only such approaches are likely to allow harnessing the full potential of PMCs in applications within aerospace, automotive and energy fields where lightweight and high performance capabilities are key to success. The features of composite materials, such as heterogeneous microstructure and anisotropy in response to mechanical loading, necessitate proper terminology and definitions of terms such as damage and fracture. These terms will be accordingly described to remove misconceptions that arise from usage that is the legacy of metals. Proper energy based criteria for failure at different scales, from microstructural to the structure scales, will be described. Finally, the role of manufacturing induced defects in influencing performance and thereby allowing cost/performance trade-off will be discussed.

**Biodata of the Speaker :** Dr. Ramesh Talreja is currently a AAAS Science and Technology Policy Fellow placed in the DOE Water Power Technologies Office.

In his permanent position, Dr. Talreja is a Tenneco Professor in the Department of Aerospace Engineering and in the Department of Materials Science and Engineering at Texas A&M University. Prior to that, 1991-2001, he was a professor of aerospace engineering at Georgia Institute of Technology. His research is in composite materials that he began at the Technical University of Denmark where he earned his PhD in Solid Mechanics in 1974 and was endowed with a Doctor of Technical Sciences degree in 1985 on his collected works on fatigue and damage mechanics of composites. His recent work has focused on the effects of manufacturing defects on the performance of advanced composites. He is the recipient of the 2013 ICCM Scala Award, and World Fellow and Life Member of ICCM. The American Society for Composites selected him for the 2017 Outstanding Researcher Award.



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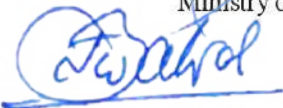
## Polymer Matrix Composites for Naval Applications

**Dr. Debdatta Ratna**

Sc F, Head Directorate of polymer Science and technology  
Naval Materials Research Laboratory, Shil Badlapur Road, Anandanagar P.O.,  
Addl. Ambemath (E), Thane District, Maharashtra - 421 506, India  
Tel : 0251-2623110/2623036. 9766619055 Email : [ratnad29@hotmail.com](mailto:ratnad29@hotmail.com)

**Abstract :** Over the last three decades, the use of PMCs, especially fibre-reinforced plastic (FRP) composites, has increased tremendously and this dramatic growth is expected to continue in the future. The composites possess many useful properties like high specific stiffness and strength, dimensional stability, adequate electrical properties and excellent corrosion resistance. The implications are easy transportability, high payload for vehicle, low stress for rotating parts, high ranges for rockets and missiles, which make them attractive for both the civil and defense applications. The composite industries are dominated by thermoset resins. This is because of their availability, relative ease of processing, lower cost of capital equipment for processing and low material cost. Since thermosetting resins are available in oligomeric or monomeric low-viscosity liquid forms, they have excellent flow properties to facilitate resin impregnation of fiber bundles and proper wetting of the fiber surface by the resin. They are characterized by a crosslinking reaction or curing, which converts those into a three-dimensional (3D) network form (insoluble, infusible). Because of the crosslinked structure, thermoset composites offer better creep properties and environmental stress cracking resistance compared to many thermoplastics e.g. polycarbonate. However, thermosets composites are in general known to highly susceptible to internal damage caused by a low velocity impact due inherent brittleness of thermoset resins. The various ways to improve damage tolerance of a composite and the composite based products developed for naval applications will be deliberated in the present lecture.

**Biodata of the Speaker :** Dr. Ratna, Sc "F" is heading the Directorate of Polymer Science and Technology of Naval Materials Research Laboratory (NMRL) (Defence research and development organization-DRDO), Ambemath. He did his M. Tech in Materials Science & Engineering and Doctorate in Polymer Science from Indian Institute of Technology, Kharagpur. He was a visiting scientist to Monash University, Australia on BOYSCAST Fellowship in 2000, sponsored by DST, India. He was also a visiting scientist to Technical University, Kaiserslautern, Germany on a prestigious Alexander von Humboldt Fellowship from 2006 to 2008. Dr. Ratna has been working at NMRL for the last 26 years and developed several products for Indian Navy, some of them are already inducted. He has published more than 95 papers in reputed international journals and three books. Most recent book on "Polymers for vibration damping applications" has been published by ELSEVIER in 2020. He is a reviewer related to research paper/book/project proposal for several Publishers, research grant councils (Hongkong and Czech Republic), National Science Foundation (USA). He is the recipient of Institute silver Medal (IIT Kharagpur), Indian Paint association award, Thermal analysis award (TA Instrument, UK), Technology day Medal (DRDO), , Lab Technology Group Award (2016), Fifth (2015) and Seventh National Award (2017) on Technology innovation from Ministry of Chemicals and Fertilizers, Govt of India.



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## “MECHANICAL BEHAVIOUR OF METAL MATRIX COMPOSITES (MMC)”

**Dr. Dineshsingh Thakur**

Professor and Director, T & P

PGC Chairman, Department of Mechanical Engineering

Defence Institute of Advanced Technology, Pune

**Abstract :** In the recent years, the continuous research effort on advance engineering materials has been focused towards the development of different new unified combination of materials. The continuous thrive for superior strength, high stiffness and lightweight structural materials pertaining to high performance critical applications has resurrected much interest in metal matrix composites. MMCs have been widely recognized as a legitimate class of composite materials, consisting of at least two physically and chemically different phases; in which high strength and high modulus ceramic reinforcements are incorporated in alloy matrix. However, metal matrix composites, which is only two decades old, is still in its infancy stage due to the possibilities of various combination of reinforcements with the matrix. Extensive research is in progress to enhance the physical and mechanical behavior of the existing MMC, and to develop.

The specific yield stress that can be obtained in these materials make them very attractive for high temperature applications where the conventional heat treated alloys are useless as a consequence of the dissolution of the precipitates that give them good mechanical properties at moderate temperatures. However, the low fracture toughness that these materials exhibit remains as their major drawback. This problem has reduced its expansion in applications to structural uses. A great effort has been done on this field trying to understand the mechanisms that control the fracture process but, as a consequence of the complexity of the problem, not enough understanding has been achieved up to date. It is an attempt to address the issues associated in this research work.

**Biodata of the Speaker :** Dr. Dineshsingh Thakur is currently working as Professor and Director, T & P, PGC Chairman, Department of Mechanical Engineering, Defence Institute of Advanced Technology, Pune. He is the recipient of “Teacher of the Year Award” for the year 2013- 14 of DIAT (DU)-Pune. He is the Member, Board of Management, DIAT (DU)-Pune. Academic Council Member, DIAT (DU)-Pune. Worked as Head, Material Management Group (HMMG). Worked as a Controller of Examinations, DIAT (DU). Director, Incubation cell DIAT (DU). Director, IQAC, DIAT (DU). Nodal Officer, Ek Bharat Shrestha Bharat (EBSB)-MHRD. Chairman, PGC-DIAT (DU). Executive council Member, Indian Institute of Metals (IIM).



Nominated for best paper award at “World Congress on Engineering-2009, London”. Invited to Chair International conference AES-ATEMA-2012- Italy. Listed in the “Who’s who in the World, (2010). Nominated for “ Bharat Shiksha Ratan Award” (2016). Nominated for “Bharat Jyoti Award” (2016). Listed in the “ Learned India Educationists Who’s Who” 2017. Listed in the “Asian American Who’s Who” 2017. Recipient of best paper award International Conference ICRAME 2015-Pune (MS). Invited to Chair International conference AES-ATEMA-2013- Italy. Recipient of best paper award International Conference ICTIEM-2018, Feb 26-27, 2018 at Deogiri Institute of Engineering and Management Studies-Aurangabad.

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## Fabrication of Sandwich Composites and its Applications

**Mr. Rimzath B**

DIAB, Sweden

**Abstract :** Why sandwich composites? With sandwich composites you can:

- Decrease weight and increase strength
- Save fuel cost or increase payload
- Reduce lifecycle cost
- Lower your carbon footprint
- Enjoy more design freedom

What is sandwich composite? The concept is cleverly simple. Two thin, strong and stiff materials are separated by a lightweight core. The result is a strong and durable product that provides mechanical properties at much lower weight than traditional monolithic materials, such as single skin FRP, wood, steel or aluminum. Sandwich composite materials also allow designers to engineer with extreme optimization to their loading requirements. A sandwich solution can be tailored to avoid over-engineering, saving weight and increasing performance. By choosing the appropriate fibers, resin and core you can create a product that has, for example, high thermal insulation, tailored mechanical behavior and fire resistance.

### **Biodata of the Speaker : Mr. Rimzath B**

DIAB, Sweden, Technical Manager India / Middle East

Mr. Rimzath Ali graduated from B.Tech (Polymer Technology), MBA Production and has 18 years' experience in Composites Engineering and infusion process, working largely in the wind & Marine segment industry mobilising plant work forces and controlling build production and quality assurance procedures. His role in CCG India sees him travelling extensively in the region and Middle East for supporting new designs and processes for a wide range of client needs, as well as educating staff and implementing new application and techniques. Rimzath has done a lot of infusion training & has excellent raw materials and process knowledge.

He has won JEC ASIA & ICERP innovation award in composite process



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## NDE and Inspection of Composites - Trends and Advances

**Dr. Shyamsunder Mandayam**

Former Principal Scientist, GE Research, Bangalore  
Former Senior Scientist, IGCAR, Department of Atomic Energy, Kalpakkam  
Chairman, National Certification Board, ISNT

**Abstract :** The engineering industry has seen an increasing adoption of composites as a material of choice in the last few decades. Newer applications are being discovered for composites given its attractive properties, cost, availability and the concurrent benefits. Significant strides have been made in the development, advancement and deployment of polymer matrix composites (PMC), ceramic matrix composites (CMC) and metal matrix composites (MMC) in industries ranging from aerospace, automotive, oil & gas, renewable energy, healthcare, transportation, and several others. Industry demands for increases utilization has also resulted in enabling design of complex and larger shapes and parts as well as hybrid structures combining composites and metallic materials. Irrespective of the type of industry using composites in their components and structures, the primary requirement of assuring quality of the composite part during the manufacturing and assembly stage and the subsequent step of assuring its integrity and life during installation and in-service is a very critical pre-requisite. This is primarily accomplished through use of several Nondestructive Evaluation (NDE) and Inspection methodologies including basic techniques like Ultrasound, Radiography, etc. However the increasing complexity of the material and the size of the parts combined with higher demands on capability for defect detection and characterization including incipient damage has resulted in the development of several new inspection techniques including Shearography, Microwave, Terahertz, micro/nano-CT, positron annihilation, Flash Infrared imaging, Air Coupled UT, etc. The continued and increasing demand for safety, reliability and productivity combined with the usage of newer materials and manufacturing processes, innovative and complex designs of components and structures for higher efficiencies, has also brought in increased adoption of automation in the industrial inspection world. This presentation will highlight the various NDE techniques currently in extensive use for composite inspection by the industry and highlight the trends being observed in newer and advanced techniques including automation and use of modern approaches like Signal and Image Processing, Artificial Intelligence/Machine Learning and Robotics which are showing good promise and are being developed by R&D labs to meet the needs of industrial inspection.

**Biodata of the Speaker :** Dr. Shyamsunder Mandayam is the Chairman, National Certification Board -Indian Society of Nondestructive Testing (ISNT), worked as Principal Scientist at GE Global Research for 20+ years and Senior Scientific Officer @IGCAR, Kalpakkam for 16 years, Certified Lean Six Sigma Black Belt, TRIZ Level 3 expert, ASNT Level 3. Worked extensively in the development of new NDE / Inspection techniques, driving the vision and prepared roadmaps for next generation technologies in NDE for metallic and non-metallic materials (composites) related to aerospace, energy, renewables and oil and gas industries.



Worked on Eddy current array sensors, POD, Nonlinear ultrasound, Positron annihilation, Microwave and Terahertz NDE, Pipeline inspection, Automation, Robotics and Lifing of components. Currently pioneering the adoption of digital transformation to NDE and Inspection. He has 10 patents and 150+ papers in various journals, books and proceedings and delivered 70+ invited talks. Received several prestigious awards like National NDT award for R&D, GE India's R&D Tata award for excellence award to name a few. He is a Honorary Fellow of ISNT.

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## Thermography and Computed Tomography Applications in Composites

**Dr. Raghu Prakash,**

Professor, IIT Madras

**Abstract :** Composite structures are widely used for Aerospace structural applications. Composites have complex structure and damage mechanisms, therefore, conventional NDT techniques provide limited information of defects. Thorough understanding of structure, damage and delamination during FRP composite manufacturing is provided by thermography and computed tomography. The void formation in FRP composites is unavoidable and the void content measurement is very important to study its deleterious effects on the mechanical properties of the material. Generally destructive methods are used to calculate the void volume fraction. But the recent advances in X-ray computed tomography can be used to detect and quantify the void content in the composites in a non-destructive manner. In this presentation, Thermography and Computed Tomography Applications in Composites are described and discussed.

**Biodata of the Speaker :** Dr. Raghu Prakash received his Ph.D. from Indian Institute of Science, Bangalore.

His research interests include Fatigue of materials, small specimen testing, environmental degradation of materials and product development.

Binani Gold Medal, Indian Institute of Metals (1997).

NSC visiting Professor/Scientist, National Taiwan University, 2003-04.

Erasmus-Mundus Heritage Fellowship, 2013, 2014.

CSIR SRF 1989-1993.

National Merit Scholarship, 1979-85.

ICCES Distinguished Fellow, 2015.

Vice-Chairman, ASME Technical Committee on Materials Processing, Materials Division, 2018.

Chairman, ASME Technical Committee on Materials Processing, Materials Division, 2019.

Chairman, Society for Failure Analysis (Chennai Chapter), (2017-date).

Editor-in-Chief, Journal of Structural Longevity

Regional Editorial Board Member, Frattura ed Integrità Strutturale (IGF Journal of Fracture and Structural Integrity).

Editorial Board Member, Journal of Life Cycle Reliability and Safety Engineering.



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## **Effect of Electrospun Nanofibers and Carbon Nanotubes on the Properties of Polymeric Composite and its Failure Analysis**

**Dr. Dattaji Shinde**

Associate Professor and Former Head of Production Engineering,  
VJTI, Mumbai India

**Abstract :** High specific modulus and strength are the most desired properties of the material for the structural applications and since composite materials exhibit these properties during last decade; these materials have gained significant increase in usage for the applications ranging from automotive, defense, aerospace, recreation and shipbuilding etc. The major cause of failures in these composite laminates is due to delaminations. Nanoengineered beams were fabricated by interleaving non-woven Tetra Ethyl Orthosilicate (TEOS) electrospun nanofibers (ENFs) between the laminated fiberglass composites to improve the flexural properties. In addition, interlaminar shear strength (ILSS) of fiber reinforced polymer composite is an important property for most of the structural applications. Matrix modification is an effective method used to improve the interlaminar shear strength of composite. EPON 862/w epoxy system was modified using Tetraethyl orthosilicate (TEOS) electrospun nanofibers (ENFs) which were produced using electrospinning method. The ILSS of the Glass Fiber Reinforced Polymeric Composites (GFRP) was investigated. The study shows that introduction of TEOS ENFs in the epoxy resin enhanced the ILSS of GFRP by 15% with 0.6% wt. fraction of TEOS ENFs.

A Polymer can enhance its properties by addition of a very small weight percentage of micro or nanomaterials which can tailor of polymer. The multiwall carbon nanotubes (MWCNTs) were added in percentage ranging from 0.1 to 0.3% by weight in acrylonitrile butadiene styrene (ABS) and a spool in the form of material was prepared for 3-D printing with the help of an extrusion machine. Characterization of multiwall carbon nanotubes into ABS based nanocomposite. The samples were printed as per the ASTM D638 and ISO 178 standards using dual extruder 3-D printer by fused deposition modelling (FDM). The tensile test results in an increase in strength by 21.61% while the flexural test results a decrease in strength by 15.13. Further an electrical conductivity test was performed on nanocomposites with weight percentage of multiwall carbon nanotubes, and have shown significant increase in electrical conductivity with the addition of multiwall carbon nanotubes.

Electrospinning is the most widely utilized method to create nanofibers because of the direct setup, the capacity to mass-deliver consistent nanofibers from different polymers, and the ability to produce ultrathin fibers with controllable diameters. Smooth and much arranged ultrafine Polyacrylonitrile (PAN) nanofibers with diameters going from submicron to nanometer were delivered utilizing Electrospinning technique. The effect of electrospinning processing parameter on the morphology of electrospun PAN nanofibers were investigated. The nanofibers were heat treated for carbonization to examine the changes in properties and composition to make for electrical application. The average diameter of the PAN fiber observed 365nm and 280nm for flat plat and rotating drum collector respectively. The four probe strategy was utilized to inspect the electrical conductivity of the nanofibers and the electrical conductivity is significantly improved with increase in oxidation temperature exposed.

The progressive failure of the laminated fibreglass nanocomposite was analyzed using stiffness degradation method using ANSYS. Further Molecular dynamic simulation of polymeric nanocomposite was carried out validate the experimental result of mechanical characterization using J-OCTA software.



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**Biodata of the Speaker :** Dr. Dattaji K. Shinde has obtained B. E. (Mechanical) from Government College of Engineering Aurangabad Maharashtra (2000), M. Tech. (Design Engineering) from Indian Institute of Technology, Delhi (Jan 2002). He has obtained Ph D in Nanoengineering at Joint School of Nanoscience and Nanoengineering, North Carolina A & T State University Greensboro NC, USA in December 2014. Also, he was Postdoctoral Scholar at North Carolina A and T State University USA during 1<sup>st</sup> January to 31<sup>st</sup> June 2015. He has worked as Graduate Research Assistant in Nanoengineering department (Aug. 2011- Dec. 2014). He is visiting Professor at Department of Mechanical and Material Science, University of North Carolina, Charlotte NC USA (2018-19).



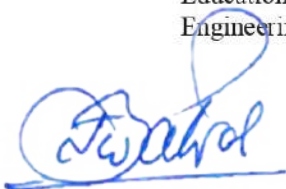
Currently, he is Associate Professor of Production Engineering Department and is Former Head of Production Engineering Department, VJTI Mumbai. The additional portfolios handling at VJTI Mumbai are MHRD's Institutions Innovation Council President, Start-up and E-Cell Coordinator, AISHE Convener, ARIIA Nodal officer, SAMPE International Student VJTI Mumbai Chapter and SAMPE International Professional Chapter President. Dr. Shinde has 18 years of rich experience in teaching, research, industry and consultancy.

Collaborative research with Imperial College of London Material Engineering Department U. K, University of Malaysia, Pahang, Malaysia and Rice University, USA Texas A and M University USA, North Carolina A and T state University USA. He has visited many universities of USA such as Michigan University, Georgia Tech University, Duke University, South Carolina State University, Texas State University for collaborative research and currently working on many joint research projects on Nanotechnology in materials and Manufacturing. He is working as editorial board of world Academy of Science Engineering and Technology USA (WASET).

He has published three international journal paper and 67 international and national journals and conferences papers in peer reviewed proceeding in area of Nanotechnology, nanomaterials, manufacturing, nanocomposites and advanced composite materials. His area of interest is nanotechnology, nanomaterial, nanocomposite, advanced composite materials, design engineering, finite element analysis micro/nanofabrication, value engineering, lean manufacturing, and project management.

Dr. Shinde is lifetime member of ASME (USA), SAMPE (USA), WASET, SAE India, ISTE (India), and AMSI. SAVE International USA.

He is recipient of Dr. Wadaran L. Kennedy Scholar Award for 2012-2013 form North Carolina A&T State University, recipient of Graduate Research Assistantship award from North Carolina A&T State University from August 2011 to Dec. 2014. Recipient of Scholarly Accomplishments and Excellence in Academic Performance Award, Division of Student Affair and International Student and Scholar's office, North Carolina A and T State University, NC 2012. Dr. Dattaji Shinde has awarded Best Dronacharaya Award for Innovative product Smart Navigation Band in the National level Entrepreneurship Generation –Y competition Hunar 2.0 organized by Jaro Education for 2018-19. Also working as Board Studies Member for K K Wagh College of Engineering Nasik for from 2018-19.



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## Failure Analysis of Polymer Matrix Composites

**Dr. PRAVEER VERMA**

Sc. "F", DMSRDE, KANPUR

**Abstract :** PMCs with application on the technological system frontiers by about the end of last century have progressively moved from functionally non critical to most critical structural units, driven by the data accumulated on its performance as non-critical functional units and the basic feature of the material of high specific strength with the flexibility to the design the components as per the actual system requirement and thus dictating orientation and volume fraction or mass, which can be kept minimum thereby possessing the cutting edge feature over the isotropic conventional materials which pays in huge volumes in various concerned sectors, thus the technology is near its maturation and therefore the likely various failure modes and their remedial measures need to be addressed more widely at this time with a view to build up more and more type of systems with advantages of mass savings with inherent better dynamic mechanical and electrochemical properties etc. , thus, succeeding in higher and more reliable service life of the system. The talk deals mainly with the various failure modes of PMCs and their prominent causes right from component forming till their replacement as a result of a flaw during inspection, it is interesting that no unscheduled replacement have taken place during orator's functioning at inspection level for more than a decade.

**Biodata of the Speaker :** B. Tech. (HBTU), M. Tech. (IIT, DELHI) - Centre for material science & technology-1990 .

More than 20 technology day award from hal and technology driven awards/honors from cemilac & dmsrde, drdo & indian air force.

More than 150 publications largely pertaining to airworthiness, failure analysis of aeronautical stores, including rubbers, PMCs, glazing plastics, FOL items etc.

His areas of interest include endeavour for making our country technologically completely self reliant with cutting edge combat capabilities & guiding budding engineers and scientists, for brighter country's technological advancement & prosperity.



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## **Analysis of interlaminar cracking of composite laminates**

**Dr. P. J. Guruprasad**

Professor

Department of Aerospace Engineering, Indian Institute of Technology Bombay, Mumbai 400076 INDIA

**Abstract :** Delamination is one among many modes of failure observed in laminated composites. Regions close to the free edge of laminates have complex stress state, including interlaminar stress. These stress components lead to laminas separating from each other. In this talk, a general understanding of interlaminar stress in laminated composites will be first presented. Subsequently, possible approximate analytical solutions to estimate interlaminar stress near the free edge and the notion of boundary-layer region will be discussed. As an application, estimating interlaminar stress in pre-twisted composite strips that have potential application in helicopter flexbeams will be demonstrated. Finally, possible techniques to model other modes of damage in fiber reinforced composite materials and textile composites will be shown.

**Biodata of the Speaker :** Dr. P. J. Guruprasad is an Associate Professor in the Dept. of Aerospace Engineering at IIT Bombay. He obtained his B.E. in Mechanical Eng. from B. M. S. College of Engineering, Bengaluru; M.Sc (Eng) in Aerospace Eng. from IISc, Bengaluru; and Ph.D. in Aerospace Eng. from Texas A&M University, USA. Subsequently, he was a Post Doctoral Fellow in Centre des Materiaux at Ecole des Mines de Paris, Paris. His research interests fall within the broad area of mechanics of materials.



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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.17<sup>th</sup> titled "Biomedical Textiles and its Composites as a Powerful Weapon for Combating Covid 19" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Anasuya Roy
2.	Bank account number	31866504173
3.	Bank name	STATE BANK OF INDIA
4.	Bank branch address	IIT DELHI CAMPUS
5.	Branch IFSC code	SBIN0001077
6.	Mobile number	9555798694
7.	PAN	BULPR7028D

Signature: Anasuya Roy

Name: Dr. Anasuya Roy.

Designation: Founder, CEO

Affiliation: NANOSAFE SOLUTIONS

  
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S.No.	Item	Details
1.	Name of account holder	Mr. Shantanu Prabhune
2.	Bank account number	002601041127
3.	Bank name	ICICI Bank
4.	Bank branch address	Kailash Plaza, Plot 355, Vallabh Baug Lane, Opp Odeon Cinema, Ghatkopar (E), Mumbai
5.	Branch IFSC code	ICIC0000026
6.	Mobile number	9930695359
7.	PAN	AJQPP1629P

Signature: 

Name: Shantanu C Prabhune.....

Designation: Asst. Gen Manager.....

Affiliation: Larsen & Toubro



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Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr.Ram Chandra Prasad
2.	Bank account number	52142180010736
3.	Bank name	Canara Bank
4.	Bank branch address	Khaire, Patalganga
5.	Branch IFSC code	CNRB0000033
6.	Mobile number	9819377021
7.	PAN	

Signature: 

Name: Dr.R.C.Prasad

Designation: Professor

Affiliation: PHCET, Rasayani

  
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S.No.	Item	Details
1.	Name of account holder	Dr.Biswajit Panda
2.	Bank account number	67802186735
3.	Bank name	State Bank of India
4.	Bank branch address	Vichumbe
5.	Branch IFSC code	SBIN0071073
6.	Mobile number	9819377021
7.	PAN	

Signature: .....

Name: Dr.Biswajit Panda

Designation: Professor

Affiliation: PCE Panvel



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S.No.	Item	Details
1.	Name of account holder	Dr. Virendrakumar Gupta
2.	Bank account number	005201006412
3.	Bank name	ICICI Bank
4.	Bank branch address	Surat Athwalines
5.	Branch IFSC code	ICIC0000052
6.	Mobile number	9998965284
7.	PAN	

Signature: .....

Name: Dr. Virendrakumar Gupta

Designation: .Head, R&D

Affiliation: Reliance Research, Mumbai

  
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2.	Bank account number	60376670935
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4.	Bank branch address	Pune ShaniwarPeth
5.	Branch IFSC code	MAHB0000675
6.	Mobile number	9881253425
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Dist. Raigad - 410 207.

Signature: ..........

Name: KashinathDamodarDeodhar

Designation: Group Director

Affiliation: ARDE, DRDO



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Mahatma Education Society's  
Pillai HOC College of  
Engineering and Technology,  
Pillai's HOC Educational Campus  
Rasayani, Tal. Khalepur  
Dist. Raigad, Pin-410 207

Mahatma Education Society's

**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.18<sup>th</sup> titled "Understanding of Structure Properties Relations in Advanced Polymer Nano-Composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr.Ram Chandra Prasad
2.	Bank account number	52142180010736
3.	Bank name	Canara Bank
4.	Bank branch address	Khaire, Patalganga
5.	Branch IFSC code	CNRB0000033
6.	Mobile number	9819377021
7.	PAN	

Signature:



Name: Dr.R.C.Prasad

Designation: Professor

Affiliation: PHCET, Rasayani



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Dist. Raigad, Pin-410 207

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Pillai HOC College of Engineering & Technology, Rasayani

RECEIPT

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.19<sup>th</sup> titled " Mechanical Behaviour of Metal Matrix Composites(MMC)" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Dineshsingh Thakur
2.	Bank account number	11252509008
3.	Bank name	SBI Mangalore
4.	Bank branch address	SBI Mangalore, Raigad (MS)
5.	Branch IFSC code	SBIN0000273
6.	Mobile number	9096090173
7.	PAN	AAHPT1254C

Signature: 

Name: Dr. D.S. Thakur

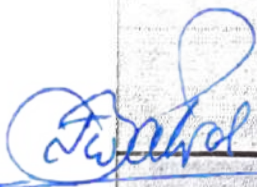
Designation: Professor & Head

Affiliation:

Dept. of Mech Engg.  
DIAT COU, DRDO  
Pune 411025



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Mahatma Education Society's

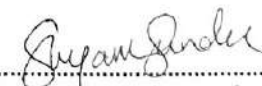
**Pillai HOC College of Engineering & Technology, Rasayani**


**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov. 20<sup>th</sup> titled " NDE of Composites- Trends and Advances" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Shyamsunder M.
2.	Bank account number	771050012564
3.	Bank name	HDFC Bank
4.	Bank branch address	IT PARK, BANGALORE
5.	Branch IFSC code	HDFC0000077
6.	Mobile number	9880508266
7.	PAN	ADVPS7416M

Signature:   
Name: Dr. Shyamsunder M  
Designation: Chairman  
Affiliation: NCB-ISNT

  
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**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

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Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Shyamsunder M.
2.	Bank account number	771050012564
3.	Bank name	HDFC Bank
4.	Bank branch address	IT PARK, BANGALORE
5.	Branch IFSC code	HDFC0000077
6.	Mobile number	9880508266
7.	PAN	ADVPS7416M



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Rasayani, Tal. Khalapur,  
Dist. Raigad - 410 207.

Signature: 

Name: Dr. Shyamsunder M

Designation: Chairman

Affiliation: NCB-ISNT



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Pillai's HOC Educational Campus  
Rasayani, Tal. Khalapur  
Dist. Raigad, Pin-410 207

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**Pillai HOC College of Engineering & Technology, Rasayani**

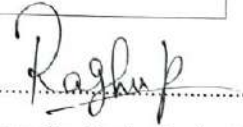
**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.21<sup>st</sup> titled "Thermography and computed tomography applications in composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Raghu Prakash
2.	Bank account number	10620886373
3.	Bank name	State Bank of India
4.	Bank branch address	IIT Madras
5.	Branch IFSC code	SBIN0001055
6.	Mobile number	
7.	PAN	

Signature: .....



Name: Dr. Raghu Prakash

Designation: Professor

Affiliation: IIT Madras



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**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov. 21<sup>st</sup> titled "3D printing of polymers & polymer composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2021.

Below mentioned are details of Bank Account and PAN


S.No.	Item	Details
1.	Name of account holder	Dr. Ravi Babu
2.	Bank account number	6518459894
3.	Bank name	Indian Bank
4.	Bank branch address	Alagappa college campus
5.	Branch IFSC code	IDIB000A008
6.	Mobile number	8300826339
7.	PAN	

Signature: ..........

Name: Dr. Ravi Babu

Designation: Scientist

Affiliation: CECRI, Tamilnadu

  
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**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.21<sup>st</sup> titled "Effect of electrospun nanofibers and carbon nanotubes on the properties of polymeric composites as a functional materials" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN


S.No.	Item	Details
1.	Name of account holder	Dr. Dattaji Shinde
2.	Bank account number	10538307244
3.	Bank name	State Bank of India
4.	Bank branch address	VJTI Matunga
5.	Branch IFSC code	SBIN0011075
6.	Mobile number	7045809459
7.	PAN	BAKPS3688F

Signature: 

Name: Dr Dattaji K Shinde

Designation: Associate Professor Production Department

  
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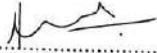
**Pillai HOC College of Engineering & Technology, Rasayani**

**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov. 22<sup>nd</sup> titled " Analysis of interlaminar cracking of composites laminates" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Guruprasad P J
2.	Bank account number	2724101102941
3.	Bank name	Canara Bank
4.	Bank branch address	Canara Bank, IIT Bombay, Powai, Mumbai 400076
5.	Branch IFSC code	2724101102941
6.	Mobile number	9167667142
7.	PAN	BULPP5705P

Signature: 

Name: Guruprasad P J

Designation: Associate Prof.

Affiliation: IIT Bombay



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Rasayani, Tal. Khalapur  
Dist. Raigad, Pin-410 207

Zoom Video Communications, Inc.  
 55 Almaden Blvd, 6th Floor  
 San Jose, CA 95113  
 billing@zoom.us

Invoice Date: 06/22/2020  
 Invoice #: INV27194872  
 Payment Terms: Due Upon Receipt  
 Due Date: 06/22/2020  
 Account Number: 3001110404  
 Currency: USD  
 Account Information: Mahatma Education Society  
 KMV Pillai Campus, Plot No 10, Sector 16 New  
 Panvel,  
 Navi Mumbai, Maharashtra 410206,  
 India  
 ppillai@mes.ac.in

Purchase Order #

VAT ID

Zoom W-9

**CHARGE LIST**

Charge Description	Service Period	Subtotal	Tax	TOTAL
Charge Name: Education Annual Quantity: 30 Unit Price: \$90.00	06/22/2020-06/21/2021	\$2,700.00	\$0.00	\$2,700.00

**TOTALS**

Subtotal: \$2,700.00  
 Total (Including Tax): \$2,700.00  
 Invoice Balance: \$0.00

Charge Name	Tax Name	Jurisdiction	Charge Amount	Tax Amount
			Total Tax	\$0.00

**TRANSACTIONS**

Transaction Date	Transaction Number	Transaction Type	Description	Applied Amount
06/22/2020	P-28638864	Payment		(\$2,700.00)
			Invoice Balance	\$0.00

  
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NO RELIGION IS GREATER THAN TRUTH

## MAHATMA EDUCATION SOCIETY

Chembur Naka, Mumbai - 400 071 Tel: 2522 4856 / 2522 8414 Fax: 91 22 2522 9597

**Copy of the RESOLUTION of the Governing Body of MAHATMA  
EDUCATION SOCIETY passed at its meeting held on 29<sup>th</sup> August, 2020.**

Resolution No. 04A/08/2020.

“WHEREAS, it is necessary to the efficient operation of the education institutions to obtain certain additional softwares for online mode; and WHEREAS, it is more advantageous to the Society/Trust to issue / allocate the software units to each institution rather than purchase it, be it:

“RESOLVED that “Zoom” software and its 3 units costing each US\$ 90.00 has been issued and be used by Mahatma Education Society’s Pillai HOC College of Engineering & Technology(PHCET), Pillai HOCL Educational Campus, Rasayani, Tal. Khalapur, Dist. Raigad till the expiry of the agreement.”

“RESOLVED further that the allocated software unit and its cost will be paid by the PHCET to the Mahatma Education Society.”

For Mahatma Education Society.

Chairman.

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Engineering and Technology,  
Pillai's HOC Educational Campus  
Rasayani, Tal. Khalapur  
Dist. Raigad, Pin-410 207

# Gavdevi Cable Network

House No-792,At. Post, Nere, Tal- Pannel, Dist- Raigad.  
Mob. 9322684466, 8779169647

Receipt No :

Date :23/3/2021

Name : **Sunilsing Rajput**.....

User ID: **sing203**.....

The Sum of Rupees : .....

Package: **50/mbps...1 month**

Payment in Cheque/ Cash:.....

Cheque No: .....

Bank:.....

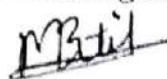
Date:.....

Inst :	
Pack:	1000
Total:	1000

Package Renew Date **17/11/2020**

expir: **16/12/2020**

Authorized Signature



For Gavdevi Cable Network



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HOC College  
Engineering & Techno  
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Rassyanl, Tal. Khelapur  
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Annexure-A

Name of the Institute: Pillai HOC College of Engineering & Technology, Rasayani

**UTILISATION CERTIFICATE FOR THE FINANCIAL YEAR 2020-21.**

Name of the Scheme under which the amount was sanctioned under the **Short Term Training Program (STTP) under AQIS during financial year 2020-21**

(to be submitted separately for each sanction order)

Sl. No	AICTE Sanction Order/Letter No. & Date under which the amount was sanctioned	Amount (Rs.)	
	Ref. No. 34-66/442/FDC/STTP/Policy-1/2019-2020 Dated: 10 <sup>th</sup> Aug 2020	Rs 2,99,667/- (Rupees Two Lac Ninety Nine Thousand Six Hundred and Sixty Six Only)	Certified that out of Grant-in-Aid of Rs 2,99,667/- (Rupees Two Lac Ninety Nine Thousand Six Hundred and Sixty Six Only) sanctioned by the AICTE during the financial year 2020-21 in favour of Pillai HOC College of Engineering & Technology, Rasayani. as per letter mentioned in column 2 and Rs. Nil on account of unspent balance of previous year, Rs.97435/- has been utilized for the purpose for which it was sanctioned and the balance of Rs. 202232/- remained unutilized at the end of the first session.

Certified that I have satisfied myself that the conditions on which the amount was sanctioned have been duly fulfilled and that I have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned.

**Kinds of checks exercised:-**

1. Audited Annual Accounts of the Institute
2. Receipt and Payment account
3. Periodical Progress Reports.

Signature of Chartered Accountant

Name of Chartered Accountant

Membership No.: 234002

Full Address with Seal MA, LANE-3, SECTOR-9, CBD BELAPUR.

UDIN: 21234002AAAAAH7007

Signature of the Finance Officer

Name & Designation Shema Nair

Name of the Finance Officer

Full Address with Seal

(Govt. Aided/University & wherever applicable)

Place:

Date: 31/03/2021



SUSANNA CHERIAN  
MEMBERSHIP No. 234002  
Proprietor



Signature of Head of the Institute

Name & Designation

Full Address with Seal

PRINCIPAL  
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Engineering & Technology  
Pillai HOCL Educational Campus,  
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Rasayani, Tal. Khalapur  
Dist. Raigad, Pin-410 207

FORMAT FOR RECEIPT AND PAYMENT ACCOUNT - 1<sup>ST</sup> SESSION

SI. No.	Receipt	Amount (Rs.)	Amount (Rs.)	SI. No.	Payments	Amount (Rs.)	Amount (Rs.)
1	To Opening Balance	2,99,667/-	2,99,667/-	1	Honorarium to experts	23 * 3000/- each	69000/-
				2	Honorarium to Coordinator	5000/-	5000/-
				3	Lab attendant	3000	3000/-
				4	Miscellaneous (i) Zoom license copy for period of 5 months (From Nov 2020 to March 2020)	19435/-	19435/-
				5	Miscellaneous (ii) Broadband Connection	1000/-	1000/-
					Balance c/d		2,02,232/-
	<b>Grand Total</b>		2,99,667/-		<b>Grant Total</b>		2,99,667/-

Signature of Chartered Accountant

SUSANNA CHERIAN

Name of Chartered Accountant

Membership No.: 234002

SUSANNA CHERIAN

Memb. No. 234002

Proprietor

Full Address with Seal MA, LANE-3, SECTOR-9,  
CBD BELAPUR

UDIN: 21234002AAAAAH7007

31/03/2021

Signature of the Finance Officer

Name &amp; Designation Sheena Nair.

Name of Finance Officer:

Full Address with Seal

(Govt. Aided University &amp; wherever applicable)

Signature of Head of the Institute

Name &amp; Designation

Full Address with Seal

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Engineering & Technology  
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Dist. Raigad, Pin-410 207



## PROCEEDINGS OF ONE WEEK AICTE APPROVED



### SHORT TERM TRAINING PROGRAM

ON

### COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS

STTP-1 : DURING NOVEMBER 17 - 22, 2020



Organized by

DEPARTMENT OF MECHANICAL ENGINEERING  
PILLAI HOC COLLEGE OF ENGINEERING AND TECHNOLOGY, RASAYANI

Supported by



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# Society for Failure Analysis

[Registration No. 97/2008/HYDERABAD]



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Dr. Amol A. Gokhale, DMRL, Hyderabad

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Dr. T. Jayakumar, Ex. Director (MMG)  
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Dr. M. Srinivas, DMRL, Hyderabad  
Dr. D R Yadav, DRDL, Hyderabad  
Dr. N Eswara Prasad, RCMA (Mat), Hyderabad  
Dr. B P C Rao, IGCAR, Kalpakkam  
Prof. T Srinivasa Rao, NIT, Warangal

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Shri S K Jha, CEMILAC, Bengaluru

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Shri Bahukhandi, Former IOCI, Mumbai  
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Dr. Kulvir Singh, BHEL R&D, Hyderabad

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Dr. S Tarafdar, NML, Jamshedpur  
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Dr. Sandeep Bhattacharyya, Tata Steel, Jamshedpur  
Dr. R Eswaran, BHEL, Tiruchirappalli  
Prof. VS Rajs, IIT-B, Mumbai  
Dr. M Sujatha, NAL, Bengaluru  
Dr. M Vijayalakshmi, IGCAR, Kalpakkam  
Dr. Komal Kapoor, NFC, Hyderabad  
Ms. Swati Biswas, GTRE, Bengaluru  
Shri YS Gowarikar, Metatech, Pune  
Shri S D Lagavankar, RCMA (Nasik), Nasik

#### Contact Us at:

[sfa-india@gmail.com](mailto:sfa-india@gmail.com)

[bjana02@yahoo.co.in](mailto:bjana02@yahoo.co.in)

Website: [www.sfaindia.com](http://www.sfaindia.com)

The Society for Failure Analysis was established in the year 2006 with the patronage from many eminent experts with a mission to reduce failures that are estimated to cost 3-4% of GDP in a developing country.

#### Aims & Objectives of SFA

- Promote, encourage and develop growth of "Art and Science of Failure Analysis".
- Stimulate interest in compilation of database for effective identification of root causes of failures and their mitigation.
- To serve as a common forum for individuals, organizations and industries interested to investigate root cause of failures.
- Establish liaison with Government, academic and research institutions, commercial bodies and individuals on methodologies of failure analysis and render help.
- Collaborate with appropriate international organizations for the promotion of common objectives.
- Train personnel to conduct systematic failure analysis.
- Identify and recommend areas for research and development in the country, to prevent failures.

In order to fulfil the above objectives, the society organises lectures, workshops, clinics, conferences, seminars, colloquia and courses related to failure analysis at different regional chapters spread across the country and networks with professional bodies, in addition to bringing out periodic newsletters.



For the first time, the Theme-Symposium on Failure Analysis is being jointly conducted by The Society for Failure Analysis and The Indian Institute of Metals during the NMD-ATM 2014. For further details about the society,

kindly see the web page: [www.sfaindia.org](http://www.sfaindia.org).

#### PRINCIPAL

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Engineering and Technology.

Pillai's HOC Educational Campus  
Rasayani, Tal. Khelapur  
Dist. Raigad, Pin-410 207

# ONE WEEK AICTE APPROVED CERTIFICATE STTP - 1

ON

## COMPOSITES : FRACTURE TOUGHNESS, NDE & FAILURE ANALYSIS



### PROGRAM – ITINERARY FOR 20/11/2020

DATE	TIME	SPEAKER / Title of Presentation
20/11/2020	9:30 am to 11:00 am	Dr. R. C. Prasad, Professor, PHCET, Rasayani <b>Fracture toughness and failure analysis of composites</b>
20/11/2020	11:00 am to 12:30 pm	Dr. C. M. Manjunatha, Chief Scientist, NAL Bangalore <b>Fatigue and Fracture of Composites</b>
20/11/2020	1:30 pm to 3:00 pm	Dr. Shyamsunder M., Former Principal Scientist, GE Research; Former Senior Scientist, IGCAR, Kalpakkam; Chairman, National Certification Board, ISNT <b>NDE of Composites - Trends and Advances</b>
20/11/2020	3:00 pm to 4:30 pm	Dr. Shyamsunder M., Former Principal Scientist, GE Research; Former Senior Scientist, IGCAR, Kalpakkam; Chairman, National Certification Board, ISNT <b>NDE of Composites - Trends and Advances</b>

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## “Crashworthy Design of Composites for Automotive Applications ”

**Prof. Shridhar Yarlagadda,**

Assistant Director for Research, Center for Composite Materials  
University of Delaware, USA

**Abstract :** Carbon Fiber reinforced plastic (CFRP) material is becoming one of the preferred solutions for vehicles to achieve overall weight reduction in order to meet fuel economy and emission standards while maintaining safety requirements. Carbon fiber thermoplastic composites offer several advantages compared to metallic alternatives, including higher levels of ductility and specific energy absorption, rapid processing, and recyclability and reuse. The objective of this study was to investigate the computational tools for the design, optimization and manufacture of carbon fiber thermoplastic materials for vehicle sideframe structures (e.g., B-pillar) subjected to high-velocity side-impact crash loading, and to investigate and demonstrate the appropriateness of simulative methods and tools to adequately predict behavior relevant for the assessment of vehicle safety.

In this study, CFRP intensive vehicle components were designed, manufactured, and tested. The project team investigated thermoplastic carbon fiber reinforced materials for vehicle sideframe structures, created requirements, and defined assessment strategies. The design of the B-pillar was followed by the manufacturing and testing of a prototype and validation of the predictive engineering tools. This study demonstrated that the carbon fiber thermoplastic B-pillar offered 60 percent weight savings over the metallic baseline and satisfied the side-impact crash requirements. Also, the dynamic impact and crush response of the B-pillar was adequately modeled using computational tools.

**Biodata of the Speaker :** Dr. Yarlagadda is the Assistant Director for Research at the University of Delaware Center for Composite Materials (UD-CCM) and Research Professor in Electrical and Computer Engineering at the University of Delaware. Dr. Yarlagadda holds a Ph.D. in Aerospace Engineering from The Pennsylvania State University. Founded in 1974 within the University of Delaware’s College of Engineering, the Center for Composite Materials (CCM) is an internationally recognized, interdisciplinary center of excellence for composites research and education. Dr. Yarlagadda has 7 awarded patents and over 80 publications in scientific journals and technical conference proceedings. Research interests include composite manufacturing, material characterization, process-microstructure-property relationships and multifunctional composite materials. Dr. Yarlagadda is a core member of the UD-CCM team that developed the Tailored Universal Feedstock for Forming (TuFF) technology, winner of the 2019 ACE award for unsurpassed innovation and 2020 SAMPE Delmonte award.



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## “PROCESSING AND PROPERTIES OF HIGH-PERFORMANCE PLASTICS”

**Dr. PRAKASH TRIVEDI**

Gharda Chemicals Mumbai

**Abstract :** High performance or Specialty Thermoplastics (STP) are becoming more important in last few years because of their unique properties, which are needed for such application fields as Medical, Aerospace, Transports, Oil/Gas Fields and general engineering.

Their uniqueness rests in their resistance to high temperature, chemicals, radiation, wear and tear and such properties. They show very high mechanical properties at normal and at higher temperatures as compared to engineering plastics.

Interestingly, they can be processed nearly similarly as engineering plastics, except at higher temperatures and with superior wear and corrosion resistant screws and barrels. The 3D Printing is the latest processing which has made these STP both attractive and important in the world of plastics today.

**Biodata of the Speaker :** Dr. Prakash Trivedi obtained his M.Sc. in chemistry working at UDCT, now ICT, Univ. of Bombay, Mumbai, India, in 1970 and PH.D. in polymer science at Dept. of Polymer Science, The University of Akron, Ohio, USA, in 1977 with Prof. J. P. Kennedy as his guide. He worked, starting 1974, in Firestone Central Research in Akron and returned to India in 1978. He then worked with IPCL at Vadodara, NOCIL, Rishiroop Polymer and Apar Oil at Mumbai from 1978 till 1990. He started Pace Polymer Technology Pvt. Ltd. and thereafter helped develop polymer business for PES, PSU, PPSU, two novel Polysulfone block copolymers, and their monomers and electrophilic PEEK from concept to commercialization for Gharda Chemicals Ltd. Mumbai, from 1990 to 2006. Once, this business was sold to Solvay in 2006, he joined Solvay as Managing Director of Solvay Specialities India Pvt. Ltd. till 2009 and there after he was member of Solvay's Advanced Technology Group, Brussels, till he retired in June 2011. He consults now with Gharda Chemicals for developing & marketing PEK, ABPBI & PEKK and their compounds and products. All of these specialty polymers were developed and commercialized for the first time in India and in Asia and some for the first time, even in the World! Additionally, he has developed Bio-Polyamides for Chembond Chemicals, India, which are now getting commercialized.

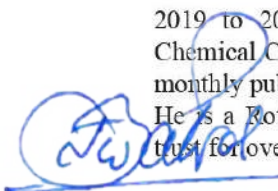


Dr. Trivedi has about sixteen patents granted and six more patents are awaiting grant in Indian and abroad and more than ninety papers and presentations in National & International conferences. He has coauthored "PVC Technology" with Mr. Arvind Athalye. He is currently writing a Book on Specialty Plastics. He is also an author of six books of fiction and two full-length plays in Gujarati.

Dr. Trivedi is a member of American Chemical Society since 1972 & of Society of Plastics Engineers, USA. He is a life member, Fellow and ex-Chairman of Indian Plastics Institute. He is life member of UDCT Alumni Association and was awarded Distinguished Alumnus award by UDCT Alumni Association. He is nominated as Adjunct Professor for ICT from 2019 to 2021. He was a member of managing committee of Indian Chemical Council (ICC) and is presently Hon. Editor of Chemical News, a monthly published by ICC.

He is a Rotarian since 1988, and is Chairman of Govardhanram Tripathi trust for over 15 years.

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## Fracture and Fatigue Behaviour of Polymer Composites

**Dr. C. M. Manjunatha**

Structural Integrity Division  
CSIR-National Aerospace Laboratories  
Bangalore 560017, India

**Abstract :** Fiber reinforced polymer (FRP) composites are widely used in engineering structures such as airframe, wind turbine etc., due to their high specific strength and stiffness. Such composite structures are subjected to various types of constant and variable amplitude fatigue loads in service. For damage tolerance and durability of such structures, the composites should possess high fracture toughness and fatigue resistance. Engineering FRP composites consists of carbon or glass fibers reinforced in a thermosetting epoxy polymer. Polymer epoxy, being relatively brittle, exhibit poor resistance to crack initiation and growth affecting the overall fatigue and fracture resistance of composite. In this presentation, fracture and fatigue behavior of FRP composites including failure mechanisms are described in detail. Methodologies used in fatigue life estimation of composites under service loads are dealt with in detail. Further, recent advances in fatigue life enhancement of composites by addition of nano fillers in epoxy matrix are explained with examples.

**Biodata of the Speaker :** Dr. CM Manjunatha is currently Chief Scientist and Head, Structural Integrity Division, CSIR-National Aerospace Laboratories, Bangalore, India.

He obtained his B.E. (NITK) in 1988, M.E. (IISc.), in 1991 and Ph.D. (Cambridge Univ., UK) in 1995. He was a post-doctoral fellow at Imperial College, London, UK in 2008

He has over 20 years of experience and specialized in mechanical testing and evaluation of aerospace materials, damage tolerance evaluation, full scale static and fatigue tests, life extension of aging aircraft, polymer composites, nanocomposites etc. He has executed over 50 sponsored and research projects related to HANSA, SARAS, LCA, MiG-21 BiS, MiG-29, Rustum-II, Dhruv, etc

He is a recipient of Gold medal for first rank in B.E. (1988), Cambridge-Nehru Scholarship (1991), ORS award from CVCP London (1991-1994) and UKIERI research fellowship (2008). He was awarded NAL outstanding award for project execution: 2013 and Best innovation award: 2017

He has over 150 publications to his credit in international journals, conferences and seminars.



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## 3D Printing of Polymers & Polymer Composites

**Dr. V. RAVI BABU**

SCIENTIST , CSIR-Central Electrochemical Research Institute  
Karaikudi, Tamil Nadu, India 686560

**Abstract :** 3D printing also known as "Additive Manufacturing (AM)" technique offers the unique advantage for fabricating complex structures via computer aided design (CAD). 3D printing allows for the fabrication of customized objects with a great level of geometrical complexity at reduced fabrication time and cheaper cost. In the case of conventional techniques used for polymer processing, high degree of supply chain management and large work force or machinery are required. In order to overcome the limitations associated with conventional processing techniques, 3D printing emerged as a potential technology for processing of polymers. Owing to the intrinsically limited mechanical and functional characteristics of 3D printed neat polymer parts, there is adequate necessity for development of polymer composites for high performance applications. 3D polymer printing presents potential to be utilized for wide variety of applications like tissue engineering, energy storage devices and aerospace engineering etc. The manufacturing sectors with very high prospects for 3D printing include aerospace as well as automobile production industries. The potential for fuel savings due to even more lighter parts manufactured through 3D printing is the most attractive benefit for the aerospace as well as automobile industry. Furthermore, 3D printed components for aerospace has the potential to decrease decommissioning-related CO<sub>2</sub> emissions. Polymers of natural and synthetic origin are widely being used in tissue engineering. Biodegradation is one of the important features for natural polymers. Modern 3D printing allows for fabricating complex multicellular tissue/organ due to their ability to use multiple print heads loaded with different cell lines. 3D printing acts as a versatile tool for design of next-generation energy storage devices in order to meet emerging requirements in the field of flexible electronics.

**Biodata of the Speaker :** Dr. V. RAVI BABU is currently working as Scientist, CECRI, Karaikudi (Since March 2017 to Till date). Technical Officer, Centre for Biopolymer Science and Technology, A Unit of CIPET, Kochi, India (April 2015 to March 2017). Lecturer, PRIST University, Thanjavur, India (June 2009 to May 2010).

He has completed his **Ph.D** Chemical Engineering, from Indian Institute of Technology Guwahati, India, **M.Tech** Chemical Engineering (Plant design), from National Institute of Technology Trichy, India and B. Tech. (Chemical Engineering), Jawaharlal Nehru Technological University Hyderabad, India.



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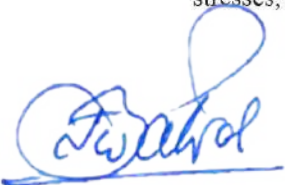
## **Fracture Mechanics and Computational Methods for Damage Assessment in Composite Structures**

**Dr. S. K. Panigrahi**

Professor and Head, Department of Mechanical Engineering  
Defence Institute of Advanced Technology (DU), Pune

**Abstract :** Fibre Reinforced Polymeric (FRP) composite materials are widely used for many structural applications primarily in defence due to their inherent superior mechanical properties i.e. possessing high strength-to-weight ratios. However, it is difficult to make accurate estimations on their behavior, as it is affected by several factors involved both during the manufacturing/fabrication processes and the experimental testing. Generally speaking, the use of FRP composite materials are abundantly increasing their applications on one hand and, on the other hand special attentions are also needed to deal with such materials as they have very low inter laminar out of strength. It is utmost important to use the principle of fracture mechanics in order to ascertain the structural integrity of any structure made of composite materials. Basically, the three-dimensional non-linear Finite Element Analyses (FEA) have been considered to be an efficient tool while applying the fracture mechanics principles for damage assessment. Sub-laminate modelling techniques have to be adopted for modelling of damages in terms of delaminations which have been presumed either to pre-exist or get evolved in the laminated FRP composites. In the FE based computational methods, the Multi-Point Constraints (MPC) need to be employed along the delamination damage fronts for maintaining the interface continuity. By sequential release of these constraints, self similar delamination progression can be realized. For preventing the interpenetration of damaged surfaces 3D Contact elements are to be used inside the damaged region. The fracture characterizing parameter such as Strain Energy Release Rate (SERR) is the focus of the present research for assessment of damage growth. The three individual components of Strain Energy Release Rate (SERR), GI, GII and GIII have been used as the defining parameters for assessing the damage propagation behaviours. Modified Crack Closure Techniques (MCCI) based on the concepts of Linear Elastic Fracture Mechanics (LEFM) has been employed for computation of the SERR components. The above mentioned computational techniques i.e. FEA are employed in a few case studies where pertinent three-dimensional issues relating to stress states and damage onset and propagations have been highlighted. The distributions of out-of-plane stresses at various critical surfaces and the SERR corresponding to the three individual modes have been evaluated for these special cases. Strength of materials based coupled stress failure criteria have been used to determine the locations of onset of the critical locations. Damage assessment has to be made, if the structure having damages pre-existed at the same critical location. This can be studied by determining the magnitudes of SERR values. Depending on their magnitudes, rate of propagation of such damages can be concluded. In this research, the detailed computational methods used in fracture mechanics will be discussed. The methodologies to determine the values of SERR and its importance on assessment of damages can be explained. Finally, a few applications/case studies can be presented as a part of applications.

Keywords: Delamination damage, FEA, Fracture mechanics, FRP composites, Inter laminar stresses, Sub-laminate modelling, SERR.



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**Biodata of the Speaker :** Dr. S. K. PANIGRAHI (PhD, IIT Kharagpur) is working as Professor in the Department of Mechanical Engineering of Defence Institute of Advanced Technology (DIAT), Pune and heading the Department at present for the second term. He has worked as an International Visiting Academic with University of New South Wales at the Australian Defence Force Academy (UNSW@ADFA). He has more than 28 year of wide and intensive teaching, research, training and administrative experience.



His research works primarily in the areas of Analysis and Design of composite materials, Characterization of FRP composite materials, Finite Element Analysis of FRP composite materials and composite structures, Natural Fiber Reinforced Composite (NFRC) materials, Fracture Mechanics principle applicable to modelling and simulation of damages in orthotropic and isotropic materials and material characterization/Stress analysis/Solid Mechanics/Machine design. He has been working on the development of advanced finite element methods and nonlinear finite element analyses and modelling of engineering structures with functionally graded/monolithic adhesively bonded joints. He has published over 210 research articles in peer-reviewed scholarly research papers International Journals/Conferences including 6 books (2 are under preparation), 1 monograph and many conference proceedings including a series of lecture materials. He has been awarded with “Bharat Jyoti” in the year 2012, Distinguished Scientist in Composite Structures Award in the year 2018, Innovative Technological Research & Dedicated Professor Award by JETR-JETMS Kuala Lumpur, Malaysia in the year 2017 and conferred as Fellow of different professional bodies which includes Institution of Engineers, Indian Society for Mechanical Engineering (ISME). He is a member of many International/National professional bodies and has been a frequent reviewer for many leading peer reviewed International journals of high standards. He has also served as Technical committee member or advisory board member for several National/International conferences.



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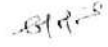
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**RECEIPT**

Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.20<sup>th</sup> titled " Fatigue and fracture of composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. C.M.Manjunatha
2.	Bank account number	10461095959
3.	Bank name	State bank of India (SBI)
4.	Bank branch address	NAL branch, Kodihalli PO, Vimanapura Bangalore 560017
5.	Branch IFSC code	SBIN0004815
6.	Mobile number	080-25086300 / 6301
7.	PAN	AELPM6496H

Signature: 

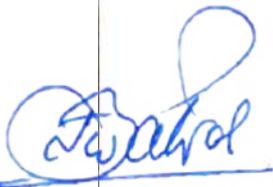
Name: CM Manjunatha

Designation: Chief Scientist

Affiliation: CSIR-NAL, Bangalore-17



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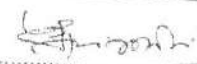
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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.21<sup>st</sup> titled "Fracture mechanics & computational methods for damage assessment in composites for defence applications" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2021.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. S.K. Panigrahi
2.	Bank account number	10224477087
3.	Bank name	SBI
4.	Bank branch address	SBI Girinagar, Pune
5.	Branch IFSC code	SBIN0002155
6.	Mobile number	8308193578
7.	PAN	AFOPP4799Q

Signature: 

Name: Dr. S.K. Panigrahi

Designation: Associate Professor, Mechanical Engineering / Dr.

Affiliation:



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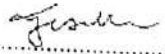
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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for delivering invited expert lecture dated Nov.22<sup>nd</sup> titled "Challenges in design & manufacturing of composites" for one session during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Chandra Sekar Yerramalli
2.	Bank account number	2724118000025
3.	Bank name	Canara bank
4.	Bank branch address	I I T POWAI BRANCH,, BANK & CAFETERIA BUILDING,, OPP.KRESIT, I I T POWAI, State: MAHARASHTRA
5.	Branch IFSC code	CNRB0002724
6.	Mobile number	9819768104
7.	PAN	AAFPY6145D

Signature: 

Name: Chandra S Yerramalli

Designation: Asst. Professor

Affiliation: IIT Bombay



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Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Dr. Guruprasad Rao (GURUPRASAD KUPPU RAO)
2.	Bank account number	108010100065344
3.	Bank name	Axis Bank Ltd
4.	Bank branch address	Mulund West, Mumbai.
5.	Branch IFSC code	UTIB0000108
6.	Mobile number	9930069776
7.	PAN	ABDPG50A3R

Signature: 

Name: Guruprasad Rao

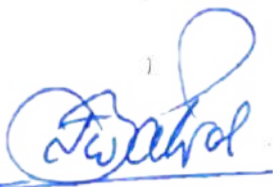
Designation: Director - Mentor

Affiliation:

Imagination India  
Pvt Ltd,  
Mumbai.


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Received a sum of Rs. 3,000/- (Rupees three thousands only) on account of Honorarium for working as a Lab attendant during AICTE Sponsored online Short Term Training Program on "Composites: Fracture Toughness, NDE & Failure Analysis" Organised by the Department of Mechanical Engineering, Pillai HOC College of Engineering & Technology, Rasayani during 17 November to 22 November 2020.

Below mentioned are details of Bank Account and PAN

S.No.	Item	Details
1.	Name of account holder	Mr. Sunilsing Rajput
2.	Bank account number	52142180003781
3.	Bank name	Canara Bank
4.	Bank branch address	Khaire, Patalganga
5.	Branch IFSC code	CNRB0000033
6.	Mobile number	7276222267
7.	PAN	

Signature: 

Name: Sunilsing Rajput

Affiliation: PHCET, Rasayani



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Sr. No	Name	Department
1	Mohammad Affan Noor Ahmed Sayyed	Mechanical Engineering
2	Jeevan Vishwanath Patil	Mechanical Engineering
3	Hemant Rajesh Karge	Mechanical Engineering
4	Ninad Satish Mistri	Automobile Engineering
5	Sahil Devendra Singh	Mechanical Engineering
6	Navil Dashrath Rao	Automobile Engineering
7	Hritik Gokuldas mhatre	Mechanical Engineering
8	Rishi Habbu	Mechanical Engineering
9	Manish Thale	Mechanical Engineering
10	Devu Rishab D P Babu	Mechanical Engineering
11	Saurabh Nandkumar Kuthe	Mechanical Engineering
12	Adarsh Rajeev Mumbuveetil	Mechanical Engineering
13	Patil Kunal Niwas	Mechanical Engineering
14	Saish Prakash More	Mechanical Engineering
15	Amitkumar More	Mechanical Engineering
16	Tanmay Janardan Gawand	Mechanical Engineering
17	Tanmay Sunil Salanke	Mechanical Engineering
18	Taranpreet Singh Saini	Mechanical Engineering
19	Shubham Maurya	Mechanical Engineering
20	Shubham Dabholkar	Mechanical Engineering
21	Shreyash Jaiswal	Automobile Engineering
22	Adib Shaikh	Automobile Engineering
23	Omkar Gharat	Mechanical Engineering
24	Nitin Golap	Automobile Engineering
25	Vaibhav Bhagat	Automobile Engineering

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**Department of Electronics and Telecommunication Engineering**

**Details of IIT Spoken Tutorials A.Y. 2018-19**

**Courses: 1. Python Programming**

**2. Arduino**



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 Department of Electronics and Telecommunication Engineering  
**IIT Spoken Tutorial Registration**

SR No	First Name	Last Name	Email ID	Class	Spoken Tutorial
1	Akash	Patil	akashmp12et@student.mes.ac.in	BE Extc	Python
2	Shivam	Pandey	shivamp12et@student.mes.ac.in	BE Extc	Python
3	Vipul	Rahate	rahatevipul14et@student.mes.ac.in	BE Extc	Python
4	Aniket	Patil	patilaniket16et@student.mes.ac.in	BE Extc	Python
5	Shruti	Potdar	shrutipotdar97@gmail.com	BE Extc	Python
6	Megha	Pol	polmeni15et@student.mes.ac.in	BE Extc	Python
7	Anuja	Joshi	anujajo1997@gmail.com	BE Extc	Python
8	Shruti	Bagave	shrutibagave.kitty@gmail.com	BE Extc	Python
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Department Coordinator  
IIT Spoken Tutorial

*T. D. Patil*  
Head of the Department

*T. D. Patil*

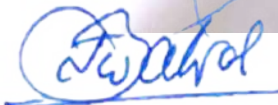
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Mahatma Education Society's  
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 Department of Electronics and Telecommunication Engineering  
**IIT Spoken Tutorial Registration**


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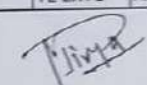


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***Geoprocessing using Python: July 22 – July 26,2019***

This online course will cover following topics related to geoprocessing using python programming language.

- Overview of python programming language.
- Integrated Development Environment (IDE): Anaconda.
- Data types: Basic and Compound
- Programming concepts: Iteration/Conditionals/ Recursion/Functions/File handling and External Libraries usage
- Open-Source geospatial libraries like GDAL, Geopandas
- Vector data handling.
- Raster data handling.

No of students participated: 56

**IRS Outreach Program**  
**49<sup>th</sup> Outreach Course**  
**Geoprocessing using Python**  
**July 22-26, 2019**

**Course Schedule:**

<b>Date/Time</b>	<b>Topic</b>	<b>Resource Person</b>
22.07.2019 1600 hrs – 1730 hrs	Overview of GIS and Geoprocessing, Basics of Python and Introduction to IDE (Anaconda)	Mr. Kamal Pandey
23.07.2019 1600 hrs – 1730 hrs	Introduction to external libraries in Python (Numpy, Matplotlib)	Mr. Kamal Pandey
24.07.2019 1600 hrs – 1730 hrs	Geospatial Vector data handling and analysis using python	Mr. Prasun Kumar Gupta
25.07.2019 1600 hrs – 1730 hrs	Geospatial Raster data handling and analysis using python	Mr. Ravi Bhandari
26.07.2019 1600 hrs – 1700 hrs	Plugin Development for QGIS using python	Mr. Prasun Kumar Gupta
26.07.2019 1700 hrs – 1730 hrs	Panel Discussion and Interactive session	Mr. Prasun Kumar Gupta Mr. Ravi Bhandari and Mr. Kamal Pandey



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**RS & GIS in Urban & Regional Planning: 09 December – 20 December , 2019**

The Indian cities are experiencing rapid growth with share of country's urban population increasing from 27% in 2001 to 32% in 2011. Majority of this growth has taken place in an unplanned and haphazard manner, the ill-effects of which are manifested in the form of poor quality of urban life. In order to ensure a planned development, the Govt. of India has launched the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) Mission, Smart city mission which place increased emphasis on application of remote sensing and GIS in urban planning and master plan formulation

Application of Remote sensing and GIS in urban and regional planning

- ♣ Urban infrastructure
- ♣ Urban disasters
- ♣ Urban sprawl studies
- ♣ Urban micro climate studies
- ♣ Urban Heritage studies
- ♣ 3D city modelling
- ♣ Urban green space
- ♣ Smart city and AMRUT: Mission guidelines

No of students participated : 3

S.No.	Date	Day	Lecture / Demonstration	Faculty
1.	09.12.2019	Monday	Remote Sensing Overview and Earth Observation Data for Urban Planning	PK
2.	10.12.2019	Tuesday	Concepts of Base Maps and Cadastral Mapping	KG
3.	11.12.2019	Wednesday	Assessment of Urban Green Spaces	KG
4.	12.12.2019	Thursday	Urban Sprawl and Growth Modeling	SM
5.	13.12.2019	Friday	Urban Seismic Risk Assessment	SM
6.	14.12.2019	Saturday		
7.	15.12.2019	Sunday		
8.	16.12.2019	Monday	3D City Modeling for Urban Planning	KG
9.	17.12.2019	Tuesday	Crowd-sourcing and Mobile Apps for Citizen-centric services	KP
10.	18.12.2019	Wednesday	Close Range Photogrammetry for Urban Heritage Studies	PST
11.	19.12.2019	Thursday	Urban Flood Risk Assessment	PK
12.	20.12.2019	Friday	Panel discussion	

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***Geo-processing and Visualization on Web Platform January 27- February 07, 2020***

Today large amount of satellite imagery and geospatial data collected from different sources is available at free of cost. Satellite imagery combined with power of Geographic information System can be a great tool for supporting environmental management, disasters, global climate change, natural resources, wildlife, land cover and many other applications. Processing this vast amount of data in time and space efficient manner and deriving useful information and knowledge from data is one of the most challenging aspect of geospatial technology

- ♣ Overview of GIS and different geospatial data types
- ♣ Overview to Python programming using
- ♣ Introduction anaconda and Jupyter notebook
- ♣ Raster data processing, resampling and analysis
- ♣ Vector data processing and analysis
- ♣ Geo-spatial data visualization on web
- ♣ Familiarization to various open source geospatial data processing libraries e.g. GDAL, Geopandas etc.

No of students participated :15

**Course Schedule:**

Date/Time	Topic	Resource Person
27-01-2020 1600 hrs – 1730 hrs	Fundamentals of Remote Sensing & Geographic Information System	Kamal Pandey
28-01-2020 1600 hrs – 1730 hrs	Introduction to Anaconda, Jupyter Notebook and Overview of Python	Ravi Bhandari
29-01-2020 1600 hrs – 1730 hrs	Functions in Python, Introduction to Numpy and Matplotlib	Ravi Bhandari
30-01-2020 1600 hrs – 1730 hrs	Reading and Writing Raster data using Python using GDAL	Ravi Bhandari
31-01-2020 1600 hrs – 1730 hrs	Raster Data processing(Mosaicking, Sub setting etc.) in python	Ravi Bhandari
03-02-2020 1600 hrs – 1730 hrs	Reading and Writing Vector data using GeoPandas	Ravi Bhandari
04-02-2020 1600 hrs – 1730 hrs	Vector Data Analysis using geopandas	Ravi Bhandari
05-02-2020 1600 hrs – 1730 hrs	Map Visualization using Folium	Ravi Bhandari
06-02-2020 1600 hrs – 1730 hrs	Introduction to Cartopy	Ravi Bhandari
07-02-2020 1630 hrs – 1730 hrs	Panel Discussion	Kamal Pandey, Ravi Bhandari, Dr. Harish Karnatak

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***Overview of Planetary Geosciences with special emphasis to the Moon and Mars: June-08- 12, 2020***

Planetary exploration has revealed several interesting facts related to the surface features on the planets and their satellites. The workshop on Planetary Geosciences is planned to provide an overview of planetary science, introduce students to the geology of the Moon and Mars and applications of various remote sensing techniques in analyzing their surface characteristics.

Overview of Planetary Geosciences with special emphasis to the Moon and Mars

- Planetary Geoscience: Issues and Challenges
- Geology of the Moon
- Remote Sensing of the Moon: Tools and Techniques
- Geology of the Mars • Remote Sensing of Mars: Tools and Techniques

No of students participated: 242

Sr. No.	Date	Time	Name of the topic	Faculty	Dept.
1	08 June, 2020	10: 30 - 11: 30 Hr	Planetary Geoscience: Issues and Challenges	Dr. Prakash Chauhan	GSD
2	09 June, 2020	10: 30 - 11: 30 Hr	Geology of the Moon	Dr. S.L. Chatteraj	
3	10 June, 2020	10: 30 - 11: 30 Hr	Remote Sensing of the Moon: Techniques and Findings	Dr. P.K. Champati Ray	
4	11 June, 2020	10: 30 - 11: 30 Hr	Geology of Mars	Dr. Mamta Chauhan	
		10: 30 - 11: 30 Hr	Remote Sensing of Mars	Dr. Mamta Chauhan	
5	12 June, 2020	11: 30 - 12: 30 Hr	Microwave remote sensing with emphasis on Indian Moon Missions	Dr. R.S. Chatterjee	



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S. No.	Topic	Date & Time	Resource Person
10	Development of Web GIS applications using Mashup architecture	01/07/2021 16:00- 17:00 hrs	Mr. Kamal Pandey
	Interactive Session	17:00-1730 hrs	
11	Web GIS applications for Governance	02/07/2021 16:00- 17:00 hrs	Dr. Harish C Karnatak
	Panel Discussion	17:00-1730 hrs	

**Registration link-** <https://elearning.iirs.gov.in/edusatregistration/student>

Course Coordinator  
IIRS DLP Program

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भारत सरकार Government of India  
अंतरिक्ष विभाग Department of Space  
भारतीय अंतरिक्ष अनुसंधान संगठन Indian Space Research Organisation  
भारतीय सूदूर संवेदन संस्थान, देहरादून Indian Institute of Remote Sensing, Dehradun

Special "online" course on  
GIS for Supply Chain Management

April 26-30, 2021

**SCHEDULE**

Date	Time (hrs)	Lecture Description	Faculty
April 26, 2021 Monday	1530 - 1615	Inaugural session	
	1630 - 1715	Role of Geospatial technology in supply chain management	Dr. Sameer Saran
April 27, 2021 Tuesday	1530 - 1615	Use case of geospatial technology on supply chain management	Prasun Kumar Gupta
	1630 - 1715	Supply chain asset digitization using GIS	Kapil Oberai
April 28, 2021 Wednesday	1530 - 1615	GIS spatial analysis and non-spatial queries	Prabhakar Alok Verma
	1630 - 1715	GNSS and current advancements in GNSS technology	Dr. Ashutosh Srivastava
April 29, 2021 Thursday	1530 - 1615	GNSS and current advancements in GNSS technology	Dr. Ashutosh Srivastava
	1630 - 1715	Network analysis and algorithms	Ashutosh Kumar Jha
April 30, 2021 Friday	1530 - 1615	Visualization and dissemination	K. Shiva Reddy
	1630 - 1715	Wrap up and Interaction Session	Dr. Sameer Saran & Team

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Updated on 04/10/2021



Govt. of India  
Department Space  
Indian Space Research Organization  
Indian Institute of Remote Sensing



**89<sup>th</sup> IIRS Outreach Programme**  
On  
**Course Schedule**

S. No.	Course Name	Module Name	From	To
1.	Basics of Geocomputation and Geoweb Services	Module- 4	25-10-2021	02-11-2021

**Module Name-** Basics of Geocomputation and Geoweb Services  
**Module/ Course Module/Course Coordinator:** Shri. Kamal Pandey  
**Course Duration:** 25 October -02 November 2021

**Timing:** 1600 hrs – 1730 hrs

Date	Day	Time	Topic	Speaker
25/10/2021	Monday	1600-1700hrs 1700-1730 hrs	Introduction to Geocomputation, Online GIS and Geo-web services Interactive Session	Dr. Harish C. Karnatak
26/10/2021	Tuesday	1600-1700hrs 1700-1730 hrs	Open Geodata Repositories & ISRO Geoweb Services for thematic applications Interactive Session	Mr. Kamal Pandey
27/10/2021	Wednesday	1600-1700hrs 1700-1730 hrs	Programming concepts for Geo-computation - Introduction to Python and R Interactive Session	Mr. Ravi Bhandari
28/10/2021	Thursdays	1600-1700hrs 1700-1730 hrs	Overview on concept of DBMS, RDBMS and SDBMS for geo-data handling Interactive Session	Mr. Dharmendra Kumar
29/10/2021	Friday	1530-1630hrs	Programming concepts for Geo-computation - Introduction to R Interactive Session	Mr. Kamal Pandey
30/10/2021	SAT			
31/10/2021	SUN			
01/11/2021	Monday	1530-1630hrs	Overview of WebGIS and application Interactive Session	Mr. Anoop Singh
02/11/2021	Tuesday	1600-1700hrs 1700-1730 hrs	Practical Demonstration on Introduction to Cloud based geospatial data processing Interactive Session	Mr. Ravi Bhandari

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**Course Name:** Remote Sensing & Digital Image Analysis  
**Course Coordinator:** Mrs. Minakshi Kumar

**Duration of the Course:** 28 August-22 September 2023

Date	Day	Time	Topic	Speaker
28-08-2023		1600-1730 hrs	Basic Principles of Remote Sensing	Dr. Manu Mehta
29-08-2023		1600-1730 hrs	Spectral Signatures of Different Land cover Features and Visual Image interpretation	Dr. Hina Pande
30-08-2023	<b>Raksha Bandhan</b>			
31-08-2023		1600-1730 hrs	Earth Observation Sensors and Platforms	Mr. Vinay Kumar
01-09-2023		Offline	RS and Image Interpretation Practical	Offline
02-09-2023			<b>SAT</b>	
03-09-2023			<b>SUN</b>	
04-09-2023		1600-1730 hrs	Digital Image Processing: Basic Concepts Rectification and Registration	Ms. Minakshi Kumar
05-09-2023		1600-1730 hrs	Image Enhancement techniques	Dr. Poonam S. Tiwari
06-09-2023		1600-1730 hrs	Image Classification Techniques	Dr. Anil Kumar
07-09-2023	<b>Holiday (Janamashtmi)</b>			
08-09-2023		1600-1730 hrs	Accuracy Assessment and Digital Change Detection	Dr. Anil Kumar
09-09-2023			<b>SAT</b>	
10-09-2023			<b>SUN</b>	
11-09-2023		1600-1730 hrs	Image Processing Hands-on Demo using QGIS	Mr. Prasun Kumar Gupta
12-09-2023		1600-1730 hrs	Thermal Remote Sensing	Dr. Shashi Kumar
13-09-2023		offline	Image Processing QGIS- hand-n Self Practice	Offline
14-09-2023		1600-1730 hrs	Hyperspectral Remote Sensing	Mr. Vinay Kumar
15-09-2023	<b>Break</b>			
16-09-2023			<b>SAT</b>	
17-09-2023			<b>SUN</b>	
18-09-2023		1600-1730 hrs	Open Source Data and International Geoportals for Satellite data download	Dr. Harish Karnatak
19-09-2023	<b>Vinayak Chaturthi</b>			
20-09-2023		1600-1730 hrs	Basics of Microwave Remote Sensing	Dr. Shashi Kumar
21-09-2023		1600-1730 hrs	Basics of SAR Data Processing	Mr. Ashish Joshi
22-09-2023		1600-1730 hrs	Basics of UAV Remote Sensing	Mrs. Shefali Agrawal

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**Module/Course Name- RS & GIS Applications**  
**Modules:/ Course Id-129**  
**Module/ Course Coordinator: Shri C.M. Bhatt**  
**Course Duration: 06 November- 17 November 2023**

Date	Day	Time	Topic	Speaker
06/11/23	Monday	1600-1730 hrs	RS & GIS Applications in Geological studies	Dr. R.S. Chatterjee
07/11/23	Tuesday	1600-1730 hrs	RS & GIS Applications in Disaster Mitigation & Management	Dr. Arijit Roy
08/11/23	Wednesday	1600-1730 hrs	RS & GIS Applications in Water Resources Management	Dr. Praveen Thakur
09/11/23	Thursday	1600-1730 hrs	RS & GIS Applications in Coastal Zone Management	Dr. D. Mitra
10/11/23	Friday	1600-1730 hrs	RS & GIS Applications in Atmospheric & Studies	Dr. Yogesh Kant
13/11/23	Monday	1600-1730 hrs	RS and GIS Applications in Soil Resource Management	Dr. Suresh Kumar
14/11/23	Tuesday	1600-1730 hrs	RS & GIS Applications in Crop Resource Assessment and Monitoring	Dr. N.R. Patel
15/11/23	Wednesday	1600-1730 hrs	RS & GIS Applications in Forestry and Ecology	Dr. Hitendra Padalia
16/11/23	Thursday	1600-1730 hrs	RS & GIS Application in Urban & Regional Planning	Dr Sandeep Maithani
17/11/23	Friday	1600-1730 hrs	Demonstration on ISRO's EO data hub Bhoonidih Portal	Sh C.M.Bhatt

**Lecture: 1600-1700hrs; Discussion: 1700-1730**



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Government of India  
Department of Space  
Indian Space Research Organisation  
Indian Institute of Remote Sensing  
Geoinformatics Department

Distance Learning Course  
Geographical Information System  
(Module 3 of IIRS Outreach Programme)

9-10-2023 to 27-10-2023

Time Table

Annexure - I

Date	Day	Time	Topic	Speaker
09/10/2023	Monday	1600-1730 hrs	Introduction to GIS	Dr. Vandita Srivastava
10/10/2023	Tuesday	1600-1730 hrs	Geographic Phenomena. Concepts and examples	Mr. Prasun Kumar Gupta
11/10/2023	Wednesday	1600-1730 hrs	Map Projection Concepts & Use in RS & GIS	Dr. Ashutosh
12/10/2023	Thursday	1600-1730 hrs	GIS Data Models (Spatial and Non spatial)	Mr. Ashutosh Kumar Jha
13/10/2023	Friday	1600-1730 hrs	Data Inputting and Editing in GIS	Mr. Prabhakar Alok Verma
14/10/2023	Saturday			
15/10/2023	Sunday			
16/10/2023	Monday	1600-1730 hrs	Spatial Analysis – Introduction	Dr. Vandita Srivastava
17/10/2023	Tuesday	1600-1730 hrs	Spatial Analysis (Vector & Raster)	Dr. Vandita Srivastava
18/10/2023	Wednesday	1600-1730 hrs	Open Source Software Technology & Tools	Mr. Prasun Kumar Gupta
19/10/2023	Thursday	1600-1730 hrs	Overview of Spatial Data Quality	Dr. Ashutosh
20/10/2023	Friday	1600-1730 hrs	Uncertainty in GIS and Error Propagation	Mr. Prabhakar Alok Verma
21/10/2023	Saturday			
22/10/2023	Sunday			
23/10/2023	Monday	1600-1730 hrs	Network Analysis	Mr. Ashutosh Kumar Jha
24/10/2023	Holiday (Dussehra)			
25/10/2023	Wednesday	1600-1730 hrs	Map Visualisation	Mr. Ashutosh Kumar Jha
26/10/2023	Thursday	1600-1730 hrs	Overview of Big Data Analytics	Mr. Kapil Oberai
27/10/2023	Friday	1600-1730 hrs	Recent Trends in Geoinformatics	Mr. Kapil Oberai

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***Advances in Remote Sensing and Geospatial Technologies for Disaster early warning, monitoring and mitigation: July 08- July 12, 2019***

In recent years there has been a shift in focus from “disaster recovery and response” to “risk management and mitigation,” and adoption of frontier technologies for disaster management. The application of geoinformatics has today become an integrated part of disaster management cycle. Geo informatic technologies include communication and information technologies coupled with geographic information system, global positioning system, and remote sensing. The availability of numerous types of data sets from various sources have greatly enhanced the capability to develop approaches that support rapid and efficient disaster response, including forecasting, early warning systems, and damage assessments. The real-time web applications, and distributed Web based GIS services, feature platforms for systematizing and sharing data, maps, applications, and analytics has further enhanced the application of geospatial technologies. Today internet has emerged as the only means which maximizes the potential of GIS data and software application for wider and easier access of geographical data to the planners and decisionmakers. These mechanisms are quite useful for the applications where real-time dynamic data is required for planning and decision-making such as disaster or emergency management.

The course is therefore of special interest for the professionals, researchers and students interested in learning utility of the advanced geospatial technologies in the context of geospatial technologies for disaster early warning, monitoring and mitigation.

No of students participated: 29

**"Advances in Remote Sensing and geospatial technologies for  
Disaster early warning, monitoring and mitigation"  
(July 8-12, 2019)**

Lectures	Topics	Faculty
08-07-2019	Geological hazards: early warning, early detection and monitoring	Dr. P. K. Champati Ray
09-07-2019	Forest fire: detection, monitoring and modelling for susceptibility analysis	Dr. Arijit Roy
10-07-2019	Global initiatives and emerging technological trends in disaster early warning and monitoring	Shri. C. M. Bhatt
11-07-2019	Role of UAVs in disaster monitoring & mitigation	Mrs. Shefali Agarwal
12-07-2019	Geo-web portals and disaster management	Dr. Harish C. Karnatak

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***Satellite Remote Sensing for Air pollution studies: August 05 -August 09,2019***

Air Pollutants like O<sub>3</sub>, fine particulate matter, NO<sub>2</sub>, black carbon, CO, ammonia, sulphur, trace gases and heavy metals originating from traffic, industrial and all natural and anthropogenic combustion process shown to have adverse effect on human health and environment. The degree of pollution is different across different cities. Air pollution is spatially highly dynamic and hence measurement from ground observation do not continuously provide the vigor and distribution. Satellite observation allows for a consistent retrieval of air pollution concentration independent of ground based stations, especially in sparsely built or rural environments and is able to provide information about the distribution of air pollutants on a regional , national or global level.

The course will provide an overview on the types and forms of air pollution, parametrization, monitoring from satellite observations, air quality observations and modelling.

No of students participated: 60

**47<sup>th</sup> IIRS Outreach Programme on 'Satellite Remote Sensing for Air Pollution Studies'**

**August 5-9, 2019**

Date and Time	Day	Lecture	Faculty
05.08.2019 1600-1730 hrs	Monday	Air Pollutants- Emission, transport and transformation	Dr. Shuchita Srivastava
06.08.2019 1600-1730 hrs	Tuesday	Atmospheric Aerosols- characterization, measurement, monitoring and impact on environment	Dr. Yogesh Kant
07.08.2019 1600-1730 hrs	Wednesday	Mineral dust aerosol- emission, transport and impact on weather & climate	Mrs. Charu Singh
08.08.2019 1600-1730 hrs	Thursday	Satellite observation and modelling of trace gases	Dr. Shuchita Srivastava
09.08.2019 1600-1730 hrs	Friday	Remote sensing observation of aerosols	Dr. Yogesh Kant
		Demo on air quality portal	Dr. Sanjeev K Singh
		Panel discussion	Course Faculty

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***Digital Photogrammetry based 3D Modelling: July 29 – August 02,2019***

In recent years it has been possible to collect vast quantities of 3D data using new Technology and to interpret and visualize the data in new ways. The third dimension has become an integral part of geospatial information. Different methods and techniques are adopted to acquire 3D data from space borne, utility in resource monitoring, facilities management, urban planning, defence and integral security and has not only revolutionized the surveying and mapping applications but it has emerged as a powerful tool for planning, monitoring and evaluation of developmental activities, informed decision making in governance. With the prevalence of smartphones and drones, photogrammetry is now widely present as an effective and cost-efficient method to easily recreate 3D models of large areas and specific object or buildings.

No of students participated: 38

**Forty-Eight IIRS Outreach Programme  
On  
Digital Photogrammetry based 3D modelling**

Sl No.	Date	Time	Topic	Faculty
1.	29 July 2019	1600-1730 hrs	Introducing Photogrammetric Concepts	Dr. Poonam S. Tiwari
2.	30 July 2019	1600-1730 hrs	Concepts of Stereophotogrammetry	Dr. Poonam S. Tiwari
3.	31 July 2019	1600-1730 hrs	Digital and Satellite Photogrammetry	Dr. Hina Pande
4.	01 August 2019	1600-1730 hrs	Close Range Photogrammetry	Dr. Hina Pande
5.	02 August 2019	1600-1730 hrs	DEM and its derivatives, Orthoimage generation	S. Raghavendra



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**Basics of RS, GIS & GNSS: 19 August – 22 November, 2019**

IIRS announces four courses commencing from August 19, 2019

- Remote Sensing and Digital Image Analysis (19/08/2019 to 13/09/2019): Basic Principles of Remote Sensing, Earth Observation Sensors and Platforms, Spectral Signature of different land cover features, Image interpretation, Thermal & Microwave Remote Sensing, Digital Image Processing: Basic Concepts of Rectification and Registration, Enhancement, Classification and accuracy assessment techniques.
- Global Navigation Satellite System (16/09/2019 to 27/09/2019): Introduction to GPS and GNSS, receivers, processing methods, errors and accuracy.
- Geographical Information System (30/09/2019 to 25/10/2019): GIS, databases, topology, spatial analysis and open-source software.
- RS and GIS Applications (29/10/2019 to 24/11/2019): Agriculture and Soil, Forestry and Ecology, Geoscience and Geo-hazards, Marine and Atmospheric Sciences, Urban and Regional Studies and Water Resources.

No of students participated: 186

Sl No.	Course Name	Module Name	From	To
1.	Basic of RS, GIS & GNSS	-	19-08-2019	22-11-2019
2.	Remote Sensing & Digital Image Analysis	Module-1	19 Aug	09 Sep
3.	Global Navigation Satellite System	Module-2	12 Sep	24 Sep
4.	Geographical Information System Module	Module-3	25 Sep	24 Oct
5.	RS & GIS Applications	Module-4	29 Oct	22 Nov



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**Remote Sensing and Digital Image Analysis: 19 August – 09 September, 2019**

The course includes Basic Principles of Remote Sensing, Earth Observation Sensors and Platforms, Spectral Signature of different land cover features, Image interpretation, Thermal & Microwave Remote Sensing, Digital Image Processing: Basic Concepts of Rectification and Registration, Enhancement, Classification and accuracy assessment techniques.

No of students participated: 163

Module I: Remote Sensing & Digital Image Analysis Module/ Course Coordinator: Mrs. Minakshi Kumar				
Date	Day	Time	Topic	Speaker
19 Aug 19	Monday	1530-1550 hrs	Course Inauguration	Dr. S.K.Srivastav
19 Aug 19	Monday	1600-1730 hrs	Basic Principles of Remote Sensing	Dr. Manu Mehta
20 Aug 19	Tuesday	1600-1730 hrs	Earth Observation Sensors and Platforms	Mr. Vinay Kumar
21 Aug 19	Wednesday	1600-1730 hrs	Thermal Remote Sensing	Dr. Yogesh Kant
22 Aug 19	Thursday	1600-1730 hrs	Spectral Signatures of Different Land cover Features and Visual Image interpretation	Dr. Hina Pande
23 Aug 19	Friday	1600-1730 hrs	Introduction to RS Data Products	Dr. Hina Pande
24 Aug 19	-	Saturday	-	
25 Aug 19	-	Sunday	-	
26 Aug 19	Monday	Offline	RS and Image Interpretation Practical	By University Coordinator
27 Aug 19	Tuesday	1600-1730 hrs	Digital Image Processing: Basic Concepts Rectification and Registration	Ms. Minakshi Kumar
28 Aug 19	Wednesday	1600-1730 hrs	Image Enhancement techniques- Contrast, Filtering Transformations	Ms. Minakshi Kumar
29 Aug 19	Thursday	1600-1730 hrs	Image Classification Techniques – Unsupervised, Supervised and Separability Analysis	Dr. Poonam S. Tiwari
30 Aug 19	Friday	1600-1730 hrs	Digital Change Detection and Accuracy Assessment	Dr. Poonam S. Tiwari
31 Aug 19		Saturday	-	
01 Sep 19		Sunday	-	
02 Sep 19		Monday	Vinayaka Chaturthi	
03 Sep 19	Tuesday	1600-1730 hrs	Hyperspectral Remote Sensing	Mr. Vinay Kumar
04 Sep 19	Wednesday	1630-1730 hrs	Image Processing hands on using ILWIS	Ms. Minakshi Kumar
05 Sep 19	Thursday	Offline - as per computer lab availability	Image Processing Hands-on and Practical Assignment	By University Coordinator
06 Sep 19	Friday		Digital Data Browsing	Dr. Poonam S. Tiwari
07 Sep 19	-	Saturday	-	
08 Sep 19	-	Sunday	-	
09 Sep 19	Wednesday	1630-1730 hrs	Microwave Remote Sensing	Dr. Shashi Kumar

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**Global Navigation Satellite System: 12 September -24September,2019**

The course includes Introduction to GPS and GNSS, receivers, processing methods, errors and accuracy.

No of students participated: 27

Module-2 Global Navigation Satellite System Module/ Course Coordinator: Shri Ashutosh Bhardwaj				
12 Sep 19	Thursday	1600-1730 hrs	Introduction to GPS and GNSS	Dr. Ashutosh Bhardwaj
13 Sep 19	Friday	1600-1730 hrs	GPS receivers, processing methods, errors and accuracy	Dr. Ashutosh Bhardwaj
14 Sep 19	-	-	<b>Saturday</b>	
15 Sep 19	-	-	<b>Sunday</b>	
16 Sep 19	Monday	1600-1730 hrs	Satellites based Augmentation systems & GPS Aided and GEO Augmented Navigation (GAGAN)	Dr. Ashutosh Bhardwaj
17 Sep 19	Tuesday	1600-1730 hrs	GPS signal characteristics, Data formats (broadcast, precise ephemeris)	Shri S. Raghavendra
18 Sep 19	Wednesday	1600-1730 hrs	Indian Regional Navigation Satellite System (IRNSS)	Dr. Ashutosh Bhardwaj & Shri Kamal Pandey
19 Sep 19	Thursday	1600-1730 hrs	DGPS demonstration (Pre-recorded)  Live query session	Offline  Shri S. Raghavendra
20 Sep 19	Friday	1600-1730 hrs	Advance GNSS processing	Shri Suresh Kannaujiya
21 Sep 19	-	-	<b>Saturday</b>	
22 Sep 19	-	-	<b>Sunday</b>	
23 Sep 19	Monday	1600-1730 hrs	Mobile Mapping	Dr. Harish Chandra Karnatak
24 Sep 19	Tuesday	1600-1730 hrs	Demonstration on Mobile mapping applications	Shri Kamal Pandey



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**Geographical Information System: 25 September – 24 October, 2019**

The course includes GIS, databases, topology, spatial analysis and open-source software

No of students participated: 42

<b>Course on Geographical Information System</b>				
<b>Module/ Course Coordinator: Shri Prasun Kumar Gupta</b>				
25 Sep 19	Wednesday	1600-1730 hrs	Introduction to GIS	Dr. Sameer Saran
26 Sep 19	Thursday	1600-1730 hrs	Geographic Phenomena, Concepts and examples	Shri Prasun Kumar Gupta
27 Sep 19	Friday	1600-1730 hrs	Data Inputting and Editing in GIS	Shri K. Shiva Reddy
28 Sep 19		Saturday		
29 Sep 19		Sunday		
30 Sep 19	Monday	1600-1730 hrs	GIS Data Models (Spatial and Non spatial)	Shri Ashutosh Kumar Jha
01 Oct 19	Tuesday	1600-1730 hrs	Map Projection Concepts & Use in RS & GIS	Dr. Ashutosh Srivastav
02 Oct 19			Mahatma Gandhi	
03 Oct 19	Thursday	1600-1730 hrs	Spatial Analysis - Introductory Concepts and Overview	Shri Prabhkar Alok Verma
04 Oct 19	Friday	1600-1730 hrs	Spatial Analysis - Functionality and Tools	Shri Kapil Oberai
05 Oct 19	<b>Saturday</b>	-		
06 Oct 19	<b>Sunday</b>	-		
07 Oct 19	Monday	-	Dussehra (Maha Navmi)	
08 Oct 19	Tuesday	-	Dussehra (Vijay Dashmi)	
09 Oct 19	Wednesday	-	Festival Break	
10 Oct 19	Thursday	-	Festival Break	
11 Oct 19	Friday	1600-1730 hrs	Demo of QGIS Software – Session 01: Adding GIS Data, Attribute table & Identity tool; Change symbology, Create map composites; Manage plugins, CRS & EPSG; Geo-referencing & Tie-points, RMSE & Rectification	Recorded Lecture
12 Oct 19	<b>Saturday</b>	-	-	-
13 Oct 19	<b>Sunday</b>	-	-	-
14 Oct 19	Monday	1600-1730 hrs	Demo of QGIS Software – Session 02: (Data Creation/Vector Generation) Digitization, Setting digitizing environment; Adding attributes, Editing digitized layer; Attribute Queries, Spatial Queries; Linking spatial & non-spatial data	Recorded Lecture
15 Oct 19	Tuesday	1600-1730 hrs	<b>Extra Lecture – DEMO on QGIS 03</b>	<b>Shri Prasun Kumar Gupta</b>
16 Oct 19	<b>Wednesday</b>	1530-1555hrs 1600-1730 hrs	Interactive Session of Demo of QGIS Software – Session 01 & Session 02 & 03 Open Source Software Technology & Tools	Shri Prasun Kumar Gupta
17 Oct 19	Thursday	1600-1730 hrs	Data Quality & Policies OGC, NSDI & GSDI initiatives. Discussion on Internet resources	Dr. Harish Karnatak
18 Oct 19	Friday	1600-1730 hrs	Advanced Geospatial Modeling	Shri Ashutosh Kumar Jha

19 Oct 19	<b>Saturday</b>	-	-	-
20 Oct 19	<b>Sunday</b>	-	-	-
21 Oct 19	Monday	1600-1730 hrs	Uncertainty in GIS and Error Propagation	Shri Hari Shankar
22 Oct 19	Tuesday	1600-1730 hrs	3D GIS, City Models and Applications	Dr. Sameer Saran
23 Oct 19	<b>Wednesday</b>	1600-1730 hrs	Recent Trends in Geoinformatics	Dr. Sameer Saran
24 Oct 19	Thursday	1600-1730 hrs	Panel Discussion	All Faculty
25 Oct 19	Friday	-	<b>Dipwali Festival Break</b>	-
26 Oct 19	<b>Saturday</b>	-	-	-
27 Oct 19	<b>Sunday</b>	-	Deepavali	-
28 Oct 19	Monday	1600-1730 hrs	Festival Break	-

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**RS and GIS Applications:29 October – 24 November,2019**

The course includes Agriculture and Soil, Forestry and Ecology, Geoscience and Geo-hazards, Marine and Atmospheric Sciences, Urban and Regional Studies and Water Resources.

No of students participated : 2

RS & GIS Applications				
Module/ Course Coordinator: Dr. C M Bhatt				
Date	Day	Time	Topic	Speaker
29 Oct 19	Tuesday	1600-1730 hrs	Applications of Remote Sensing & other Geospatial Technologies in Natural Resources Management, Development & Governance	Dr. S. K. Srivastav
30 Oct 19	Wednesday	1600-1730 hrs	Applications of Geo-web Services and mobile GIS in governance	Dr. Harish Karnatak
31 Oct 19	Thursday	1600-1730 hrs	Remote Sensing Applications in Agriculture- Crop Inventory & Yield Forecasting	Dr. N.R. Patel
01 Nov 19	Friday	1600-1730 hrs	RS & GIS for Coastal Zone Management	Dr. D. Mitra
02 Nov 19	Saturday	-	<b>Break</b>	
03 Nov 19	Sunday	-	<b>Break</b>	
04 Nov 19	Monday	1600-1730 hrs	Engineering Geology with emphasis on landslide studies	Dr. Shovan Chatteraj
05 Nov 19	Tuesday	1600-1730 hrs	Geology and Geomorphology	Dr. R.S. Chatterjee
06 Nov 19	Wednesday	1600-1730 hrs	<b>Break</b>	
07 Nov 19	Thursday	1600-1730 hrs	Space-enabled Products & Services for Disaster Management -Indian Initiatives	Dr. P.K.C.Ray
08 Nov 19	Friday	1600-1730 hrs	RS & GIS Application in Urban & Regional Planning	Shri. Pramod Kumar
09 Nov 19	Saturday			
10 Nov 19	Sunday			
11 Nov 19	Monday	1600-1730 hrs	<b>Break</b>	
12 Nov 19			<b>Break</b>	
13 Nov 19	Wednesday	1600-1730 hrs	Remote Sensing Application to Atmospheric & Marine Environment	Dr. A.K. Mishra
14 Nov 19	Thursday	1600-1730 hrs	RS & GIS Applications in Forestry and Ecology	Dr. Hitendra Padalia
15 Nov 19	Thursday	16.30 - 1730 hrs	RS applications for Planetary Studies	Dr. Prakash Chauhan
16 Nov 19	Saturday	-		
17 Nov 19	Sunday	-		
18 Nov 19	Monday	1600-1730 hrs	RS & GIS Applications to Water Resources Management	Dr. S.P. Aggarwal
19 Nov 19	Tuesday	1600-1730 hrs	Geospatial Technology for climate change studies	Dr. Arijit Roy
20 Nov 19	Wednesday	1630 – 1730 hrs	<b>Break</b>	
21 Nov 19	Thursday	1600-1730 hrs	Remote Sensing and GIS Applications in Soil Resource Assessment	Dr. Suresh Kumar
22 Nov 19	Friday	1600-1730 hrs	Panel Discussion Module-3	All speakers

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***Web GIS: Geo visualisation & Online Mapping: 25 November -29 November, 2019***

This online course is being conducted for highlighting the role of Web GIS for various spatial decision support systems. The main aim of this workshop is to showcase the importance of Geo visualization and Online Mapping in Web GIS environment for various decision support systems in developing strategic action plans

This online workshop will cover following topics related to crowd sourcing and participatory GIS

- Concept and Components of WebGIS.
- Architecture of WebGIS.
- Geovisualization in WebGIS: Bhuvan Geoportal Case Study
- Online Mapping in WebGIS: Open Street Map (OSM) case study.

No of students participated :2



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***Space Based Application of Geospatial Technologies for Disaster Risk Reduction: February 17- March 06, 2020***

Earth observation data and geospatial technology can be an important tool in addressing the Sendai Framework priorities. The workshop on Geo Spatial Technologies and Sendai framework for Disaster Risk Reduction (SFDRR) will provide an overview of Sendai framework and the role of geospatial technologies (RS & GIS) in implementing and addressing the priority areas outlined in SFDRR.

Overview of Geospatial Technology

- ♣ Basic concepts of remote sensing Earth Observation data
- ♣ Visual and Digital Image Analysis
- ♣ GIS concepts and analysis
- ♣ Concepts of GNSS
- ♣ Advanced Earth observation Sensors for Disaster Risk Reduction.

No of students participated :

S. No.	Date	Lecture	Faculty
1	24-02-2020	Basic concepts of remote sensing Earth Observation data	Dr. Manu Metha
2	25-02-2020	Visual and Digital Image Analysis	Ms. Hina Pande
3	26-02-2020	Concepts of GNSS	Dr. Ashutosh Bhardwaj
4	27-02-2020	GIS concepts and analysis	Mr. Hari Shankar
5	28-02-2020	Advanced Earth observation Sensors for Disaster Risk Reduction	Mr. Vinay Kumar
6	05-03-2020 1530 Hrs-1625 Hrs	Basic Concepts of DRR	Mr. C M Bhatt
8	06-03-2020 1530 Hrs-1625 Hrs	Space Based Communication & Navigation ( Yet to be confirmed)	Guest Lecture (SAC)
9	06-03-2020 1630Hrs to 1730 Hrs	Coastal Hazards	Dr. D . Mitra
10	09-03-2020	Drought Hazards	Dr. N R Patel
11	11-03-2020	Atmospheric & Pollution Hazards	Dr. Yogesh Kant
12	12-03-2020 1530 Hrs-1625 Hrs	Forest Fire Hazards	Dr. Arijit Roy
13	12-03-2020 1630Hrs to 1730 Hrs	Geological Hazards	Dr. P. K. Champati Ray
14	13-03-2020 1530 Hrs-1625 Hrs	Hydrological Hazards	Mr. C. M. Bhatt
15	13-03-2020 1630Hrs to 1730 Hrs	Web Portals & Data Services	Dr. Harish C. Kamatak

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### ***Basic Principles of Remote Sensing Technology :April 13- 25, 2020***

The COVID-19 pandemic is a global phenomenon that has affected all sectors in every country in the world, including higher education. Universities and colleges were forced to abruptly close and ongoing teaching of various courses was abandoned midstream. As a result, management of institutions of higher learning with thousands of stranded students have been left wondering how to fill the gap. In the current scenario IIRS has responded to the current crises by tapping into its existing distance learning program and launched a special course on Basic Principles of Remote Sensing, Technology.

The use of Remote Sensing, Geographical Information System, Global Navigation Satellite System and associated geospatial technologies is increasing rapidly, creating an urgent demand for trained manpower. The course will deal with the following topics:

- Basic Principles of Remote Sensing, Earth Observation Sensors and Platforms, Spectral Signature of different land cover features, Image interpretation, Digital Image Processing: Basic Concepts of Rectification and Registration, Enhancement, Classification etc.
- Introduction to GPS and GNSS, receivers, processing methods, errors and accuracy;
- Introduction to GIS Technology.

No of students participated: 179

Date	Day	Time	Topic	Speaker
13/04/2020	Monday	1100-1230 Hrs	Basic Principles of Remote Sensing	Dr. Manu Mehta
13/04/2020	Monday	1500-1630 Hrs	Earth Observation Sensors & Platforms	Mr. Vinay Kumar
14/04/2020	Tuesday	1100-1230 Hrs	Spectral Signatures Of Different Land Cover Features & Visual Image Interpretation	Dr. Hina Pande
14/04/2020	Tuesday	1500-1630 Hrs	Data Image Processing: Basic Concepts, Rectification & Registration	Mrs. Minakshi Kumar
15/04/2020	Wednesday	1100-1230 Hrs	Image Enhancement Techniques: Contrast, Filtering Transformations	Mrs. Minakshi Kumar
15/04/2020	Wednesday	1500-1630 Hrs	Image Classification Techniques: Unsupervised, Supervised & Separability Analysis	Dr. Poonam S Tiwari
16/04/2020	Thursday	1100-1230 Hrs	Digital Change Detection & Accuracy Assessment	Dr. Poonam S Tiwari
16/04/2020	Thursday	1500-1630 Hrs	Introduction To GPS & GNSS	Dr. Ashutosh Bhardwaj
17/04/2020	Friday	1100-1230 Hrs	GPS Receivers, Processing Methods, Errors & Accuracy	Dr. Ashutosh Bhardwaj
17/04/2020	Friday	1500-1630 Hrs	Satellite Based Augmentation Systems & GPS Aided & Geo Augmented Navigation (GAGAN)	Dr. Ashutosh Bhardwaj
18/04/2020	Saturday	1100-1230 Hrs	Indian Regional Navigation Satellite System (IRNSS)/NavIC	Dr. Ashutosh Bhardwaj & Shri Kamal Pandey
20/04/2020	Monday	1500-1630 Hrs	Mobile GIS – An overview	Mr. Kamel Pandey
20/04/2020	Monday	1100-1230 Hrs	Introduction To GIS	Dr. Saimar Saran
21/04/2020	Tuesday	1100-1230 Hrs	Geographic Phenomena, Concepts & Examples	Shri Prasan Kumar Gupta
21/04/2020	Tuesday	1500-1630 Hrs	Data Inputting & Editing in GIS	Shri Shiva K. Reddy
22/04/2020	Wednesday	1100-1230 Hrs	GIS Data Models (Spatial & Non – Spatial)	Shri Ashutosh Kumar Jha
22/04/2020	Wednesday	1500-1630 Hrs	Map Projection Concepts & Use In GIS & RS	Dr. Ashutosh Shrivastav

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***Basics of SAR Remote Sensing: May 26- May 30, 2020***

The advancement of earth observation has opened new avenues of research in the field of earth sciences. With the technological advancements in geo-information sciences, remote sensing has become an effective method for detection and investigation of various factors. The visible and infra-red regions are known as optical regions, and the microwave region (1mm - 1m) is considered as non-optical region. Systems operating in optical region are being used for several decades and therefore, are more advanced and widely employed. However, their use is limited by availability of sunlight and interference of the atmospheric conditions such as haze and cloud cover especially in the tropical regions. Therefore, the use of microwave or radar remote sensing is preferred in such areas. Radar imaging through Synthetic Aperture Radar (SAR) systems has revolutionized and expanded the technology of Microwave remote sensing especially in thematic applications using different techniques like SAR Polarimetry (PolSAR), SAR Interferometry (InSAR), Persistent Scatterer Interferometric Synthetic Aperture Radar (PSInSAR) and Polarimetric SAR Interferometry (PolInSAR). SAR systems in general helps in understanding glacier and ice movement to give better understanding on long term variation in climate, developing highly accurate and detailed elevation maps, flood and oil spill monitoring, land use and land cover change, soil moisture and forest biomass estimation, assessing the health of crops and forests and even in urban planning and development.

No of students participated : 191

Date & Time (hrs)	Days	Lecture Description/Faculty	Lecture Description/Faculty
26-05-2020 1130-1300	Tuesday	An Overview of SAR Remote Sensing ( <b>Lecture</b> )	Dr. Shashi Kumar
26-05-2020 1430-1600	Tuesday	Hands-on exercise on SAR Image Interpretation ( <b>Practical</b> )	Dr. Shashi Kumar
27-05-2020 1130-1300	Wednesday	SAR Systems and Image Acquisition Modes ( <b>Lecture</b> )	Dr. Shashi Kumar
28-05-2020 1130-1300	Thursday	SAR data processing and backscatter image generation ( <b>Lecture</b> )	Dr. Shashi Kumar
28-05-2020 1430-1600	Thursday	Radiometric and Geometric Corrections of SAR Data ( <b>Lecture</b> )	Shri Ashish Joshi
29-05-2020 1130-1300	Friday	Information Extraction from SAR data ( <b>Lecture</b> )	Dr. Shashi Kumar
30-05-2020 1100-1300	Saturday	Hands-on SAR data processing exercise ( <b>Practical</b> )	Dr. Shashi Kumar

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***Remote Sensing & GIS Technology and Applications” for University Teachers & Government Officials: June 13 - July 01, 2020***

The prime objective of this course is to train the faculty members in universities and their affiliated colleges in RS & GIS technology and their applications, so that they can further train the students. Besides that, the course would also help government officials develop an understanding of the subject and utilise the knowledge in their field of interest. The course would cover concepts and overview of Remote Sensing, Image Processing, GPS/GNSS, GIS technologies and their applications in various domains (viz. Agriculture & Soils, Coastal & Ocean Sciences, Forest Resources & Ecosystem Analysis, Geosciences, Urban & Regional Studies, Water Resources and Natural Hazards and Disaster Risk Management).

Date	Day	Time	Topic	Speaker
13/06/2020	Saturday	10:45-11:15 Hrs	Inauguration	
13/06/2020	Saturday	11:30-12:45 Hrs	Basic Principles of Remote Sensing	Dr. Manu Mehta
15/06/2020	Monday	10:00-11:15 Hrs	Earth Observation Sensors & Platforms	Mr. Vinay Kumar
15/06/2020	Monday	11:30-12:45 Hrs	Spectral Signatures Of Different Land Cover Features & Visual Image Interpretation	Dr. Hina Pande
16/06/2020	Tuesday	10:00-11:15 Hrs	Data Image Processing: Basic Concepts, Rectification & Registration	Mrs. Minakshi Kumar
16/06/2020	Tuesday	11:30-12:45 Hrs	Image Enhancement Techniques: Contrast, Filtering Transformations	Mrs. Minakshi Kumar
17/06/2020	Wednesday	10:00-11:15 Hrs	Image Classification Techniques: Unsupervised, Supervised & Separability Analysis	Dr. Poonam S Tiwari.
17/06/2020	Wednesday	11:30-12:45 Hrs	Digital Change Detection & Accuracy Assessment	Dr. Poonam S Tiwari.
18/06/2020	Thursday	10:00-11:15 Hrs	Introduction To GPS & GNSS	Dr. Ashutosh Bhardwaj
18/06/2020	Thursday	11:30-12:45 Hrs	GPS Receivers, Processing Methods, Errors & Accuracy	Dr. Ashutosh Bhardwaj
19/06/2020	Friday	10:00-11:15 Hrs	Satellite Based Augmentation Systems & GPS Aided & Geo Augmented Navigation (GAGAN)	Dr. Ashutosh Bhardwaj
19/06/2020	Friday	11:30-12:45 Hrs	Indian Regional Navigation Satellite System (IRNSS)/NavIC	Dr. Ashutosh Bhardwaj & Shri Kamal Pandey
20/06/2020	Saturday	10:00-11:15 Hrs	Introduction To GIS	Dr. Sameer Saran
20/06/2020	Saturday	11:30-12:45 Hrs	Geographic Phenomena, Concepts & Examples	Shri Prasun Kumar Gupta

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**Health GIS: Geoinformatics for COVID19: June 15 - June 19, 2020**

No of students participated: 149

Date and Day	Time (hrs)	Lecture Description	Faculty
June 15, 2020 Monday	1530 – 1615	Role of Geospatial technology in Health GIS; Use Case on COVID 19	Dr. Sameer Saran
	1635 – 1715	Public Health Surveillance System	Shri Koti Shiva Reddy
June 16, 2020 Tuesday	1530 – 1615	Role of Mobile GIS and Web GIS in COVID 19 Pandemic	Shri Kapil Oberai
	1635 – 1715	Cloud based Geo Processing for Public Health Application	Shri Prasun Kumar Gupta
June 17, 2020 Wednesday	1530 – 1615	Risk mapping of disease occurrence	Shri Prabhakar Alok Verma
	1635 – 1715	Cluster and outlier analysis	Shri Ashutosh Kumar Jha
June 18, 2020 Thursday	1530 – 1615	Exploratory Data Analysis	Shri Koti Shiva Reddy
	1635 – 1715	Dynamic Epidemiology Modeling	Dr. Priyanka Singh
June 19, 2020 Friday	1530 – 1615	Guest lecture	
	1635 – 1715	Interaction Session	Dr. Sameer Saran & Team



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**Indian Institute of Remote Sensing  
Dept of Space, Govt. of India  
4, Kalidas Road Dehradun**

**Revised Course Schedule**  
(Last Updated on May 13, 2021)

78<sup>th</sup> IIRS Outreach Program  
on  
“Geospatial Technology for Archaeological studies”

Session timing: 1600 to 1730 Hrs

Date	Topic	Faculty
17/05/2021	Geospatial Technology for Cultural Heritage Studies	Dr. Hina Pande
18/05/2021	Ground based Remote Sensing for archaeological/Heritage studies	Dr. Poonam S. Tiwari
19/05/2021	Geospatial Technology for documentation and damage detection of built Heritage	Dr.Poonam S.Tiwari & Dr. Hina Pande
20/05/2021	Microwave Remote Sensing for Archaeological Studies: Space and Ground based	Dr. Shashi Kumar
21/05/2021	Patterns in Past Settlements: Geospatial Analysis of imprints of Cultural Heritage on Landscapes	Dr. M.B.Rajani

Course Coordinator

IIRS Distance Learning Program



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## IIRS Outreach Programme

The IIRS outreach programme, which was started in 2007 with 12 universities/ institutions has now grown substantially to 1100. The beneficiaries of the programme may include:

- Central/ State/ Private Universities & Academic Institutions
- Central & State Government Departments
- ICAR Universities/Institutes Professionals
- Agriculturists
- Research Institutes
- Geospatial Industries
- NGOs

## Feedback Mechanism

IIRS has conducted workshops and sessions during IIRS User Interaction Meet to take feedback from participating institutions to improve the quality of future courses.



Feedback session during IIRS User Interaction Meet (IUIIM)-2020

## Awards of Appreciation

IIRS has received national awards for excellence in training for outreach and e-learning programme during 1<sup>st</sup> National Symposium on Excellence in Training conducted during April 11-12, 2015 in New Delhi by Department of Personnel & Training (DoPT), Govt. of India in collaboration with United Nations Development Programme (UNDP).



## About the Course

Natural forests and well-managed agroecosystems are major "sinks" of atmospheric carbon in Terrestrial Biosphere. Accurate quantification of carbon fluxes of forest and agroecosystems at local, regional and global scales is utmost important for understanding the feedback mechanism between the terrestrial biosphere and the atmosphere. Hitherto, a quantum of research works executed to ascertain the carbon status of vegetation/soil and advanced carbon accounting of natural and managed ecosystems on seasonal/annual scale over varied climate regimes.

In present context, Earth Observation (EO) satellites operated in optical/thermal and microwave domains with frequent revisit and improved spatial resolution providing periodic monitoring of vegetation biomass carbon and ecosystem scale carbon exchanges (GPP/NEP) with ground validation using covariance (EC) towers for informed decision making on carbon management, region policy on carbon emission targets and input to national climate change programs. Furthermore, availability of new airborne sensors, unmanned aerial vehicle (UAV), sun-induced fluorescence sensors supported with in-situ observation and process based models are providing newer dimensions to precise carbon cycle studies and geospatial carbon accounting using earth observation sensors.

## Course Contents

- Role of EO in Carbon Cycle Assessment : Status, Challenges and Issues
- Measuring Ecosystem Carbon Exchange : Observational network, Instrumentation and advanced sensors
- Up-scaling and Modeling of Carbon fluxes: Remote Sensing and Process-based modeling
- Earth Observation and its role in Vegetation Carbon Pool Assessment
- Earth Observation and its role in Soil Organic Carbon (SOC) Assessment

## About IIRS

Indian Institute of Remote Sensing (IIRS) under Indian Space Research Organisation (ISRO), Department of Space, Govt. of India is a premier Training and Educational Institute set up for developing trained professionals in the field of Remote Sensing, Geoinformatics and GNSS Technology for Natural Resources, Environmental and Disaster Management. Formerly known as Indian Photo-interpretation Institute (IPI), founded in 1966, the Institute boasts to be the first of its kind in entire South-East Asia. While nurturing its primary endeavour to build capacity among the user community by training mid-career professionals, the Institute has enhanced its capability and evolved many training and education programmes that are tuned to meet the requirements of various target groups, ranging from fresh graduates to policy makers including academia.

IIRS also conducts e-learning programme on Remote Sensing and Geo-information Science (<http://elearning.iirs.gov.in>).

## Contact Details

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Course Director

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Dr. Poonam S Tiwari

Programme Coordinator

IIRS Outreach Programme

Tel: 0135-2524334

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IIRS DLP Team

Mr. Janardan Vishwakarma

&

Mr. Ashok Ghildiyal

Tel: 0135-2524130

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Indian Institute of Remote Sensing,  
Indian Space Research Organisation  
Department of Space, Govt. of India,  
4-Kalidas Road, Dehradun  
Email: [dip@iirs.gov.in](mailto:dip@iirs.gov.in)

## IIRS Outreach Programme



## Earth Observation for Carbon Cycle Studies

June 21 – 25, 2021



## Organised by

Indian Institute of Remote Sensing  
Indian Space Research Organisation  
Department of Space, Govt. of India  
Dehradun  
[www.iirs.gov.in](http://www.iirs.gov.in)

## Target Participants

- This course is designed for professionals from Central / State Govt. / Private Organizations / NGO/ students & researchers engaged in Earth observations aspects, carbon modeling, Carbon assessment using RS & GIS .
- The course participants have to be duly sponsored by their university/ institution and application should be forwarded through coordinators from respective Organisations/ Centres. Users attending programmes under CEC-UGC / CIET / other networks can also participate. Institutions on high speed National Knowledge Network (NKN) can also participate using A-VIEW software.

## Course Study Material

Course study materials like lecture slides, video recorded lectures, open source software & handouts of demonstrations, etc. will be made available through e-class. Video lectures will also be uploaded on e-class (<https://www.eclass.iirs.gov.in/login>).

## Course Fee

There is no course fee for attending this programme.

## Course Registration

Course updates and other details will be available on URL- <http://www.iirs.gov.in/Edusat-News/>. All the participants has to register online through registration page available on above web page.

## Course Funding & Technical Support

The programme is sponsored by National Natural Resources Management System – Standing Committee on Training and Education (SC-T), Indian Space Research Organisation, Department of Space, Government of India.

## Programme Reception

- Individuals can attend the course live via any web browser through the eclass portal of IIRS Dehradun i.e. <https://eclass.iirs.gov.in>
- The participants can also attend the live workshop via the YouTube channel of IIRS i.e. <https://www.youtube.com/user/edusat2004>
- The content of the workshop will be available offline after 24 hours in the eclass portal.

## Award of Certificate

- All the participants who attend 70% sessions of the course live via eclass portal.
- The participants who attend the course sessions via IIRS youtube channel should mark their attendance via offline session available after 24 hrs.

## Pre-requisites:

- Understanding of Basic concepts of Remote Sensing and GIS

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Last updated on June 21, 2021

**Overview of Web GIS Technology**  
**Target Participants- Open for all**  
Course Duration- **June 21, 2021 to July 02, 2021**

**Tentative Schedule**

S. No.	Topic	Date & Time	Resource Person
1	Inaugural Session	21/06/2021 15:30 hrs	IIRS
2	Introduction to Client-server systems, Internet and Web GIS technology  Interactive Session	21/06/2021 16:00- 17:00 hrs  17:00-1730 hrs	Dr. Harish C Karnatak
3	Introduction to HTML and Javascript  Interactive Session	22/06/2021 16:00- 17:00 hrs  17:00-1730 hrs	Mr. Anoop Kumar Singh / Mr. Ankit
4	Introduction of Database Management System- SQL Queries and Data visualization including PostgreSQL and POSTGIS  Interactive Session	23/06/2021 16:00- 17:00 hrs  17:00-1730 hrs	Mr. Dharmendra Kumar
5	Introduction to publicly available webGIS platform for Geodata Processing  Interactive Session	24/06/2021 16:00- 17:00 hrs  17:00-1730 hrs	Mr. Ravi Bhandari
6	OGC We Services and Data publishing using Geoserver  Interactive Session	25/06/2021 16:00- 17:00 hrs  17:00-1730 hrs	Mr. Kamal Pandey
7	Hand-on Experiment on Geoserver-SLD, WMS, WFS, WCS and other Geo-web services.  Interactive Session	28/06/2021 16:00- 17:00 hrs  17:00-1730 hrs	Mr. Kamal Pandey
8	Web Mapping APIs – OpenLayers  Interactive Session	29/06/2021 16:00- 17:00 hrs  17:00-1730 hrs	Mr. Anoop Kumar Singh
9	Web Mapping APIs – Leaflet  Interactive Session	30/06/2021 16:00- 17:00 hrs  17:00-1730 hrs	Mr. Kamal Pandey



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Schedule Updated on 14<sup>th</sup> September 2021



Govt. of India  
Department Space  
Indian Space Research Organization  
Indian Institute of Remote Sensing



**Eighty Fifth IIRS Outreach Programme**  
On  
Basic of RS, GIS & GNSS

**Course Schedule**

S. No.	Course Name	Module Name	From	To
1.	Basic of RS, GIS & GNSS	Complete Basic Course	16-08-2021	26-11-2021
2.	Remote Sensing & Digital Image Analysis	Module-1	16-08-2021	10-09-2021
3.	Global Navigation Satellite System	Module-2	13-09-2021	24-09-2021
4.	Geographical Information System Module	Module-3	27-09-2021	22-10-2021
5.	Basics of Geocomputation and Geoweb Services	Module- 4	25-10-2021	02-11-2021
6.	RS & GIS Applications	Module-5	08-11-2021	26-11-2021

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**Course Name: Remote Sensing & Digital Image Analysis**  
**Course Coordinator: Mrs. Minakshi Kumar**

**Duration of the Course: 16 August-10 September 2021**

Date	Day	Time	Topic	Speaker
16/08/2021	Monday	1530-1600 hrs	Course Inauguration	
		1610-1700 hrs	Inaugural Lecture <b>ISROs Earth Observation missions for Societal benefits</b>	Dr. Prakash Chauhan
17/08/2021	Tuesday	1600-1730 hrs	Basic Principles of Remote Sensing	Ms. Manu Mehta
18/08/2021	Wednesday	1600-1730 hrs	Earth Observation Sensors and Platforms	Mr. Vinay Kumar
19/08/2021	Thursday	1600-1730 hrs	Spectral Signatures of Different Land cover Features and Visual Image interpretation	Dr. Hina Pande
20/08/2021	Friday	-	<b>Holiday - Muharram</b>	-
23/08/2021	Monday	1600-1730 hrs	Digital Image Processing: Basic Concepts Rectification and Registration	Ms. Minakshi Kumar
24/08/2021	Tuesday	Offline	RS and Image Interpretation Practical	
24/08/2021	Tuesday	1600-1730 hrs	Image Enhancement techniques	Dr. Poonam S. Tiwari
25/08/2021	Wednesday	1600-1730 hrs	Image Classification Techniques	Dr. Anil Kumar
26/08/2021	Thursday	1600-1730 hrs	Advanced Classifiers and Accuracy Assessment	Dr. Anil Kumar
27/08/2021	Friday	1600-1730 hrs	Thermal Remote Sensing	Dr. Yogesh Kant
<b>30/08/2021</b>	<b>Monday</b>	<b>Holiday - Janmashtami</b>		
31/08/2021	Tuesday	1600-1730 hrs	Hyperspectral Remote Sensing	Mr. Vinay Kumar
01/09/2021	Wednesday	1600-1730 hrs	Image Processing Hands-on Demo using QGIS	Mr. Prasun Gupta
02/09/2021	Thursday	1600-1730 hrs	Google Earth Engine API: Introduction and case studies	Ms. Supriya Sharma
03/09/2021	Friday	1600-1730 hrs	Open Source Data and International Geoportals for Satellite data download	Dr. Harish Karnatak
06/09/2021	Monday	1600-1730 hrs	Overview of Microwave Remote Sensing	Dr. Shashi Kumar
07/09/2021	Tuesday	1600-1730 hrs	Overview of SAR Data Processing	Mr. Ashish Joshi
08/09/2021	Wednesday	1600-1730 hrs	Overview of UAV Remote Sensing	Mrs. Shefali Agrawal
09/09/2021	Thursday	1600-1730 hrs	Overview of LIDAR Remote Sensing	Dr. Hina Pande
10/09/2021	Friday	<b>1430- 1730 Query Session / Feedback / Valedictory</b>		

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**Module- 2: Global Navigation Satellite System**  
**Module/ Course Coordinator: Dr. Ashutosh Bhardwaj**

**Course Duration: 13 September-24 September 2021**

Date	Day	Time	Topic	Speaker
13/09/2021	Monday	1600-1700 hrs	Introduction to GPS and GNSS	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
14/09/2021	Tuesday	1600-1700 hrs	GPS receivers, processing methods, errors and accuracy	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
15/09/2021	Wednesday	No Lecture		
16/09/2021	Thursday	1600-1700 hrs	Satellites based Augmentation systems & GPS Aided and GEO Augmented Navigation (GAGAN)	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
17/09/2021	Friday	1600-1700 hrs	GPS signal characteristics, Data formats (broadcast, precise ephemeris)	Dr. Ashutosh Bhardwaj & Shri Ashish Joshi
		1700-1730 hrs	Interactive Session	
<b>18/09/2021</b>	<b>SATURDAY</b>			
<b>19/09/2021</b>	<b>SUNDAY</b>			
20/09/2021	Monday	1600-1700 hrs	Indian Regional Navigation Satellite System (IRNSS)	Dr. Ashutosh Bhardwaj & Shri Kamal Pandey
		1700-1730 hrs	Interactive Session	
21/09/2021	Tuesday	1600-1700 hrs	DGPS demonstration (Pre-recorded followed by live query session)	O ffline
		1700-1730 hrs	Interactive Session	Dr. Ashutosh Bhardwaj
22/09/2021	Wednesday			
23/09/2021	Thursday	1600-1700 hrs	Advance GNSS processing	Shri Suresh Kannaujiya
		1700-1730 hrs	Interactive Session	
24/09/2021	Friday		<b>Panel Discussion</b>	

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**Module- 3: Geographical Information System**  
**Module/ Course Module/Course Coordinator:** Shri. Prabakar Alok Verma  
**Course Duration:** 27 September-22 October 2021

Date	Day	Time	Topic	Speaker
27/09/2021	Monday	1600-1730 hrs	Introduction to GIS	Dr. Sameer Saran
28/09/2021	Tuesday	1600-1730 hrs	Geographic Phenomena, Concepts and examples	Mr. Prasun Kumar Gupta
29/09/2021	Wednesday	1600-1730 hrs	GIS Data Models (Spatial and Non spatial)	Mr. Ashutosh Kumar Jha
30/9/2021	Thursday	1600-1730 hrs	Data Inputting and Editing in GIS	Mr. K. Shiva Reddy
01/10/2021	Friday	1600-1730 hrs	Spatial Analysis – Introduction	Mr. Prabhakar Alok Verma
02/10/2021	Saturday			
03/10/2021	Sunday			
05/10/2021	Tuesday	1600-1730 hrs	Map Projection Concepts & Use in RS & GIS	Dr. Ashutosh
06/10/2021	Wednesday	1600-1730 hrs	Spatial Analysis (Vector & Raster)	Mr. Kapil Oberai
07/10/2021	Thursday	1600-1730 hrs	Open Source Software Technology & Tools	Mr. Prasun Kumar Gupta
08/10/2021	Friday	1600-1730 hrs	Overview of Spatial Data Quality	Mr. Prabhakar Alok Verma
09/10/2021	Saturday			
10/10/2021	Sunday			
11/10/2021	Monday	1600-1730 hrs	Uncertainty in GIS and Error Propagation	Mr. Prabhakar Alok Verma
12/10/2021	Tuesday	1600-1730 hrs	Map visualisation	Mr. Ashutosh Kumar Jha
13/10/2021	Wednesday	1600-1730 hrs	Demo visualisation	Mr. Ashutosh Kumar Jha
14/10/2021	Thursday	1600-1730 hrs	Network Analysis	Mr. Ashutosh Kumar Jha
15/10/2021	Friday	Holiday (Dussehra)		
16/10/2021	Saturday			
17/10/2021	Sunday			
18/10/2021	Monday	1600-1730 hrs	Overview of Machine Learning for GIS	Mr. Prabhakar Alok Verma
19/10/2021	Tuesday	Holiday (Milad-Un-Nabi)		
20/10/2021	Wednesday	1600-1730 hrs	Overview of Big Data Analytics	Mr. Kapil Oberai
21/10/2021	Thursday	1600-1730 hrs	Recent Trends in Geoinformatics	Dr. Sameer Saran
22/10/2021	Friday	1600-1730 hrs	Panel Discussion	

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**Module Name-4 Basics of Geocomputation and Geoweb Services**

**Module/ Course Module/Course Coordinator:** Shri. Kamal Pandey

Course Duration: 25 October -02 November 2021

**Note:** Detailed schedule of the Course will be updated soon.

**Module/Course Name-5 : RS & GIS Applications**

**Module/ Course Coordinator:** Shri C.M. Bhatt

Course Duration: 08 November- 26 November 2021

**Note:** Detailed schedule of the Course will be updated soon.

**Note:** Details about the course, examination and latest schedule will be updated on below link;

<https://www.iirs.gov.in/> or <https://www.iirs.gov.in/EDUSAT-News>



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Last Update: 18<sup>th</sup> August 2021



Govt. of India  
Department Space  
Indian Space Research Organization  
Indian Institute of Remote Sensing



### Eighty Sixth IIRS Outreach Programme

On

Remote Sensing & Digital Image Analysis

### Course Schedule

S. No.	Course Name	Module Name	Module Coordinator	From	To
1.	Remote Sensing & Digital Image Analysis	Module-1	Mrs. Minakshi Kumar	16-08-2021	10-09-2021

Duration of the Course: 16 August-10 September, 2021

Date	Day	Time	Topic	Speaker
16/08/2021	Monday	1530-1600 hrs	Course Inauguration	
		1610-1700 hrs	Inaugural Lecture ISROs Earth Observation missions for Societal benefits	Dr. Prakash Chauhan
17/08/2021	Tuesday	1600-1730 hrs	Basic Principles of Remote Sensing	Ms. Manu Mehta
18/08/2021	Wednesday	1600-1730 hrs	Earth Observation Sensors and Platforms	Mr. Vinay Kumar
19/08/2021	Thursday	1600-1730 hrs	Spectral Signatures of Different Land cover Features and Visual Image interpretation	Dr. Hina Pande
20/08/2021	Friday	-	Holiday - Muharram	-
23/08/2021	Monday	1600-1730 hrs	Digital Image Processing: Basic Concepts Rectification and Registration	Ms. Minakshi Kumar
24/08/2021	Tuesday	Offline	RS and Image Interpretation Practical	
24/08/2021	Tuesday	1600-1730 hrs	Image Enhancement techniques	Dr. Poonam S. Tiwari
25/08/2021	Wednesday	1600-1730 hrs	Image Classification Techniques	Dr. Anil Kumar
26/08/2021	Thursday	1600-1730 hrs	Advanced Classifiers and Accuracy Assessment	Dr. Anil Kumar

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Date	Day	Time	Topic	Speaker
27/08/2021	Friday	1600-1730 hrs	Thermal Remote Sensing	Dr. Yogesh Kant
<b>30/08/2021</b>	<b>Monday</b>	<b>Holiday - Janmashtami</b>		
31/08/2021	Tuesday	1600-1730 hrs	Hyperspectral Remote Sensing	Mr. Vinay Kumar
01/09/2021	Wednesday	1600-1730 hrs	Image Processing Hands-on Demo using QGIS	Mr. Prasun Gupta
02/09/2021	Thursday	1600-1730 hrs	Google Earth Engine API: Introduction and case studies	Ms. Supriya Sharma
03/09/2021	Friday	1600-1730 hrs	Open Source Data and International Geoportals for Satellite data download	Dr. Harish Karnatak
06/09/2021	Monday	1600-1730 hrs	Overview of Microwave Remote Sensing	Dr. Shashi Kumar
07/09/2021	Tuesday	1600-1730 hrs	Overview of SAR Data Processing	Mr. Ashish Joshi
08/09/2021	Wednesday	1600-1730 hrs	Overview of UAV Remote Sensing	Mrs. Shefali Agrawal
09/09/2021	Thursday	1600-1730 hrs	Overview of LIDAR Remote Sensing	Dr. Hina Pande
10/09/2021	Friday	<b>1430- 1730 Query Session / Feedback / Valedictory</b>		

Note: Details about the course, examination and latest schedule will be updated on below link;

<https://www.iirs.gov.in/>

OR

<https://www.iirs.gov.in/EDUSAT-News>

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Course – 84<sup>th</sup> IIRS Outreach Programme  
“Geospatial Modelling for Watershed Management”  
"भू-स्थानिक मॉडलिंग द्वारा वाटरशेड प्रबंधन"

Last updated on 02 Aug 2021

Duration of the Course: 02 August – 06 August 2021 Time : 4.00 – 5.00 PM

Date	Speaker	Topic
02 August, 2021	Dr. Dipanwita Haldar	<b>Introduction to the Course</b>
	Dr. Suresh Kumar	Overview of RS and GIS applications in watershed management
03 August, 2021	Dr. Suresh Kumar	Digital Terrain analysis for watershed characterization
04 August, 2021	Dr. Suresh Kumar	Geospatial modelling for soil erosion assessment in watershed
05 August, 2021	Dr. Suresh Kumar	Land Use Planning & Soil and water conservation Measures
06 August, 2021	Dr. T. Ravisankar	Monitoring of watershed development programs using RS and GIS <b>&amp; Panel Discussion</b>

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Last Update on 22 July 2021



Govt. of India  
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**Eighty Seventh IIRS Outreach Programme**  
On  
Global Navigation Satellite System

**Course Schedule**

S. No.	Course Name	Course Coordinator	Module Name	From	To
1.	Global Navigation Satellite System	Dr. Ashutosh Bhardwaj	Module-2	13-09-2021	24-09-2021

Course Duration: 13 September-24 September 2021

Date	Day	Time	Topic	Speaker
13/09/2021	Monday	1600-1700 hrs	Introduction to GPS and GNSS	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
14/09/2021	Tuesday	1600-1700 hrs	GPS receivers, processing methods, errors and accuracy	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
15/09/2021	Wednesday	No Lecture		
16/09/2021	Thursday	1600-1700 hrs	Satellites based Augmentation systems & GPS Aided and GEO Augmented Navigation (GAGAN)	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
17/09/2021	Friday	1600-1700 hrs	GPS signal characteristics, Data formats (broadcast, precise ephemeris)	Dr. Ashutosh Bhardwaj & Shri Ashish Joshi
		1700-1730 hrs	Interactive Session	
18/09/2021			SAT	
19/09/2021			SUN	
20/09/2021	Monday	1600-1700 hrs	Indian Regional Navigation Satellite System (IRNSS)	Dr. Ashutosh Bhardwaj & Shri Kamal Pandey
		1700-1730 hrs	Interactive Session	
21/09/2021	Tuesday	1600-1700 hrs	DGPS demonstration (Pre-recorded followed by live query session)	Offline
		1700-1730 hrs	Interactive Session	Dr. Ashutosh Bhardwaj
22/09/2021	Wednesday			
23/09/2021	Thursday	1600-1700 hrs	Advance GNSS processing	Shri Suresh Kannaujiya
		1700-1730 hrs	Interactive Session	
24/09/2021	Friday		Panel Discussion	

Note: Details about the course, examination and latest schedule will be updated on below link;

<https://www.iirs.gov.in/> or <https://www.iirs.gov.in/EDUSAT-News>

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**Eighty Seventh IIRS Outreach Programme**  
On  
Global Navigation Satellite System

**Course Schedule**

S. No.	Course Name	Course Coordinator	Module Name	From	To
1.	Global Navigation Satellite System	Dr. Ashutosh Bhardwaj	Module-2	13-09-2021	24-09-2021

Course Duration: 13 September-24 September 2021

Date	Day	Time	Topic	Speaker
13/09/2021	Monday	1600-1700 hrs	Introduction to GPS and GNSS	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
14/09/2021	Tuesday	1600-1700 hrs	GPS receivers, processing methods, errors and accuracy	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
15/09/2021	Wednesday	No Lecture		
16/09/2021	Thursday	1600-1700 hrs	Satellites based Augmentation systems & GPS Aided and GEO Augmented Navigation (GAGAN)	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
17/09/2021	Friday	1600-1700 hrs	GPS signal characteristics, Data formats (broadcast, precise ephemeris)	Dr. Ashutosh Bhardwaj & Shri Ashish Joshi
		1700-1730 hrs	Interactive Session	
18/09/2021			SAT	
19/09/2021			SUN	
20/09/2021	Monday	1600-1700 hrs	Indian Regional Navigation Satellite System (IRNSS)	Dr. Ashutosh Bhardwaj & Shri Kamal Pandey
		1700-1730 hrs	Interactive Session	
21/09/2021	Tuesday	1600-1700 hrs	DGPS demonstration (Pre-recorded followed by live query session)	Offline
		1700-1730 hrs	Interactive Session	Dr. Ashutosh Bhardwaj
22/09/2021	Wednesday			
23/09/2021	Thursday	1600-1700 hrs	Advance GNSS processing	Shri Suresh Kannaujiya
		1700-1730 hrs	Interactive Session	
24/09/2021	Friday		Panel Discussion	

Note: Details about the course, examination and latest schedule will be updated on below link;

<https://www.iirs.gov.in/> or <https://www.iirs.gov.in/EDUSAT-News>

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**Course Name:** Remote Sensing & Digital Image Analysis  
**Course Coordinator:** Mrs. Minakshi Kumar

**Duration of the Course:** 22 August-16 September 2022

Date	Day	Time	Topic	Speaker
22/08/2022	Monday	1600-1730 hrs	Basic Principles of Remote Sensing	Dr. Manu Mehta
23/08/2022	Tuesday	1600-1730 hrs	Earth Observation Sensors and Platforms	Mr. Vinay Kumar
24/08/2022	Wednesday	1600-1730 hrs	BREAK	
25/08/2022	Thursday	1600-1730 hrs	Spectral Signatures of Different Land cover Features and Visual Image interpretation	Dr. Hina Pande
26/08/2022	Friday	Offline	RS and Image Interpretation Practical	
27/08/2022			SAT	
28/08/2022			SUN	
29/08/2022	Monday	1600-1730 hrs	Digital Image Processing: Basic Concepts Rectification and Registration	Ms. Minakshi Kumar
30/08/2022	Tuesday	1600-1730 hrs	Image Enhancement techniques	Dr. Poonam S. Tiwari
31/08/2022	Wednesday		<b>Vinayaka Chaturthi /Ganesh Chaturthi</b>	
01/09/2022	Thursday	1600-1730 hrs	Image Classification Techniques	Dr. Anil Kumar
02/09/2022	Friday	1600-1730 hrs	Thermal Remote Sensing	Dr. Shashi Kumar
03/09/2022			SAT	
04/09/2022			SUN	
05/09/2022	Monday	1600-1730 hrs	Accuracy Assessment and Digital Change Detection	Ms. Minakshi Kumar
06/09/2022	Tuesday	1600-1730 hrs	Image Processing Hands-on Demo using QGIS	Mr. Prasan Kumar Gupta
07/09/2022	Wednesday	Offline	Image Processing QGIS- hand-n Self Practice	
08/09/2022	Thursday	1600-1730 hrs	BREAK	
09/09/2022	Friday	1600-1730 hrs	Hyperspectral Remote Sensing	Mr. Vinay Kumar
10/09/2022			SAT	
11/09/2022			SUN	
12/09/2022	Monday	1600-1730 hrs	Open Source Data and International Geoportals for Satellite data download	Dr. Harish Karnatak
13/09/2022	Tuesday	1600-1730 hrs	Basics of Microwave Remote Sensing	Dr. Shashi Kumar
14/09/2022	Wednesday	1600-1730 hrs	Basics of SAR Data Processing	Mr. Ashish Joshi
15/09/2022	Thursday	1600-1730 hrs	BREAK	
16/09/2022	Friday	1600-1730 hrs	Basics of UAV Remote Sensing	Mrs. Shefali Agrawal

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Updated on 04/10/2021



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**89<sup>th</sup> IIRS Outreach Programme**  
On  
**Course Schedule**

S. No.	Course Name	Module Name	From	To
1.	Basics of Geocomputation and Geoweb Services	Module- 4	25-10-2021	02-11-2021

**Module Name-** Basics of Geocomputation and Geoweb Services  
**Module/ Course Module/Course Coordinator:** Shri. Kamal Pandey  
**Course Duration:** 25 October -02 November 2021

**Timing:** 1600 hrs – 1730 hrs

Date	Day	Time	Topic	Speaker
25/10/2021	Monday	1600-1700hrs 1700-1730 hrs	Introduction to Geocomputation, Online GIS and Geo-web services Interactive Session	Dr. Harish C. Karnatak
26/10/2021	Tuesday	1600-1700hrs 1700-1730 hrs	Open Geodata Repositories & ISRO Geoweb Services for thematic applications Interactive Session	Mr. Kamal Pandey
27/10/2021	Wednesday	1600-1700hrs 1700-1730 hrs	Programming concepts for Geo-computation - Introduction to Python and R Interactive Session	Mr. Ravi Bhandari
28/10/2021	Thursdays	1600-1700hrs 1700-1730 hrs	Overview on concept of DBMS, RDBMS and SDBMS for geo-data handling Interactive Session	Mr. Dharmendra Kumar
29/10/2021	Friday	1530-1630hrs	Programming concepts for Geo-computation - Introduction to R Interactive Session	Mr. Kamal Pandey
30/10/2021	SAT			
31/10/2021	SUN			
01/11/2021	Monday	1530-1630hrs	Overview of WebGIS and application Interactive Session	Mr. Anoop Singh
02/11/2021	Tuesday	1600-1700hrs 1700-1730 hrs	Practical Demonstration on Introduction to Cloud based geospatial data processing Interactive Session	Mr. Ravi Bhandari

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भारत सरकार Government of India  
अंतरिक्ष विभाग Department of Space  
भारतीय अंतरिक्ष अनुसन्धान संगठन Indian Space Research Organisation  
भारतीय सुदूर संवेदन संस्थान, Indian Institute of Remote Sensing,  
देहरादून Dehradun

**आईआईआरएस दूरस्थ अधिगम कार्यक्रम**

**अंतरिक्ष प्रौद्योगिकी का अवलोकन**

**पाठ्यक्रम (माध्यम: हिन्दी) की सारिणी (अद्यतन)**

दिनांक	समय	शीर्षक	वक्ता
सितंबर 14, 2023	11:15-11:45	उद्घाटन कार्यक्रम	-
	12:00-12:45	अंतरिक्ष अवलोकन के मूल सिद्धांत	डॉ० पूनम सेठ तिवारी
सितंबर 15, 2023	11:00-11:45	रोकेट और उपग्रहों की भौतिकी	डॉ० शशि कुमार
	12:00-12:45	इसरो प्रक्षेपण यान और सेटेलाइट पेलोड	श्री विनय कुमार
सितंबर 18, 2023	11:00-11:45	सुदूर संवेदन तकनीक	डॉ० हिना पांडे
	12:00-12:45	अंतर्राष्ट्रीय अंतरिक्ष स्टेशन (आईएसएस) और अंतरिक्ष पर्यटन	डॉ० मनु मेहता
सितंबर 19, 2023	11:00-11:45	आकाशीय पिंड, एक्सोप्लैनेट और अंतरिक्ष में जीवन	डॉ० प्रवीण ठाकुर
	12:00-12:45	संचार उपग्रह	श्री प्रसून कुमार
सितंबर 20, 2023	11:00-11:45	नेविगेशन उपग्रह	डॉ० कमल पांडे
	12:00-12:45	इसरो ग्रहीय मिशन	डॉ० ममता चौहान
सितंबर 21, 2023	11:00-11:45	अंतरिक्ष विज्ञान उपयोग	डॉ० शेफाली अग्रवाल
	12:00-12:45	अंतरिक्ष जीव विज्ञान, खाद्य और चिकित्सा	श्री आशुतोष कुमार झा
सितंबर 22, 2023	11:00-11:45	मानसून अध्ययन में उपग्रह डेटा का अनुप्रयोग	डॉ० चारु सिंह
	12:00-12:45	पारिस्थितिक अध्ययन के लिए रिमोट सेंसिंग डेटा	डॉ० सुरेश कुमार
सितंबर 25, 2023	11:00-11:45	ऑनलाइन डेटा भंडार और प्रसार	डॉ० हरीश कर्नाटक
	12:00-12:45	भूविज्ञान में सुदूर संवेदन के अनुप्रयोग	श्रीमति ऋचा शर्मा
सितंबर 26, 2023	11:00-11:45	आपदा प्रबंधन	डॉ० अरिजित रॉय
सितंबर 27, 2023	11:00-11:45	भारतीय तट का खुलासा और समझ: एक वैज्ञानिक दृष्टिकोण	डॉ० डी. मित्रा

(श्रीमति शेफाली अग्रवाल)

समूह निदेशक, भू-स्थानिक प्रौद्योगिकी एवं आउटरीच  
कार्यक्रम समूह  
आईआईआरएस, देहरादून

(डॉ० हरीश कर्नाटक)

प्रमुख, जियोवेब सर्विसेस, आईटी एवं दूरस्थ  
अधिगम विभाग  
आईआईआरएस, देहरादून

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**Pillai HOC College of Engineering and Technology, Rasayani, Maharashtra, India**  
**Capacity Building in Space-Based Disaster Management Support and Risk Reduction for Maharashtra State - Basic Course**

**Basic Course: 20th March 2023 to 25th March 2023**

Date	Day	Theme	09:00 - 10:00	10:00 - 11:30	11:30 - 01:00	01:00 - 02:00	02:00 - 03:30	03:45 - 05:15
20-03-2023	Monday	SBDM Tools and Data	OverView	A 360 degree Introduction - Space Based Disaster Management Support in India Using Bhuvan			Municipal Corporation of Greater Mumbai(MCGM) Disaster Management Framework in Maharashtra State	
		Speaker						
		Designation		NRSC, ISRO			Chief Officer, MCGM, Maharashtra DM Cell	
		Venue		Focusing on ISRO BHUVAN Satellite Data Sets			Focusing on Maharashtra meteorological Data	
				LECTURE SERIES on SBDM			HANDS On Practicals on SBDM	
21-03-2023	Tuesday	SBDM about Major Disasters in Maharashtra ( Case studies & Handson )	Introduction to SBDM	Introduction of Physics of Remote Sensing and GIS in SBDM			Hands On BHUVAN and QGIS - for Beginners (Shape Files, Vector & Raster Images etc )	
	Speaker		Dr.Karthik Nagarajan			Dr.Karthik Nagarajan		
	Designation		IIRS Outreach Coordinator			IIRS Outreach Coordinator		
	Venue		Computer Lab 1			Computer Lab 1		
			LandSlides	SBDM for Landslides with Case studies from focusing on Maharashtra			Hands On QGIS and Bhuvan - Case studies of Landslides in Maharashtra	
22-03-2023	Wednesday	Speaker	Dr.Amitdas Gupta			Dr.Karthik Nagarajan		
		Designation	Prof. Civil Engg. PHCET			IIRS Outreach Coordinator		
		Venue	Conclave 2			Computer Lab 1		
23-03-2023	Thursday	Floods/ Droughts	SBDM for floods/Droughts with Case studies from focusing on Maharashtra			Hands On QGIS and Bhuvan - Case studies of floods/droughts in Maharashtra		
		Speaker	Dr.Vinay Nikam			Dr.Vinay Nikam		
		Designation	Prof. Civil Engg. PHCET			Prof. Civil Engg. PHCET		
		Venue	Conclave 1			Computer Lab 1		
24-03-2023	Friday	Cyclones	SBDM for Cyclones with Case studies from focusing on Maharashtra			Hands On QGIS and Bhuvan - Case studies of Cyclones in Maharashtra		
		Speaker	Mr.Raju Narwade			Mr.Raju Narwade		
		Designation	HOD Civil Engg. PHCET			HOD Civil Engg. PHCET		
		Venue	Smart Class Room 2			Computer Lab 1		
25-03-2023	Saturday	Earthquake	SBDM for Maharashtra Earthquake			Hands On QGIS - Earthquakes	Group Discussions and Valedictory	
		Speaker	Dr.Amitdas Gupta			Dr.Amitdas Gupta	Dr.J.W.Bakal	
		Designation	Prof. Civil Engg. PHCET			Prof. Civil Engg. PHCET	Principal PHCET	
		Venue	Smart Class Room 2			Computer Lab 1	Auditorium	



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Revised: 26 Sep 2023

Module- 2: Global Navigation Satellite System  
Module/ Course Coordinator: Dr. Ashutosh Bhardwaj

Course Duration: 25-09-2023 to 06-10-2023

Date	Day	Time	Topic	Speaker
25-09-2023	Monday	1600-1700 hrs	Satellite Navigation*- I	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
26-09-2023	Tuesday	1600-1700 hrs	DGPS demonstration (Pre-recorded followed by live query session)	Offline Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
27-09-2023	Wednesday	1600-1700 hrs	Satellite Navigation*- II	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
28-09-2023	Thursday	Holiday		
29-09-2023	Friday	1600-1700 hrs	GPS receivers, processing methods, errors and accuracy	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
SAT				
SUN				
02-10-2023	Monday	Holiday		
03-10-2023	Tuesday	1600-1700 hrs	GPS signal characteristics, Data formats (broadcast, precise ephemeris)	Dr. Ashutosh Bhardwaj & Shri Ashish Joshi
		1700-1730 hrs	Interactive Session	
04-10-2023	Wednesday	1600-1700 hrs	Indian Regional Navigation Satellite System (IRNSS)	Dr. Ashutosh Bhardwaj & Dr. Kamal Pandey
		1700-1730 hrs	Interactive Session	
05-10-2023	Thursday	1600-1700 hrs	Satellites based Augmentation systems & GPS Aided and GEO Augmented Navigation (GAGAN)	Dr. Ashutosh Bhardwaj
		1700-1730 hrs	Interactive Session	
06-10-2023	Friday	1600-1700 hrs	Advance GNSS processing	Dr. Suresh Kannaujiya
		1700-1730 hrs	Interactive Session	



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भारतीय सुदूर संवेदन संस्थान/ INDIAN INSTITUTE OF REMOTE SENSING  
देहरादून/ DEHRADUN  
Two Weeks Online Course on  
“Advances in Remote Sensing Techniques for Geological Applications”  
March 13-24, 2023

TECHNICAL PROGRAMME				
S.No.	Date	Lecture Topic	Faculty	Timing
1.	13/03/2023	<b>Opening Session</b>		15:30-16:00 Hrs
2.	13/03/2023	Overview of Earth Observation System and recent initiatives for terrestrial and planetary studies	RPS, Director, IIRS	16:00-17:30 Hrs
3.	14/03/2023	Overview of RS and GIS Applications in Geosciences	RSC	16:00-17:30 Hrs
4.	15/03/2023	Advances in Thermal and Microwave RS for Geological Applications	RSC	16:00-17:30 Hrs
5.	16/03/2023	Advances in Hyperspectral RS and spectroscopic analysis for mineral exploration	RU	16:00-17:30 Hrs
6.	17/03/2023	Advances in Data Processing Techniques in Geology	JM	16:00-17:30 Hrs
7.	20/03/2023	Advance RS Techniques for Geological hazards with Emphasis on Landslides	SLC	16:00-17:30 Hrs
8.	21/03/2023	RS Applications in Engineering Geology: Recent Advances	SLC	16:00-17:30 Hrs
9.	22/03/2023	Integration of EO data with Geodetic Observations with Emphasis on Crustal Deformation.	SK	16:00-17:30 Hrs
10.	23/03/2023	Advance RS Techniques for Glacial Health monitoring and Climate Change	PP	16:00-17:30 Hrs
11.	24/03/2023	Planetary exploration using RS with emphasis on recent international and ISRO missions	MC	16:00-17:00 Hrs
	24/03/2023	<b>Valedictory</b>		17:00-17:30 Hrs

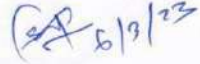
RPS- Dr. R.P. Singh, Director, IIRS	
<b>Faculty Members of Geosciences Division</b>	
RSC- Dr. R.S. Chatterjee, GD, GDMS	
SLC- Dr. Shovan L. Chattoraj	SK - Dr. Suresh Kannaujiya
PP – Dr. Pratima Pandey	MC – Dr. Mamta Chauhan
RU- Mrs. Richa U. Sharma	JM – Mrs. Jappji Mehar

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Course Director

  
Course Coordinator/s

पुनः  
06/3/23

Distribution:

1. Director, IIRS – *for kind information*
2. GD, GTO
3. All concerned faculty members
4. Dr. Poonam S. Tiwari - Programme Co-ordinator, IIRS Outreach Programme
5. Head, GIT&DL



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354	20183660211 (student_detail.php? stu_reg_id=20183660211)	Shreyas Mhatre	9-8- 1998	8983225061	shreyasmhatre777@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
355	20183660212 (student_detail.php? stu_reg_id=20183660212)	Suraj Sutar	1-11- 1999	9004481794	Suraj.sutar1199@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
356	20183660215 (student_detail.php? stu_reg_id=20183660215)	pravin sankpal	5-26- 1997	9594479897	pravinsankpal1997@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
357	20183660221 (student_detail.php? stu_reg_id=20183660221)	MANOJ PRASAD	3-31- 1996	9702489708	mp1415580132@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
358	20183660231 (student_detail.php? stu_reg_id=20183660231)	Viraj Bhalerao	2-14- 1999	8655200967	virajbhalerao2@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
359	20183660232 (student_detail.php? stu_reg_id=20183660232)	SANKET BHOSALE	2-17- 1998	7208707278	S7208707278@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
360	20183660235 (student_detail.php? stu_reg_id=20183660235)	Siddhesh Gawade	10- 20- 1999	8796380125	siddheshgawade45@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
361	20183660237 (student_detail.php? stu_reg_id=20183660237)	Kajal Bhoir	4-17- 1999	8412864003	kajalbhoir9@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
362	20183660239 (student_detail.php? stu_reg_id=20183660239)	Pratik Sanodia	7-21- 1997	9082414268	sanodia49@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
363	20183660244 (student_detail.php? stu_reg_id=20183660244)	Sankalp Mali	8-15- 1998	9833690621	sankalpmali6@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
364	20183660251 (student_detail.php? stu_reg_id=20183660251)	Mohini Nimbalkar	11-3- 1997	9594282487	mohininimbalkar9@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
365	20183660252 (student_detail.php? stu_reg_id=20183660252)	KAIRAVI SAMARTH	11- 21- 1994	7066014474	kairavl_samarth@rediffmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
366	20183660259 (student_detail.php? stu_reg_id=20183660259)	Suyog Chavan	7-9- 1999	9867107544	suyog.d.chavan@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
367	20183660261 (student_detail.php? stu_reg_id=20183660261)	Sanjana Shete	5-15- 1999	8691986763	sanjanashete17he@student.mes.ac.in	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
368	20183660266 (student_detail.php? stu_reg_id=20183660266)	KARTIK BHATARE	2-4- 2000	8108470755	kartikbhatare@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
369	20183660269 (student_detail.php? stu_reg_id=20183660269)	Manojkumar Moorthy	7-15- 1998	8169102285	manoj10.mk.18@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
370	20183660272 (student_detail.php? stu_reg_id=20183660272)	Shreyas Mhatre	9-5- 1998	9028408581	shreysmhatre1998@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
371	20183660274 (student_detail.php? stu_reg_id=20183660274)	Mohammed Faheem Shalkh	5-29- 1996	8237166486	faheemshalkh854@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
372	20183660277 (student_detail.php? stu_reg_id=20183660277)	SHUBHAM PATIL	11- 12- 1997	9881829435	sp241615@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )

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639	20183662176 (student_detail.php? stu_reg_id=20183662176)	Dipti Bhoite	5-16- 1998	8149983257	bhoitedipti16051998@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
640	20183662192 (student_detail.php? stu_reg_id=20183662192)	Karan Langi	11- 12- 1995	8237472445	karanlangi121@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
641	20183662196 (student_detail.php? stu_reg_id=20183662196)	Suraj Patil	1-2- 1997	8007607628	patilsuraj68@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
642	20183662210 (student_detail.php? stu_reg_id=20183662210)	Manas Patil	5-11- 2000	7045795171	manaspatil49@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
643	20183662213 (student_detail.php? stu_reg_id=20183662213)	adil ali	1-14- 2000	9284412672	adilali78677@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
644	20183662232 (student_detail.php? stu_reg_id=20183662232)	Mrunal Deshmukh	12- 15- 1999	8983678333	mrunaldeshmukh1313@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
645	20183662236 (student_detail.php? stu_reg_id=20183662236)	Rushikesh Nikam	9-25- 1998	7083886181	rushikeshnikam603@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
646	20183662242 (student_detail.php? stu_reg_id=20183662242)	Aditi Pingale	4-30- 2000	7977076276	aditipingale48@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
647	20183662244 (student_detail.php? stu_reg_id=20183662244)	Aishwarya Kharade	10-9- 1998	9765334489	Kharadeaishwarya9@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
648	20183662252 (student_detail.php? stu_reg_id=20183662252)	vrucha mhatre	6-18- 1999	7558235978	mvrucha188@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
649	20183662259 (student_detail.php? stu_reg_id=20183662259)	SMIT GAWAND	12- 14- 1999	8451817161	SMITGAWAND99.SG@GMAIL.COM	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
650	20183662261 (student_detail.php? stu_reg_id=20183662261)	SMIT GAWAND	12- 14- 1999	8451817161	SMITGAWAND99.SG@GMAIL.COM	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
651	20183662265 (student_detail.php? stu_reg_id=20183662265)	Suyog Jangam	12- 13- 1999	9764890700	srjangam108@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
652	20183662282 (student_detail.php? stu_reg_id=20183662282)	Sejal Sutar	1-22- 2001	9082565689	Sejalsutar22@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
653	20183662283 (student_detail.php? stu_reg_id=20183662283)	Nikesh Tanpatil	6-17- 1995	8983535652	tanpatilnikesh95@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
654	20183662292 (student_detail.php? stu_reg_id=20183662292)	ROHIT GORE	9-21- 1999	9702601953	rohitgore1999@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
655	20183662298 (student_detail.php? stu_reg_id=20183662298)	AKSHAY SONAWANE	1-19- 1999	9892544487	sonawaneakshay2000@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
656	20183662300 (student_detail.php? stu_reg_id=20183662300)	SANKET GHADIGAONKAR	8-19- 1997	8007702061	ghadi.sanket941@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
657	20183662306 (student_detail.php? stu_reg_id=20183662306)	MUHAJIZ KARJIKAR	9-24- 1999	918446426103	muhafizkarjkar.24@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )

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677	20183662425 (student_detail.php? stu_reg_id=20183662425)	VINAY KATE	9-12- 1995	8286736484	vinaykate.2010@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
678	20183662429 (student_detail.php? stu_reg_id=20183662429)	Snehal Sarode	7-7- 1997	8879896429	snehalsarode77@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
679	20183662438 (student_detail.php? stu_reg_id=20183662438)	ANIKET DHAMALE	5-27- 1999	7045916425	aniketdhamale02@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
680	20183662440 (student_detail.php? stu_reg_id=20183662440)	Durvank Sawant	8-9- 1999	7506894875	durvanksawant9@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
681	20183662442 (student_detail.php? stu_reg_id=20183662442)	Muskan Gupta	6-26- 1999	9960500667	muskangupta260699@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
682	20183662443 (student_detail.php? stu_reg_id=20183662443)	Muskan Gupta	6-26- 1999	9960500667	muskangupta260699@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
683	20183662445 (student_detail.php? stu_reg_id=20183662445)	Rohan Dutta	1-15- 1999	9471950787	rohankumard99@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
684	20183662448 (student_detail.php? stu_reg_id=20183662448)	VIGHNESH MESTRY	12-6- 1997	8108244895	vighanesh97@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
685	20183662451 (student_detail.php? stu_reg_id=20183662451)	Harshita Shetty	1-3- 1999	7977637154	harshitashetty98@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
686	20183662455 (student_detail.php? stu_reg_id=20183662455)	Ankit Dhakre	4-25- 2000	8850131437	dhakre402@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
687	20183662480 (student_detail.php? stu_reg_id=20183662480)	harshali chavan	7-7- 1997	08425862045	harshuchavan07@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
688	20183662482 (student_detail.php? stu_reg_id=20183662482)	Neelam Yadav	1-31- 1998	8652212025	nr31yadav@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
689	20183662518 (student_detail.php? stu_reg_id=20183662518)	Aadinath Shinde	11- 27- 1998	7039752749	aadinathshinde148@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
690	20183662520 (student_detail.php? stu_reg_id=20183662520)	shraddha punde	10- 25- 1998	9594025821	shraddhapunde1234@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
691	20183662530 (student_detail.php? stu_reg_id=20183662530)	Chetan Amrute	5-13- 1999	8097721273	chetanamrute789@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
692	20183662550 (student_detail.php? stu_reg_id=20183662550)	Sneha Patil	4-17- 1999	8108028162	psneha9111@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
693	20183662564 (student_detail.php? stu_reg_id=20183662564)	krunal bhoir	5-14- 1997	7350058778	krunalbhoir58@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
694	20183662583 (student_detail.php? stu_reg_id=20183662583)	Abhishek Jaiswal	11- 24- 1995	9769122802	abshek.jaiswal1478@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
695	20183662627 (student_detail.php? stu_reg_id=20183662627)	Shubham Sawle	4-25- 1999	8655494052	shubhamsawle48@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )

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31	20183757999 (student_detail.php? stu_reg_id=20183757999)	Tehmeem Bukhari	2-8- 1998	7045519589	bktehmeem@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
32	20183758007 (student_detail.php? stu_reg_id=20183758007)	heta shah	12- 18- 1997	9763337896	heta.shah18@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
33	20183758014 (student_detail.php? stu_reg_id=20183758014)	Dhiraj Mane	3-22- 1998	9130403987	dhirajmane476@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
34	20183758019 (student_detail.php? stu_reg_id=20183758019)	shivraj bobade	5-21- 1998	9167126457	shivrajbobade59@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
35	20183758022 (student_detail.php? stu_reg_id=20183758022)	Niraj Mane	3-22- 1998	9130403987	nirajmane2@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
36	20183758023 (student_detail.php? stu_reg_id=20183758023)	Sharan Nair	10- 10- 1998	7057308184	sharannair98@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
37	20183758027 (student_detail.php? stu_reg_id=20183758027)	Shrivatsa Kulkarni	8-18- 1999	9049970809	shrivatsakulkarni98@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
38	20183758028 (student_detail.php? stu_reg_id=20183758028)	Prasad kalambe	11- 27- 1998	7387202044	kalambeprasad100@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads">https://elearning.iirs.gov.in/edusatregistration/uploads</a> )
39	20183758030 (student_detail.php? stu_reg_id=20183758030)	Shivam Kharje	5-13- 1998	9284870732	its.kshivam@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
40	20183758031 (student_detail.php? stu_reg_id=20183758031)	Suyash Bhalinge	9-29- 1999	9664600045	suyashbhalinge@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
41	20183758108 (student_detail.php? stu_reg_id=20183758108)	SAMIDHA PATIL	4-13- 1997	7208613960	samidhapatil1397@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
42	20183758124 (student_detail.php? stu_reg_id=20183758124)	Nazim Khan	12- 10- 1996	9004264783	nazimkhan3333@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
43	20183758132 (student_detail.php? stu_reg_id=20183758132)	Nishant Gharat	5-25- 2000	9136283221	nishantgharat679@gamil.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
44	20183758133 (student_detail.php? stu_reg_id=20183758133)	Nishant Gharat	5-25- 2000	9136283221	nishantgharat679@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
45	20183758226 (student_detail.php? stu_reg_id=20183758226)	Neelam Yadav	7-31- 1998	865221225	nr31yadav@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
46	20183758227 (student_detail.php? stu_reg_id=20183758227)	Neelam Yadav	7-31- 1998	865221225	nr31yadav@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
47	20183758285 (student_detail.php? stu_reg_id=20183758285)	Tejas Kumbhar	8-5- 1999	8779073594	tejasdk581999@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
48	20183758286 (student_detail.php? stu_reg_id=20183758286)	Sanket Chevan	7-19- 1999	9987944102	sanketchevan907@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
49	20183758308 (student_detail.php? stu_reg_id=20183758308)	Chaitanya Kale	11- 21- 1996	7208846469	kalechaitanya16cp@student.mes.ac.in	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads">https://elearning.iirs.gov.in/edusatregistration/uploads</a> )

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563	20183762075 (student_detail.php? stu_reg_id=20183762075)	SURAJ KHALADKAR	5-16- 2000	9022271286	surajkhaladkar2000@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
564	20183762082 (student_detail.php? stu_reg_id=20183762082)	Vishal Gavali	1-21- 1999	8779963494	gavalivishal425@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
565	20183762090 (student_detail.php? stu_reg_id=20183762090)	OMKAR KUDALE	1-9- 1998	9833857353	omkudale9198@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
566	20183762091 (student_detail.php? stu_reg_id=20183762091)	Guru Joshi	1-10- 2000	8691832382	signaturejoshi@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
567	20183762093 (student_detail.php? stu_reg_id=20183762093)	Shivani Bele	9-6- 1998	7887646502	shivanibele1998@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
568	20183762098 (student_detail.php? stu_reg_id=20183762098)	ANUJA PATINGE	7-9- 1999	9284186588	anujapatinge2563@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
569	20183762101 (student_detail.php? stu_reg_id=20183762101)	Mayuri Agaj	5-30- 1999	9112495440	mayuriagaj99@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
570	20183762104 (student_detail.php? stu_reg_id=20183762104)	sandhya anpat	11- 26- 1998	7738636783	sandhya.anpat7782@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
571	20183762105 (student_detail.php? stu_reg_id=20183762105)	Dipesh Gavand	3-7- 2000	8208752844	dipeshgavand17@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
572	20183762118 (student_detail.php? stu_reg_id=20183762118)	Chetan Waykar	10- 22- 1999	8828069772	chetan.waykar22@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
573	20183762120 (student_detail.php? stu_reg_id=20183762120)	Krishnakant Singh	4-11- 2000	9969417260	kksingh1104@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
574	20183762122 (student_detail.php? stu_reg_id=20183762122)	Krishnakant Singh	4-11- 2000	9969417260	kksingh1104@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
575	20183762131 (student_detail.php? stu_reg_id=20183762131)	Mrunal Deshmukh	12- 15- 1999	8983678333	mrunaldeshmukh1313@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
576	20183762141 (student_detail.php? stu_reg_id=20183762141)	Sonali patil	10- 18- 1995	9764817531	sp37461@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
577	20183762143 (student_detail.php? stu_reg_id=20183762143)	Omkar Mahamuni	10-5- 1999	9594490874	omkarm51099@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
578	20183762147 (student_detail.php? stu_reg_id=20183762147)	Omkar Kadam	3-1- 2000	9867828019	omkarkadam17it@student.mes.ac.in	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
579	20183762153 (student_detail.php? stu_reg_id=20183762153)	HEEBA SHAIKH	2-7- 2001	9766725627	heebashaikh.ss197@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
580	20183762160 (student_detail.php? stu_reg_id=20183762160)	Ashitosh Durgannavar	6-18- 1999	9869764095	ashitosh180699@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
581	20183762161 (student_detail.php? stu_reg_id=20183762161)	Abhishek Boritkar	9-30- 1999	9028659880	abhi.boritkar456@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )

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582	20183762169 (student_detail.php? stu_reg_id=20183762169)	Supriya Shukla	12-23-1998	7021203485	supriyashukla2312@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
583	20183762179 (student_detail.php? stu_reg_id=20183762179)	Snehal Marge	8-22-1999	7045985230	jayant11283@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
584	20183762182 (student_detail.php? stu_reg_id=20183762182)	Rohan More	11-23-1999	8169891659	rohanmore99@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
585	20183762184 (student_detail.php? stu_reg_id=20183762184)	Sonia Koli	1-27-2001	9619062701	kolimishi09@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
586	20183762186 (student_detail.php? stu_reg_id=20183762186)	NIKHIL MHATRE	5-28-1999	8454044624	nikhilmhatre703@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
587	20183762194 (student_detail.php? stu_reg_id=20183762194)	Namit singh	9-28-1999	9768869240	namit1114@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
588	20183762203 (student_detail.php? stu_reg_id=20183762203)	Karan Langi	11-12-1995	8237472445	karanlangi121@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
589	20183762204 (student_detail.php? stu_reg_id=20183762204)	AKSHAY SONAWANE	1-19-1999	9892544487	sonawaneakshay2000@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
590	20183762207 (student_detail.php? stu_reg_id=20183762207)	Bhagyashree Shingare	9-18-1999	9082243564	bhagyashreeshingare09@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
591	20183762208 (student_detail.php? stu_reg_id=20183762208)	Shreyank Patil	9-21-1999	09892649433	shreyankpatil1999@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
592	20183762218 (student_detail.php? stu_reg_id=20183762218)	Manas Patil	5-11-2000	7045795171	manaspatil49@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
593	20183762234 (student_detail.php? stu_reg_id=20183762234)	Bhupendra Jambhulkar	3-1-2000	9970063092	bhupendra2000@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
594	20183762245 (student_detail.php? stu_reg_id=20183762245)	adil ali	1-14-2000	9284412672	adilali78677@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
595	20183762250 (student_detail.php? stu_reg_id=20183762250)	Omkar Bhargude	8-23-1997	8689898616	omkarbhargude@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
596	20183762267 (student_detail.php? stu_reg_id=20183762267)	vruha mhatre	6-18-1999	7558235978	mvruha188@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
597	20183762269 (student_detail.php? stu_reg_id=20183762269)	ROHAN LOKHANDE	4-30-1999	9167208480	rrohanlokhande99@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads">https://elearning.iirs.gov.in/edusatregistration/uploads</a> )
598	20183762271 (student_detail.php? stu_reg_id=20183762271)	Rushikesh Nikam	9-25-1998	7083886181	rushikeshnikam603@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
599	20183762272 (student_detail.php? stu_reg_id=20183762272)	MANSI CHALAWARI	10-7-1999	9076405604	chalawanmansi@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
600	20183762303 (student_detail.php? stu_reg_id=20183762303)	vidya thakare	9-22-1999	8669331877	vidyathakare683@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads">https://elearning.iirs.gov.in/edusatregistration/uploads</a> )

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50	20183858795 (student_detail.php? stu_reg_id=20183858795)	AMIT GIDDE	3-12- 1998	8108756997	amitgidde1630@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
51	20183858811 (student_detail.php? stu_reg_id=20183858811)	Abhishek Dahi	10- 10- 1996	9022291111	abhidahi96@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
52	20183858870 (student_detail.php? stu_reg_id=20183858870)	shubham maurya	12-1- 1999	9594054607	mauryashubham48@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
53	20183859011 (student_detail.php? stu_reg_id=20183859011)	Saurabh Shinde	9-5- 1999	9158206132	saurabhshinde5999@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
54	20183859014 (student_detail.php? stu_reg_id=20183859014)	NISHA INAMDAR	3-15- 1999	9987969343	nisha15399@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
55	20183859018 (student_detail.php? stu_reg_id=20183859018)	NACHIKET ROKADE	7-16- 2000	9892064045	nachiketnr10@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
56	20183859021 (student_detail.php? stu_reg_id=20183859021)	SAAKSHI GUPTA	12- 16- 1999	9930707826	saakshigupta1629@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
57	20183859025 (student_detail.php? stu_reg_id=20183859025)	JONNIYA CHOUDHARY	12- 28- 1998	9082782946	jonniyamahla12@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
58	20183859028 (student_detail.php? stu_reg_id=20183859028)	Rohit Patil	9-27- 1999	7045296016	patil.rohit717132@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads">https://elearning.iirs.gov.in/edusatregistration/uploads</a> )
59	20183859050 (student_detail.php? stu_reg_id=20183859050)	ATHIRA PILLAI	2-15- 1999	7045302337	athira15021999@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
60	20183859051 (student_detail.php? stu_reg_id=20183859051)	ATHIRA PILLAI	2-15- 1999	7045302337	athira15021999@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
61	20183859055 (student_detail.php? stu_reg_id=20183859055)	Rushikesh Chavan	9-24- 1997	8446130424	rushikeshchavan2131222@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
62	20183859056 (student_detail.php? stu_reg_id=20183859056)	KARTIK BHATARE	2-4- 2000	8108470755	kartikbhatare@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
63	20183859058 (student_detail.php? stu_reg_id=20183859058)	Prasad Pawar	1-18- 1998	8149289954	pawarprasad0610@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
64	20183859085 (student_detail.php? stu_reg_id=20183859085)	Anjali Wagh	9-13- 1998	7738606027	Anj123wagh@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
65	20183859129 (student_detail.php? stu_reg_id=20183859129)	RUTUJA PATIL	11- 18- 1999	9096877440	rutuja1999patil@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
66	20183859152 (student_detail.php? stu_reg_id=20183859152)	karthi murugan	3-22- 1997	9920755394	karthikmurugan593@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
67	20183859163 (student_detail.php? stu_reg_id=20183859163)	Elizabeth Cherian	5-7- 1999	8879570052	elizabethcherian904@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
68	20183859177 (student_detail.php? stu_reg_id=20183859177)	Shubham Patil	12- 14- 1999	9673819583	Shubha141299@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )

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582	20183862374 (student_detail.php? stu_reg_id=20183862374)	Abhijeet Parab	10-11-1999	7710007261	abhiparabr7.ap@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
583	20183862379 (student_detail.php? stu_reg_id=20183862379)	VIDYA THAKARE	9-22-1999	8669331877	vidyathakare683@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
584	20183862381 (student_detail.php? stu_reg_id=20183862381)	Raksha Bangera	4-29-1998	9664134523	rkshbangera17@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
585	20183862385 (student_detail.php? stu_reg_id=20183862385)	OMKAR MANDAKE	8-18-2000	8421484383	omkar4815mandake@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
586	20183862386 (student_detail.php? stu_reg_id=20183862386)	ANIRUDDHA BAMANE	9-21-1999	9764890700	aniruddhabamane1111@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
587	20183862390 (student_detail.php? stu_reg_id=20183862390)	Jay Padloskar	4-10-1999	8080121528	jaypadloskar35@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
588	20183862391 (student_detail.php? stu_reg_id=20183862391)	Sairaj Chaudhari	5-7-1999	9561049876	sai70559@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
589	20183862398 (student_detail.php? stu_reg_id=20183862398)	Suyog Jangam	12-13-1999	9764890700	srjangam108@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
590	20183862407 (student_detail.php? stu_reg_id=20183862407)	Tanmay Khopkar	11-19-1998	7776862738	tmk191198@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
591	20183862409 (student_detail.php? stu_reg_id=20183862409)	shivam singh	8-9-1997	8087875799	shivanrajput9aug@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
592	20183862411 (student_detail.php? stu_reg_id=20183862411)	Omkar Shirke	9-21-1999	9969009465	shirkeomkar44@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
593	20183862413 (student_detail.php? stu_reg_id=20183862413)	SIDDHALI more	4-30-1999	9082403108	siddhal30@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
594	20183862414 (student_detail.php? stu_reg_id=20183862414)	Gandharv Dhayatkar	4-1-2000	7715074716	gandharvd0@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
595	20183862415 (student_detail.php? stu_reg_id=20183862415)	UJWAL DESHPANDE	5-27-1999	9167912735	deshpandeujuwal5515@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
596	20183862418 (student_detail.php? stu_reg_id=20183862418)	Dinesh Jadhav	11-1-1998	9820296871	dineshjadhav1198@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
597	20183862421 (student_detail.php? stu_reg_id=20183862421)	Sahil ali Ansari	11-22-1997	9930002587	Sahil.ansari221197@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
598	20183862426 (student_detail.php? stu_reg_id=20183862426)	Gaurav Gurav	9-17-1999	9767573115	gaurav1933gr@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
599	20183862434 (student_detail.php? stu_reg_id=20183862434)	SHRUTI POTDAR	1-27-1998	9764498189	shrutipotdar97@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
600	20183862450 (student_detail.php? stu_reg_id=20183862450)	Muskan Gupta	6-26-1999	9960500667	muskangupta260699@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )

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620	20183862706 (student_detail.php? stu_reg_id=20183862706)	movie atmaram	5-6- 1993	9136328736	tejasmovie93@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
621	20183862714 (student_detail.php? stu_reg_id=20183862714)	GANESHKUMAR NADAR	12- 24- 1997	8973327466	m.ganeshkumar97@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
622	20183862738 (student_detail.php? stu_reg_id=20183862738)	Shanmugaraja Thevar	6-30- 1998	8369052271	satyano.1man@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
623	20183862752 (student_detail.php? stu_reg_id=20183862752)	Hrutik Gaikwad	11- 20- 1999	9765613105	hrutikgaikwad2018@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
624	20183862757 (student_detail.php? stu_reg_id=20183862757)	Raj Shah	6-17- 1997	8652116644	tony.rj86@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
625	20183862763 (student_detail.php? stu_reg_id=20183862763)	Aditya Jha	10-8- 2003	8451016918	adijha1112@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
626	20183862765 (student_detail.php? stu_reg_id=20183862765)	Kashif Khan	2-8- 1998	9821657840	khankashif98.kk12@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
627	20183862794 (student_detail.php? stu_reg_id=20183862794)	Omkar Patil	1-5- 1999	9004464896	omkarpat99@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
628	20183862798 (student_detail.php? stu_reg_id=20183862798)	GAURI GARIMA NAIR	8-17- 1997	09653485182	ngaurigarima@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
629	20183862800 (student_detail.php? stu_reg_id=20183862800)	Akshay Mhatre	10-7- 1995	8379974444	akshaymhatre619@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
630	20183862801 (student_detail.php? stu_reg_id=20183862801)	sourabh jha	7-1- 1993	9769513749	jhasourabh004@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
631	20183862812 (student_detail.php? stu_reg_id=20183862812)	Kiran Shinde	1-20- 2000	86002 11138	kiranshinde4895@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
632	20183862815 (student_detail.php? stu_reg_id=20183862815)	Nehal Sutar	4-5- 1999	8975784504	Nehalsutar4@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
633	20183862819 (student_detail.php? stu_reg_id=20183862819)	Atharva Kadam	9-9- 2000	7738384771	atharva.kadam00@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
634	20183862820 (student_detail.php? stu_reg_id=20183862820)	Kamlesh Papal	6-3- 1998	8425026943	kamleshpapal@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
635	20183862823 (student_detail.php? stu_reg_id=20183862823)	Aditya Patil	11-4- 1999	8308508570	patiladi411@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
636	20183862824 (student_detail.php? stu_reg_id=20183862824)	Aditya Patil	11-4- 1999	8308508570	patiladi411@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
637	20183862828 (student_detail.php? stu_reg_id=20183862828)	Arnav Mishra	11-1- 1996	7738256577	arnavm1996@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )
638	20183862832 (student_detail.php? stu_reg_id=20183862832)	Akshay Bhoir	2-2- 1999	7775057277	akshaybhoir302@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/upload">https://elearning.iirs.gov.in/edusatregistration/upload</a> )

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35- IIRS Outreach Programme on Advanced Geospatial Modelling tools and techniques

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1	20183549974 ( <a href="#">student_detail.php?stu_reg_id=20183549974</a> )	Vishal Mehta	8-25-1996	8007455963	vishalm9860@gmail.com	<a href="#">View</a> ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students_doc/upload/2018354">https://elearning.iirs.gov.in/edusatregistration/uploads/students_doc/upload/2018354</a> )
2	20183549987 ( <a href="#">student_detail.php?stu_reg_id=20183549987</a> )	Omkar Shitole	4-17-1998	9833386597	omkarshitole1990@gmail.com	<a href="#">View</a> ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students_doc/upload/2018354">https://elearning.iirs.gov.in/edusatregistration/uploads/students_doc/upload/2018354</a> )
3	20183550004 ( <a href="#">student_detail.php?stu_reg_id=20183550004</a> )	Manish Mandal	1-2-1996	8898939815	manishmandal786@gmail.com	<a href="#">View</a> ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students_doc/upload/2018355">https://elearning.iirs.gov.in/edusatregistration/uploads/students_doc/upload/2018355</a> )
4	20183550017 ( <a href="#">student_detail.php?stu_reg_id=20183550017</a> )	Chirag Dhoble	8-23-1997	7387354367	chiragdhoble@gmail.com	<a href="#">View</a> ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students_doc/upload/2018355">https://elearning.iirs.gov.in/edusatregistration/uploads/students_doc/upload/2018355</a> )

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#### IMPORTANT LINKS

IIRS e-Learning Brochure ([https://eclasscms.iirs.gov.in/imgs/elearning\\_IRS--English\\_Version2018.pdf](https://eclasscms.iirs.gov.in/imgs/elearning_IRS--English_Version2018.pdf))

IIRS Course calendar for the Year 2019 ([https://eclasscms.iirs.gov.in/imgs/AcademicCalendar\\_2019-20.pdf](https://eclasscms.iirs.gov.in/imgs/AcademicCalendar_2019-20.pdf))

IIRS Application Form ([https://eclasscms.iirs.gov.in/imgs/application\\_form.pdf](https://eclasscms.iirs.gov.in/imgs/application_form.pdf))

ISRO (<http://www.isro.gov.in>)

CSSTEAP (<http://www.cssteap.org/>)

National Biodiversity Information System (<http://bis.iirs.gov.in/>)

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164	20194270951 (student_detail.php? stu_reg_id=20194270951)	Ashishkumar Thakur	4-24- 1997	8268552376	thakurashish542@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
165	20194270956 (student_detail.php? stu_reg_id=20194270956)	Ashik Poojari	7-11- 1998	8652037235	Ashikpoojari98@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
166	20194270959 (student_detail.php? stu_reg_id=20194270959)	anup vishwakama	9-20- 1996	9545219339	anup.wish1961@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
167	20194270989 (student_detail.php? stu_reg_id=20194270989)	Shivshankar Mulage	8-30- 1999	9082911508	mulageshiba17ee@student.mes.ac.in	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
168	20194270999 (student_detail.php? stu_reg_id=20194270999)	MANOJ PRASAD	3-31- 1996	7715898704	mp1415580132@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
169	20194271023 (student_detail.php? stu_reg_id=20194271023)	Aakash Jogalekar	12-2- 1998	7875700412	aakashj298@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
170	20194271025 (student_detail.php? stu_reg_id=20194271025)	Jefin Commen	12- 29- 1998	8446424931	jefinbiju81@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
171	20194271053 (student_detail.php? stu_reg_id=20194271053)	Raju Narwade	6-9- 1974	8108202122	narwade.rajesh@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
172	20194271055 (student_detail.php? stu_reg_id=20194271055)	Raju Narwade	6-9- 1974	8108202122	narwade.rajesh@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
173	20194271064 (student_detail.php? stu_reg_id=20194271064)	GAURAV DESHMUKH	11- 16- 1996	9167321689	gauravdeshmukh4@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
174	20194271125 (student_detail.php? stu_reg_id=20194271125)	SHREYAS MHATRE	9-8- 1998	8983225061	shreyasmhatre777@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
175	20194271206 (student_detail.php? stu_reg_id=20194271206)	vighnesh kumar nadar	12- 24- 1997	09500834118	m.vighneshkmar@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
176	20194271215 (student_detail.php? stu_reg_id=20194271215)	prasad patil	6-16- 1997	7021364627	patilprasad0123@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
177	20194271220 (student_detail.php? stu_reg_id=20194271220)	Siddhesh Chavan	10-8- 1995	9820327764	sidchavan8@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
178	20194271280 (student_detail.php? stu_reg_id=20194271280)	SAURABH HYALINGE	2-19- 1997	8451828629	saurabhhyalinge@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
179	20194271291 (student_detail.php? stu_reg_id=20194271291)	Anuksha Bhoir	4-4- 1999	8108043986	anukshapb987@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students_dc">https://elearning.iirs.gov.in/edusatregistration/uploads/students_dc</a> )
180	20194271292 (student_detail.php? stu_reg_id=20194271292)	Pratyosh Sharma	1-8- 1999	9757218328	pratyoshset16e@student.mes.ac.in	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
181	20194271419 (student_detail.php? stu_reg_id=20194271419)	ALEKH KUMAR	11-9- 1996	9769544714	skalekh@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )
182	20194271426 (student_detail.php? stu_reg_id=20194271426)	Shweta Bhole	10- 29- 1997	9167464046	shwetabhole97@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/students">https://elearning.iirs.gov.in/edusatregistration/uploads/students</a> )

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69	20194370705 (student_detail.php? stu_reg_id=20194370705)	Sushant Jachav	11-2- 1998	8692857759	jadhavsushant15123@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
70	20194370711 (student_detail.php? stu_reg_id=20194370711)	PRANAV CHAUDHARI	8-8- 1997	7506035586	chaudhari.pranav09@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
71	20194370721 (student_detail.php? stu_reg_id=20194370721)	mayuresh mandhare	6-30- 1998	9762710652	mthree007@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
72	20194370723 (student_detail.php? stu_reg_id=20194370723)	Jayesh Bhoir	5-1- 1998	9773282076	jayeshbhoir559@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
73	20194370727 (student_detail.php? stu_reg_id=20194370727)	Tanmay Khopkar	11- 19- 1998	7776862738	tmk191198@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
74	20194370728 (student_detail.php? stu_reg_id=20194370728)	Kunal Dalmia	11- 26- 1996	09920260197	kunal758@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
75	20194370734 (student_detail.php? stu_reg_id=20194370734)	STEVEN PAUL	8-27- 1997	09819096457	stevenspaul97@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
76	20194370735 (student_detail.php? stu_reg_id=20194370735)	ANIL Gowda	4-16- 1998	8291003128	gowdaanil772@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
77	20194370736 (student_detail.php? stu_reg_id=20194370736)	VIRAJ MHATRE	2-5- 1999	9767665985	virajmhatre415415@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
78	20194370738 (student_detail.php? stu_reg_id=20194370738)	Sachin Gupta	5-8- 1999	8879133809	sachingupta1999@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
79	20194370739 (student_detail.php? stu_reg_id=20194370739)	Shivani Kankatala	12- 20- 1998	8691932852	kankatalashchet16e@student.mes.ac.in	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
80	20194370743 (student_detail.php? stu_reg_id=20194370743)	Amit Hire	9-18- 1998	7039185733	amithire1777@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
81	20194370748 (student_detail.php? stu_reg_id=20194370748)	HARSHAD KEDAR	7-19- 1999	9892951278	kedarharshad@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
82	20194370749 (student_detail.php? stu_reg_id=20194370749)	Gaurav Solanki	11- 16- 1999	8149143901	gauravsolanki172@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
83	20194370807 (student_detail.php? stu_reg_id=20194370807)	Ganesh Chaudhari	1-5- 1999	9082978205	ganeshchaudhari4665@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
84	20194370846 (student_detail.php? stu_reg_id=20194370846)	POOJA ALLU	4-2- 1999	8268480833	poojaallu2@gmail.coms	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
85	20194370920 (student_detail.php? stu_reg_id=20194370920)	Chaitali Kulkarni	10- 16- 1997	8291706206	T6chaitalik@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
86	20194370948 (student_detail.php? stu_reg_id=20194370948)	Ashutosh Sharma	9-15- 1994	8097178044	ashutoshas87@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )
87	20194370952 (student_detail.php? stu_reg_id=20194370952)	Ashishkumar Thakur	4-24- 1997	8268552376	thakurashish542@gmail.com	View ( <a href="https://elearning.iirs.gov.in/edusatregistration/uploads/stud">https://elearning.iirs.gov.in/edusatregistration/uploads/stud</a> )

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