A Brief Report On

DST Funded 7-Day Training Program on "ADVANCED MATERIALS & MANUFACTURING METHODS FOR AUTOMOBILE APPLICATIONS (AMMMAA)-November 2022.

Date: 23rd – 29th November 2022

Venue: GITAM Deemed to be University, GIT, Visakhapatnam.

The inauguration of DST Funded 7-Day Training Program on "ADVANCED MATERIALS & MANUFACTURING METHODS FOR AUTOMOBILE APPLICATIONS (AMMMAA)" from 23rd to 29th November 2022, organised at GITAM INSTITUTE OF TECHNOLOGY, GITAM Deemed to be university, Visakhapatnam, Andhra Pradesh- 530045, under STUTI Program-2021 (DST/RND/STUTI/2021/18) took place on 23rd November.

INAUGURATION

Chief guest Dr. K. Ramji, Professor and Director, Center of Nanotechnology, Andhra University, Visakhapatnam, Former Vice-chancellor, Dr. B.R. Ambedkar University, Srikakulam. Dr. V. Srinivas, Convener & Head of the Department, Mechanical Engineering, GST, GITAM. Prof. C. Vijaysekhar, Dean, Engineering and Technology, GITAM. Prof. Balla Srinivasa Prasad, STUTI program coordinator, GITAM. Prof. D. Siva Prasad, program coordinator, GITAM, Visakhapatnam: Inaugurated the event by addressing the participants and the importance of collaborating with other organisations. Dr. K. Ramji discussed the central theme behind this training program to establish and share the collaboration of organisations with technical and practical education. He briefly explained the research facilities available at GITAM, Visakhapatnam and congratulated the organisers for their initiative. Prof. C. Vijaysekhar, Dean, Engineering and Technology, GITAM, has spoken about the importance of workshops and developments in education standards in Instrumentation Sensors and Actuators. Prof. D. Siva Prasad, the program coordinator at GITAM, discussed the importance of the seven-day workshop conducted on the premises. The event was graced by participants from various branches of engineering, such as Mechanical, Metallurgy and Instrumentation and the management and faculty members of GITAM Deemed to be University. Then the program was followed by STUTI program coordinator Dr. Balla Srinivasa Prasad, who briefly addressed the STUTI program.

Figure 1: Inaugural of the DST Funded 7-Day Training Program on "Advanced Materials & Manufacturing Methods for Automobile Applications" on 23rd November 2022.

SCHEDULE

DAY	MORNING SESSION (10.00 AM- 12.00 PM)		AFTERNOON SESSION (2.00 PM-4.30 PM)
DAY-1	**Resource Person:** Dr.K. Ramji		**Resource Person:** Dr. A. Sandeep/ Mr. B. Diwakar
	Topic: Emerging trends in Advanced Materials & Applications for innovative system		Hands-On Experience on fatigue of metals
DAY-2	**Resource Person:** Dr. A. Sandeep		**Resource Person:** Dr. A. Sandeep/ Mr. B. Diwakar
	Topic: Understanding the Importance of material testing: static in Engineering Research		Hands-on session on Tension, Compression and Flexural test **Name of the research equipment: 8801 Servo Hydraulic Fatigue Testing System (DST FIST Funding)**
DAY-3	**Resource Person:** Dr. P. Srinivasa Rao		**Resource Person:** Dr. P. Srinivasa Rao
	Topic: 3D printing and CNC Programming		Hands-On Experience using additive manufacturing/hands-on experience using code generation (CADM) for CNC machining centres **Name of the research equipment: CNC Turn-mill Center-TMC-XL-200 Funded by SERB – Science Engineering and Research Board**
DAY-4	**Resource Person:** Dr. K. Arun Vikram	**LUNCH BREAK (12.00 PM – 2.00 PM)**	**Resource Person:** Dr. K. Arun Vikram
	Topic: Metal machining of components using CNC machining Centres.		Hands-On Experience using CNC Turn-mill centre **Name of the research equipment: CNC Turnmill Center-TMC-XL-200 Funded by SERB – Science Engineering and Research Board**
DAY-5	**Resource Person:** Dr.Ramakrushna Sabat.		**Resource Person:** Mr. T. Rajesh Kumar Dora.
	Topic: Corrosion Testing of Metals and Alloys		Hands-On Experience on Corrosion Testing **Name of the research equipment: IVIUM-Electrochemical Work Station (Funded by GITAM University)**
DAY-6	**Resource Person:** Dr. Ch. Shoba and Prof. D. Siva Prasad		**Resource Person:** Dr. Ch. Shoba and Prof. D. Siva Prasad
	Topic: Development of microbial-assisted Sintered AI/ SiC Composites		Hands-On Experience on the Fabrication of AI/SiC composites by powder metallurgy route. **Name of the research equipment: Hydraulic press, Planetary ball mill, Impedance tube, Microwave furnace(funded by Science Engineering and Research Board SERB- DST)**
DAY-7	**Resource Person:** Dr. V. Srinivas and Dr. S. Jai Kumar		**Resource Person:** Dr. V. Srinivas and Dr. S. Jai Kumar
	Topic: Bio-Diesel Nano Fuels and Nano Lubricants		Hands-On Experience On testing of Biofuels **Name of the research equipment: BS VI multi-fuel research engine, Gas and smoke analyser, Magnetic stirrer, Bath Sonicator and Probe sonicator etc. (Funded by GITAM University)**

Schedule for 7 Days Training Program On "Advanced Materials & Manufacturing Methods for Automobile Applications" (23-29 NOVEMBER 2022)

DAY-1, 23rd NOVEMBER 2022:

TECHNICAL SESSION:

The first-day session focused on ***"Emerging trends in Advanced Materials & Applications for smart system"*** by **Dr. K Ramji,** Professor and Director Center of Nanotechnology. He lectured that smart materials have intrinsic sensing, controlling, actuation or information processing capabilities in microstructures.

Figure 2: Session by **Dr. K Ramji,** Professor and Director, Center of Nanotechnology.

HANDS-ON SESSION:

Later in the afternoon, the hands-on session was carried out by **Mr. B. Diwakar** on the *"**Fatigue of metals**"*. The session taught the participants how to detect shape characteristics that maximise a metal's fatigue life and enable the best fatigue life.

Figure 3: Training session on Fatigue of metals by Mr. B. Diwakar, GITAM, GST

DAY-2, 24th NOVEMBER 2022:

TECHNICAL SESSION:

On day 2, the session started with ***"Understanding the Importance of material testing: static in Engineering Research"*** by **Dr. A Sandeep, Assistant Professor, GST**, who explained that engineering Statics is the gateway into engineering mechanics, which is the application of design and analyse objects, systems, and structures concerning motion, deformation, and failure.

Figure 4: Session by Dr. A Sandeep, Assistant Professor, GST

HANDS-ON SESSION:

In the afternoon session after lunch, by **Dr. A Sandeep, Assistant Professor, GST**, conducted a hands-on session on Tension, Compression and Flexural test in handling the 8801 Servo Hydraulic Fatigue Testing System.

Figure 5: Training session in handling 8801 Servo Hydraulic Fatigue Testing Machine

DAY-3, 25th NOVEMBER 2022:

TECHNICAL SESSION:

On day three, **Dr. P.Srinivasa Rao, Assistant Professor, GST**, delivered a "3D Printing" session**.** He discussed the importance of 3D printing, which covers a variety of processes in which material is joined or solidified under computer control to create a three-dimensional object.

Figure 6: Session delivered by Dr. P.Srinivasa Rao, Assistant Professor, GST

HANDS-ON SESSION:

Later in the afternoon, the practical hands-on sessions were conducted on Additive Manufacturing by **Mr. Kolla Narendra Kumar, Assistant Professor, GITAM, GST**. The participants were able to learn and operate how 3D printing works.

Figure 7: Practical session on Additive Manufacturing techniques.

DAY-4, 26th NOVEMBER 2022:

TECHNICAL SESSION:

On day four, **Dr. K. Arun Vikram, Assistant Professor, GST,** gave a presentation on ***"Metal machining of components using CNC machining Centres."***. He explained the importance of machining centres are critical equipment for machining metal parts and components in addition to their primary purpose of die manufacture.

Figure 8: Session delivered by Dr. K. Arun Vikram, Assistant Professor, GST

HANDS-ON SESSION:

In the afternoon session, **Dr. K. Arun Vikram, Assistant Professor, GST**, focused on a training session on a CNC Turn-mill centre in handling **CNC Turn-mill Center-TMC-XL-200** equipment.

Figure 9: Training session on CNC Turn-mill centre

DAY-5, 27th NOVEMBER 2022:

TECHNICAL SESSION:

On the fourth day of class, the session was delivered by a resource person **Dr. Ramakrushna Sabat, IIT Bhubaneshwar,** on the topic **"Introduction to Corrosion Testing of Metals and Alloys."** He stated that the corrosion test is used to evaluate the corrosion resistance of metals, alloys, coatings, and plastics. It can be used to assess the performance of materials in both atmospheric and marine environments.

Figure 10. Session delivered by Dr. Ramakrushna Sabat, IIT Bhubaneshwar

HANDS-ON SESSION:

Later in the afternoon, **Mr. T. Rajesh Kumar Dora, GST,** demonstrated on Corrosion testing hands-on session in handling the IVIUM-Electrochemical Work Station.

Figure 11: Demonstration of corrosion testing by Mr. T. Rajesh Kumar Dora, GST

DAY-6, 28th NOVEMBER 2022:

INDUSTRIAL VISIT-AMTZ (ANDHRAPRADESH MED TECH ZONE LTD)

TECHNICAL SESSION:

On day 6, There was an Industrial visit to AMTZ, Visakhapatnam. The participants were given a technical lecture on the facilities in the morning session.

Figure 12: Technical session at AMTZ, Vishakhapatnam

HANDS-ON SESSION:

Later in the afternoon, the participants visited all the facilities and were demonstrated the working of equipment like 3D printing, Prosthetics, Design and Manufacturing facilities, Metallurgy etc., by the experts.

Figure 13: Hands-on practical session on Prosthetics

Figure 14: Group Photo of participants at ATMZ, Visakhapatnam

DAY-7, 29th NOVEMBER 2022:

TECHNICAL SESSION:

On day 7, **Prof. C. Vijaysekhar, Dean, Research and Development, GITAM, Visakhapatnam,** delivered a lecture on ***" Data Science and its importance".*** Later in the session, **Prof. V.V.S. Prasad, Professor at Andhra University,** delivered a lecture on ***"Testing of Polymer Composites".***

Figure 15: Session delivered by Prof. C. Vijaysekhar, Dean, R&D, GITAM, GST.

HANDS-ON SESSION:

In the afternoon, **Prof. V. Srinivas**, **Head of the Department of Mechanical Engineering, GITAM, GST**, delivered a lecture on ***"Nano Lubricants"***. Later hands-on training session for the participants was given on Bio-fuels by **Dr. S. Jai Kumar, Assistant Professor, GST.** At the end of the day, participants could understand and learn the concepts.

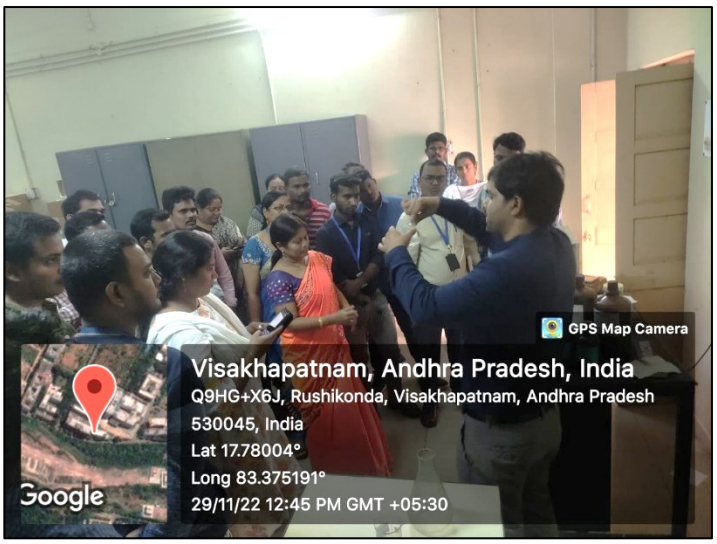

Figure 16: Hands-on live demonstration of Bio-fuels

Distribution of Certificates:

Figure 17: Distribution of certificates to the Participants at GITAM Deemed to be University, GST, Visakhapatnam

STUTI program coordinator Dr. Balla Srinivasa Prasad congratulated all the participants on the successful completion of the seven-day training. The training coordinator, Dr. D. Siva Prasad of GITAM Deemed to be University, Visakhapatnam, thanked each other for completing the training program successfully. Prof. V. Srinivas, Head of the department, and Chief guest Prof. V.V.S. Prasad, distributed certificates to participants and collected participant feedback forms.

VOTE OF THANKS

At the end of day seven, the STUTI program coordinator Dr. Balla Srinivasa Prasad thanked the training coordinator of GITAM, GST Dr. D. Siva Prasad, and also the program panel members of GITAM Deemed to be University and also thanked the delegates and resource persons on successful completion of the 7-day program by sharing their knowledge and experiences to all participants. The program concluded with the National Anthem.

Figure 18: Group photo with the participants who attended the 7-day workshop from 23rd – 29th NOVEMBER 2022 at GITAM, GST, Rushikonda, Vishakapatnam, Andhra Pradesh.