

A Report on Expert Talk under IIIC on “Advanced Materials and Manufacturing Processes for Automobile and Aerospace Applications”

15th October, 2016

(Under TEQIP-II)

An expert talk was organized by the Department of Mechanical Engineering under IIIC on “Advanced Materials and Manufacturing Processes for Automobile and Aerospace Applications” under TEQIP-II on 15th October, 2016. Dr. T. Ram Prabhu, Asst. Director, Materials and Manufacturing Processes, Defence R&D Organization, Bangalore was the resource person. The students of II B.Tech (Mechanical Engineering) participated and gained knowledge on advanced materials and manufacturing processes.



Dr.T. Ram Prabhu addressing the students

During the first session, Dr. T. Ram Prabhu stressed that materials performance is often a critical consideration and controlling factor in the innovation

process. For example, high strength alloys, aluminum, and magnesium are used to build stronger, lighter, and safer vehicles; superalloys are used to make higher efficiency gas turbines; composites make larger, more efficient wind turbine blades and provide improved performance in aerospace applications; and nanomaterials are finding their way into better performing batteries, energy storage devices, high voltage transmission lines, and health care applications. During the session he taught about processing of advanced materials for automobiles and aerospace applications. He concentrated mainly on processing of aluminium, titanium, and super alloys by using various methods.

The second session continued with the presentation on manufacturing processes of the advanced materials for automobile applications. Because of the intimate relationship between advanced materials and structures produced from them, the design and manufacture of these new materials must be treated as an integrated process. These materials make it possible to form parts and systems in larger, more combined operations than are possible with traditional metals technology. One operation can form both the part and the material, thereby eliminating costly assembly operations. The need for such an integrated, or unified, approach will affect all aspects of manufacturing.



The students listening to the lecture

Dr. Ram Prabhu focused on the composite materials and its vision for future during the third session. Composites are able to meet diverse design requirements with significant weight savings as well as high strength-to-weight ratio as compared to conventional materials. For certain applications, the use of composites rather than metals has in fact resulted in savings of both cost and weight. Some examples are cascades for engines, curved fairing and fillets, replacements for welded metallic parts, cylinders, tubes, ducts, blade containment bands etc. Armed with a wide gamut of advantages, composites have a key role to play in the growing market in India. Composites have made an entry into diverse end-use segments and the developmental efforts for finding newer composites for existing and novel applications is an area of top priority.

The session ended with the interaction of the students with the resource person. The expert clarified the doubts raised by the students in the Automobile and Aerospace applications. Dr. Ram Prabhu also guided the students on their research thoughts.



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DEPARTMENT OF MECHANICAL ENGINEERING

An Expert Talk on
“COMPUTATIONAL FLUID DYNAMICS (CFD) FOR MECHANICAL ENGINEERS”

19th October 2016

(Under TEQIP-II)

The Department of Mechanical Engineering conducted an expert talk on **“COMPUTATIONAL FLUID DYNAMICS (CFD) FOR MECHANICAL ENGINEERS”** under Technical Education Quality Improvement Program–II on the forenoon of 19.10.2016.

The program started with conveying the objectives of the talk and introducing the resource person Sri. Ramesh Kolluru, Asst. Professor, B.M.S College of Engineering, Bangalore. Participants of II & III B.Tech, I semester (ME) attended the program.

During the first session, the resource person delivered a lecture on fluid dynamics. He started the session by defining the fluid and fluid dynamics

applications. He then continued with computational fluid dynamics concepts like control volume, system, boundary conditions etc., and their governing equations. He also emphasised on the various problems in fluid dynamics with their solving procedures. Many illustrative examples were discussed in his talk.

During the second session, he focussed on solving the CFD problems using CFD softwares like FLUENT, ANSYS, etc. He also delivered various concepts of CFD like shock with live examples and their applications.

Finally, the participants interacted with the resource person and clarified their doubts on CFD.



Sri. Ramesh Kolluru, Asst. Professor, B.M.S College of Engineering, Bangalore



Sri. Ramesh Kolluru, delivering lecture on Computational Fluid Dynamics



Students listening to the lecture



Sri. Ramesh Kolluru, explaining about the topics of CFD

An Expert Talk under IIIC
on
“6 SIGMA- ITS SIGNIFICANCE AND APPLICATIONS
IN A PRODUCTION SYSTEM”

25th October, 2016

(Under TEQIP-II)

An expert talk was organized under IIIC on “**6 SIGMA- Its Significance and Applications in a Production System**” by Dr.G.Saravanan, Operations Group Manager, Caterpillar India Pvt. Ltd., Thiruvallur, Tamil Nadu sponsored by Technical Education Quality Improvement Programme (TEQIP-II) on 25th October, 2016 by the Department of Mechanical Engineering, Sree Vidyanikethan Engineering College, Tirupati.



Six sigma is important because it scores much higher over other quality improvement techniques such as Total Quality Management. Six Sigma concepts and methodologies stress the use of statistical tools and techniques for improving quality and reducing defects.



Dr.G.Saravanan, Operations Group Manager, Caterpillar, India Pvt.Ltd.

Dr. Saravanan started his first session with the fundamental concepts in six sigma. He defined six sigma and various levels of sigma in a production system and its importance. He explained the significance of six sigma, how it is improving the quality of the output of a process by identifying and removing the causes of defects and minimizing variability in manufacturing and business processes.



Dr.G.Saravanan, delivering a talk on 6 Sigma

In the second session, Dr.Saravanan explained about the Six Sigma methodology. It is the implementation of a measurement-based strategy that focuses on process improvement and variation reduction. This is accomplished

through the use of two Six Sigma sub-methodologies: DMAIC and DMADV. The Six Sigma DMAIC process (define, measure, analyze, improve, control) is an improvement system for existing processes falling below specification and looking for incremental improvement. The Six Sigma DMADV process (define, measure, analyze, design, verify) is an improvement system used to develop new processes or products at Six Sigma quality levels.



Students listening the lecture

During the third session, Dr.Saravanan focused on applications of six sigma in a production system. He shared some case studies about the applications of six sigma in Industry. He also told that the goal of Six Sigma is to create a plan that results in a solution to improve a process or product to a ratio of 3.4 defects per million opportunities.

The students of Mechanical Engineering got enriched by the interaction with Dr.G.Saravanan. His knowledge and experience helped them in appreciating the significance of six sigma and its implications in the industries.



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A report on

“ADVANCED MATERIAL JOINING AND SURFACE ENGINEERING”

(Expert Talk)

20th January, 2017

(Under TEQIP-II)

An expert talk was organized for the students of Mechanical Engineering on “Advanced Material Joining and Surface Engineering” by Mr. C.V.Srinivasa Murthy, Scientist-G, DRDL, Hyderabad, Telangana under IIC sponsored by Technical Education Quality Improvement Programme (TEQIP-II) on 20th January, 2017 in the Seminar Hall of Department of Mechanical Engineering.

The main objective of the talk is to enlighten the students with the developments of new joining and coating materials, techniques for advanced materials and characterization of joined and coated materials in relevant conditions.



Mr. Srinivasa Murthy in his talk highlighted that there have been several recent developments in joining, surfacing and associated fabrication processes. These are often driven by the continuous demand for higher productivity and quality, lower costs and the use of advanced materials in manufacturing.

Advances in materials and coatings technologies are important to strategic sectors, such as the energy and transport ones, because of increasingly challenging environments and the aging and life extension of components. The joining and coating of advanced materials were identified as a key enabling technology to innovative and sustainable manufacturing. Lightweight and high performance structures and components integrating a large number of functions can be obtained only by combining various materials into a multi-material structure.

Also he explained that surface protection, including corrosion protection and permeation barrier have been the main functions of coatings in the past. In more recent years, many new opportunities have arisen for coatings to provide products with innovative new functionalities (such as self-healing, anti-fouling, sensing, etc.) Chemical and thermo-mechanical incompatibilities between the different materials to be joined and coated (thermal expansion, ductility, fatigue/fracture mechanics, elastic modulus etc.) can create problems both for the joining and coating process itself, but also for the structural integrity of the components during their use. The joining and coating materials and processes must be designed to minimise these differences.

With this expert talk students had gained knowledge on new joining and coating materials and techniques for advanced materials with other innovative techniques such as advanced surface engineering.



Mr.C.V.Srinivasa Murthy Delivering the lecture



Felicitation to the resource person



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A report on "AWARENESS PROGRAM ON OVERSEAS STUDIES"
(Expert Talk)

11th April, 2017

An awareness program on overseas education is organized for the students of Mechanical Engineering on 11th April, 2017. Sri. V. Praveen Kumar Reddy, Director, Overseas Study Consultants Pvt. Ltd., Hyderabad created awareness and inspired students regarding the importance of overseas education.

The outcome of the program was to create awareness and encourage students who aspire to continue higher education in abroad after their graduation.



Sri. V. Praveen Kumar Reddy, Director, Overseas Study Consultants Pvt. Ltd., Hyderabad

International study provides a wonderful opportunity for all students to gain a new perspective on the impact of a different culture on them, both in relation to their own identities and the identities of their peers on the program. Certainly, an international study experience enlarges their knowledge of the world. However, in today's increasingly competitive global economy, an international education experience must provide more concrete benefit for a student who will need to embrace the changing world that awaits post-graduation.

Sri Praveen Kumar Reddy emphasized that in the increasingly global marketplace, an international education experience can be more relevant than ever to a post-college career. Such an experience has the potential to alter students' lives by influencing their professional choices and by preparing them for the many challenges they will face in the current, rapidly changing global economy.

Students of Mechanical Engineering benefitted a lot by listening to the lecture and interacted with the resource person about the ways to approach universities, GRE, TOEFL, IELTS scores, scholarships and career opportunities.

The lecture helped to clarify the ambiguity of the students hoping to pursue higher education in abroad. Lot of academic benefits pertaining to personal growth, gaining of valuable life skills, strengthening the leadership skills, broadening the world view and advancement in career.

A report on
“CHALLENGES AND OPPORTUNITIES IN THERMAL
POWER SECTOR”
(Expert Lecture)

27th April, 2017

Today there is pressure on thermal power generation due to Government of India's emphasis on clean energy production such as solar power, hydro power, wind power and nuclear power. This is a transition time to migrate from thermal power generation to environmental friendly clean power generation. *Dr.K.Dakshina Moorthy, Director-Administration* clearly presented the power scenario, problems and challenges in India.

Indian Energy sector has consistently adopted relevant global trends to support sustainable growth in Indian economy. The increasing maturing of the sector is evidenced by adoption and indigenization of new technologies across the energy sector in general and power sector in particular.

Of late, the sector has grappled with new challenges which have arisen out of rapid growth of the sector. Some of these challenges will be overcome relatively quickly; some will require all the resourcefulness and intellect to convert them into promising opportunities for future.

The Indian power sector has achieved a lot over the last decade in the areas of policy reforms, private sector participation in generation and transmission, new manufacturing technology and capabilities, but there is still much to achieve and a number of challenges to overcome before the opportunities can be leveraged.

Strong growth in generation capacity led by per capita consumption, urbanization, there is strong growth opportunity in power generation led by exponential growth in economy, increasing propensity for electricity consumption and urbanization. India has made considerable progress in building up capability and uncovering opportunities for capacity additions.

Dr. Dakshinamurthy highlighted that there are lot many career opportunities in the thermal power sector such as

- Design Engineers
- Planning Engineers
- Manufacturing Engineers
- Sales Engineers
- Procurement Engineers
- Assessment Engineers
- Testing Engineers
- Erection Engineers
- Commissioning Engineers
- Operation Engineers
- Maintenance Engineers

Students of Mechanical Engineering benefitted a lot by listening to the lecture and interacted with the resource person about the key challenges in the power sector and growth with respect to the career aspect.