

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.