Valedictory of short term course and workshop on Adaptronics (shape control, vibration control, noise reduction and structural health monitoring) at IIT Mandi.

A short term course and workshop on Adaptronics(Active Shape Control, Active Vibration Control, Active noise Reduction and Structural Health Monitoring) was organized at IIT Mandi during September 20-23, 2017. Nineteen participants from 8 different states Karnataka, Maharashtra, Gujarat, Uttar Pradesh, Haryana, Punjab, Chandigarh and Himachal Pradesh attended the event.Among the participants we had Assistant Professors, research scholars from academic and research institutions, students of M.Tech. and B.Tech. The short term course had lectures from Prof. Michael Sinapius, member of the Directorate of German Aerospace Centre at Braunschweig Germany and Professor & Head of the Institute of Adaptronics and Functions Integration at the Technical University of Braunschweig. The course also had laboratory sessions conducted by Dr. Naser Al Natsheh, Lecturer at the Technical University of Braunschweig Germany. On the last day lectures on the current areas of research related to adaptronics were given by Prof. Sinapius, Dr. Naser Al Natsheh, Dr. Rajeev Kumar, Dr. Vishal S Chauhan and Mr. Anurudh Kumar. The program ended with the distribution of certificates to the participants by Prof. Sinapius.

The course comprised of 9 lectures,6 laboratory sessions and 5 lectures on current research as given below.

Lectures

- Introduction of adaptronics and their components.
- Smart materials, Piezo ceramics
- Electro active polymers.
- Structural conformity.
- Shape control.
- Structurally integrated health monitoring.
- Active vibration control
- Active Noise Control

Lab Sessions

- Piezoelectric effect – butterfly hysteresis
- Piezoelectric actuators – working diagram
- Shape control
- Vibration control
- Placement of actuators and observability
- Acoustic control with electric networks

Lectures in the Workshop:

- Acting principles of nano-scaled matrix additives for composite structures
- Adaptive tribological system
- Deformation induced electromagnetic radiation
- Vibration & shape control and energy harvesting using smart materials
- Isogeometric analysis of flexoelectric and piezoelectric structure