



ENGINEERING METROLOGY

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PRE-REQUISITES : The student should have completed two semesters of UG Engineering or Science program

INTENDED AUDIENCE : Students of all Engineering and Science disciplines.

INDUSTRIES APPLICABLE TO : HAL, NAL, SAIL, ISRO

COURSE OUTLINE :

Engineering metrology is the use of measurement science in manufacturing. The study of metrology is highly valuable for the students and practitioners, specifically from mechanical and allied engineering stream. For a product to be successful, it needs to be manufactured according to metrological specifications, otherwise heavy costs are incurred to comply with the specifications in the later stage. Also, the role played by measurements in the day today life makes it essential to study metrology. This course is designed to impart the knowledge to develop measurement procedures, conduct metrological experiments, and obtain and interpret the results. A laboratory demonstration are also induced to enhance the learning process. The course would be useful in many areas in the traditional and modern high technology viz. manufacturing, industrial, scientific research, defense, and many others.

ABOUT INSTRUCTOR :

Prof. Janakarajan Ramkumar is Professor of Mechanical Engineering Department, and Design Program, at Indian Institute of Technology, Kanpur. He teaches manufacturing science, micro/nano technology, new product development. He has a bachelors in Production Engineering with his doctorate in Defect quantification in drilling of composites from IIT Madras, India with a best thesis award. Over the years his contribution in teaching and research is remarkable. He has worked for BOSCH group and improved the productivity of the company. His research and teaching focus is on nano technology and inclusive design. He has several international and national patents in his credit and has published more than 100 journal papers

Prof. Amandeep Singh is working as Research Scientist in the Mechanical Engineering Department, and Design Program, Indian Institute of Technology, Kanpur, India. He holds PhD degree from Indian Institute of Technology Kanpur, India, and a bachelor degree in Production Engineering. Dr. Singh has ten years of industrial and academic experience. His research interests are Sustainable Manufacturing Processes and Systems, Simulation of Manufacturing Systems, Product Design and Manufacturing, Applied Ergonomics and Engineering Metrology. He has traveled in countries like US, Canada, and Australia to present his research in various international conferences organized by reputed bodies like CIRP and IEOM. His research is also published in various international reputed journals.

COURSE PLAN :

Week 1 : Introduction to Engineering Metrology

Week 2 : Introduction to Engineering Metrology

Week 3 : Statistics in Metrology

Week 4 : Linear Measurements

Week 5 : Angular and rotation measurements

Week 6 : Comparators

Week 7 : Optical measurements, and temperature measurements

Week 8 : Screw threads metrology, and gears metrology

Week 9 : Transducers

Week 10: Flow and Pressure measurements, and strain measurements

Week 11: Surface finish metrology, and mechatronics

Week 12: Nano-metrology, and Quality control