



METAL CUTTING AND MACHINE TOOLS

PROF. ASIMAVA ROY CHOUDHURY

Department of Mechanical Engineering
IIT Kharagpur

TYPE OF COURSE : Rerun | Core | UG/PG

COURSE DURATION : 4 weeks (15 Feb' 21 - 12 Mar' 21)

EXAM DATE : 24 Apr 2021

PRE-REQUISITES : Nil

INTENDED AUDIENCE : Mechanical Engg, Manufacturing Engg, Industrial Engg

INDUSTRIES APPLICABLE TO : All metal cutting industries

COURSE OUTLINE :

This course would encompass a comprehensive study of metal cutting and machine tools. Within a limited time of 10 hours, this course would elaborate on the theory of metal cutting supplemented with numerical problems. Tool geometry, chip formation, cutting force calculations and measurement, tool wear and other aspects will be given due attention. This would be followed by a descriptive study of the machine tools like lathe, milling, grinding, drilling and shaping machines, followed by numerical problems.

A study would also be made on fixed automation, Computer numerical control (CNC) machines, gear cutting machines, non-traditional machine tools, Rapid prototyping, together with numerical problem solving.

There would be discussions on MCQ at the end of each week of lectures.

ABOUT INSTRUCTOR :

Prof. Asimava Roy Choudhury received his B.E, (Mechanical) Degree from Jadavpur University in 1983, M.Tech. (Machine Tools Engg) from IIT Kharagpur in 1984 and Ph.D. (Engg) from IIT Kharagpur in 1999. Asimava Roy Choudhury is at present a professor in the Mechanical Engineering Department of IIT Kharagpur. His interests include: Computer numerical control, Direct slicing in Rapid Prototyping, Non-traditional manufacturing processes and Laser coating of surfaces.

COURSE PLAN :

Week 1: Introduction, Geometry of single point turning tools A ,Geometry of single point turning tools B , Different types of cutting tools ,MCQ discussion

Week 2: Mechanism of chip formation ,Calculation of Cutting forces, Measurement of cutting forces ,Tool wear and tool life, MCQ discussion

Week 3: General purpose machine tools : Lathe, Milling machine and grinding machine, Drilling and shaping machines, Alignment tests : Radial drilling machine, MCQ discussions :

Week 4: Gear cutting machines, Fixed automation, CNC machines
Non-traditional machine tools, rapid prototyping machines, MCQ discussions