



GEAR AND GEAR UNIT DESIGN : THEORY AND PRACTICE

PROF. RATHINDRANATH MAITI
Department of Mechanical Engineering
IIT Kharagpur

TYPE OF COURSE : Rerun | Elective | UG
COURSE DURATION : 8 weeks (21 Feb' 22 - 15 Apr' 22)
EXAM DATE : 23 Apr 2022

PRE-REQUISITES : Prior knowledge of general mechanics, theory of machines and solid mechanics

INTENDED AUDIENCE : It may be considered as a part of UG Core Course- Design of Machine Elements, but in a rigorous way. Mostly suitable for UG (Senior Level) and PG engineering students of Mechanical Engineering/Aeronautical Engg./Automobile Engg./Agricultural (Machinery) Engg./Mining (Machinery) Engg.

INDUSTRIES APPLICABLE TO : Industries designing/manufacturing gears and gear units, and machines involving gears, such as earth moving & construction machineries, conveying and elevating equipments, automobiles, aircrafts, machine tools etc., would recognize this online course.

COURSE OUTLINE :

Over and above the outline of gear design that are taught in undergraduate and postgraduate levels through the basic course of design of Machine Elements or specialized course Mechanical Drives, detail aspects of practical design in industries will be focused. The course would help to fill the gap the knowledge at graduation and step into producing the detail design and drawing of gear units in Industries. The course is developed based on long time research, teaching and working in industries in this area.

ABOUT INSTRUCTOR :

Prof. Rathindranath Maiti is at present Professor in Mechanical Engineering Department, IIT, Kharagpur. His teaching and research interests are Machine design, Gear Engineering, Mechanical and Fluid Drives. He has worked in Design and R&D divisions in Hindustan Aeronautics Ltd. and Macneil and Magor Ltd. in India and Eaton Hydraulics in Japan, for about ten years together. Recipient of DAAD and INSA Fellowships he has worked in the areas of Fluid power/ Mechanical Power Transmissions in TU-Dresden, Germany; Cardiff School of Engineering, UK ; Krakow University of Technology and Wroclaw University of Technology, Poland. Publications, over 40 in peer reviewed international journals and conferences; and few patents are in his credit.

COURSE PLAN :

- Week 1:** Introduction to Gear and Gear unit Design
- Week 2:** Design of Spur (Straight and Helical), Bevel and Worm gears.
- Week 3:** Design of a gear box- part-1
- Week 4:** Design of a gear box- part-2
- Week 5:** Design of a gear box- part-3
- Week 6:** Design of a gear box- part-4
- Week 7:** Introduction to Involute Gear Tooth Correction
- Week 8:** Internal Gearing, Epicyclic and other special Gearing