19AG218 MACHINE DESIGN

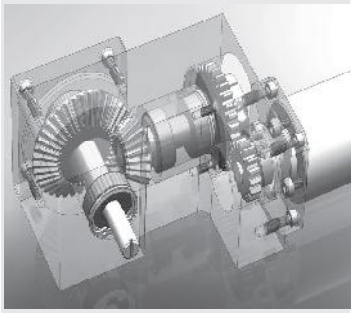
Hours Per Week :

L	T	P	C
2	0	0	2

Total Hours :

L	T	P
30	-	0

WA/RA	SSH/HSH	CS	SA	S	BS
5	40	5	8	5	-



Source :
http://me.erciyes.edu.tr/upload/UDUGD9Vdesign.jpg

COURSE DESCRIPTION AND OBJECTIVES:

This course deals with the design of different machine elements. The objective of this course is to make the students to familiarize with the various steps involved in designing the shape and dimensions of engineering components with quality functional and strength requirements.

COURSE OUTCOMES:

Upon completion of the course, student will able to achieve the following outcomes:

COs	Course Outcomes	POs
1	Understand, the design procedure and selection of materials.	---
2	Apply a fasteners such as rivets, bolts and cotter joints properly in machines and real life practice according to the given load conditions.	5,7
3	Analyze power transmitted by shafts and couplings, also can design it.	3,5
4	Evaluate stress and load along with deformations of various types of springs.	1,2
5	Apply design concepts for the components subjected to static and cyclic loading.	3

SKILLS:

- ✓ *Assemble the components of an engine.*
- ✓ *Part drawing of machine elements.*
- ✓ *Design of rivets, bolts and cotter joints.*
- ✓ *Design of spur and helical gears.*

UNIT - I **L-6**

Introduction: Meaning of design, Phases of design, design considerations, Common engineering materials and their mechanical properties. Design against static load: Types of loads and stresses, modes of failure, factor of safety, Theories of failure, selection and use of failure theories.

UNIT - II **L-6**

Design against fluctuating load: Stress concentration and factor, Reduction of stress concentration. Fluctuating stresses, Fatigue failure, Creep, Endurance limit, Low cycle and high cycle fatigue, Notch sensitivity, Endurance limit, Design for finite and infinite life. Soderberg, Goodman and Modified Goodman diagram, Gerber Equation, Fatigue design under combined stresses.

UNIT - III **L-6**

Design of knuckle joint, cotter joint, Design of spur and helical gears.

UNIT - IV **L-6**

Design of bolted: Joints loaded in shear and bolted joints subjected to eccentric loading. Design of welded joints subjected to static loads.

UNIT - V **L-6**

Design of helical and leaf springs, Design of shafts under torsion and combined bending and torsion.

TEXT BOOK :

1. Bhandari, V. B 3rd edition, “Design of Machine Elements”, Tata-McGraw Hill Companies, New Delhi.

REFERENCE BOOKS :

1. Khurmi R. S and Gupta J. K. 2005, “A Textbook of Machine Design”, Eurasia Publishing House Pvt. Ltd. Ram Nagar, New Delhi.
2. Joseph, E. 2003, Shigley and Charles R. Mischke, 6th edition, “Mechanical Engineering Design”, McGraw-Hill International.