Birla Institute of Technology & Science, Pilani
Instruction Division
Second Semester 2015-2016
Course Handout (Part-II)

Date: 15/01/2016

In addition to Part I (General Handout for all courses appended to the Time Table), this portion gives further specific details regarding the course.

Course No. : **ME F241, MF F241**
Course Title : **Machine Design & Drawing**
Instructor-in-Charge : **M S Dasgupta**
Practical Instructor : Nitesh Sihag, Simarpreet Singh, Kapil Dev, Nilesh Purohit

1. Course Description : The course introduces students to concepts and nuances of Mechanical Engineering Design. Content includes materials and design of machine elements and application of scientific principles, technical knowledge, and imaginative skills to be developed in a student. The machine elements covered are Shafts, Screw fasteners, Welded joints, Springs, Brakes & Clutches, Bearings and Gears.

The Practical classes of the course will cover fundamentals of machine drawing and solid modeling using conventional software. Practices for orthographic drawing of machine parts, sectional view, assembly drawing & exploded view included.

2. Scope & Objective: To prepare a student of mechanical engineering to apply theory and practice of Design of Mechanical Elements. It is an introductory course laying foundation on design ground rules, application of strength of material principles, selection of components, and selection of materials for a given application. The objective also includes learning of Machine Drawing and Solid modeling.

3. Text Books:

T1. Budynas, R. G. and Nisbett, K. J., "*Shigley's Mechanical Engineering Design*" Tata–McGraw Hill, 9th Edition, New Delhi, 2011.
T2. Cencil Jensen, Jay D. Helsel & Dennis R. Short, Engineering Drawing & Design, Tata McGraw-Hill 7th Ed. 2012.

4. Reference Books:

R1 Robert L Norton, Machine Design an integrated approach, second edition, Pearson Education Asia, 2001

R2 V B Bhandari, Design Of Machine Elements, Tata Mc-Graw Hill publishing Co, 1994

R3 Lieu D. K. and Sorby S., Visualization, Modeling and Graphics for Engineering Design, Cengage Learning, 2009

5. Course Plan:

Lect-No.	Learning Objectives	Topics to be covered	Reference (T1)
1-2	Fundamentals of Mechanical Design	Mechanical Engineering Design Principles, Preferred Number, Concept of Safety Factor, Engineering Units.	Ch1
3	Materials in Design	Material considerations in design and Material Specification.	Ch2
4-6	Strength based design	Failure resulting from static loading Failure resulting from Variable Loading	Ch5 & 6

Lect-No.	Learning Objectives	Topics to be covered	Reference (T1)
7-10	Design of Mechanical Elements	Shafts	Ch7
11-14	"	Screws fasteners & non-permanent joints	Ch8
15-18	"	Weldments and permanent joints	Ch9
19-22	"	Mechanical springs	Ch10
23-27	"	Rolling Contact bearings	Ch11
28-32	"	Lubrication and Journal bearings	Ch12
33-37	"	Spur, helical and Bevel gears	Ch13-15
38-40	"	Clutches and Brakes	Ch16

Practical Sessions	Topics	Reference (T2)
1	Orthographic Drawing with basic Dimensioning	Ch8
2	Orthographic Drawing with Advanced Dimensioning	Ch8
3	Orthographic Drawing with Dimensioning and Tolerancing	Ch16
4	Sectional View, Simple Section	Ch9
5	Sectional View, Complex Section	Ch9
6	Detail & Assembly Drawing, Simple Machine part	Ch14
7	Detail & Assembly Drawing, Complex Machine part	Ch14
8	Pictorial Drawing	Ch15
9	Pictorial Drawing & Exploded view	Ch14-15
10	Solid Modeling	Ch15

6. Evaluation Scheme:

EC No.	Evaluation Component	Duration (mints)	Weightage	Nature of Component	Date & Time
1.	Mid- Semester Test	90	25	OB	**16/3 9:00 - 10:30 AM**
2.	Assignment & Surprise Test	-	10	OB/CB	
3.	Practical (best n-3) out of 'n' evaluated practical marks will be taken for grading.	110	25	OB	
4.	Comprehensive Exam	180	40	OB	7/5 FN

OB – Open Book, CB – Closed Book

Chamber Consultation Hour: To be announced in the class.

Notices: If any, will be displayed in Mechanical Engineering notice board only.

Make-up policy: Make-up request for Mid Semester / comprehensive examination must accompany appropriate supporting medical / exigency documents. No makeup is allowed for Tutorials / Surprise test and Practical components.

Instructor-in-charge