FIRST SEMESTER 2020-21

COURSE HANDOUT

16/03/2020

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 F112**
Course name : **Workshop Practice**
Credit : **2 (1 Lecture per week)**
Instructor-in-charge : **Girish Kant Garg**

Practical Instructors : Shailendra Pawanr, Shailender Singh, Naveen PT, Ramesh Kumar

1. Course Description:

Casting; metal forming; Joining Processes; metal cutting machines e.g., Sand casting, rolling, extrusion, forging, arc welding, gas welding, lathe, shaper, drilling, milling and grinding; Engineering metrology and equipment. Overview of Non-traditional manufacturing processes. Laboratory exercise involving machining, joining and welding etc.

2. Course Objectives:

This course aims at imparting theoretical and practical aspects of the basic techniques and skills used to manufacture metal and wooden products. This course provides an overview of the basic manufacturing processes and allied processes used to produce finished products from raw materials. In addition to theory, demonstration of various basic manufacturing processes like sand casting, machining, forming, sheet metal working and joining processes using common machine tools and hand tools etc will be imparted.

3. Text book

(i) B S Nagendra Parashar and R K Mittal, *Elements of Manufacturing Processes*, Prentice Hall of India, 2006, 4th print.

(ii) Sangwan, K. S. et. al, *Workshop Practice Manual*, BITS Pilani.

4. References book

Serope Kalpakjian and Steven R. Schmid, "Manufacturing Engineering and Technology," Pearson Education, 4th edition, 2005, New Delhi

5. Course Plan

Week	Learning Objectives	Topics to be covered	Text Book- Chapter No.
1-2	Theory of Metal cutting/Machining	Metal cutting, machine tools, cutting tools, tool material, type of tools, tool geometry, type of chips, cutting fluids, operating conditions, tool life and machinability.	T-4
3	Production of cylindrical surfaces: machine tool and operations	Lathe machine tool, operating conditions, various operations on a lathe and MRR.	T-5
4	Production of cylindrical holes and allied operations	Drilling machine, drill, operating conditions, boring, reaming, tapping and MRR.	T-6
5	Production of flat surfaces: shaping	Shaping machines, operations on shapers, operating conditions and MRR.	T-7
6	Production of complex and flat surfaces	Milling machine, type of milling processes & operations, operating conditions and MRR.	T-8
7	Obtaining surface finish	Abrasive machine, abrasives, grinding, grinding wheel, grinding machines and fine finishing operations.	T-9
8	Role of measurements in manufacturing	Metrology, inspection, measuring, gauging, limits & fits.	T-3
9-10	Production of parts by casting	Casting processes, pattern making, moulding sand, moulding process, cores, gating system, melting, pouring, solidification, casting defects, advantages and disadvantages of casting	T-11
11-12	Production of parts by forming	Metal forming processes, rolling, extrusion, and forging processes.	T-12
13	Mechanical joining processes	Mechanical joining, arc welding, gas welding, soldering, brazing and mechanical fastening.	T-15
14	Role of computers in manufacturing	Numerical control, computerized numerical control (CNC), machine tools, advantages and disadvantages.	T-18

6. Evaluation scheme

Evaluation component	Duration (minutes)	Weightage (%)	Marks	Nature of component
Mid semester examination	90	40%	80	Open book
Quiz*	30	20%	40	Open book
Comprehensive examination	90	40%	80	Closed book

*** Two multiple-choice quiz of equal weightage will be conducted in practical hours.**

7. Chamber consultation hour: Thursday 5 to 6 PM

8. Notices: All the notices will be displayed on Nalanda.

9. Make-up policy: No make up will be permitted for practical quiz under any circumstances. Make-up for mid semester and comprehensive examination will be permitted only in genuine cases with prior permission**.**

Instructor-In-charge

ME F112