Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2024-2025
COURSE HANDOUT (PART-II)

Date: 06/01/2025

In addition to Part-I (General Handout for all courses appended to the timetable) this portion gives specific details regarding the course.

Course No.	:	**ME F112**
Course Title	:	**Workshop Practice**
Instructor-in-charge	:	**Prof. Sujith R**
Instructors	:	**Prof. Kundan Kumar Singh**

1. Course description (as given in the Institute Bulletin):

Engineering materials, casting, forming, machining, joining, powder metallurgy, additive manufacturing, plastic processing, various other manufacturing processes and related laboratory exercises.

2. Scope and Objective of the Course:

This course is required for all first-degree students at the first-year level. The course will provide an overview of the techniques and applications of basic manufacturing processes used for producing finished articles from raw materials. The course is practice-orientated and requires basic skills in handling tools and machines, and machine tools used in different manufacturing processes are acquired through hands-on experience. The lectures supplement the practical knowledge to provide the expertise and genesis of various manufacturing processes. The primary objective of this course is to learn how the physical artefacts we use are manufactured and gain technical knowledge and skills. Much of the knowledge in the course is conceptual, and no great mathematics is involved. This knowledge will be helpful in whatever discipline the students are going to specialize.

3. Books:

(i) Laboratory Manual: Practical Manual for Workshop Practice, EDD, BITS Pilani, 2008.
(ii) Textbook:

(1) B S Nagendra Parashar and R K Mittal, Elements of Manufacturing Processes, Prentice Hall of India, 2008.

Reference Books:

(i) Mikell P. Groover, “Fundamentals of Modern Manufacturing”, Second edition, John Wiley& sons Pvt Ltd. Campbell J.S., Principles of Manufacturing Materials and Processes, Tata McGraw-Hill, New Delhi, 1995.

(ii) Richard R. Kibbe et al, Machine Tool practices, Sixth edition, Prentice Hall of India Pvt. limited, New Delhi, 2003.

(iii) E. Paul Degarmo, J.T. Black, Ronald A. kosher, Materials and processes in Manufacturing, PHI 2005.

(iv) Choudhary H., "Elements of Workshop Technology", (Vols I & II), Media Promoters and Publishers, Bombay.

4. Course Plan:

Lec #	Learning Objectives	Topics to be covered	Chapter in the Text Book
1	Introduction	Basics, ethics and safety in workshop	**T1-1**
2	Engineering Materials	Material properties, Mechanical properties, Common engineering materials	**T1-2**
3-4	Role of Measurements and Quality	Metrology, Quality, Limits & fits, Examples.	**T1-3**
5-7	Basics of Foundry	Casting processes, Pattern making, Moulding, Defects in casting	**T1-11**
8-10	Basics of Metal Cutting	Metal cutting, Machine tools, Cutting tools, Tool material, Tool geometry, Tool wear, Tool life, Effect of	**T1-4 T1-5**

Lec #	Learning Objectives	Topics to be covered	Chapter in the Text Book
		lubricants, MRR	
11-12	Basics of Metal Forming	Metal forming processes, Hot and cold forming, Rolling, Extrusion, Forging, Defects in forming	**T1-12 T1-13**
13-14	Powder metallurgy, Mechanical joining processes	Metal powders: mixing, compaction and sintering Mechanical joining, Welding (arc, gas), Soldering, Brazing, Fasteners, Examples.	**T1-14 T1-15**
15	Additive manufacturing and Plastics in manufacturing	Processing of plastics, Types of plastics, Processing. 3D printing, SLA, SLS and SLM techniques	**T1-16 Lecture material**

5. Evaluation Scheme:

EC No.	Component	Duration	Weightage (%)	Date & time	Nature
1	Mid Semester Exam	60 min	15	08/03 2:00 PM – 03:00 PM	CB
2	Comprehensive Exam	120 min	25	15/05FN	CB
3	Classroom Assessment		10		OB
4	Laboratory Practical Regular Classwork		40		OB
5	Laboratory Practical Comprehensive Exam		10	To be announced later	OB

❖ ***Minimum pass mark criteria:*** A student should obtain 30% of the lower bound of A grade, or 40% of the median marks of the class, whichever is lower to clear the course.

6. Laboratory:
The practical work contributes **fifty percent** directly and much more indirectly; therefore, it must be carried out seriously. The practicals are intended to provide experience in handling of basic tools, machine tools and make simple utility jobs. Laboratory marks mentioned includes marks for models (viva) and attendance in practicals. Details of practical are available in the "Laboratory Manual". Mobile phones are strictly not allowed within the workshop.

7. Chamber Consultation Hour: Every Monday 5 pm in E207.

8. Notices concerning the course: All notices concerning the course will be displayed on the LMS notice board.

9. Make-up Policy: Maximum 2 makeups will be permitted for the lab exercises. Makeups will be permitted for other evaluation components only for genuine cases.

10. Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-charge
ME F112