BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
FIRST SEMESTER 2022-23
COURSE HANDOUT (PART-II)

29.08.2022

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

Course Code : ME F315
Name of the Course : Advanced Manufacturing Processes
Instructor-In-Charge : N. SURESH KUMAR REDDY
Instructors (Prac & Tut) : N. Suresh Kumar Reddy

1. **Course Description:**
A brief overview of different metal cutting processes, Unconventional manufacturing processes and analysis, Micro-manufacturing technologies, Introduction to computer-aided manufacturing, CNC machines, CNC part programming, Additive manufacturing, Modelling & simulation of manufacturing processes, Surface technologies, Related laboratory exercises and fabrication project.

2. Scope and Objective of the Course
This course is designed to enrich theoretical, analytical as well as practical knowledge about advanced production techniques used in manufacturing. Methods of selection of proper production techniques, CAM and micro manufacturing technologies are also included.

3. Textbook
1. Serope Kalpakjian and Steven R. Schmid, "Manufacturing Engineering and Technology," Pearson Education (Low Cost Indian Edition), 4/e, 2001, New Delhi
2. Amitabha Ghosh and Asok Kumar Mallik, "Manufacturing Science", Affiliated East-West Press, New Delhi, 1985.

4. Reference Books
1. Roy A. Lindberg, "Processes and Materials of Manufacture," PHI, New Delhi, 2004.
2. P. N. Rao, "Manufacturing Technology: Foundry, Forming & Welding," TMH, New Delhi, 2000.
3. P. N. Rao, "Manufacturing Technology: Metal Cutting & Machine Tools," TMH, New Delhi, 2000.

5. Course Contents

Topics to be covered	*Learning Objectives*	*Number of Lectures*	*Chapter in the Text Book*
Metal cutting theory	A brief overview of different metal cutting processes	6	T1 & T2
Non-traditional machining processes	Introduction, Ultrasonic Machining, Abrasive Jet Machining, EDM, ECM, LBM, EBM, ECG and Chemical Machining	6	T1 & T2
Micro-manufacturing technologies	Introduction, Chemistry-based, Electron-beam lithography	2	T1

Topics to be covered	*Learning Objectives*	*Number of Lectures*	*Chapter in the Text Book*
Introduction to computer aided manufacturing (CAM)	Introduction, developments in conventional machine tools, CIM, FMS, Modern developments in machine tools	1	T1
CNC machines	NC and CNC Machines, Operation of NC/CNC, Definition of terms often used in numerical control, Positional control	2	T1
CNC part programming	Introduction, Programming for NC/CNC Machining, Some commonly used G codes	3	T1
Surface Technologies	Surface Finish, Meaning of tribology, Lubrication, Wear, Cost of friction and wear	5	T1
Additive manufacturing	Introduction to Additive manufacturing processes	2	T1
Modelling & simulation of manufacturing processes	Introduction and purpose of Modelling & simulation of manufacturing processes	1	T1
Fabrication project	Design and material selection	3	Class notes
	Total	31	

6. Evaluation Scheme and Schedule

EC No.	Component	Duration	Weightage (%)	Date & time	Nature
1	Mid Sem Test	90 min	25	02/11 3.30 - 5.00PM	CB
2	Tutorial		10	To be announced later	OB
3	Class Room Assignments		10	To be announced later	OB
4	Practical		15		OB
5	Comprehensive exam	180 min	40	23/12 AN	CB

7. Chamber Consultation Hour: To be announced in the class.

8.Notice: Notices, if any, concerning this course shall be displayed on CMS only.

9. Make-up Policy: Make-up will be granted ONLY in genuine cases with prior permission. The request application for make-up test must be reached to the Instructor-in-charge before commencement of the scheduled test.

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.

NOTE: The border cases in final grading will be decided based on mainly classroom attendance and attentiveness in the classroom.

Instructor-In-Charge
ME F313