



Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2020-2021

Course Handout Part II

Date: 16-01-2021

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

<i>Course No.</i>	: ME F313
<i>Course Title</i>	: PRODUCTION TECHNIQUES II
<i>Instructor-in-Charge</i>	: AMRITA PRIYADARSHINI
<i>Instructors (Lab/Tut)</i>	: Amrita Priyadarshini, Ravi Shanker Vidyarthi, Sreejith S, R Naresh

Scope and Objective of the Course:

- Identify the necessity of “machining” in production
- State the main purposes of “machining”
- Define with examples the concept of “machining”
- State with example the principles of “machining”
- State with examples the main requirements for “machining”
- State with examples the main functions of “Machine tools”
- Define the concept of “machine tools”

Textbooks:

1. B. L. Juneja, G.S.Sekhon, Nitin Seth, “Fundamentals of Metal Cutting and Machine Tools, New Age International, 2005, New Delhi.
2. Amitabha Ghosh and Asok Kumar Mallik, “Manufacturing Science”, Affiliated East-West Press, New Delhi, 1985.

Reference books

1. Geoffrey Boothroyd, Fundamentals of metal machining and machine tools, TMH, New Delhi, 2007..
2. Serope Kalpakjian and Steven R. Schmid, “Manufacturing Engineering and Technology,” Pearson Education (Low Cost Indian Edition), 4/e, 2001, New Delhi.
3. Roy A. Lindberg, “Processes and Materials of Manufacture,” PHI, New Delhi, 2004.
4. P. N. Rao, “Manufacturing Technology: Metal Cutting & Machine Tools,” TMH, New Delhi, 2000.

Course Plan:



Lecture No.	Learning objectives	Topics to be covered	Chapter in the Text Book
1-3	<ul style="list-style-type: none"> To identify the need of machining in manufacturing industries To determine machining time for various machining processes 	Metal cutting theory: A brief overview of different metal cutting processes, Machining time calculations	T1 & T2
4-10	<ul style="list-style-type: none"> To understand the basic principles of chip formation process 	Analysis: Analysis of mechanics of metal cutting in turning, milling and drilling, cutting force calculation, power estimation, cutting temperature calculation, Lee-Shafer theory, Ernest-Merchant theory, chip separation, tool life, Machining with controlled contact tools	T1 & T2
11-14	<ul style="list-style-type: none"> To understand the economics of machining processes 	Economics: Costs of single pass turning operation, optimum cutting speed for maximum profit rate in turning, restrictions on optimum cutting speed	T1 & T2
15-17	<ul style="list-style-type: none"> To understand the importance of machining outputs 	Laboratory exercises in metal cutting: Tool wear, surface finish, key way production	T1& T2
17-24	<ul style="list-style-type: none"> To study and gain hands on experience on various machining processes 	Laboratory exercises in metal cutting: Milling, drilling, Shaping, Abrasive machining processes	T1 & T2
25-30	<ul style="list-style-type: none"> To understand the concept of Non Traditional Machining processes 	Non-traditional machining processes: Introduction, Ultrasonic Machining, Abrasive Jet Machining, EDM, ECM, LBM, EBM, ECG and Chemical Machining	T2
31-32	<ul style="list-style-type: none"> To understand the basic principles of micro manufacturing processes 	Micro-manufacturing technologies: Introduction, Chemistry-based, Electron-beam lithography	T2
33-34	<ul style="list-style-type: none"> To understand the need of CAM 	Introduction to computer aided manufacturing (CAM): Introduction, developments in conventional machine tools, CIM, FMS, Modern developments in machine tools	T2
35-37	<ul style="list-style-type: none"> To be able to differentiate between conventional 	CNC machines: NC and CNC Machines, Operation of NC/CNC, Definition of terms often used in numerical control, Positional control	R3

	machines and CNC machines		
	<ul style="list-style-type: none"> Need of CNCs 		
38-42	<ul style="list-style-type: none"> To learn CNC part programming 	CNC part programming: Introduction, Programming for NC/CNC Machining, Some commonly used G codes	R4
Total number of lectures = 42			

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid Semester	90 min	25	05/03 9.00 -10.3AM	Open Book
Tutorials		10		Open Book
Surprise Quiz		10		Open Book
Lab Practical + Project		15		Open Book
Comprehensive Examination	120 min	40	12/05 FN	Open Book

Chamber Consultation Hour: Will be announced in the class.

Notices: Will be displayed on CMS only

Make-up Policy: Only genuine cases will be granted make up.

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

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 F313

