

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
INSTRUCTION DIVISION
FIRST SEMESTER 2016-2017
COURSE HANDOUT (PART-II)

Date: 13/05/2016

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 F313
Name of the Course : Production Techniques-II
Instructor-In-Charge : AMRITA PRIYADARSHINI
Instructors (L, P, T)): Amrita Priyadarshini, C Kiran Sagar, Khalid Anwar

I. Scope and Objective of the Course

This course is designed to enrich theoretical, analytical as well as practical knowledge about common production techniques used in machining. Methods of selection of proper production techniques, CAM and micro manufacturing technologies are also included.

II. Textbook

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.

III. 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.

IV. Course Contents

<i>Topic</i>	<i>Learning Objectives</i>	<i>Number of Lectures</i>	<i>Source</i>
Metal cutting theory	A brief overview of different metal cutting processes	2	T1 & T2
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	8	T1 & T2
Economics	Costs of single pass turning operation, optimum cutting speed for maximum profit rate in turning, restrictions on optimum cutting speed	3	T1 & T2
Quality control of metal cutting	Introduction, aims of inspection, scope	1	T1 & T2

<i>Topic</i>	<i>Learning Objectives</i>	<i>Number of Lectures</i>	<i>Source</i>
Laboratory exercises in metal cutting	Tool wear, surface finish, key way production	2	T1& T2
Different machine tools; their description and operation	Milling, drilling, Shaping, Abrasive machining processes	7	T1 & T2
Non-traditional machining processes	Introduction, Ultrasonic Machining, Abrasive Jet Machining, EDM, ECM, LBM, EBM, ECG and Chemical Machining	6	T2
Micro-manufacturing technologies	Introduction, Chemistry-based, Electron-beam lithography	2	T2
Introduction to computer aided manufacturing (CAM)	Introduction, developments in conventional machine tools, CIM, FMS, Modern developments in machine tools	3	T2
CNC machines	NC and CNC Machines, Operation of NC/CNC, Definition of terms often used in numerical control, Positional control	2	R3
CNC part programming	Introduction, Programming for NC/CNC Machining, Some commonly used G codes	6	R4
Total		42	

V. Evaluation Scheme and Schedule

EC No.	Component	Duration	Weightage (%)	Date, time, venue	Nature
1	Test I	60 min	20		CB
2	Test II	60 min	20		CB
3	Class Room Assignments		5		OB
4	Practical & Fabrication Project		15 (5+10)		OB
5	Comprehensive exam	3 hours	40		CB

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

VII. Notices concerning the course: All notices concerning the course will be displayed on the CMS.

VIII. Make-up Policy: Make-up will be permitted only in genuine cases with prior permission.

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

**Instructor-In-Charge
ME F313**