BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus

INSTRUCTION DIVISION
FIRST SEMESTER 2015-2016
Course Handout (Part II)

Date: 03/08/2015

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 F313**
Course Title : **Production Techniques-II**
Instructor-in-Charge : **Tufan Chandra Bera**
Instructors (Practical) : **Tufan Chandra Bera, Manikandan H.**

1. Course Description:

Metal cutting theory, Basic metal cutting processes, Mechanics of various machining processes, Analysis, economics and quality control of metal cutting, Laboratory exercises in metal cutting and fabrication project. Introduction to non-traditional machining processes, Mechanics and their applications. Introduction to micromanufacturing technologies.

2. Scope and objective of the course:

In-depth comprehension of metal cutting and machining processes is mandatory for a mechanical or manufacturing engineer as machining is a common and versatile operation in product manufacturing. Therefore, an attempt has been made to nurture fresh talents and transform them to competent manufacturing engineers by studying metal cutting theory, various conventional and non-conventional machining processes in detail. In later stage, micromanufacturing is introduced to be familiar with recent development and future scope of micro technology. This course is designed to enrich theoretical, analytical as well as practical knowledge about metal cutting, various conventional and non-conventional machining processes.

3. Text Book:

T. Amitabha Ghosh and Asok Kumar Mallik, “Manufacturing Science”, Affiliated East-West Press, New Delhi, Second Edition, 2010.

4. Reference Books:

R1. Serope Kalpakjian and Steven R. Schmid, “Manufactuirng Engineering and Technology,” Pearson Education, New Delhi, Fourth Edition, 2001.

R2. Milton C. Shaw, "Metal Cutting Principles", Oxford University Press, Second Edition, 2005.

R3. A. Bhattacharyya, “ Metal Cutting Theory and Practice", New Central Book Agency, 2000.

R4. P. C. Pandey and H. S. Shan, "Modern Machining Processes", Tata McGraw-Hill, New Delhi, First Edition 1980.

5. Course Plan:

Number of Lecture	Topics	Objectives	T/R-Chapter
1	Introduction to machining	To be familiar with metal cutting and machining process.	(TB) Ch-4.1, (R2) Ch-1 (R3) Ch-1
2	Various machining processes	To study the various motions in different machining process.	(TB) Ch-4.3, (R1) Ch-23 (R3) Ch-11
3-5	Geometry of cutting tools and metal cutting theory	To study geometry of cutting tool and mechanism of chip formation.	(TB) Ch-4.2, (R1) Ch-21 (R3) Ch-3
6-9	Mechanics of machining processes	To understand the mechanics of basic machining processes.	(TB) Ch-4.3, (R2) Ch-8 (R3) Ch-4
10-11	Thermal aspects and cutting fluids	To analyze role of cutting fluids in machining.	(TB) Ch-4.2, (R2) Ch-12 (R3) Ch-8
12-13	Tool wear, tool life and machinability	To understand tool wear phenomena and machinability.	(TB) Ch-4.2, (R2) Ch-11 (R3) Ch-9
14-15	Grinding and other abrasive machining processes	To study abrasive machining process and other finishing process such as lapping and honing.	(TB) Ch-4.4, (R1) Ch-25 (R3) Ch-15
16-17	Surface finish and surface integrity	To get to know surface integrity in machining process.	(TB) Ch-4.5, (R2) Ch-17 (R3) Ch-14
18-19	Economics of machining processes	How to make the process economic in terms of production cost and production rate.	(TB) Ch-4.6, (R2) Ch-1 (R3) Ch-10
20	Non-conventional machining processes	Preface with non-traditional machining.	(TB) Ch-6, (R1) Ch-26 (R4) Ch-1
21-38	AJM, USM, ECM, EDM, EBM, LBM, PAM	To study the mechanics, applications and influence of various process variables of different non-conventional processes.	(TB) Ch-6, (R1) Ch-26 (R4) Ch-1
39-40	Introduction to micromanufacturing	Preface with micro manufacturing and micro technology.	(TB) Ch-7.2, (R1) Ch-26

6. Evaluation Scheme:

Component	Duration	% Weightage	Date & Time	Remarks
Mid Semester Test	90 min	30	8/10 2:00 - 3:30 PM	Open book
Class Assignments & Surprise Quiz		10		Home work & Closed book
Comprehensive Examination	3 hours	35	9/12 FN	Closed book
Lab Practical	Semester long	25		Experimentations, Fabrications

7. Chamber Consultation Hours:

To be announced in the class.

8. Notices:

All notices related to the course will be displayed on Notice Board of Mechanical Engineering Department 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 along with **DOCUMENTARY PROOF**. No make-up will be allowed for the Surprise Quiz Tests.

Instructor-in-Charge
ME F313