INSTRUCTION DIVISION

SECOND SEMESTER 2015-16

Course handout (Part II)

Date: 17/01/2016

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. : **MF F243**
Course name : **Manufacturing Processes**
Instructor-in-charge : **Girish Kant**
Tutorial instructor : **Girish Kant**

1. **Course description:** Material removal processes, Metal casting processes, Forming processes, Joining processes, Engineering metrology and equipment, Powder metallurgy, Rapid prototyping, Automation of manufacturing processes and operations.

2. **Scope and objectives:** This course aims at imparting theoretical aspects of the basic manufacturing processes used to produce finished products from raw materials. It lays foundation for other manufacturing courses like casting and welding, metal forming and machining, design of machine tools etc.

3. **Text book:**

   Manufacturing Processes for Engineering Materials, Serope Kalpakjian, Steven R. Schmid, Pearson Education, 5th Ed., 2011.

4. **References books:**

   R1: Manufacturing Engineering and Technology, Serope Kalpakjian, Steven R. Schmid, Pearson Education, 4th Ed., 2006.

   R2: Manufacturing Technology: Foundry, Forming and Welding, Vol.1, P.N. Rao, McGraw Hill, 4th Ed., 2015

   R3: Manufacturing Technology: Metal Cutting and Machine Tools, Vol.2, P.N. Rao, McGraw Hill, 3rd Ed., 2015

5. Course plan

Lecture No.	Topic	Learning Objectives	Chapter
1	Introduction	Introduction and classification of manufacturing processes	Ch 1
2	Engineering metrology and instrumentation	Measuring instruments, limits and fits, dimensional tolerances, surface texture and roughness	Ch 4
3-10	Material removal processes	Mechanism of metal cutting, operating conditions, machine tools, cutting tools, tool material, tool geometry, type of chips, tool wear, tool life, machinability, machining processes and machine tools for producing round shapes and various shapes, abrasive material removal processes, calculation of manufacturing time, process sequence	Ch 8 & 9
11-14	Metal casting processes	Casting processes, pattern, moulding sand, cores, gating system, directional solidification, casting defects	Ch 5
15-18	Forming processes	Rolling, extrusion, forging, drawing, sheet metal forming processes.	Ch 6 & 7
19-21	Joining processes	Arc welding, gas welding, soldering, brazing and mechanical fasteners	Ch 12
22	Non conventional machining processes	Water jet machining, chemical machining, electrochemical machining, electrical discharge machining	Ch 9
23	Rapid prototyping	Rapid prototyping and rapid tooling	Ch 10
24	Powder metallurgy	Production of metal powders, mixing, compaction, sintering	Ch 11
25-26	Automation of manufacturing processes and operations	Numerical control, programming for numerical control, adaptive control	Ch 14

6. Evaluation scheme

Evaluation component	Duration	Weightage (%)	Date & time	Nature of component
Mid semester examination	90 min	30	16/3 2:00 -3:30 PM	OB
Surprise quiz test		10	-	OB/CB
Tutorial and project		20	-	OB/CB
Comprehensive examination	3 hrs	40	9/5 FN	CB

7. Chamber consultation hour: To be announced in the class.

8. Notices: Will be displayed on the notice board of mechanical engineering department as well as on nalanda.

9. Make-up policy: Make-up will be permitted only in genuine cases with prior permission**. No make-up for class room quiz and tutorial.**

Instructor-In-charge

MF F243