



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. : BITS F431/EA C412
Course Title : Flexible Manufacturing Systems
Instructor-in-Charge : Tufan Chandra Bera

1. Course description

Introduction of CAD/CAM systems, overview of FMS, system hardware and general functions, material handling system, work holding systems, cutting tools and tool management, physical planning of system, software structure functions and description, cleaning and automated inspection, communications and computer networks for manufacturing, quantification of flexibility, human factors in manufacturing, FMS and CIM in action (case studies), justification of FMS, modelling for design, planning and operation of FMS.

2. Scope and objective of the course

In recent years the manufacturing industries are facing problems of survival. They find it difficult to maintain a long term competitive advantage due to uncertainty in environmental conditions. The ideal production system for such environment is Flexible Manufacturing Systems (FMS), which are considered to meet the demand for a variety of products with improvement of productivity in mid-volume manufacturing. This course will highlight the fundamentals of FMS and modelling for design, planning and control of FMS.

3. Text books

- T1. Mikell P Groover, "Automation, Production Systems and CIM", 3rd Edition, Prentice Hall/Pearson Education, 2011.

4. Reference books

- R1. Rao P.N., "CAD/CAM, Principles and Applications", 3rd Edition, TMH.
R2. Talavage J, "FMS in Practice, Applications, Design and Simulation", Marcel Dekker Inc, 1988
R3. Greenwood, "Implementation of FMS", Macmillan Edition, 1988
R4. William W.L, "FMS Cells and Systems", PHI, 1991
R5. Ranky P.G, "Design and Operation of FMS", IFS Publications, 1983





5. Course plan

Lecture No.	Learning Objectives	Topics to be covered	Reference Chap/see (Book)
1	Introduction To FMS	Introduction to Production Systems	TB - Ch. 1
2-3	Overview of Manufacturing	Manufacturing Operations	TB - Ch. 2
4-5		Manufacturing Models and Metrics	TB - Ch. 3
6	Automation and Control Technologies	Introduction to Automation	TB - Ch. 4
7-8		Industrial Control Systems	TB - Ch. 5
9-10		Hardware components for Automation and Process Control	TB - Ch. 6
11-15		Numerical Control	TB - Ch. 7
16		Industrial Robotics	TB - Ch. 8
17-18		Discrete Control using PLC and PC	TB - Ch. 9
19-20	Material Handling and Identification Technologies	Material Transport Systems	TB - Ch. 10
21-22		Storage Systems	TB - Ch. 11
23-24		Automatic Identification and Data Capture	TB - Ch. 12
25-26	Manufacturing Systems	Introduction to Manufacturing Systems	TB - Ch. 13
27-28		Single Station Manufacturing Cells	TB - Ch. 14
29-30		Manual Assembly Lines	TB - Ch. 15
31-32		Automated Production Lines	TB - Ch. 16
33-34		Automated Assembly Systems	TB - Ch. 17
35-36		Cellular Manufacturing	TB - Ch. 18
37-38		Flexible Manufacturing Systems	TB - Ch. 19
39	Advanced Topics in FMS	Advance Topics on FMS	Internet
40		Advance Topics on FMS	Internet
41		Advance Topics on FMS	Internet
42		Advance Topics on FMS	Internet





6. Evaluation scheme:

EC No.	Evaluation Component	Duration	Weightage	Date, Time Venue	Remarks
1	Mid Semester Test	90 Min	30%	8/10 10:00 - 11:30 AM	Closed Book
2	Comprehensive Examination	3 Hrs	40%	8/12 AN	Closed/ Open Book
3	Project, Seminars/ Assignments/ Case Studies	--	30%		Presentation & Viva voce

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

8. Notices: All notices regarding the course will be displayed **only** on **Mechanical Engineering Department notice board**.

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,
BITS F431/EA C412**

