

PROFESSOR'S NAME	Dr. Shrikrishna N. Joshi
DEPARTMENT	Department of Mechanical Engineering
INSTITUTE	Indian Institute Of Technology Guwahati
COURSE OUTLINE	<p>Manufacturing industry contributes a major share in the GDP of our country. Application of automated systems is certainly improving the productivity of the manufacturing industry. In view of this, a course on "Automation in Manufacturing" is designed with the primary focus on the design and development of automated systems in the manufacturing. Initially the course introduces various automated systems being used in the manufacturing industry. Then the building blocks of a typical automated system are described. It presents a study on the principle of operation and construction details of sensors/transducers, actuators, drives and mechanisms, hydraulic and pneumatic systems. It also covers up the microprocessor technology, programming and CNC technology. The contents are lucidly presented with real-life examples. Case studies based on manufacturing industry applications are presented.</p>

COURSE DETAILS

S. No	Module ID/ Lecture ID	Lecture Title/Topic
1.	Module1_L1	Basic Concepts
2.	Module1_L2	Mechatronics
3.	Module2_L3	Mechatronics based Systems
4.	Module2_L4	Automated Systems and Equipment used in Manufacturing Part - I
5.	Module2_L5	Automated Systems and Equipment used in Manufacturing Part - II
6.	Module3_L6	Selection of Electrical and Electronics Components for Mechatronics based

		Automated Systems
7.	Module3_L7	Terms Related to Performance of Electro-Mechanical Systems
8.	Module3_L8	Computer Aided Design of Components
9.	Module3_L9	Fabrication Processes
10.	Module4_L10	Measurement System and Potentiometer Sensors
11.	Module4_L11	Displacement, Position and Proximity Sensors - I
12.	Module4_L12	Displacement, Position and Proximity Sensors - II
13.	Module4_L13	Fluid Flow, Pressure, and Temperature Measurement
14.	Module5_L14	Signal Conditioning : Amplification, Filtering
15.	Module5_L15	Pulse Modulation, Protection Devices, and Wheatstone Bridge
16.	Module5_L16	Signal Conversion
17.	Module5_L17	Microprocessor Technology
18.	Module5_L18	Introduction to Microprocessor Programming
19	Module6_L19	Application of Electric Drives in Automation
20	Module6_L20	DC and AC Motors
21	Module6_L21	Stepper Motor and Servo Motor
22	Module7_L22	Types of Industrial Automation and Mechanisms
23	Module7_L23	Ball Screw based Linear Motion Drives
24	Module7_L24	Application of Cams in Automation
25	Module8_L25	Application of Indexing Mechanisms in Automation
26	Module8_L26	Application of Tool Magazines in Automation
27	Module8_27	Material Handling Systems
28	Module9_L28	Fundamental Concepts
29	Module9_L29	Hydraulic Pumps
30	Module10_L30	Direction Control Valves

31	Module10_L31	Flow Control and Pressure Relief Valves
32	Module10_L32	Graphical Representation of Hydraulic System Elements
33	Module11_L33	Basic Concepts and Air Compressors
34	Module11_L34	Air Treatment and Pressure Regulation
35	Module11_L35	Graphical Representation and Pneumatic Circuits
36	Module12_L36	Computer Aided Manufacturing and Process Planning
37	Module12_L37	CNC Machines and Interpolation

List of reference material/ books:

Name and contact details of two referees for the course: