

	<b>National University of Sciences and Technology</b>	
	<b>Course Description</b>	
<b>Course Title</b> Interdisciplinary problems in Manufacturing Automation	<b>Course Code</b> <b>DME-820</b>	<b>Credit Hours</b> <b>3 – 0</b>

**Textbook:**

- Mikell P. Groover, “Automation, Production Systems and Computer Integrated Manufacturing”, Fifth Edition, Pearson Education, 2019 or latest edition

**Reference Books:**

- Robert J. Schilling, “Fundamentals of Robotics, Analysis & Control”, Prentice Hall, 2009.
- Chang, T.C., Wysk, R.A., and Wang, H.P., “Computer-Aided Manufacturing”, Prentice Hall, 2008
- Nanua Singh, Tatla Dar Singh., “Systems Approach to Computer-Integrated Design and Manufacturing”, John Wiley & Sons, 1995

**Course Objective:**

- Interdisciplinary knowledge in mechanical, electric, and control subsystems
- Development of automated manufacturing systems
- Introduction of various sensing, actuating and control elements
- Hands on experience on automated system design using Hydraulics, Pneumatics, PLC, Microcontrollers and Robotics

**Course Outline:**

Phases of Design Process, Production planning and feasibility, design specification. Introduction to automation, Basic Elements-Levels of automation, Hardware Components of automation, Application of fluid power in automation Mechanization of parts handling, Discrete Process Control, Microprocessor interfacing, DLD, Robotics in Automation, Data Monitoring using Arduino/Raspberry Pi, Fluid Power Circuits, PLC Programming, Exercises on sensor integration using Arduino/Raspberry Pi.

**ASSESSMENTS**

Description	Percentage Weightage (%)
Assignments	05-10%
Quizzes	10-15%
Project	05-10%
Mid Semester Exams	30-40%
End Semester Exam	40-50%