

**Faculty of Engineering & Technology**

**Industrial Automation (CAD/CAM)**

**Information :**

**Course Code :** MAN 350

**Level :** Undergraduate

**Course Hours :** 2.00- Hours

**Department :** Specialization of Mechatronics Engineering

**Instructor Information :**

Title	Name	Office hours
Associate Professor	Hussein Mohamed Abdelmoneam Hussein	1
Assistant Lecturer	Rana Mohamed Abdel Rahman Saleh	4
Teaching Assistant	Donia Waheed Mohamed Abdelmonem Saleem	

**Area Of Study :**

- Explain the basic concepts and engineering fundamentals in mechanical parts process planning
- Prepare student to acquire the essential knowledge and understanding for the common CNC machines programming.
- Develop students knowledge about using CAD/CAM packages: basic of CAD, basic of CAM, G-code programming, and computer assisted part programming.

**Description :**

Computer assisted manufacturing systems NC, CNC, DNC, robotics, material handling, group technology, flexible manufacturing systems, process planning and control. Scope and utilization of CAM- data bases needed for manufacturing . Languages- for CAM- integration between CAD and CAM- software and applications. How to implement the right industrial robot system for a plant.

**Course outcomes :**

**a. Knowledge and Understanding: :**

1 -	Identify the principles of G-Code part programing.
2 -	Explain how CNC machines are working.
3 -	Interpret basic Science and engineering fundamentals in mechanical parts process planning.
4 -	Explain the basic concepts and theories of how CAD works.
5 -	List the different CAD modeling features.

**b. Intellectual Skills: :**

1 -	Use analytical thought in choosing 3D features to construct CAD model.
2 -	Select suitable parameters for machining operation (Milling and Drilling).
3 -	Select suitable G-code programming parameter to operate CNC machine.
4 -	Solve profiling or slotting problems for any given mechanical part.

**c. Professional and Practical Skills: :**

1 -	Apply solutions for mathematical transformation in CAD modelling.
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2 -	Select the 3D feature to create any mechanical CAD model.
3 -	Create or part programming for mechanical parts.
4 -	Apply analytical methods for milling operations.
<b>d.General and Transferable Skills: :</b>	
1 -	Communicate effectively.
2 -	Effectively manage tasks, time, and resources.
3 -	Acquire entrepreneurial skills.

<b>Course Topic And Contents :</b>			
<b>Topic</b>	<b>No. of hours</b>	<b>Lecture</b>	<b>Tutorial / Practical</b>
Introduction	3	2	1
Basics of CAD	3	2	1
Main types of CNC machines	3	2	1
G-code programming	3	2	1
G-code programming for milling	6	4	2
G-code programming for drilling	3	2	1
Cycles in G-codes	6	4	2
Computer assisted part programming	6	4	2
CAD transformation	3	2	1
Boundary representation	3	2	1
Constructive solid geometry	3	2	1
Boolean operation with CAD modeling	3	2	1

<b>Teaching And Learning Methodologies :</b>
Interactive Lecturing
Problem solving
Discussuion
Experiential Learning
Project
Research

<b>Course Assessment :</b>			
<b>Methods of assessment</b>	<b>Relative weight %</b>	<b>Week No</b>	<b>Assess What</b>
Assignment	5.00		
Final Exam	40.00		
Mid- Exam 1I	15.00		
Mid- Exam I	15.00		
Project	10.00		
Quizzes	10.00		

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Research	5.00		
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