

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 |
|--------------------|---------------------------------|--------------|
| Lecturer | Ahmed Sobhi Mohamed Gad | 1 |
| Assistant Lecturer | Rana Mohamed Abdel Rahman Saleh | 4 |

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: :

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| 1 - | Identify the principles of G-Code part programming. |
| 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: :

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| 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: :

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| 1 - | Apply solutions for mathematical transformation in CAD modelling. |
| 2 - | Select the 3D feature to create any mechanical CAD model. |

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| 3 - | Create or part programming for mechanical parts. |
| 4 - | Apply analytical methods for milling operations. |
| d.General and Transferable Skills: : | |
| 1 - | Communicate effectively. |
| 2 - | Effectively manage tasks, time, and resources. |
| 3 - | Acquire entrepreneurial skills. |

| Course Topic And Contents : | | | |
|-------------------------------------|---------------------|----------------|-----------------------------|
| Topic | No. of hours | Lecture | Tutorial / Practical |
| 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 |

| Teaching And Learning Methodologies : |
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| Interactive Lecturing |
| Problem solving |
| Discussuion |
| Experiential Learning |
| Project |
| Research |

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

