



Course Specification

— (Bachelor)

Course Title: **Computer Aided Design**

Course Code: **444-MEC-3**

Program: **Bachelor of Science in Engineering**

Department: **Mechanical Engineering**

College: **College of Engineering**

Institution: **Najran University**

Version: **1.0**

Last Revision Date: **27/02/2024**



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A. General information about the course:

1. Course Identification

1. Credit hours: (3)

2. Course type

A. University College Department Track Others
 B. Required Elective

3. Level/year at which this course is offered: (Fifth Year \ Level 10)

4. Course general Description:

In this competency-based course students will learn the fundamentals of drafting in a modern, networked, computer lab using AutoCAD drafting software. The course will cover the concepts and application of orthographic projection, isometric representation, and basic dimensioning. Topics also include line type conventions, lettering, freehand drafting, geometric construction, sections, and auxiliary views. Students will be introduced to 3-D visualization using computer wireframe and surface modeling techniques. Advanced students will learn 3-D modeling techniques and have the opportunity to use AutoDesk's Inventor Software. This course includes classroom instruction and laboratory activities.

5. Pre-requirements for this course (if any):

342-MEC-3 (MECHANICAL ENGINEERING DESIGN 2)

6. Co-requisites for this course (if any):

NIL

7. Course Main Objective(s):

1. Demonstrate basic knowledge of CAD and the ability to use appropriate techniques and procedures for the care and use of hardware and software to produce a series of orthographic and isometric drawings.
2. Understand the history of drafting as a graphic language, will be able to identify early drafting tools and implements, and will understand why CAD is presently used.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%



No	Mode of Instruction	Contact Hours	Percentage
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	15
3.	Field	
4.	Tutorial	15
5.	Others (specify)	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Identify CAD hardware and computer procedures.	1	<p>TS:1-Interactive lectures using PowerPoint slides</p> <p>TS:2- Engaging the students in problem-based learning through tutorials</p> <p>TS: 3 – Associating the topics in each chapter with the CLO.</p> <p>TS:4 – Conducting quizzes from each chapter</p>	<p>-Test performance evaluation</p> <p>-Evaluation of participation in discussion and group assignments</p>



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			<p>TS:5 – Giving more example programs in the lecture</p> <p>TS: 6 – Discussion with the students in the class hours</p>	
1.2	Describe and use the basic terms, concepts and techniques of computer aided drafting	7	<p>TS:1-Interactive lectures using PowerPoint slides</p> <p>TS:2- Engaging the students in problem-based learning through tutorials</p> <p>TS: 3 – Associating the topics in each chapter with the CLO.</p> <p>TS:4 – Giving more assignment from each chapter</p> <p>TS:5 – Giving more example programs in the lecture</p> <p>TS: 6 – Discussion with the students in the class hours</p>	<p>-Test performance evaluation</p> <p>-Evaluation of participation in discussion and group assignments</p>
2.0	Skills			
2.1	Understand the proper technique of scaling and plotting to proper size and will be able to demonstrate that ability by plotting industry-quality drawings.	6	<p>TS:1-Interactive lectures using PowerPoint slides</p> <p>TS:2- Engaging the students in problem-based learning through tutorials</p> <p>TS: 3 – Associating the topics in each chapter with the CLO.</p>	<ul style="list-style-type: none"> •Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics •Assignments involving critical and



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			<p>TS:4 – Conducting quizzes from each chapter</p> <p>TS: 5 – Discussion with the students in the class hours</p>	<p>logical thinking questions</p> <p>•Quizzes</p>
3.0	Values, autonomy, and responsibility			
3.1	Understand the educational qualifications and levels on the drafting career ladder and will be able to demonstrate the ability to write a resume and complete a job application.	5	<p>TS:1-Interactive lectures using PowerPoint slides</p> <p>TS:2- Engaging the students in problem-based learning through tutorials</p> <p>TS: 3 – Associating the topics in each chapter with the CLO.</p> <p>TS:4 – Conducting midterm and Final Exam from each chapter</p> <p>TS:5 – Giving more example programs in the lecture</p> <p>TS: 6 – Discussion with the students in the class hours</p>	<p>Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics</p> <p>•Assignments involving critical and logical thinking questions</p> <p>•Quizzes</p>

C. Course Content

No	List of Topics	Contact Hours
1.	The fundamentals of drafting in a modern, networked, computer lab using AutoCAD drafting software	12
2.	The concepts and application of orthographic projection, isometric representation, and basic dimensioning	12
3.	Line type conventions, lettering, freehand drafting, geometric construction, sections, and auxiliary views.	12





4.	Introduced to 3-D visualization using computer wireframe and surface modeling techniques.	12
5.	3-D modeling techniques and have the opportunity to use AutoDesk's Inventor Software.	12
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	1-10	10%
2.	Quizzes	1-10	10%
3.	Mid-term	4 & 8	20%
4.	labs	1-10	10%
5.	Final exam	15	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	CAD/CAM: Principles and Applications by P. N. Rao, McGraw Hill Publications, 2017
Supportive References	CAD/CAM: Computer Aided Design and Manufacturing by Groover and Zimmers, Pearson Education, 2003
Electronic Materials	Online custom books
Other Learning Materials	Other learning material such as computer-based programs/CD, professional standards or regulations and software.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and laboratories
Technology equipment (projector, smart board, software)	AutoCAD and other CAD Software



Items	Resources
Other equipment (depending on the nature of the specialty)	Desktop Computer

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders and Peer Reviewer	Direct, Indirect
Effectiveness of Students assessment	Students & Faculty	Direct and Indirect
Quality of learning resources	Students & Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students & Faculty	Direct and Indirect
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT OF MECHANICAL ENGINEERING
REFERENCE NO.	
DATE	27/02/2024

