

Northern Marianas College

CURRICULUM ACTION REQUEST

Course: EG100L CAD Essentials

Effective Semester / Session: Fall/Spring YEAR

Type of Action:

- New
- Modification
- Move to Inactive (Stop Out)
- Cancellation

Course Alpha and Number: EG100L

Course Title: Essentials of Computer-Aided Design

Reason for initiating, revising, or canceling:

Computer-Aided Design (CAD) is widely used in various industries such as architecture, engineering, construction, manufacturing, and interior design. By learning CAD, individuals can enhance their skill set and increase their value in the job market. It can open up new career opportunities and help individuals advance in their current roles. This course provides CDI and pre-engineering students with hands-on technical skills and exposure to CAD software.

Emanuel P. Borja 
Emanuel P. Borja (Nov 28, 2023 12:54 GMT+10) Nov 28, 2023


Proposer  **Date**

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Interim Dean of Academic Programs & Services **Date**

Northern Marianas College

Course Guide

Page: 2

Course: EG100L CAD Essentials

1. Department

Sciences, Mathematics, Health & Athletics

2. Purpose

The purpose of initiating a CAD class is to acquire the knowledge, skills, and confidence to effectively utilize CAD for personal or professional endeavors, enabling individuals to create precise and detailed designs while staying up-to-date with industry standards.

3. Description

A. Required/Recommended Textbook(s) and Related Materials

Required: None

Recommended: None

B. Contact Hours

1. **Lecture:** 1 per week / 15 per semester
2. **Lab:** None
3. **Other:** None

C. Credits

1. **Number:** 1
2. **Type:** Regular Degree Credits

D. Catalog Course Description

This introductory CAD course is designed for individuals with little to no prior experience. It aims to provide students with a solid foundation in using CAD for 2D drafting and basic 3D modeling. Through a combination of lectures, demonstrations, and hands-on exercises, students will gain a comprehensive understanding of the software's interface, tools, and functionalities.

E. Degree or Certificate Requirements Met by Course

A grade of "C" or higher in this course fulfills the AA in Liberal Arts with an emphasis in pre-engineering. This course will also be an elective for any A.S. degree with a science major, and satisfies an elective option for non-majors. Prerequisite: EN095, MA132. Offered in Fall

F. Course Activities and Design

Course activities include: lectures, group work, discussions, homework, web-based assignments, viewing audio-visual materials, periodic quizzes, tests, drawing, demonstrations, class participation, discussions, and project-based presentations.

Northern Marianas College

Course Guide

Page: 3

Course: EG100L CAD Essentials

4. Course Prerequisite(s); Concurrent Course Enrollment

Prerequisites: EN095; MA132

Concurrent Course Enrollment: EG100 or CDI

Required English/Mathematics Proficiency Level(s)

English Placement Level: EN101

Mathematics Placement Level: MA161

5. Estimated Cost of Course; Instructional Resources Needed

Cost to the Student: Tuition for a 1-credit course, cost of instructional materials fee, and any applicable fees.

Cost to the College: 2 credits for the SMHA full time and adjunct faculty and the cost of the instructional resources listed below.

Instructional resources needed for this course include: CAD Software, computer equipped with CAD and the necessary hardware specifications, computer lab, course materials, 3-D printer, 11x17 paper, printer, internet access, projector or display system.

6. Method of Evaluation

Student evaluation of learning will be based on quizzes and assessments, homework, research assignments, and a final portfolio. NMC's grading and attendance policies will be followed.

Course: EG100L CAD Essentials

7. Course Outline

This is a topical outline and does not necessarily indicate the sequence in which the material will be presented.

- 1.0 Introduction to CAD
 - 1.1 Overview of CAD's interface and workspace
 - 1.2 Understanding commands, menus, and toolbars
 - 1.3 Navigating and zooming in the drawing area
 - 1.4 Drawing setup and precision techniques

- 2.0 Setting up Drawing Units, Scales, & Limits
 - 2.1 Working with coordinate systems and precision input
 - 2.2 Using drawing aids such as grids and snap tools
 - 2.3 Creating and modifying 2D geometry

- 3.0 Drawing & Editing Lines, Circles, Arcs, Polygons, & Other Basic Shapes
 - 3.1 Applying editing commands for manipulation and modification
 - 3.2 Exploring object selection methods and grips editing
 - 3.3 Dimensioning and annotation

- 4.0 Adding Dimensions to Drawings
 - 4.1 Creating and editing text annotations
 - 4.2 Applying dimension and text styles
 - 4.3 Layers of linetypes

- 5.0 Understanding Layer Properties & Organization
 - 5.1 Assigning colors, linetypes, and line weights to objects
 - 5.2 Managing layers and layer states
 - 5.3 Introduction to 3D modeling

- 6.0 Working in 3D Space: Coordinate Systems & Viewpoints
 - 6.1 Creating basic 3D objects: extrude, revolve, loft, and sweep
 - 6.2 Modifying and manipulating 3D objects
 - 6.3 Blocks and external references

- 7.0 Creating & Inserting Reusable Blocks
 - 7.1 Managing block libraries and attributes
 - 7.2 Working with external references (Xrefs) for collaborative workflows
 - 7.3 Printing and plotting

- 8.0 Setting up Layouts & Viewports
 - 8.1 Configuring plot settings and plot styles
 - 8.2 Generating printed or plotted output

Course: EG100L CAD Essentials

8. Instructional Goals

The course will introduce students to:

- 1.0 The CAD user interface, commands, and navigation tools;
- 2.0 The basic principles of drafting, including drawing setup, units, and scales;
- 3.0 Creating and modifying 2D geometric shapes and objects using drawing tools and precision techniques;
- 4.0 Dimensioning and annotation tools to accurately annotate and document drawings;
- 5.0 Layers and line types for organizing and managing drawing elements;
- 6.0 Creating and editing basic 3D models using CAD's 3D tools and techniques;
- 7.0 The concept of blocks and how to create, insert, and manage them; and
- 8.0 The printing and plotting process to generate hard copies of their drawings.

Course: EG100L CAD Essentials

9. Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1.0 Identify various CAD interface components, including commands, menus, and toolbars;
- 2.0 Set up drawing units, scales, and limits to create accurate and properly scaled drawings;
- 3.0 Create and modify 2D geometric shapes using drawing tools and precision techniques;
- 4.0 Apply dimensioning and annotation tools to accurately annotate and document drawings;
- 5.0 Manage drawing elements using layers and linetypes;
- 6.0 Create basic 3D models using CAD's 3D tools and techniques;
- 7.0 Generate hard copies of drawings using the printing and plotting process;
- 8.0 Demonstrate proficiency in using object selection methods and grips editing;
- 9.0 Apply appropriate editing commands for manipulation and modification of drawings; and
- 10.0 Demonstrate effective communication of design concepts through annotations and text.

10. Assessment Measures of Student Learning Outcomes

Assessment of student learning may include, but not be limited to, the following:

- 1.0 Written Examination;
- 2.0 Drawing Assignments;
- 3.0 Project-Based Assessment;
- 4.0 Quizzes;
- 5.0 Peer Review;
- 6.0 Practical Demonstrations; and

Northern Marianas College

Course Guide

Page: 7

Course: EG100L CAD Essentials

7.0 Final Portfolio or Showcase.












EG100L


Final Audit Report


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