Northern Marianas College
CURRICULUM ACTION REQUEST

Course: EG 100 Introduction to Pre-Engineering

Effective Semester / Session: Fall 2023

Type of Action:

__	New
X	Modification
__	Move to Inactive (Stop Out)
__	Cancellation

Course Alpha and Number: EG 100

Course Title: Introduction to Pre-Engineering

Reason for initiating, revising, or canceling:

Additional compensation of 1 credit is being added to the course guide for the extra time and effort associated with the lab preparation.

Borja (Sep 12, 2023 16:08 GMT+10)

Emanuel Borja Sep 12, 2023

Proposer(s) Date

Velma C. Deleon Guerrero (Sep 12, 2023 16:10 GMT+10)

Velma C. Deleon Guerrero Sep 12, 2023

Department Chair Date

Adam M. Walsh (Sep 13, 2023 22:17 GMT+10)

Adam Walsh Sep 13, 2023

Language & Format Review Specialist Date

Velma C. Deleon Guerrero (Sep 12, 2023 16:10 GMT+10)

Velma C. Deleon Guerrero Sep 12, 2023

Academic Council Vice Chair Date

Lorraine Maui (Sep 13, 2023 23:45 GMT+10)

Lorraine C. Maui Sep 13, 2023

Interim Dean of Academic Programs and Services Date

Northern Marianas College
Course Guide

Course: EG 100 Introduction to Pre-Engineering

1. **Department**
   Science, Mathematics, Health, and Athletics

2. **Purpose**
   The course is for students interested in engineering that plan to transfer to an accredited engineering program. Students receive an introduction to the engineering profession and the academic program it entails.

3. **Description**

   A. Required/Recommended Textbook(s) and Related Materials
   Required:
   Moaveni, Saeed. Engineering Fundamentals: An Introduction to Engineering, 6th Edition. Cengage Learning, 2019.

   Recommended: None

   B. Contact Hours
   1. **Lecture:** 3 per week / 45 per semester
   2. **Lab:** None
   3. **Other:** None

   C. Credits
   1. **Number:** 3
   2. **Type:** Regular Degree Credits

   D. Catalog Course Description
   This course is an introduction to a wide range of disciplines in engineering including civil, electrical, computer, mechanical and others. The course focuses on problem-solving exercises that apply fundamental concepts from subfields to integrate the steps of analysis, synthesis, and evaluation using individual homework assignments and group projects that all require attention to engineering fundamentals. The course explores issues related to engineering practice such as working in teams, scheduling, evaluating risk, and making ethical decisions. Prerequisite: MA091 and EN095. (Offered Fall).

   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 requirement for any A.S. degree with a science major and satisfies an elective option for non-majors.

   F. Course Activities and Design
   This course may include lectures, group work, discussions, homework, web-based assignments, viewing audio-visual materials,quizzes, tests, field trips, comprehensive final exam, and research projects with oral presentations.

4. **Course Prerequisite(s); Concurrent Course Enrollment**
   Prerequisites: None
   Concurrent Course Enrollment: None

   Required English/Mathematics Proficiency Level(s)
   English Placement Level: EN 101
   Mathematics Placement Level: MA 203

5. **Estimated Cost of Course; Instructional Resources Needed**
   Cost to the Student: Tuition for a 3-credit course; cost of the textbooks; and instructional materials fee.

   Cost to the College: Instructor's salary for 3 credits, encompassing an additional 1 course credits to accommodate the instruction of a science lab.

   Instructional resources needed for the course include: classroom; whiteboard and pen; audio-visual programs/software; and multimedia projectors; and various course materials and supplies.

6. **Method of Evaluation**
   Student grades will be based on: class attendance and participation, homework completion, in-class and online quizzes, presentations, midterm and final exams. NMC's grading and attendance policies will be followed.

7. Course Outline

This is an outline of possible topics. This does not necessarily indicate the sequence in which the material will be presented, nor the depth in which topics will be covered.

1.0 Introduction to the Engineering Profession
- 1.1 Engineering disciplines
- 1.2 Professional practice and licensing
- 1.3 Communication and teamwork
- 1.4 Ethics

2.0 Introduction to Engineering Design
- 2.1 Engineering design process
- 2.2 Engineering standards and codes
- 2.3 Problem solution process

3.0 Engineering Fundamentals
- 3.1 Making math and science relevant
- 3.2 Fundamental dimensions and systems of units
- 3.3 Length, time, mass, force, temperature, and related variables
- 3.4 Electric current and related variables
- 3.5 Energy and power

4.0 Computational Engineering Tools
- 4.1 Electronic spreadsheet
- 4.2 MATLAB

5.0 Engineering Graphical Communication
- 5.1 Drawings and symbols
- 5.1.1 Mechanical
- 5.1.2 Civil, electrical, and electronic drawings
- 5.1.3 Solid modeling
- 5.1.4 Engineering symbols

6.0 Engineering Material Selection
- 6.1 Material selection and origin
- 6.2 Properties of materials

7.0 Mathematics, Statistics, and Engineering Economics
- 7.1 Symbols and Greek alphabet
- 7.2 Linear and nonlinear models
- 7.3 Exponential and logarithmic models

7.4 Matrix algebra
7.5 Calculus
7.6 Differential equations
7.7 Basic probability and statistics
7.8 Frequency and normal distributions
7.9 Mean, median, and standard deviations
7.10 Engineering economics

8. Instructional Goals

The course will introduce students to:

1.0 Weaving knowledge in mathematics, science, and engineering;
2.0 Critical analysis of data;
3.0 Collaborative, communication, and teamwork required as a skill in the engineering career;
4.0 Engineering solutions in a global, economic, environmental, and societal context;
5.0 Techniques, skills, and modern engineering tools necessary for engineering practice; and
6.0 Lifelong learning in the pursuit of continuous professional development.

9. Student Learning Outcomes

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

1.0 Explain the nature of the role of engineers in society;
2.0 Demonstrate the basic principles of the engineering method;
3.0 Apply the key concepts of design, ethics, safety, and sustainability;
4.0 Explain the nature of the work of an engineer in fields of civil, environmental, chemical, electrical and electronic, and mechanical;
5.0 Critically evaluate and interpret information through research;
6.0 Write and speak in a style appropriate to academic and professional contexts; and
7.0 Work effectively in small teams.

10. Assessment Measures of Student Learning Outcomes

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

1.0 Tests and Quizzes;
2.0 Homework;
3.0 Presentation;
4.0 Project; and
5.0 Exam.

EG 100 Pre-Engineering (FA 2023)

Final Audit Report 2023-09-13

Created:	2023-09-11
By:	Rita Duan (lili.duan@marianas.edu)
Status:	Signed
Transaction ID:	CBJCHBCAABAA935mOCta59RtQu_u7ZfD0cJUGJNPXvEZ

"EG 100 Pre-Engineering (FA 2023)" History

Document created by Rita Duan (lili.duan@marianas.edu)
2023-09-11 - 11:53:40 PM GMT

Document emailed to emanuel.borja@my.marianas.edu for signature
2023-09-11 - 11:54:59 PM GMT

Email sent to emanuel.borja@my.marianas.edu bounced and could not be delivered
2023-09-11 - 11:55:02 PM GMT

Rita Duan (lili.duan@marianas.edu) replaced signer emanuel.borja@my.marianas.edu with Borja (eborja@my.marianas.edu)
2023-09-11 - 11:58:11 PM GMT

Document emailed to Borja (eborja@my.marianas.edu) for signature
2023-09-11 - 11:58:11 PM GMT

Email sent to emanuel.borja@my.marianas.edu bounced and could not be delivered
2023-09-11 - 11:58:17 PM GMT

Email viewed by Borja (eborja@my.marianas.edu)
2023-09-12 - 6:07:55 AM GMT

Document e-signed by Borja (eborja@my.marianas.edu)
Signature Date: 2023-09-12 - 6:08:49 AM GMT - Time Source: server

Document emailed to Velma C. Deleon Guerrero (velma.deleon.guerrero@marianas.edu) for signature
2023-09-12 - 6:08:49 AM GMT

Email viewed by Velma C. Deleon Guerrero (velma.deleon.guerrero@marianas.edu)
2023-09-12 - 6:10:15 AM GMT

Document e-signed by Velma C. Deleon Guerrero (velma.deleon.guerrero@marianas.edu)
Signature Date: 2023-09-12 - 6:10:25 AM GMT - Time Source: server

Document emailed to adam.walsh@marianas.edu for signature

2023-09-12 - 6:10:26 AM GMT

Email viewed by adam.walsh@marianas.edu

2023-09-13 - 12:13:29 PM GMT

Signer adam.walsh@marianas.edu entered name at signing as Adam M. Walsh

2023-09-13 - 12:17:32 PM GMT

Document e-signed by Adam M. Walsh (adam.walsh@marianas.edu)

Signature Date: 2023-09-13 - 12:17:34 PM GMT - Time Source: server

Document emailed to Lorraine Maui (lorraine.maui@marianas.edu) for signature

2023-09-13 - 12:17:36 PM GMT

Email viewed by Lorraine Maui (lorraine.maui@marianas.edu)

2023-09-13 - 1:44:48 PM GMT

Document e-signed by Lorraine Maui (lorraine.maui@marianas.edu)

Signature Date: 2023-09-13 - 1:45:05 PM GMT - Time Source: server

Agreement completed.

2023-09-13 - 1:45:05 PM GMT