

ARTICULATION AGREEMENT

DATE DRAFTED: November 18, 2020

VALID ACADEMIC YEARS: 2020-21 & 2021-22

LMC COURSE: ENGIN-010

HIGH SCHOOL COURSE: Introduction to Engineering Design (2 Semesters) & Principles of Engineering (2 semesters)

School: Pittsburg High School

Address: 1750 Harbor St, Pittsburg, CA 94565

COLLEGE COURSE DESCRIPTION: This course introduces the engineering profession. It includes the worldwide history of engineering and its influences on society and reviews the major engineering disciplines and the requirements for becoming an engineer. The course also introduces engineering reports, graphics, and presentations. Engineering calculations and a design project are an integral part of the course. Engineering ethics and the need for lifelong learning are also discussed.

A. UNITS: 3

B. PRE-REQUISITES: None

C. REQUIRED CONTENT FOR ARTICULATION:

I. Introduction to Engineering (CSLO 1) (15% of total course time)

- A. History of engineering and its impact on society
- B. Notable engineering accomplishments and their consequences
- C. Notable engineering failures and lessons learned
- D. Role of engineers in societies around the world

II. Engineering Disciplines (CSLO 2) (15% of total course time)

- A. Civil engineering and Environmental engineering
- B. Mechanical engineering
- C. Aerospace engineering
- D. Electrical engineering
- E. Industrial engineering
- F. Manufacturing engineering
- G. Computer engineering
- H. Biological and Agricultural engineering
- I. Chemical and Materials engineering
- J. Other engineering disciplines (including Nuclear, Petroleum, Biomedical, Mining, etc.)

III. How to become an Engineer (CSLO 2) (10% of total course time)

- A. Course requirements by engineering discipline
- B. Engineering schools
- C. Licensing requirements

IV. Practicing Engineering

- A. Engineering communications (10% of total course time)
 - 1. Reading and writing instructions (CSLO 4)
 - 2. Reading and writing engineering reports (CSLO 4)
 - 3. Engineering graphics (CSLO 4)
 - 4. Giving a presentation (CSLO: 4)
- B. Engineering calculations (CSLO: 3) (15% of total course time)
 - 1. Some physics principles
 - 2. Properties of selected materials

3. Economic considerations
- C. Engineering design (CSLO: 3) (15% of total course time)
 1. Generating multiple solutions to a problem.
 2. Optimizing cost, safety, and manufacturability.
 3. Engineering for product life cycle.
 4. Project management
 5. Concurrent engineering
- D. The role of computers in engineering (CSLO: 3) (10% of total course time)
 1. Types of engineering software and their uses.
 2. Introduction to programming constructs.
 3. Programming paradigms (i.e. sequential vs. object oriented)
- V. **Engineering as a Profession (10% of total course time)**
 - A. Code of Ethics (CSLO: 5)
 1. Responsibilities
 2. Consequences of ethical decisions
 - B. Engineering Societies (CSLOs: 2 and 5)
 - C. Maintaining an engineering license (CSLO: 2)

The need for lifelong learning (CSLO: 2)

D. REQUIRED COMPETENCIES (PERFORMANCE OBJECTIVES) FOR ARTICULATION:

1. Assess the impact of engineering on various societies around the world and throughout history.
2. Identify the most appropriate engineering disciplines for designing a particular product or process and develop a plan to become an engineer and maintain a license in a particular discipline.
3. Formulate and perform elementary engineering calculations.
4. Read critically and communicate effectively as a writer and speaker by reading and creating elementary engineering drawings, instructions, reports, and presentations.
5. Justify a course of action for a particular engineering ethics situation.

E. METHODS FOR END OF COURSE ASSESSMENT:

Successfully take the stanine exams for the above PHS courses with a score of "5" or better.
 Credit by exam: Students must receive a grade of "B" or better on the final exam.

F. TEXTBOOKS OR OTHER SUPPORTING MATERIALS

No textbook is required, students use Autodesk Inventor
 Curriculum is online

G. PROCEDURES AND/OR CRITERIA FOR COURSE ARTICULATION:

1. Complete the **1) Introduction to Engineering Design (2 semesters) and 2) Principles of Engineering (2 semesters) courses at Pittsburg High School** with a grade of "B" or better.
2. Successfully taking the stanine exams for the above PHS courses with a score of "5" or higher.
3. Be recommended for credit by the high school teacher.
4. Apply for admission at Los Medanos College.
5. Register for CATEMA for electronic recommendation of college credit **within the academic year in which credit was earned.**
6. Upon completion of the above, the student will receive on his/her LMC and CCCCD (California Community College District) transcript the units of credit for LMC's ENGIN-010 " course.
7. College transcripts will reflect the **FINAL EXAM GRADE** earned and will be notated as *Credit by Exam.

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COLLEGE SIGNATURES

Natalie Hannum

Natalie Hannum (Dec 11, 2020 11:51 PST)

Natalie Hannum Date
LMC Vice President of Instruction

Ryan Pedersen

Ryan Pedersen (Dec 11, 2020 11:37 PST)

Ryan Pedersen Date
LMC Dean of Mathematics and Sciences

Mindy Capes

Mindy Capes (Dec 11, 2020 11:31 PST)

Mindy Capes Date
LMC Physical Sciences Department Chair

Francesca Briggs

Francesca Briggs (Dec 11, 2020 11:00 PST)

Francesca Briggs Date
LMC Engineering Faculty

HIGH SCHOOL/ROP/DISTRICT SIGNATURES

Todd Whitmire

Todd Whitmire (Jan 5, 2021 10:18 PST)

Todd Whitmire Date
Pittsburg High School Principal

Anthony Molina

Anthony Molina (Jan 20, 2021 16:20 PST)

Anthony Molina Date
Asst. Superintendent, Pittsburg Unified School District

A.R. Pena

A.R. Pena (Jan 5, 2021 10:58 PST)

Anthony Pena Date
PHS Faculty

Elizabeth Traub

Elizabeth Traub (Jan 5, 2021 10:25 PST)

Elizabeth Traub Date
PHS Faculty












PHS-ENGIN-010-2021-22
















Final Audit Report

2021-01-21

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