

ARTICULATION AGREEMENT

DATE DRAFTED: November 1, 2022

VALID ACADEMIC YEARS: FA22-SP24

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

A. 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.

B. UNITS: 3

C. PRE-REQUISITES: None

D. HIGH SCHOOL CLASS DESCRIPTION: 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.

E. 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
- E.

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
- D.

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)
 - 4.

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)

F. 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.

G. 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.

H. TEXTBOOKS OR OTHER SUPPORTING MATERIALS

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

I. PROCEDURES AND/OR CRITERIA FOR COURSE ARTICULATION:

(all of the following must be met)

1. Students **must apply** to Los Medanos College and register in **CATEMA** in order to receive credit recommendations by their high school teacher.
2. Students **must be recommended** for credit by their high school teacher in **CATEMA**. *Teachers recommend credit at their discretion.*
3. 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.
4. Successfully taking the stanine exams for the above PHS courses with a score of “5” or higher. *High school teachers will enter this grade in CATEMA.*
5. Articulated college credit may only be recommended by the high school teacher and received by the student **within the academic year** in which it was earned.
6. Upon completion of the above, the student will receive on his/her LMC and CCCCDC (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 SIGNATURESNatalie Hannum[Natalie Hannum \(Dec 14, 2022 10:55 PST\)](#)

Natalie Hannum
LMC Vice President of Instruction
DateRyan Pedersen[Ryan Pedersen \(Dec 13, 2022 16:23 PST\)](#)

Ryan Pedersen
LMC Dean of Instruction Mathematics and Sciences
DateKurt Crowder[Kurt Crowder \(Dec 13, 2022 13:54 PST\)](#)

Kurt Crowder
LMC Physical Sciences Department Chair
DateFrancesca Briggs[Francesca Briggs \(Nov 9, 2022 13:43 PST\)](#)

Francesca Briggs
LMC Engineering Faculty
Date**HIGH SCHOOL/ROP/DISTRICT SIGNATURES**Todd Whitmire[Todd Whitmire \(Dec 14, 2022 17:15 PST\)](#)

Todd Whitmire
Pittsburg High School Principal
DateAnthony Molina[Anthony Molina \(Jan 21, 2023 09:35 PST\)](#)

Anthony Molina
Asst. Superintendent, Pittsburg Unified School District
DateA.R. Pena[A.R. Pena \(Dec 15, 2022 08:12 PST\)](#)

Anthony Pena
PHS Faculty
Date