Cerritos College

SLO Presentation

ENGR
Date: 09-15-2022

ISLO

Civic Engagement
• Students will develop values and beliefs in their role as a member of local, national and global societies to promote truth, fairness and goodwill to others. They will use the democratic process to further their values and beliefs and recognize and accept differing perspectives based on cultural diversity. They will engage in actions which provide service to others and have a positive impact on their local community.

Communication and Expression
• Students will demonstrate the ability to effectively and appropriately communicate their thoughts and ideas both in written and oral forms. They will develop verbal and non-verbal delivery skills, in an appropriate manner, to communicate their ideas as well as evaluate the ideas of others in a wide variety of contexts.

Critical Thinking and Quantitative Reasoning
• Students will demonstrate the ability to recognize assumptions within an argument and actively and skillfully analyze underlying reasoning to develop a conclusion. They will apply qualitative and/or quantitative analysis to solve problems, predict outcomes, test hypotheses, and explore alternatives in an ethical manner.

Information Literacy
• Students will demonstrate the ability to determine when gathering additional information is necessary. They will use appropriate resources and technologies to locate, evaluate and incorporate the information when developing supporting arguments and drawing conclusions. Students will also develop the ability to understand any legal, ethical or social issues regarding the use of information.

Personal Knowledge and Responsibility
• Students will develop the necessary skills to define, maintain and complete their personal educational goals. They will learn to work independently to accomplish personal goals toward realizing their full potential academically, physically and emotionally whether for personal enrichment, further education or career advancement.

Science, Engineering, and Math
ENGR

PSLO
No PSLOs

CSLO

ENGR110 - Introduction to Engineering
• Describe the role of engineers in society and classify the different engineering branches, the functions of engineers, and industries in which they work

• Identity and describe academic pathways to four-year degrees and the subsequent pathways to Professional Engineer Licensing.

• Explain engineering ethical principles and standards

• Demonstrate knowledge of effective practices for writing technical engineering documents and making oral presentations

• Analyze engineering problems using the engineering design process

• Demonstrate teamwork skills in working on an engineering design team

ENGR112 - Engineering Graphics
• Apply rules of orthographic projection to create multiview drawings

• Apply standards of dimensioning and tolerancing to engineering drawings

• Create pictorials from orthographic views

• Apply the engineering design process to a design project

• Use CAD software to create:
1.   2D engineering drawings, including working drawings and assembly drawings
2.   3D models and assemblies

• Create auxiliary and section views of an object following correct conventions

ENGR210 - Materials Science and Engineering

- Characterize structure-property-performance relationship

- Distinguish the structure of different types of materials

- Specify microstructure of an alloy from phase diagrams

- Analyze mechanical and electrical properties of materials

- Select materials for various engineering applications

- Establish how failures occur in materials and how to prevent them

- Describe corrosion of materials and how to prevent it

- Ability to design and conduct experiments, as well as to analyze and interpret data using statistical, computational, or mathematical methods.

- Ability to collaborate effectively on multidisciplinary teams.

ENGR215 - Circuits

- 1. Analyze DC circuits to find current, voltage, resistance, power, and/or energy

- 2. Draw and label circuit diagrams and show thorough mathematical solutions

- 3. Apply different circuit analysis techniques and demonstrate a process for selecting an appropriate technique for a given problem

- 4. Solve circuits containing two or more op-amps

- 5. Find the transient response and complete response for RC, RL, and RLC circuits involving DC sources

- 6. Solve AC circuits by using phasors

- 7. Calculate average and complex power for AC circuits

ENGR215L - Circuits Laboratory

- A. Analyze DC circuits to find current, voltage, resistance, power, and/or energy

- B. Draw and label circuit diagrams and show thorough mathematical solutions

- C. Apply different circuit analysis techniques and demonstrate a process for selecting an appropriate technique for a given problem

- D. Solve circuits containing two or more op-amps

- E. Find the transient response and complete response for RC, RL, and RLC circuits involving DC sources

- F. Solve AC circuits by using phasors

- G. Calculate average and complex power for AC circuits

ENGR220 - Programming and Problem-Solving in MATLAB

- Students will be able to design and implement computer programs consisting of multiple modules of numerical methods to analyze engineering problems.

- Distill numerical results into a readable format that answers specific engineering analysis and design questions.

- Synthesize multiple program modules into larger program packages.

- Analyze the applicability and accuracy of numerical solutions to diverse engineering problems.

- Test program output for accuracy using hand calculations and debugging techniques.

- Calculate solutions to engineering problems using standard numerical methods.

- Write simple program modules to implement single numerical methods and algorithms.

ENGR235 - Statics

- Analyze two- and three-dimensional force systems on rigid bodies in static equilibrium

- Calculate internal forces in members and create shear and bending moment diagrams for beams

- Determine the forces that act on rigid bodies including external forces, weight, normal and distributed loads, friction and reactions at supports

- Effectively communicate legible problem solutions to be understood by engineers in and out of their specific disciplines

- Perform vector analysis methods addressing forces acting on rigid bodies, trusses, frames, and machines

ENGR240 - Dynamics

- 1.   To develop an understanding of the fundamentals and principles engineering mechanics: statics and dynamics of particles, and rigid bodies in two and three dimensions including: kinematics and kinetics of particles and rigid bodies in 2D and 3D motion, Rotations, translations, oscillations.

- 2.   Learn to solve equilibrium of rigid bodies including the calculations of moment of force, inertia moments of solid bodies, and basic structural analysis, and be able to determine the requirement for the equilibrium of particles and solid bodies.

- 3.   To develop the ability to apply Newtonian mechanics to model and predict the responses of simple dynamical system (particle and rigid body) subjected to applied forces.

- 4.   To learn the basics of oscillations and different possibilities for vibrations of mechanical systems.

- 5.   Define basic kinematic quantities of rectilinear and curvilinear motion of particle such as: position, displacement, velocity and acceleration,

- 6.   Describe and understand plane kinematics of rigid bodies,

- 7.   Explain basic terms in kinetics of particles: Newton's second law, work and kinetic energy, impulse and momentum, gravitational and elastic potential energy

- 8.   Discuss direct and oblique central impact

- 9.   Determine moments and products of inertia of a mass,

- 10.   Explain plane kinetics of rigid bodies

- 11.   Analyze and comprehend free undamped and damped vibrations

ENGR245 - Strength of Materials

- Compute stress, strain and deformation in an axial member

- Compute direct shear stresses

- Compute bending stresses

- Compute torsional shear stresses

- Compute the state of stress at a point in a loaded beam

- Determine stress concentration factors

- Determine the stress on a plane given the state of stress

- Compute column critical load and stress

- Compute the deflection of beams and shafts

- Utilize modern computational tools in analysis and solutions

- Prepare well documented problem solutions

- Ability to apply knowledge of mathematics, science, and engineering

- An ability to design and conduct experiments, as well as to analyze and interpret data

- An ability to design a system, component, or process to meet desired needs

- An ability to function on multidisciplinary teams

- An ability to identify, formulate, and solve engineering problems

- An ability to communicate effectively