

**Student Learning Outcomes**  
**Cañada College**  
**Engineering Program**

**A. Program student learning outcomes:**

Students who have completed the Engineering program at Cañada College will be able to:

1. Apply their knowledge of math, science, and engineering to identify, formulate, and solve engineering problems.
2. Design and perform experiments, analyze and interpret data, and prepare a report summarizing the results of the experiments.
3. Develop a design given a set of requirements and specifications.
4. Demonstrate professional ethical responsibility.
5. Communicate effectively and perform on multi-disciplinary teams.
6. Formulate a plan of study to obtain a Bachelor's degree in engineering and describe the processes needed to become an engineer and maintain a license.
7. Use the techniques, skills, and modern engineering tools necessary for engineering practice.

**B. Course level student learning outcomes:**

Students who complete Engr 100 will be able to:

1. evaluate the role of engineers in various societies around the world and throughout history.
2. recommend the types of projects and responsibilities that are the most appropriate for various engineering disciplines.
3. formulate and perform elementary engineering calculations to aid the selection of the best design for a simple device.
4. read and write elementary engineering drawings, instructions, and reports.
5. perform experiments analyze and interpret data, and prepare a report summarizing the results of the experiments.
6. illustrate the processes required to become an engineer and maintain a license.
7. explain and analyze ethical issues in engineering.

Students who complete Engr 210 will be able to:

1. Read engineering drawings.
2. Distinguish between various types of projections used in engineering drawings.
3. Make freehand drawings, and demonstrate the use of drawing instruments.
4. Demonstrate the use of CAD programs, including solid modeling.
5. Apply the engineering design process to develop original solutions to engineering problems.
6. Specify dimensions and tolerances in engineering graphics.

7. Adhere to the standard conventions for terminology, symbols, and styles used in engineering graphics.

Students who complete Engr 230 will be able to:

1. Reduce systems of forces to one force or one force and one couple.
2. Solve for unknown forces for rigid bodies in two-dimensional and three-dimensional equilibrium. Analyze trusses, frames, and machines for external reaction forces and forces between the members.
4. Calculate centroids and moments of inertia for composite bodies.
5. Solve for internal forces in members and construct shear and bending moment diagrams for beams.
6. Solve problems that include friction.
7. Analyze the stability of rigid bodies in equilibrium.

Students who complete Engr 270 will be able to:

1. Identify the crystalline structure of models, and explain how the structure's characteristics affect a material's properties.
2. Distinguish between the types of imperfections that can occur in crystalline structures and compare their effects on a material's properties.
3. Calculate rates of steady-state diffusion.
4. Perform tension, compression, and hardness tests, and interpret the results.
5. Describe different strengthening mechanisms and thermal processing, and compare their effects.
6. Relate typical properties of polymers and ceramics to their structures.
7. Describe the mechanisms for electrical conduction in semiconductors.

Students who complete Engr 260 will be able to:

1. Analyze electric circuits for DC, transient, and AC voltage and current responses,
2. Evaluate different circuits analysis techniques and choose an appropriate technique for a particular circuit,
3. Apply a simple model for operational amplifiers to solve simple circuits,
4. Use multimeters, signal generators, and oscilloscopes,
5. Calculate power in DC and AC circuits (using the concepts of complex power),
6. Analyze Y-Y connected balanced three phase circuits,
7. Use a circuits simulation program (PSpice, MultiSIM) to predict circuit behavior.

Students who complete Engr 410 will be able to:

1. Read engineering drawings.
2. Distinguish between various types of projections used in engineering drawings.
3. Make freehand drawings.
4. Demonstrate the use of drawing instruments.
5. Demonstrate the use of AutoCAD to create engineering drawings.
6. Specify dimensions and tolerances in engineering graphics.
7. Adhere to the standard conventions for terminology, symbols, and styles used in engineering graphics.

Students who complete Engr 413 will be able to:

1. Apply descriptive geometry principles to solve engineering problems involving points, lines, surfaces and volumes.

2. Demonstrate the use of AutoCAD and SolidWorks to create solid models.

Distinguish between various types of projections used in engineering drawings.

3. Specify dimensions and tolerances in engineering graphics, including Geometric Dimensions and Tolerances.

4. Demonstrate the use of drawing instruments.

5. Prepare complete sets of working drawings and assemblies.

6. Apply the engineering design process to develop original solutions to engineering problems.

7. Adhere to the standard conventions for terminology, symbols, and styles used in engineering graphics.