ELECTRICAL ENGINEERING DEPARTMENT

California Polytechnic State University

2026-27 SENIOR PROJECT HANDBOOK

San Luis Obispo, California

SENIOR PROJECT COURSE SEQUENCE

First Semester
EE 4461 - Senior Project I
EE 4463 - Senior Project Design Laboratory I
Taken concurrently

Second Semester
EE 4462 - Senior Project II
EE 4464 - Senior Project Design Laboratory II
Taken concurrently

A Note from the EE Department

Welcome to the Electrical Engineering Senior Project sequence. This two-semester experience is one of the cornerstones of the EE curriculum. It provides an opportunity to apply your technical knowledge to an open-ended engineering problem while developing systems engineering, engineering design, and project management skills.

Careful planning is essential to a successful project. Develop project ideas before the first term so you can make informed decisions and enter the sequence well prepared. Preparation may include discussing project ideas with potential teammates and reviewing senior project reports from previous years, available through the Cal Poly Digital Commons via the Kennedy Library.

As you prepare for your Senior Project, keep the following points in mind:

1. The Senior Project sequence consists of four courses completed over two consecutive semesters: First Semester: EE 4461 - Senior Project I and EE 4463 - Senior Project Design Laboratory I (taken concurrently). Second Semester: EE 4462 - Senior Project II and EE 4464 - Senior Project Design Laboratory II (taken concurrently).

2. By the beginning of Week 2 of the first semester, each project team should have identified a senior project with sufficient scope and technical complexity for a team of 3-4 students. Projects may originate from faculty, students, or external sponsors. At a minimum, each team should have a clear problem statement that identifies the technical area and the need to be addressed.

3. Students proposing their own projects are responsible for recruiting their teammates. Students considering faculty-defined projects should commit only to projects they intend to pursue. Committing multiple projects and later withdrawing from all but one is unprofessional and should be avoided.

4. The EE Department provides up to $500 per project team to purchase lab instructor-approved materials needed to complete the project. This funding is intended to support project materials only and is not available for equipment, travel, or other project-related expenses. Additional information about purchasing procedures is provided later in this handbook.

5. Students are encouraged to present their work at the College of Engineering Senior Project Expo held near the end of the academic year.

We encourage you to approach your Senior Project with curiosity, professionalism, and a commitment to engineering excellence. We look forward to seeing the innovative solutions your teams develop.

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I. Objectives of the Senior Project

The Senior Project is the culminating design experience of the Electrical Engineering curriculum. It provides an opportunity to integrate the knowledge and skills developed throughout the program while addressing an open-ended engineering problem.

Throughout the two-semester sequence, students work as members of an engineering team to define the project scope, understand stakeholder needs, develop system requirements, evaluate design alternatives, implement and integrate a solution, verify that it satisfies the design requirements, and continuously document the engineering process, design decisions, technical results, and project outcomes. In doing so, students gain practical experience with engineering design, systems engineering, project management, technical communication, and teamwork.

The Senior Project is intended to model professional engineering practice. Success depends not only on technical ability, but also on planning, communication, organization, and sound engineering judgment throughout the project lifecycle.

Grading

A letter grade (A, B, C, D, or F) is assigned for each course in the Senior Project sequence. Evaluation is based on the quality of the engineering process, project progress, technical work, documentation, professionalism, and required course deliverables.

Successful completion of the course requires more than a functioning prototype. Students are expected to apply the engineering methods, systems engineering concepts, and project management practices introduced throughout the sequence. Engineering decisions should be supported by appropriate technical justification and documented throughout the project.

Projects that encounter technical challenges may still demonstrate successful learning when teams follow a disciplined engineering process, communicate results honestly, and document technical decisions and outcomes. Specific grading criteria and course expectations will be provided by the course instructor.

II. Project Lifecycle and Systems Engineering

Modern engineering projects follow a structured project lifecycle - a sequence of activities that transforms an identified need into a completed and validated solution. While every project is unique, most follow a common systems engineering process that guides the development of complex products and systems.

The concepts introduced in this handbook will be presented gradually throughout the two-semester sequence. Students are not expected to know these methods before beginning EE 4461.

The Senior Project adopts this systems engineering perspective and is organized around the Systems Engineering V-Model, illustrated in Figure 1. The V-Model provides a conceptual framework for engineering complex systems. The left side of the V focuses on understanding stakeholder needs and progressively defining the system. The bottom of the V represents implementation. The right side

focuses on integrating the system and demonstrating that it satisfies both the specified requirements (verification) and the original stakeholder needs (validation).

The Senior Project sequence follows this engineering process. During the first semester (EE 4461 and EE 4463), project teams define the problem, identify stakeholder needs, develop system requirements, evaluate design alternatives, complete a detailed design, and begin procuring long-lead materials and components as the design matures. During the second semester (EE 4462 and EE 4464), teams implement the design, integrate the system, perform verification and validation activities, and complete the formal project documentation.

Throughout both semesters, students are expected to continuously document their engineering work, including technical decisions, design iterations, project progress, and required individual and team deliverables. Formal project reports are submitted at the end of each semester to document the work completed during that term. The final EE 4464 Senior Project Report serves as the comprehensive record of the completed project.

Because each phase builds upon the work completed in the previous phase, the Senior Project courses are designed to be taken sequentially. This progression reflects professional engineering practice and provides the foundation for a successful project. Completing all four courses concurrently in a single academic term is not permitted and is inconsistent with the engineering process the sequence is designed to teach.

Although the activities are presented sequentially, engineering is inherently iterative. As new information becomes available, teams should expect to revisit earlier decisions and refine requirements, design decisions, and implementation details throughout the project.

Figure 1 illustrates the relationship between the major phases of the project lifecycle and their corresponding systems engineering activities. The sections that follow describe each phase in greater detail.

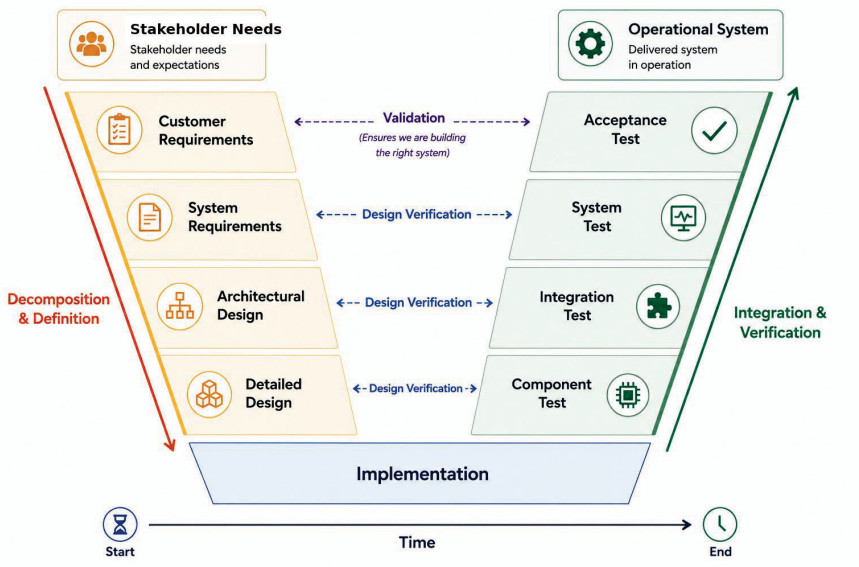

Figure 1. Systems Engineering V-Model. The model illustrates the relationship between system definition, engineering design, implementation, integration, verification, and validation.

Every successful project begins with understanding the stakeholder need to be addressed. Stakeholders may include customers, sponsors, end users, faculty advisors, or others with an interest in the project's outcome. During this phase, the team identifies the stakeholders, defines the project scope, and establishes clear project objectives.

Requirements Engineering
Once the project has been defined, the team develops a clear and complete set of system requirements, typically in accordance with ISO/IEC/IEEE 29148:2018, Systems and Software Engineering-Life Cycle Processes-Requirements Engineering. Requirements describe what the system must accomplish, not how it will be implemented. Well-written requirements provide the foundation for engineering design and later serve as the basis for project verification.

Engineering Design
During the design phase, the team develops and evaluates alternative solutions before selecting the approach that best satisfies the project requirements. The design is refined through analysis, trade studies, prototyping, and technical reviews until it is ready for implementation.

Implementation
Implementation transforms the design into a working system through hardware fabrication, software development, component procurement, assembly, and unit-level testing.

System Integration
The individual hardware and software components are combined into a complete system. Integration often reveals interface issues that require refinement of the design or implementation before system-level testing can begin.

Verification and Validation
The completed system is evaluated to determine whether it satisfies the established requirements (verification) and fulfills the original stakeholder needs (validation). Verification answers the question, "Did we build the system right?" Validation answers, "Did we build the right system?" Testing should be planned early in the project and performed throughout development rather than postponed until the end.

Project Documentation and Closeout
Documentation is integral to the engineering process and should be maintained throughout the project. Teams are expected to keep accurate technical records, document engineering decisions and progress, and complete all required individual and team deliverables. Specific deliverables, submission requirements, and due dates are established by the EE 4463 and EE 4464 laboratory instructors and are provided in the respective course syllabi.

At the end of each semester, teams submit a formal report documenting the work completed during that term. The final EE 4464 Senior Project Report covers the complete engineering effort, from project definition through verification and validation. Following approval by the EE 4464 Instructor of Record, it is submitted to Cal Poly Digital Commons through Kennedy Library and becomes publicly accessible unless restricted by an approved nondisclosure agreement (NDA). Submission instructions appear later in this handbook.

III. Disciplines and Learning Resources

Senior Project draws on four complementary disciplines: Systems Engineering, Project Management, Engineering Design, and domain-specific engineering practice. Each contributes methods and knowledge needed to develop a successful engineering solution, as illustrated in Figure 2.

Systems Engineering defines stakeholder needs, requirements, system architecture, interfaces, verification, and validation. Project Management provides methods for planning, scheduling, procurement, risk management, and project execution. Engineering Design supports concept generation, evaluation, and refinement, while domain-specific engineering provides the technical knowledge, tools, standards, and implementation methods required to realize the design.

Because the course integrates several established disciplines, no single textbook provides the appropriate breadth and depth. Instead, students will use selected chapters from books, standards, handbooks, papers, and online resources as they become relevant to their projects.

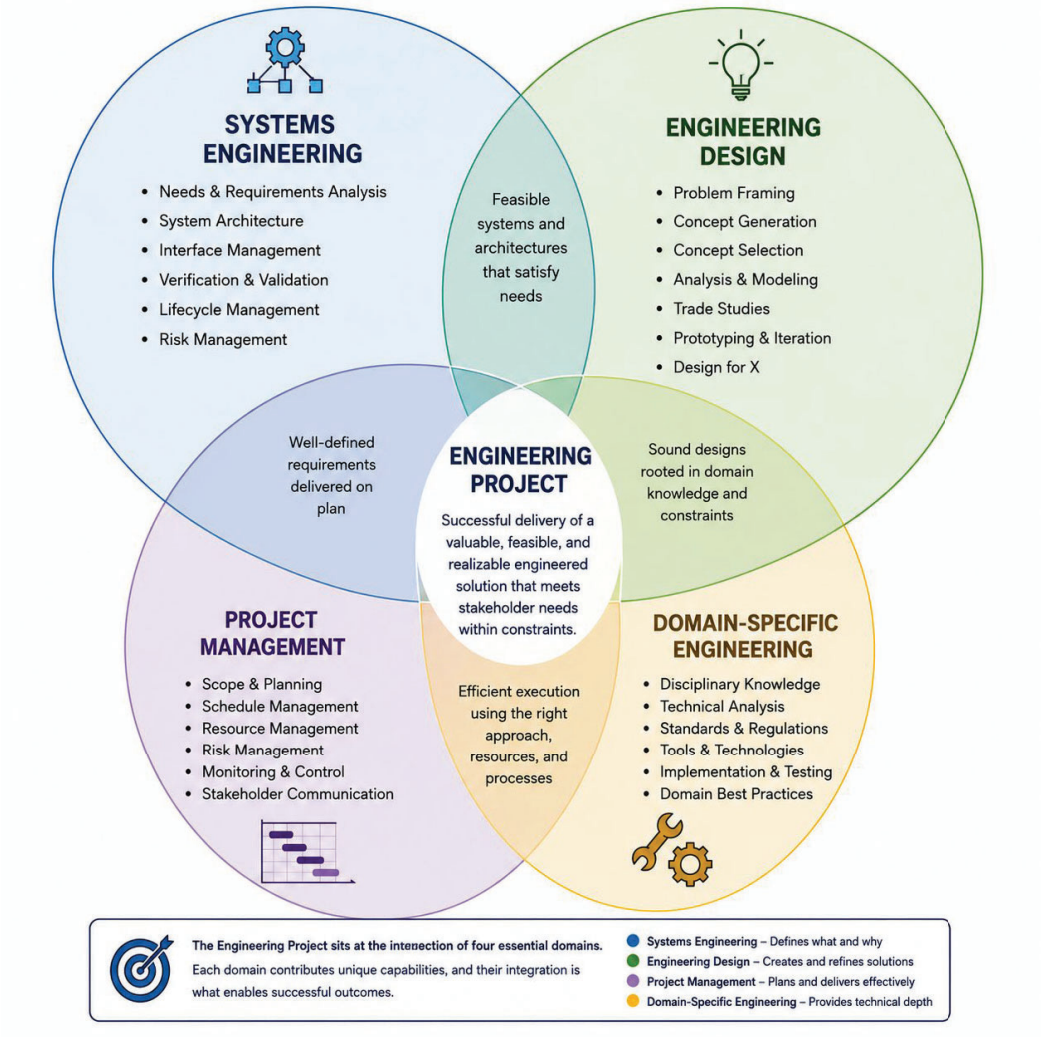

Figure 2. Disciplines Supporting an Engineering Project. The diagram illustrates how Systems Engineering, Project Management, Engineering Design, and domain-specific engineering practice contribute complementary methods and knowledge to the planning, design, implementation, and evaluation of an engineered system.

Recommended Resources

The following resources support the Senior Project sequence. At the time of publication, they are available freely online or to Cal Poly affiliates through Kennedy Library.

Systems Engineering

- **International Council on Systems Engineering, Los Angeles Chapter, *Systems Engineering Junior Handbook*, Version 1, 2015.**

This short handbook provides an accessible introduction to Systems Engineering and project organization. Its examples are simpler than many Senior Projects, making it a useful starting point for students who are new to the terminology and process.

- **ISO, IEC, and IEEE, *ISO/IEC/IEEE 29148:2018—Systems and Software Engineering—Life Cycle Processes—Requirements Engineering*, 2nd ed., 2018.**

This standard defines accepted terminology and practices for stakeholder needs, system requirements, verification, and validation. Students are not expected to read the entire standard. Selected sections will be assigned when relevant to the project.

Engineering Design

- **R. Ford and C. Coulston, *Design for Electrical and Computer Engineers*. New York, NY: McGraw-Hill, 2007.**

This book connects engineering design, requirements, project planning, concept selection, and technical decision-making in an electrical and computer engineering context. It provides a broad reference for much of the first-semester work.

Project Management

- **S. Morris, *Project Management Fundamentals*, K. Murtescu, Ed. Toronto, Canada: Seneca College, 2021.**

This concise resource introduces project scope, planning, scheduling, budgeting, resources, risk, communication, teamwork, project execution, and closeout. Its examples make the methods easy to apply to Senior Project work.

Electronic Systems Design and Implementation

- **J. Lienig and H. Brümmer, *Fundamentals of Electronic Systems Design*. Cham, Switzerland: Springer, 2017.**

This book addresses practical electronic system design, including architecture, packaging, printed circuit boards, shielding, thermal management, electromagnetic compatibility, manufacturing, recycling, and environmental compliance. It is especially useful during detailed design, implementation, and integration.

- **P. Wilson, *The Circuit Designer's Companion*, 4th ed. Oxford, U.K.: Newnes, 2017.**

This reference covers practical topics such as grounding, PCB design, component tolerances, electromagnetic compatibility, reliability, thermal management, testability, production, and relevant

engineering standards. It complements Lienig and Brümmer by providing additional implementation guidance and references to commonly used standards.

Professional Ethics

- **P. Stanwick and S. Stanwick, *Absolute Essentials of Business Ethics*, 1st ed. Abingdon, U.K.: Routledge, 2021.**

This concise book introduces ethical theories and frameworks, stakeholder responsibility, sustainability, human rights, and contemporary ethical dilemmas. It supports the professional ethics component of Senior Project by helping students recognize that technical, business, societal, and environmental decisions are often closely connected.

Electrical Safety

- **Lawrence Berkeley National Laboratory, *Electrical Safety Manual*, rev. 2. Berkeley, CA: Lawrence Berkeley National Laboratory, 2019.**

This authoritative manual addresses electrical hazards, including stored energy, capacitors, batteries, high voltage, electromagnetic fields, lasers, and electrical equipment. Its emphasis on risk assessment and protective controls makes it relevant to project planning, implementation, and testing.

IV. Course Registration Details

The Senior Project sequence is completed over two consecutive semesters. Registration procedures differ between the lecture and laboratory courses because laboratory section assignments are managed by the Department.

First Semester: EE 4461 and EE 4463

When registration opens, students should enroll in any open EE 4461 lecture section that fits their schedule. Students should also register for an available EE 4463 laboratory section. Because all EE 4463 laboratory sections meet at the same time in Building 20, the initial laboratory-section assignment is temporary and does not determine the student's final section.

After projects and teams are confirmed, the Department will reassign students among EE 4463 sections using permission numbers. Laboratory assignments are made to ensure that:

1. Each project team is assigned to a single laboratory section. Project teams are never split across multiple sections.

2. Laboratory sections have approximately equal student enrollment, ensuring a balanced instructional workload across all sections.

3. When a faculty member's proposed project moves forward, the corresponding project team is assigned to that faculty member's laboratory section whenever possible.

Students and teams may not request a specific laboratory section or instructor. Final section assignments are made by the Senior Design Facilitator, who may be the Department Chair.

Because laboratory assignments depend on project and team selections, the deadline for identifying a project will occur several days before the University's Last day to add or swap classes with a permission number. This provides sufficient time for the Department to assign students to laboratory sections and issue the required permission numbers.

Second Semester: EE 4462 and EE 4464

Registration in EE 4462 and EE 4464 normally requires passing grades in both EE 4461 and EE 4463. In rare cases, an RP grade in EE 4463, assigned to the entire team, may be accepted for continued enrollment.

Students register for EE 4462 directly. Registration in EE 4464 requires a Department-issued permission number. Laboratory assignments follow the same principles established for EE 4463, ensuring that project teams remain together, laboratory enrollments remain balanced, and teams are assigned to the faculty member sponsoring their project whenever possible.

Before receiving an EE 4464 permission number, students may also be required to complete the Senior Survey as directed by the EE Department.

V. Funding Support for Senior Project

The EE Department may provide up to $500 per project team for approved materials needed to complete the Senior Project. Funding is limited to project materials and is not available for equipment, travel, or other activities outside the direct needs of the project.

Department funding supports projects that primarily serve the educational mission of Senior Project. Projects sponsored by, or intended primarily to benefit, organizations outside Cal Poly should be funded by the sponsor, typically through an Industry Supported Student Project (ISSP) agreement or another Department-approved mechanism.

Before starting a purchase request, the team must review the proposed items with its laboratory instructor. The review should include the intended use of each item, item description, quantity, unit cost, and a reputable vendor. The laboratory instructor must provide verbal approval before the team begins the formal purchasing process.

Purchases are processed electronically through a Department PowerForm:

1. The team selects one student to serve as the request initiator.

2. The initiator opens the Department-provided PowerForm link and completes the initial form.

3. The initiator enters the requested items, including the item description, intended use, quantity, unit price, vendor, and a link to the vendor's product information.

4. The request is routed electronically for formal approval by the laboratory instructor and the Department Chair.

5. After approval, the request is sent electronically to the EE front office for processing.

Students should not contact individual staff members to place orders and should not purchase materials personally with the expectation of reimbursement.

When the materials arrive, the request initiator will be contacted by the front office to arrange pickup.

Materials purchased with Department or State funds become the property of the Electrical Engineering Department. Students who wish to retain project materials after the project is completed should purchase those items with personal funds rather than Department funds.

Additional Funding Opportunities

Students needing support beyond Department material funding should explore other University opportunities. The Baker/Koob Endowments competitively support eligible student projects and may fund materials, research, travel, conferences, competitions, and related expenses. Consult the current program announcement for eligibility and deadlines.

VI. Senior Project Expectations

Senior Projects must be open-ended, technically substantial, and appropriately scoped for a team of 3-4 students working across two semesters. Teams are expected to apply sound engineering methods, manage the project professionally, complete assigned individual and team responsibilities, and maintain steady progress throughout the sequence.

Students are expected to always conduct themselves professionally. Successful projects depend on teamwork, mutual respect, and civil interactions among team members, instructors, sponsors, and others who contribute to the project. Professional conduct includes meeting commitments, communicating openly and respectfully, and fostering an inclusive and collaborative working environment.

Student Responsibility

The Senior Project belongs to the student team. Instructors provide guidance, ask questions, review progress, and help maintain an appropriate project scope, but the engineering decisions belong to the team.

Students are expected to identify and evaluate relevant information, develop requirements, explore alternative solutions, justify engineering decisions, and define how the completed system will be verified and validated. Developing sound engineering judgment is one of the primary objectives of the Senior Project.

Engineering Process

The primary objective of the Senior Project is to learn and apply a disciplined engineering process. Throughout the project, teams should understand the stakeholder need, develop meaningful requirements, evaluate alternative solutions, document engineering decisions and tradeoffs, plan verification activities, and communicate technical results clearly and honestly.

The final prototype is an important outcome, but it is not the only evidence of sound engineering practice. A project that does not achieve every technical objective may still demonstrate strong

engineering when the team follows a disciplined process, makes justified decisions, documents its work thoroughly, and reports results honestly. Conversely, a functioning prototype does not demonstrate the full Senior Project learning objectives if important parts of the engineering process were omitted.

Requirements and Project Changes

Engineering projects evolve, and changes in requirements or project scope are sometimes appropriate as new information becomes available. Such changes should be supported by evidence, documented, reviewed, and reflected throughout the project.

Requirements should not be changed simply to make the final system appear more successful. Honest reporting of limitations, unexpected results, and remaining work is an essential part of professional engineering practice.

Independent Learning

Senior Projects frequently require students to learn new technical material, evaluate unfamiliar technologies, and solve problems that have no predetermined solution. Instructors, sponsors, and teammates provide valuable guidance, but students are expected to develop the technical understanding needed to make and justify their own engineering decisions.

VII. EE 4464 Senior Design Report

Purpose

The Senior Project Report is a major deliverable of EE 4464 and the primary technical record of the completed project. It documents the engineering process, technical decisions, final system implementation, and evidence that the project satisfies its objectives and requirements.

Following faculty approval, the report is archived in Cal Poly Digital Commons through Kennedy Library, where it becomes publicly available unless restricted by an approved nondisclosure agreement (NDA).

The quality of the final report depends on continuous documentation throughout the project. Engineering notebooks, design analyses, meeting records, test results, and other project documentation developed during both semesters should serve as the primary source material for the report.

Report Organization

Although every project is unique, final reports should use a consistent organization that clearly communicates the engineering process and technical results. Additional chapters or appendices may be included when appropriate.

The report should include the following major sections.

Title Page

Identifies the project title, team members, instructor of record, department, and submission date.

Statement of Disclaimer
Provides the Department's required disclaimer regarding the educational nature of the project.

Table of Contents
Lists all chapters, major sections, and appendices.

List of Figures and Tables
Lists all numbered figures and tables included in the report.

Acknowledgments
Recognizes individuals and organizations that contributed to the project.

Abstract
Provides a concise summary of the project, including the problem addressed, the proposed solution, and the principal results.

1. Introduction
Introduces the project, its objectives, and the motivation for the work.

2. Background
Summarizes the technical background, prior work, and information needed to understand the project.

3. Requirements
Documents the stakeholder needs, system requirements, assumptions, constraints, and project scope that guided the design.

4. Engineering Design
Describes the engineering approach, design alternatives considered, analyses performed, trade studies, and the rationale supporting the final design.

5. Verification Plan
Describes how compliance with the system requirements will be demonstrated. Test procedures, success criteria, and verification methods should be identified before implementation is completed.

6. Implementation
Describes the hardware, software, fabrication, procurement, and construction activities used to realize the design.

7. Integration and Verification Results
Summarizes the system integration process and presents the results demonstrating compliance with the project requirements. Any deficiencies, limitations, or unresolved issues should also be discussed.

8. Conclusions
Summarizes the project accomplishments, lessons learned, recommendations for future work, and potential improvements.

9. References
Lists all sources cited in the report using a consistent citation format.

Appendices
Appendices contain supporting technical material that would interrupt the flow of the main report.

Typical appendices include:

- Analysis of Senior Project (required)
- System requirements
- Bill of Materials
- Project schedule
- Schematics
- PCB layouts
- Software documentation
- Test procedures and results
- Additional technical documentation

VIII. Writing and Formatting Guidelines

The Senior Project Report should communicate the engineering work clearly, accurately, and professionally. It should explain the problem, document the engineering process, justify technical decisions, present results, and support conclusions with evidence. Consistent formatting, figures, tables, and references help readers evaluate the project.

The following guidelines apply to the final Senior Project Report submitted as the major deliverable for EE 4464.

Professional Writing

The report should be written as a professional engineering document intended for a technical audience.

- Write clearly, concisely, and objectively.
- Support technical statements with analysis, measurements, references, or other appropriate evidence.
- Clearly distinguish facts, assumptions, engineering judgments, and conclusions.
- Define acronyms and abbreviations the first time they are used, then use them consistently throughout the report.
- Minimize informal or colloquial language. Use terminology appropriate for a professional engineering document.
- Describe both successful and unsuccessful approaches when they contribute to understanding the engineering process.
- Carefully proofread the final document for grammar, spelling, consistency, and technical accuracy.

Document Format

The report shall be prepared using standard letter-size paper (8.5 x 11 in.).

Unless otherwise directed by the course instructor:

- Top, right, and bottom margins shall be 1 1/4 inches.
- Left margin shall be 1 1/2 inches.
- Body text shall be double spaced.
- Preliminary pages shall use lowercase Roman numerals.
- The main body and appendices shall use Arabic page numbers.
- Each major chapter shall begin on a new page.

Large drawings, schematics, or other oversized figures should be placed in the appendices or submitted separately as appropriate.

Figures and Tables

Figures and tables are an essential part of technical communication and should complement - not replace - the written discussion.

- Every figure and table shall be numbered and referenced in the text before it appears.
- Place figures and tables as close as practical to their first reference.
- Every figure shall include a descriptive caption below the figure.
- Every table shall include a descriptive title above the table.
- Axes, units, symbols, and abbreviations shall be clearly identified.
- Images, graphs, and diagrams should be of sufficient quality to remain legible when printed.

References and Citations

All information, figures, tables, data, software, standards, and other material obtained from external sources shall be properly cited.

Students should use a consistent citation style throughout the report. IEEE style is recommended for references and citations unless otherwise directed by the course instructor.

Whenever text, figures, photographs, tables, diagrams, screenshots, or other visual material are reproduced or adapted from another source, the original source shall be identified with an in-text bracketed citation (for example, [12]) placed in the figure caption, table title, or immediately following the reproduced material, as appropriate. A corresponding bibliographic entry shall also appear in the References section.

Proper attribution is required even when only part of a figure or table is reused. Failure to acknowledge the original source may constitute plagiarism.

Appendices

Appendices contain supporting technical information that would interrupt the main report.

The Analysis of Senior Project appendix is required. Other appendices may include the supporting materials listed in the Report Organization section.

Use of AI-Assisted Writing Tools

AI-assisted writing tools, including ChatGPT, may be used to improve grammar, readability, document organization, and formatting, including assistance with IEEE-style references and citations.

Students remain responsible for the technical content of the report. AI tools should not be used to generate engineering analyses, fabricate results, create fictitious references, or replace the team's engineering judgment. All technical decisions, analyses, conclusions, and reported results must accurately reflect the work performed by the project team.

When AI tools make a significant contribution beyond routine editorial assistance, students should acknowledge their use in a manner consistent with course expectations and applicable University policies.

SAMPLE: TITLE PAGE

PROJECT TITLE

by

Student Name(s) and Contact Information

Instructor of Record: Name

Senior Project

ELECTRICAL ENGINEERING DEPARTMENT

California Polytechnic State University

San Luis Obispo, California

Date

SAMPLE: Disclaimer

Statement of Disclaimer

Since this project is a result of a class assignment, it has been graded and accepted as fulfillment of the course requirements. Acceptance does not imply technical accuracy or reliability. Any use of information in this report is at the risk of the user. These risks may include catastrophic failure of the device or infringement of patent or copyright laws. California Polytechnic State University at San Luis Obispo and its staff cannot be held liable for any use or misuse of the project.

SAMPLE: TABLE OF CONTENTS

TABLE OF CONTENTS

SAMPLE: LIST OF TABLES AND FIGURES

LIST OF TABLES AND FIGURES

Tables Page

Figures

IX. Senior Project Report Submission

The final EE 4464 Senior Project Report must be approved by the Instructor of Record before submission.

After approval, the team submits the report electronically to the Electrical Engineering Senior Projects collection in Cal Poly Digital Commons. The submission page provides the required instructions and upload fields. Accepted reports become part of Cal Poly's permanent public archive.

Before submitting, the team should confirm that:

- ☐ The report is complete and has been approved by the Instructor of Record.
- ☐ All author names, project information, and abstract text are accurate.
- ☐ External figures, tables, and other reproduced material are properly cited.
- ☐ The uploaded file is the final version intended for public access.
- ☐ The required Analysis of Senior Project appendix is included.

Projects subject to a nondisclosure agreement or another distribution restriction should not be uploaded until the team has received instructions from the Department and confirmed the permitted form of submission.

Electrical Engineering Senior Projects collection: https://digitalcommons.calpoly.edu/seniorprojects/

Digital Commons submission portal: https://digitalcommons.calpoly.edu/submit.html

Appendix A

Analysis of Senior Project

This appendix provides information used by the Electrical Engineering Department for continuous program improvement and ABET accreditation. It also asks students to reflect on the broader engineering, professional, and societal aspects of their Senior Project.

Responses should be concise and based on the completed project. Attach additional pages when needed.

Project Title

Student Name and Signature

Instructor of Record and Initials

Date

1. System Purpose and Functional Requirements

Describe what the system is intended to accomplish from the user's perspective. Summarize the primary functions the completed system was designed to perform. Describe what the system does, not how it was implemented.

2. Primary Constraints

Identify the major technical, economic, schedule, safety, manufacturing, regulatory, or other constraints that influenced the team's engineering decisions.

3. Economics

Development

- Original estimated cost of component parts at the start of the project.
- Actual final cost of component parts.
- Final bill of materials for all components.
- Additional equipment or service costs required for development.
- Original estimated development time.
- Actual development time.

Production

If the system were manufactured commercially, estimate:

- Number of units sold per year.
- Manufacturing cost per unit.
- Purchase price per unit.
- Estimated annual profit.

Operation

Estimate the cost to operate the system per relevant unit of time and state the time interval used.

4. Environmental Impact
Describe environmental impacts associated with the manufacture, use, maintenance, or disposal of the system.

5. Manufacturability
Describe significant issues or challenges associated with manufacturing, assembling, or reproducing the system.

6. Sustainability
Describe how sustainability was considered during the project. Sustainability includes environmental, social, and economic considerations. As appropriate, discuss resource use, maintainability, repairability, upgradeability, reuse, end-of-life disposal, user impact, long-term affordability, or other factors relevant to the project.

7. Ethics
Discuss ethical issues associated with the design, manufacture, deployment, operation, or potential misuse of the system.

8. Health and Safety
Identify significant health and safety hazards associated with the design, manufacture, testing, or use of the system. Summarize the measures incorporated to reduce risk.

9. Social and Political Considerations
Describe social or political considerations associated with the design, manufacture, deployment, use, or misuse of the system.

10. Professional Development
Describe important technical knowledge, engineering methods, software tools, standards, or design techniques that the team learned independently during the project.

11. Engineering Standards
Identify the engineering standards, codes, regulations, or industry best practices that influenced the project. Briefly explain how each affected the design, implementation, or verification process.

Examples may include standards or guidance from ANSI, ISO, IEC, ITU, IEEE, NFPA, ESD Association, or other organizations relevant to the project. Teams should identify the specific documents they used rather than listing organizations only.