



ARIZONA STATE UNIVERSITY  
GENERAL STUDIES COURSE PROPOSAL COVER FORM

**Course information:**

Copy and paste **current** course information from *Class Search/Course Catalog*.

Academic Unit Electrical Engineering Department School of ECEE  
 Subject EEE Number 489 Title Senior Design Laboratory II Units: 13  
 Is this a cross-listed course? No  
 If yes, please identify course(s) \_\_\_\_\_  
 Is this a shared course? No If so, list all academic units offering this course \_\_\_\_\_  
 Course description: \_\_\_\_\_

**Requested designation:** Literacy and Critical Inquiry-L  
*Note- a separate proposal is required for each designation requested*

**Eligibility:**

Permanent numbered courses must have completed the university's review and approval process.  
 For the rules governing approval of omnibus courses, contact [Phyllis.Lucie@asu.edu](mailto:Phyllis.Lucie@asu.edu) or [Lauren.Leo@asu.edu](mailto:Lauren.Leo@asu.edu).

**Submission deadlines dates are as follow:**

For Fall 2015 Effective Date: October 9, 2014

For Spring 2016 Effective Date: March 19, 2015

**Area(s) proposed course will serve:**

A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study.

**Checklists for general studies designations:**

- Complete and attach the appropriate checklist
- [Literacy and Critical Inquiry core courses \(L\)](#)
  - [Mathematics core courses \(MA\)](#)
  - [Computer/statistics/quantitative applications core courses \(CS\)](#)
  - [Humanities, Arts and Design core courses \(HU\)](#)
  - [Social-Behavioral Sciences core courses \(SB\)](#)
  - [Natural Sciences core courses \(SQ/SG\)](#)
  - [Cultural Diversity in the United States courses \(C\)](#)
  - [Global Awareness courses \(G\)](#)
  - [Historical Awareness courses \(H\)](#)

**A complete proposal should include:**

- Signed General Studies Program Course Proposal Cover Form
- Criteria Checklist for the area
- Course Catalog description
- Course Syllabus
- Copy of Table of Contents from the textbook and list of required readings/books

N/A

**Respectfully request that proposals are submitted electronically with all files compiled into one PDF. If necessary, a hard copy of the proposal will be accepted.**

**Contact information:**

Name James T. Aberle Phone 5-8588  
 Mail code 5706 E-mail: aberle@asu.edu

**Department Chair/Director approval: (Required)**

Chair/Director name (Typed): Stephen Phillips Date: 1/16/14  
 Chair/Director (Signature): 

**Arizona State University Criteria Checklist for**  
**LITERACY AND CRITICAL INQUIRY - [L]**

**Rationale and Objectives**

Literacy is here defined broadly as communicative competence—that is, competence in written and oral discourse. **Critical inquiry** involves the gathering, interpretation, and evaluation of evidence. Any field of university study may require unique critical skills that have little to do with language in the usual sense (words), but the analysis of written and spoken evidence pervades university study and everyday life. Thus, the General Studies requirements assume that all undergraduates should develop the ability to reason critically and communicate using the medium of language.

The requirement in Literacy and Critical Inquiry presumes, first, that training in literacy and critical inquiry must be sustained beyond traditional First Year English in order to create a habitual skill in every student; and, second, that the skill levels become more advanced, as well as more secure, as the student learns challenging subject matter. Thus, two courses beyond First Year English are required in order for students to meet the Literacy and Critical Inquiry requirement.

Most lower-level [L] courses are devoted primarily to the further development of critical skills in reading, writing, listening, speaking, or analysis of discourse. Upper-division [L] courses generally are courses in a particular discipline into which writing and critical thinking have been fully integrated as means of learning the content and, in most cases, demonstrating that it has been learned.

Notes:

1. ENG 101, 107 or ENG 105 must be prerequisites
2. Honors theses, XXX 493 meet [L] requirements
3. The list of criteria that must be satisfied for designation as a Literacy and Critical Inquiry [L] course is presented on the following page. This list will help you determine whether the current version of your course meets all of these requirements. If you decide to apply, please attach a current syllabus, or handouts, or other documentation that will provide sufficient information for the General Studies Council to make an informed decision regarding the status of your proposal.

Revised April 2014

Proposer: Please complete the following section and attach appropriate documentation.

## ASU - [L] CRITERIA

**TO QUALIFY FOR [L] DESIGNATION, THE COURSE DESIGN MUST PLACE A MAJOR EMPHASIS ON COMPLETING CRITICAL DISCOURSE--AS EVIDENCED BY THE FOLLOWING CRITERIA:**

YES	NO		Identify Documentation Submitted
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p><b>CRITERION 1:</b> At least 50 percent of the grade in the course should depend upon writing assignments (see Criterion 3). Group projects are acceptable only if each student gathers, interprets, and evaluates evidence, and prepares a summary report. <i>In-class essay exams may not be used for [L] designation.</i></p>	syllabus grading rubrics
<p>1. Please describe the assignments that are considered in the computation of course grades--and indicate the proportion of the final grade that is determined by each assignment.</p>			
<p>2. <b>Also:</b></p> <div style="border: 1px solid black; border-radius: 50%; padding: 20px; text-align: center; margin: 10px auto; width: 80%;"> <p>Please <b>circle, underline, or otherwise mark</b> the information presented in the most recent course syllabus (or other material you have submitted) that verifies <b>this description</b> of the grading process--and label this information "<b>C-1</b>".</p> </div> <p><b>C-1</b></p>			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p><b>CRITERION 2:</b> The writing assignments should involve gathering, interpreting, and evaluating evidence. They should reflect critical inquiry, extending beyond opinion and/or reflection.</p>	syllabus grading rubrics
<p>1. Please describe the way(s) in which this criterion is addressed in the course design.</p>			
<p>2. <b>Also:</b></p> <div style="border: 1px solid black; border-radius: 50%; padding: 20px; text-align: center; margin: 10px auto; width: 80%;"> <p>Please <b>circle, underline, or otherwise mark</b> the information presented in the most recent course syllabus (or other material you have submitted) that verifies <b>this description</b> of the grading process--and label this information "<b>C-2</b>".</p> </div> <p><b>C-2</b></p>			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p><b>CRITERION 3:</b> The syllabus should include a minimum of two writing and/or speaking assignments that are substantial in depth, quality, and quantity. Substantial writing assignments entail sustained in-depth engagement with the material. Examples include research papers, reports, articles, essays, or speeches that reflect critical inquiry and evaluation. Assignments such as brief reaction papers, opinion pieces, reflections, discussion posts, and impromptu presentations are not considered substantial writing/speaking assignments.</p>	syllabus grading rubrics
<p>1. Please provide relatively detailed descriptions of two or more substantial writing or speaking tasks that are included in the course requirements</p>			
<p>2. <b>Also:</b></p> <div style="border: 1px solid black; border-radius: 50%; padding: 20px; text-align: center; margin: 10px auto; width: 80%;"> <p>Please <b>circle, underline, or otherwise mark</b> the information presented in the most recent course syllabus (or other material you have submitted) that verifies <b>this description</b> of the grading process--and label this information "<b>C-3</b>".</p> </div> <p><b>C-3</b></p>			

## ASU - [L] CRITERIA

YES	NO		Identify Documentation Submitted
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p><b>CRITERION 4:</b> These substantial writing or speaking assignments should be arranged so that the students will get timely feedback from the instructor on each assignment in time to help them do better on subsequent assignments.  <i>Intervention at earlier stages in the writing process is especially welcomed.</i></p>	<p>screen capture from BB grading rubrics</p>
<p>1. Please describe the sequence of course assignments--and the nature of the feedback the current (or most recent) course instructor provides to help students do better on subsequent assignments</p>			
<p>2. <b>Also:</b></p> <div style="border: 1px solid black; border-radius: 50%; padding: 20px; text-align: center; margin: 20px auto; width: 80%;"> <p>Please <b>circle, underline, or otherwise mark</b> the information presented in the most recent course syllabus (or other material you have submitted) that verifies <b>this description</b> of the grading process--and label this information "C-4".</p> </div> <p><b>C-4</b></p>			

Course Prefix	Number	Title	General Studies Designation
EEE	489	Senior Design Laboratory II	L

Explain in detail which student activities correspond to the specific designation criteria.  
 Please use the following organizer to explain how the criteria are being met.

Criteria (from checksheet)	How course meets spirit (contextualize specific examples in next column)	Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)
1	50% of grade for course derived from technical communications.	Attached syllabus indicates that 50% of course grade is based on technical communications. Attached grading sheets show the nature of these assignments.
2	Writing assignments involve written and oral reports on student's senior capstone project.	Attached grading sheets show the nature of these assignments describing progress on student's senior capstone project for electrical engineering.
3	The syllabus indicates that students are preparing three written and two oral reports.	Attached grading sheets show the nature of these assignments describing progress on student's senior capstone project for electrical engineering.
4	Technical communications assignments are distributed throughout the semester, and later assignments build on earlier ones.	Screen capture from Blackboard shows typical semester schedule. Attached grading sheets show how later assignments build on earlier ones and incorporate feedback received on them.

# EEE 489 – Fall 2012

## SENIOR DESIGN LAB II

*EEE 488 and EEE 489 comprise a two-semester capstone senior project for Electrical Engineering students. During the second semester (EEE 489), the project is implemented, evaluated, and documented. Appropriate soft engineering issues are addressed. Technical communications and team skills are enriched. The major deliverables at the end of the second semester are a completed project including documentation, and a final poster presentation given in a public setting.*

**Class Meetings:**

Fridays 10:30-11:45 AM in SHESC 340.

Each team is required to meet with their technical advisor at least once per week.

**Course Coordinator:**

Prof. Jim Aberle

**Telephone:**

(480) 965-8588

**Office:**

GWC 326

**E-mail:**

[aberle@asu.edu](mailto:aberle@asu.edu)

**Website:**

<http://faculty.engineering.asu.edu/aberle>

**Teaching Assistant:**

Robin Daugherty

**Catalog Description:**

Capstone senior project. Implement, evaluate, and document EEE 488 design. Social, economic, and safety considerations. Technical communications and team skills enrichment. Lecture, lab. *General studies: L (if credit also earned in EEE 488) (2 cr-hrs).*

**Prerequisites:**

EEE 488 in the immediately preceding semester.

**Course Objectives:**

1. Students can carry out team-oriented electrical engineering projects.
2. Students can communicate and critically evaluate technical information.

### Course Outcomes:

1. Students can effectively and actively participate in teams to complete the project
2. Students can use a formal design process to create a project design.
3. Students can implement, evaluate, and document a project design.
4. Students can communicate technical information in writing.
5. Students can communicate technical information in oral presentations.
6. Students can provide informed and constructive criticism on engineering projects.

### Course Performance Indicators:

1. Students can perform a design process that includes research, concept, feasibility, simulation, specifications, benchmarking, and proposal generation.
2. Students can procure appropriate materials and specialized services (e.g., machine shop) necessary to implement a project defined by a statement of work.
3. Students can implement, test, and debug subsystems necessary to complete a project.
4. Students can integrate subsystems as needed to complete a project and appropriately test, debug, for, implement, integrate, package, and demonstrate the integrated system.
5. Students can write a proposal defining a technical project.
6. Students can write progress reports that describe project progress, issues and modifications clearly and concisely.
7. Students are able to design and deliver oral project proposals and reports involving team presentation in a small-group setting.
8. Students can prepare poster presentations and real-time project demonstrations suitable for a large public forum.
9. Students can expertly reply to questions concerning their projects.
10. Students are able to write constructive critiques of other student projects after observing their progress throughout the semester.

### Grading:

Your grade for this class is based on:

- Contribution of the individual to the team (weighting factor)
- Technical communication: written reports and oral presentations (50%)
- Technical performance: assessment of the group's technical work (50%)

Grades will reflect the following percentages:

<b>Technical</b>	
<b>Performance</b>	<b>50%</b>
<b>Technical</b>	

C1

<b>Communications</b>	
Team Progress Report 1	5%
Oral Presentation 1	10%
Team Progress Report 2	10%
ABET Assessment Report	5%
Final Poster Presentation	10%
Final Report	10%

*Weighting factor*

This factor will be derived by the Course Coordinator with input from the students. Students will be asked at the end of the semester to "grade" each of their team members (including themselves) as to each member's contribution as well as the grade that they feel that each member deserves.

*Technical communication*

This portion of the grade is based on the Course Coordinator's evaluation of the team's oral and written reporting.

All written submissions must be typed and all oral presentations must make use of computer-generated slides. Writing assistance is available on campus (see <http://studentsuccess.asu.edu/home/writingcenters>).

Written reports are simultaneously submitted to both the course coordinator and the technical advisor. Reports must be submitted on time and as instructed. There may be a penalty for a late submission.

*Technical performance*

This portion of the grade is based on input from the Faculty Advisor. The Course Coordinator will attempt to equitably smooth any differences between groups working under different faculty advisors.

As part of the Electrical Engineering Department's assessment of the undergraduate program, the student's work is extensively evaluated. Part of this assessment process involves student completion of anonymous surveys during the semester. Although the surveys are anonymous, a record is kept as to whether each individual student has completed the survey. Answers to the survey do not



• **Key Dates for EEE 489**

- Posted on: Thursday, August 21, 2014 11:59:00 PM MST
- Team Continuation Form Due: Aug. 29
- Oral Time Selection Form Due: Sept. 5
- Change Report Due: Sept. 5
- Project Synopses Due: Sept. 12
- **Oral Presentations: Week of Oct. 20 - NOTE DATE CHANGE**
- Interim Report Due: Oct. 31
- ABET Assessment Report: Nov. 14
- Senior Design Prize Competition Entries Due: Dec. 1
- Poster Presentations: Dec. 5 (10am to 3pm)
- Senior Feedback Forum with EE Program Advisors: Dec. 5 (during Poster Presentations)
- Final Report: Dec. 10
- Quality of Faculty Mentorship Evaluation Due: Dec 12
- Intra-Team Evaluation Due: Dec. 12
- Project Expense Reports Due: Dec. 12

Info Only

## EEE 489 - Senior Design Laboratory II

### Team Continuation Form

**Instructions:** Please complete the form below. Note that you do not have to have a Team Name that is distinct from your Project Title. If you do not wish to use a Team Name that is different from your Project Title then just leave that line blank. Please use the Project Title or Team Name that you record on this document throughout the semester. If any of the information you record on this document changes during the semester, please complete and submit a revised Team Continuation Form.

Project Title:

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Team Name (Optional):

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Project Technical (Faculty)  
Advisor:

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#### Design Team:

Member	Student Name	POSTING ID	Student Signature
#1			
#2			
#3			
#4			

**Weekly Meeting Info with Technical Advisor:**

Day of Week: \_\_\_\_\_ Meeting Location: \_\_\_\_\_

Time of Day: \_\_\_\_\_

**Signature of Technical Advisor:** \_\_\_\_\_

Info Only

**EEE 489 - Senior Design Laboratory II**  
**Oral Presentation Time Selection Form**

Project Title: \_\_\_\_\_

Project Technical (Faculty) Advisor: \_\_\_\_\_

**Design Team:**

Member	Student Name	Posting ID
#1		
#2		
#3		
#4		

**The first oral presentations will be held the week of Oct 20, 2014. Your oral time slot selection applies only to the first oral presentations. The second oral presentations (final poster demos) will take place on Dec 5, 2014. A separate sign-up sheet will be used for that event.**

As a team, determine the days and times that you will be available to make your oral presentations. The following rules will apply:

1. Three groups will present during each 75 minute slot.
2. All members of each group must be present for the entire period.
3. Each group will be expected to question and critique the other groups' presentations.

In the matrix below, place an 'X' in any time slots for which your team is unavailable. **Make sure you strike out all times for which any member of your group has another class or commitment (such as work). If you do not strike out a particular time slot, you are responsible for making whatever arrangements are necessary to ensure your presence during that time slot, should your team be placed into that slot.**

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
10:30- 11:45 AM					All teams considered available
12:00 – 1:15 PM	X		X		
1:30 – 2:45 PM					
3:00 – 4:15 PM					
4:30 – 5:45 PM					

### General Instructions for EEE 489 Project Synopsis

The purpose of the Project Synopsis report in EEE 489 is to provide a brief overview that includes a well-defined project scope, and demonstrates that the team has thought about the actions required to successfully complete the project as well as the constraints under which success must be achieved. Because senior design projects also involve "soft" engineering issues, it is also required for each team to discuss briefly how their project addresses three to four specific EC2000 Criterion 4 Considerations.

This report should be a minimum of 3 and no more than 5 pages (single-spaced) in length, including any figures and tables, and excluding the cover page.

The Project Synopsis must meet the following general requirements:

- A separate Title Page should be used.
- The report should be organized with an Introduction and Conclusion and have a body that is organized into one or more sections. Do not have a section named "body".
- No font smaller than 12 point is used anywhere in the document except possibly within Figures and in an Appendix.
- Document conforms to all requirements given in the Project Synopsis Checksheet.
- Document is single-spaced (e.g., line spacing of 1.0 or 1.15 in Microsoft Word) and submitted in hardcopy using single-sided printing.

### Check Sheet for Project Synopsis

Project: \_\_\_\_\_

Team Member Names: \_\_\_\_\_

The following check sheet describes the criteria that will be used to grade the Project Synopsis. This assignment is worth a total of 100 points as indicated below. Significant problems with mechanics could result in more than 25 points being deducted from your score.

#### Mechanics-25 Points

	Title page <ul style="list-style-type: none"> <li>- Project title</li> <li>- Team name (if applicable)</li> <li>- Team member names</li> <li>- Faculty advisor's name(s)</li> <li>- Course number, semester, and "Project Synopsis"</li> <li>- Date</li> </ul>
	Correct spelling.
	Correct grammar.
	Written in clear, concise English.
	Figures and tables are used correctly: <ul style="list-style-type: none"> <li>- Numbered consecutively throughout the document</li> <li>- Each has an informative caption</li> <li>- Correctly referenced in the text</li> </ul>

#### Structure-25 Points

	The structure (formatting) is clear and the material is accessible
	- The main points are clearly stated up front.
	- A clear roadmap for the report is given.
	- Reader cues (headings, whitespace) guide the reader through the material.
	- The introduction and conclusion "stand alone," i.e. a reader who has read only these sections would understand all of the major points of the report.

#### Content-50 Points

	The project scope is restated.
	Major accomplishments achieved to date are mentioned.
	The ABET Criterion 4 Considerations to be addressed are discussed.
	A summary of the plan for completing the project on time and within budget is provided.
	A vision for the final project demonstration in GWC lobby is presented.

### **General Instructions for Interim Project Report**

The Interim Project Report must meet the following general requirements:

- Title page, Executive Summary, Body, and Tables and Figures must not exceed 15 pages all together; References (if any) and Appendices (if any) may increase the total number of pages to greater than 15, but under no circumstances shall the total document be more than 20 pages in length.
- No font smaller than 12 point is used anywhere in the document except possibly within Figures and in an Appendix.
- Document conforms to all requirements given in the Interim Report Checksheet.
- is single-spaced (e.g., line spacing of 1.0 or 1.15 in Microsoft Word) and submitted in hardcopy using single-sided printing..

Note that it is expected that a great deal of the material appearing in the Interim Project Report will be suitable for re-use in the Final Project Report.



## Check Sheet for Interim Project Report

**Team Reviewed:** \_\_\_\_\_

The following check sheet describes the criteria that will be used to grade the interim project report. The report will be graded out of a total of 100 points as indicated below. However, these point distributions are soft metrics; severe problems in any one of these areas can result in more points being taken off than is indicated for that section.

### Format, Editing, and Mechanics (30 Points)

	Title page. <ul style="list-style-type: none"> <li>- Proposal title</li> <li>- Team name (if applicable)</li> <li>- Team member names</li> <li>- Date</li> </ul>
	Table of Contents begins on a new page.
	List of Illustrations begins on a new page.
	Executive Summary does not share pages with other sections.
	Pages are numbered consecutively beginning with the Table of Contents (i.e., title page is not numbered but counts in page total).
	Margins, headings, and paragraph spacing are consistent.
	A coherent and consistent heading style is used.
	Visuals (charts, tables, and graphs) are used correctly: <ul style="list-style-type: none"> <li>- Visuals are set apart from the surrounding text by whitespace.</li> <li>- A caption accompanies each visual.</li> <li>- Tables are labeled Table 1, Table 2, and so on consecutively through the document; remember, table headers go on top.</li> <li>- All other visuals are labeled Figure 1, Figure 2, and so on consecutively through the document; figure captions go on the bottom.</li> <li>- In the text, tables are referred to as Table 1, Table 2, and so on.</li> <li>- In the text, figures are referred to as Figure 1, Figure 2, and so on.</li> </ul>
	The document is edited for style: <ul style="list-style-type: none"> <li>- Style is clear and readable (not awkward)</li> <li>- The document tone is professional</li> <li>- Unnecessary wordiness is avoided</li> <li>- Words are used correctly-the text is clear and accurate</li> </ul>
	Spelling is correct.
	Grammar is correct. <ul style="list-style-type: none"> <li>- <b>Do NOT use any first or second person pronouns.</b></li> </ul>
	References are in IEEE Transactions format.
	References begin on a new page.
	Report is submitted in Adobe PDF.

**Structure (10 Points)**

	The report as a whole is frontloaded-the structure is clear and the material is accessible <ul style="list-style-type: none"><li>- The main points are clearly stated up front.</li><li>- A clear roadmap for the report is given.</li></ul>
	Each major section of the report is frontloaded <ul style="list-style-type: none"><li>- The main points of the section are clearly stated up front.</li><li>- A clear roadmap of the section is given.</li></ul>

**Content (60 points)****Executive Summary (10 Points)**

	Frontloaded-introduces the project topic first.
	Summary (written in a non-technical way) of <i>all</i> the main points of the report (including technical, schedule, and budget).
	Clearly and concisely written.

**Introduction (10 Points)**

	Quick overview of the "big picture":
	Problem statement and scope clearly stated.
	Project objective ( <i>not</i> approach) clearly stated.

**Report Body (30 Points)**

	<p>Describes previous work (of others) in this area:</p> <ul style="list-style-type: none"> <li>- Adequate credit given to earlier work in the area.</li> <li>- Industrial state-of-the-art presented.</li> <li>- If the project is considered "unique," explains what research was done to come to that conclusion.</li> </ul>
	<p>Discusses project scope in detail.</p> <ul style="list-style-type: none"> <li>- States target specifications.</li> <li>- Describes what will be done to meet these specifications.</li> <li>- Presents a detailed vision of the final project demo.</li> <li>- Identifies the novelty of the project.</li> </ul>
	<p>Describes the technical work done on the project to date:</p> <ul style="list-style-type: none"> <li>- Results of research (including appropriate references for sources).</li> <li>- Results of design activities: system designs, circuit designs, model designs, etc.</li> <li>- Results of prototype implementation and testing.</li> </ul>
	<p>Describes the technical work to be completed during the remainder of the project:</p> <ul style="list-style-type: none"> <li>- Breaks the work into tasks that need to be completed.</li> <li>- Identifies milestones that will be used to judge progress.</li> <li>- Provides a schedule for these tasks, including any contingency plans necessary to ensure the success of the project.</li> <li>- Milestones and schedule include progress and final reports and presentations.</li> </ul>
	<p>Describes team capabilities and facilities.</p> <ul style="list-style-type: none"> <li>- Describes facilities necessary to conduct the project.</li> <li>- Describes processing abilities/needs necessary to conduct the project.</li> <li>- Demonstrates that the team has the necessary capabilities (or has identified subcontractors with the capabilities) for the project.</li> </ul>
	<p>Presents a projected budget:</p> <ul style="list-style-type: none"> <li>- All expenditures to date are described and justified.</li> <li>- Expected expenditures during the remainder of the project are described and justified.</li> <li>- Person hours are described and justified (but not included in the expenditures).</li> </ul>
	<p>Discusses in detail how the project encompasses selected EC2000 Criterion 4 Considerations (minimum three).</p>

**Conclusion (10 points)**

	Highlights important points from body
	Introduction and Conclusion should have enough information for the reader to understand the entire project.

C1, C3, C4

Group:  
Presenter:  
Date:  
Evaluator:

Score (1-5)

**Telling the Story**

**Organization**

**Key Points**

**Context**

**Relevant Details**

Presentation displays a logical flow and details are tailored to audience.

Presentation is well-organized; different parts of the presentation are linked together with smooth transitions.

Key points are identified and the "big picture" is clearly explained.

Major points are put in context and linked to additional relevant information outside project.

Level of detail is appropriate, examples are concrete, explanations and examples use concepts familiar to audience.


**Displaying Key Information**

**Layout and Design**

**Focused Content**

**Appropriate and Engaging Graphics**

**Correct Spelling and Grammar**

Graphics and written information reinforce oral delivery by emphasizing key points and supplying useful supporting information.

Information is easily understood; slide layout, background, and contrast are appealing.

Each slide supports one or two key points; slides are neither overly busy nor trivial.

Graphics clearly support key ideas, are visually appealing, and easy to understand.

Text and figures are free of spelling errors and poor grammar.


**Delivering the Presentation**

**Vocal Quality**

**Flow**

**Personal Presence**

**Elaboration**

**Sensitivity to Time**

Presenter uses verbal and non-verbal skills to make effective presentation.

Volume and pace are appropriate and adapt as needed to emphasize key points.

Knows material well and presents without repeated hesitations or verbal filler.

Effectively combines energy, inflection, eye contact and movement; avoids abrupt or distracting gestures.

Elaborates on slide content rather than just reading from slides.

Presenter's individual part is of an appropriate duration.


**Overall Group Performance**

**Group Synergy**

**Group Organization**

**Group Cooperation**

**Appropriate Roles**

**Group Ownership**

Team dynamics and coordination contribute to the overall effectiveness of the presentation.

Team members support one another and coordinate effectively

Introductions and transitions are utilized to improve overall presentation flow

Team members cooperate to present under a unified theme with shared goals and priorities

Team members have roles that contribute to presentation flow (Introduction, Body, Conclusion, etc.)

Each team member demonstrates ownership of some project concepts and goals


Total

--

 /90

C1, C2, C3, C4

Group:  
Presenter:  
Date:  
Evaluator:

**Telling the Story**

Organization

Key Points

Context

Relevant Details

Score (1-5)


Presentation displays a logical flow and details are tailored to audience.  
Presentation is well-organized; different parts of the presentation are linked together with smooth transitions.  
Key points are identified and the "big picture" is clearly explained.  
Major points are put in context and linked to additional relevant information outside project.  
Level of detail is appropriate, examples are concrete, explanations and examples use concepts familiar to audience.

**Displaying Key Information**

Layout and Design

Focused Content

Appropriate and Engaging Graphics

Correct Spelling and Grammar

Graphics and written information reinforce oral delivery by emphasizing key points and supplying useful supporting information.  
Information is easily understood; slide layout, background, and contrast are appealing.  
Each slide supports one or two key points; slides are neither overly busy nor trivial.  
Graphics clearly support key ideas, are visually appealing, and easy to understand.  
Text and figures are free of spelling errors and poor grammar.


**Delivering the Presentation**

Vocal Quality

Flow

Personal Presence

Elaboration

Sensitivity to Time

Presenter uses verbal and non-verbal skills to make effective presentation.  
Volume and pace are appropriate and adapt as needed to emphasize key points.  
Knows material well and presents without repeated hesitations or verbal filler.  
Effectively combines energy, inflection, eye contact and movement; avoids abrupt or distracting gestures.  
Elaborates on slide content rather than just reading from slides.  
Presenter's individual part is of an appropriate duration.


**Overall Group Performance**

Group Synergy

Group Organization

Group Cooperation

Appropriate Roles

Group Ownership

Team dynamics and coordination contribute to the overall effectiveness of the presentation.  
Team members support one another and coordinate effectively.  
Introductions and transitions are utilized to improve overall presentation flow.  
Team members cooperate to present under a unified theme with shared goals and priorities.  
Team members have roles that contribute to presentation flow (Introduction, Body, Conclusion, etc.)  
Each team member demonstrates ownership of some project concepts and goals.


Total

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 /90

## ABET Assessment Assignment (AAA)

The purpose of this assignment is to assess the senior design students in some of the areas required for ABET accreditation. In order to accomplish this goal while remaining within the framework of the senior design curriculum students will discuss some aspect of their own work as a member of the design team which reflects their abilities as an engineer.

**Submit a 2-3 page essay or personal narrative (single-spaced, 12 point font, hard-copy)**

Possibilities include, but are not limited to:

- A design specific problem that could only be overcome through the use of critical thinking, teamwork, and creativity
- An inter-personal problem within the group which required communication, empathy and understanding as peers within the engineering community to overcome
- Any concept that you did not understand prior to this project that you have come to understand through your own research and the help of your design team

This assignment is not a technical report. This is a personal narrative or essay; it is a chance for you to show your abilities as an engineer and how you have grown as an engineer from working with your team to complete your senior design project.

There is a rubric which accompanies this assignment showing the areas related to ABET accreditation for the senior design sequence. You have been asked to participate in ABET assessments throughout your undergraduate coursework at ASU; often it is integrated into the curriculum as an examination or as part of a laboratory assignment. In this case, you are asked to write a paper in the form of a narrative. This is intended to make you think critically about your role as an engineer. You are encouraged to look back on your time as a student, and reflect on how you have grown as an engineer.

The rubric includes some concepts that relate directly to the work demonstrated in your senior design project. These will be assessed primarily using your written reports and oral presentations. Therefore your AAA paper does not need to address these areas directly. The rubric also includes some concepts that are not addressed by the reporting requirements for your senior design project. These relate to considerations one makes as an engineer which transcend the work you do on any design project. Your AAA paper should strive to address these issues:

- Problem Solving
- Ethics and Professionalism
- Communication
- Global and Societal Impact
- Contemporary Issues
- Life-Long Learning

C1, C2, C3

## ABET Assessment Assignment: Rubric

Teacher Name: Dr. Aberle

Student Name: \_\_\_\_\_

CATEGORY	5: Above Standards	4: Meets Standards	3: Approaching Standards	2/1: Below Standards	Score
<b>Core Principles</b>	Demonstrates an excellent understanding of engineering principles and understands their role as an engineer	Demonstrates an understanding of engineering principles; shows some understanding of their role as an engineer	Demonstrates some understanding of engineering principles; fails to understand their role as an engineer	Demonstrates inadequate understanding of engineering principles	
<b>Experimental Design</b>	Demonstrates an excellent ability to design efficient experiments that yield useful results	Demonstrates an ability to design experiments that yield useful results	Demonstrates an ability to design experiments; results are interesting but not always useful	Demonstrates an inadequate ability to design experiments	
<b>Experimental Analysis</b>	Demonstrates an excellent ability to analyze and understand experimental results; able to learn from this analysis	Demonstrates an ability to analyze and understand experimental results.	Demonstrates an ability to analyze experimental results; unable to understand or learn from this analysis	Demonstrates an inadequate ability to analyze experimental results	
<b>System Design</b>	Demonstrates an excellent ability to design complex systems (independently or as members of a design team)	Demonstrates an ability to design complex systems (with supervision or instruction) and simple systems (independently...)	Demonstrates an ability to design systems (with supervision or instruction)	Demonstrates an inadequate ability to design systems	
<b>Component Design</b>	Demonstrates an excellent ability to design complex components (independently or as members of a design team)	Demonstrates an ability to design complex components (with supervision or instruction) and simple processes (independently...)	Demonstrates an ability to design components (with supervision or instruction)	Demonstrates an inadequate ability to design components	
<b>Process Design</b>	Demonstrates an excellent ability to design complex processes (independently or as members of a design team)	Demonstrates an ability to design complex processes (with supervision or instruction) and simple processes (independently...)	Demonstrates an ability to design processes (with supervision or instruction)	Demonstrates an inadequate ability to design processes	

<b>Hardware and Software</b>	Demonstrates an excellent ability to use and modify hardware and software to solve engineering problems	Demonstrates an ability to use hardware and modify software to solve engineering problems	Demonstrates an ability to use hardware and software to solve engineering problems	Demonstrates an inadequate ability to use hardware and software to solve engineering problems	
<b>Problem Solving</b>	Demonstrates an excellent ability to identify formulate and solve practical problems	Demonstrates an ability to identify formulate and solve simplified problems	Demonstrates an ability to solve problems once they have been identified	Demonstrates an inadequate ability to solve problems	
<b>Ethics and Professionalism</b>	Demonstrates an excellent understanding of engineering ethics and the importance of professionalism	Demonstrates a good understanding of ethics and the importance of professionalism	Demonstrates an understanding of the importance of professionalism, but a limited understanding of ethics	Demonstrates an inadequate understanding of the importance of ethics and professionalism	
<b>Communication</b>	Demonstrates excellent written and oral communication in formal and informal settings	Demonstrates good written and oral communication in a formal setting but lacks confidence in informal settings	Demonstrates good communication but writing requires revisions and oral delivery lacks confidence	Demonstrates inadequate written and oral communication skills	
<b>Global and Societal Impact</b>	Demonstrates an excellent understanding of the global and societal impact of engineering issues	Demonstrates a limited understanding of the global and societal impact of engineering issues	Demonstrates a narrow understanding of societal impacts of engineering issues but not in a global context	Demonstrates a lack of understanding of the global and societal impact of engineering issues	
<b>Contemporary Issues</b>	Demonstrates an excellent understanding of contemporary issues in engineering	Demonstrates a good understanding of many contemporary issues in engineering	Demonstrates an understanding of some contemporary issues in engineering	Demonstrates an inadequate understanding of contemporary issues in engineering	
<b>Life-Long Learning</b>	Demonstrates an excellent understanding and appreciation of the importance of life-long learning and how this is necessary for engineers	Demonstrates a good understanding and appreciation of the importance of life-long learning	Demonstrates an understanding, but lacks an appreciation for, the importance of life-long learning	Demonstrates a lack of understanding for the importance of life-long learning	



**EEE 489 FINAL REPORT INFORMATION**

1. *The exact format and length of the final report will be determined by the team in consultation with their faculty advisor.* However, the report format should be consistent with that of a formal technical document. It is suggested that the group be guided as much as possible by the instructions and checksheet provided for the Interim Report.
2. All final reports must contain:
  - a. *Title Page* – including project title, names of all team members, name of faculty advisor(s), semester and year, date of report, and the words “Final Report”.
  - b. *Project Summary* – a brief non-technical summary of the project suitable for dissemination to the general public. This summary should clearly and concisely describe the importance of the project, what was achieved, and the major conclusions. The project summary must not share a page with any other sections.
  - c. Adequate referencing of non-original material included in the report.
3. The course coordinator will issue a grade for the report based on the following criteria:
  - a. Does the report explain the importance of this project, the steps taken to achieve the project goals, and the results achieved? (40%)
  - b. Is the report readable, clear, and well-organized? (20%)
  - c. Does the report adequately discuss the soft engineering issues discussed in ABET EC2000 Criterion 4? (15%)
  - d. Is the report written in a format consistent with a formal technical document? Are figures and tables used appropriately? Is the report free of spelling and grammatical errors? Is punctuation used correctly? (25%)

## EEE 489 POSTER DEMONSTRATIONS

The final poster demonstration differs in setting and format from the oral presentations given earlier in the semester. Rather than a short talk in a conference room, the final presentation is an interactive public display in the ECG Student Center. These presentations are generally well attended by faculty, staff, and students from the Department of Electrical Engineering as well as faculty, staff, and students from other departments and visitors from local industry. Design teams may use posters, computer displays, hardware demonstrations, and other means to create presentations that both capture the attention of the audience and show the results of the year's efforts. This forum also provides the basis for judging which team will win the coveted senior design prize!

### Demo Periods

The poster demonstration is conducted at the end of the second semester of the capstone course sequence. The exact date and time for the demonstration is announced at the beginning of the second semester of the sequence. At least one team member must be present at any given time during the demo period, and all team members should be at their display as much as possible.

### Senior Design Prize

Prior to the final oral presentation, a small number of teams will be selected by the course coordinator as "prize finalists" for the Senior Design Prize competition. During the presentation period, members of a "secret" panel of judges, consisting of ASU faculty and students, as well as representatives from local industry, will visit the displays of the prize finalist teams and assess which of these teams most deserves to win the senior design prize.

### Grading Session

Each team's poster demonstration will be evaluated by the course coordinator and TAs during the presentation period. A single grade for the entire team will be given, absent noticeable differences in the participation by members and/or the ability of individuals to answer questions during the demo. A formal presentation is not necessary; rather it should be an informational session--much like an exhibitor's table at a professional trade show or conference.

The poster demo grading will be based on criteria such as:

- Has the project been completed successfully?
- Is the demonstration professional in level and appearance?
- Is the information understandable and is it standalone?
- Is the demonstration interesting?
- Does the demo show real and defensible results?

### Setup

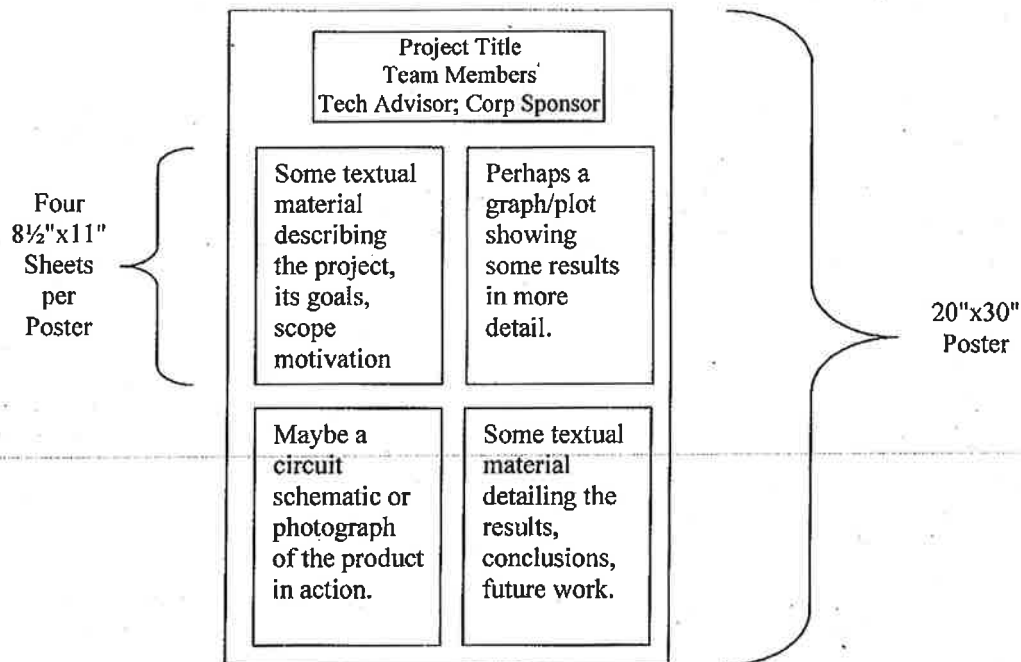
The design team should have their demonstration completely set up prior to the start of the demo period. One banquet table (roughly 72" x 30") and an artist easel will be provided for each team. Some groups will want to use the table to place their posters on, whereas other groups will want to use the easel. If a design team needs other facilities, then the course coordinator must be notified at least one week in advance.

### Poster Format

The information on the poster should be succinct and to the point. Some information should be geared toward the casual browser, whereas part of the display should be targeted to the more interested

viewer. Design teams should use from 1 to 3 posters: a group with significant hardware to show and demo might have only 1 poster; a group with a more theoretical project will probably need more posters.

Suggestions given here use a reference poster board of size 20"x30". At the demo each poster can be displayed either vertically or horizontally on an artist easel. A possible arrangement of the display pages on the poster boards is shown below. The project title, team members, technical advisor (and corporate sponsor, if any) can be printed sideways (landscape) on a legal size piece of paper and cut to 3"x13" and pasted onto a legal-sized piece of colored construction paper. It is suggested that the four "white" pages (7½"x10" each) be mounted onto colored construction paper (8½"x11" each) with no more than two total colors used. The font used should be of sufficient size as to be easily read from a distance of 3 feet, and the typeface chosen should be simple, i.e., sans serif typefaces such as Helvetica are easier to read in this format than serif typefaces such as Times.



C1, C2, C3, C4

EEE 489 POSTER DEMO GRADE: \_\_\_\_\_ Team: \_\_\_\_\_

	Very Poor (0)	Poor (1)	Fair (2)	Good (3)	Very Good (4)	Excellent (5)
Presentation Completeness (Important points covered?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical Level (Project at BSE level?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project Completion (Does the "product" work?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Setup Quality (Professional appearance?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poster Materials (Text, Figs, Size, Detail)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Response to Questions (Technical understanding present?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Impression (Interesting demo/presentation?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teamwork (Full team participation?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments (e.g., noticeable differences in team members?) \_\_\_\_\_

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**EEE 489 - Senior Design Laboratory II**

Spring 2015

**Course description:** Implement, evaluate, and document EEE 488 design. Social, economic, and safety considerations. Technical communications and team skills enrichment.

**Enrollment requirements:** Prerequisite(s): Fulton ECEE, SEMTE, or BHSE senior or post-bacc undergraduate student; EEE 488

**Units:** 3

**Repeatable for credit:** No

**General Studies:** L

**Offered by:** Ira A. Fulton Schools of Engineering

# EEE 489 – Fall 2012

## SENIOR DESIGN LAB II

*EEE 488 and EEE 489 comprise a two-semester capstone senior project for Electrical Engineering students. During the second semester (EEE 489), the project is implemented, evaluated, and documented. Appropriate soft engineering issues are addressed. Technical communications and team skills are enriched. The major deliverables at the end of the second semester are a completed project including documentation, and a final poster presentation given in a public setting.*

### **Class Meetings:**

Fridays 10:30-11:45 AM in SHESC 340.

Each team is required to meet with their technical advisor at least once per week.

### **Course Coordinator:**

Prof. Jim Aberle

### Telephone:

(480) 965-8588

### Office:

GWC 326

### E-mail:

[aberle@asu.edu](mailto:aberle@asu.edu)

### Website:

<http://faculty.engineering.asu.edu/aberle>

### **Teaching Assistant:**

Robin Daugherty

### **Catalog Description:**

Capstone senior project. Implement, evaluate, and document EEE 488 design. Social, economic, and safety considerations. Technical communications and team skills enrichment. Lecture, lab. *General studies: L (if credit also earned in EEE 488) (2 cr-hrs).*

### **Prerequisites:**

EEE 488 in the immediately preceding semester.

### **Course Objectives:**

1. Students can carry out team-oriented electrical engineering projects.
2. Students can communicate and critically evaluate technical information.

**Course Outcomes:**

1. Students can effectively and actively participate in teams to complete the project
2. Students can use a formal design process to create a project design.
3. Students can implement, evaluate, and document a project design.
4. Students can communicate technical information in writing.
5. Students can communicate technical information in oral presentations.
6. Students can provide informed and constructive criticism on engineering projects.

**Course Performance Indicators:**

1. Students can perform a design process that includes research, concept, feasibility, simulation, specifications, benchmarking, and proposal generation.
2. Students can procure appropriate materials and specialized services (e.g., machine shop) necessary to implement a project defined by a statement of work.
3. Students can implement, test, and debug subsystems necessary to complete a project.
4. Students can integrate subsystems as needed to complete a project and appropriately test, debug, for, implement, integrate, package, and demonstrate the integrated system.
5. Students can write a proposal defining a technical project.
6. Students can write progress reports that describe project progress, issues and modifications clearly and concisely.
7. Students are able to design and deliver oral project proposals and reports involving team presentation in a small group setting.
8. Students can prepare poster presentations and real-time project demonstrations suitable for a large public forum.
9. Students can expertly reply to questions concerning their projects.
10. Students are able to write constructive critiques of other student projects after observing their progress throughout the semester.

**Grading:**

Your grade for this class is based on:

- Contribution of the individual to the team (weighting factor)
- Technical communication: written reports and oral presentations (50%)
- Technical performance: assessment of the group's technical work (50%)

Grades will reflect the following percentages:

<b>Technical Performance</b>	50%
<b>Technical</b>	

<b>Communications</b>	
Team Progress Report 1	5%
Oral Presentation 1	10%
Team Progress Report 2	10%
ABET Assessment Report	5%
Final Poster Presentation	10%
Final Report	10%

### *Weighting factor*

This factor will be derived by the Course Coordinator with input from the students. Students will be asked at the end of the semester to "grade" each of their team members (including themselves) as to each member's contribution as well as the grade that they feel that each member deserves.

### *Technical communication*

This portion of the grade is based on the Course Coordinator's evaluation of the team's oral and written reporting.

All written submissions must be typed and all oral presentations must make use of computer-generated slides. Writing assistance is available on campus (see <http://studentsuccess.asu.edu/home/writingcenters>).

Written reports are simultaneously submitted to both the course coordinator and the technical advisor. Reports must be submitted on time and as instructed. There may be a penalty for a late submission.

### *Technical performance*

This portion of the grade is based on input from the Faculty Advisor. The Course Coordinator will attempt to equitably smooth any differences between groups working under different faculty advisors.

As part of the Electrical Engineering Department's assessment of the undergraduate program, the student's work is extensively evaluated. Part of this assessment process involves student completion of anonymous surveys during the semester. Although the surveys are anonymous, a record is kept as to whether each individual student has completed the survey. Answers to the survey do not



affect the computation of the course grade; however, non-completion of ANY survey is grounds for award of an incomplete grade.

**Computer Usage:**

Specific computer usage is not dictated; however, written reports are typical generated on a word processor and many oral presentations are prepared using PowerPoint. Generally, students also prepare Gantt charts with the aid of computer software. Particular design projects will require the use of computer simulation software such as SPICE or Logic Works; in addition, other projects may require the use of specialized software such as FPGA design and simulation.

**Laboratory Experiments:**

There are no prescribed lab experiments in this course. The entire class of students meet once weekly with the course coordinator in the classroom; the individual design teams then meet once weekly with the faculty advisor/mentor for their particular design project.

**Academic Integrity:**

Although there are no exams in this class, ASU's Academic Integrity Policy is still applicable. *Academic integrity* refers to each student's obligation to act with honesty and integrity and to respect the rights of others in carrying out all academic assignments. Violations of the University Academic integrity policy will not be ignored. Penalties include reduced or no credit for submitted work, a failing grade in the class, a note on your official transcript that shows you were punished for cheating, suspension, expulsion and revocation of already awarded degrees. The University requires that should I implement any penalty for violations of the academic integrity policy, I must report the matter to the Dean's office. The University has a Student Academic Integrity Policy, which will be followed in this class.

**Reimbursable Expenses:**

At the end of the second semester (EEE 489), students will be reimbursed for actual cost up to a total of \$100 per project (not per student) for material expenses approved by their Faculty Advisor. Students will need to present receipts for all reimbursable expenses. Expense claims must be limited to materials purchased specifically for performance of the senior design project.

**E-Mail Communication:**

Announcements and other information may be disseminated to students via email. Thus, students are required to maintain and check their ASU email on a regular basis.