Contents for sample AOC application with a variety of attachments

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COVER SHEET (Basic Course Information)  
FOR VOLUNTEER CORE COURSE PROPOSAL

To Submit: Please place all documents (i.e., cover sheet, proposal form, syllabus, and supporting documents) into a folder named with course subject and number (e.g., PSYC 101) and put in the folder at http://tiny.utk.edu/VolCoreProposalDrop. If you have any problems, please contact the chair of the General Education Committee.

Contact Information (please print or type):
Name: R. Keith Stanfill ____________________________________________
Department: Integrated Engineering Design/Tickle College of Engineering _________
Email: stanfill@utk.edu ____________________________________________
Phone: 865-974-9806 ____________________________________________

Course information:

Provide full catalog entry for the course including course subject, number, suffix (if any), course title, credit hours, course description, prerequisites/corequisites, credit restrictions, etc.

NOTES:
- Courses in WC category must have the following prerequisite:
  (RE) Prerequisite(s): English 102, 132, 290, or 298 (plus any others for this course).
- Courses in AOC category: We strongly encourage the oral communication general education requirement used in your program serve as a prerequisite for this course (e.g., CMST 210, 240; CE 205; Phil 244).
- Courses may apply for either OC or AOC but not both categories.

Catalog entry for course:

| Course Title: Interdisciplinary Senior Design II |
| Course Number: EF 438 Honors (AOC, EI) |
| Credit Hours: 3 |
| Contact Hours: 3 |

Course Description: The second part of the EF 437/EF 438 sequence where teams of students from both the Tickle College of Engineering and Haslam College of Business partner with industry sponsors to design and build authentic products and processes. Working closely with an industry liaison engineer and a faculty coach, students gain practical experience in teamwork and communication, problem-solving and engineering design, and develop leadership, management and people skills. Weekly workshop activities adapt lecture topics to individual projects. Students learn firsthand how to develop products and processes that meet customer requirements on time and within budget. The sequence is serving students in the Heath Integrated Business and Engineering Program (Heath IBEP) and others within the two colleges.

Prerequisites: EF 437
Co-requisites: None

Frequency of Course Offering (e.g., fall only, spring only): spring only
Course Capacity per Semester (per course & total if multiple sections): 40 per section & 150 total
Course format (e.g., lecture, discussion, lab): lecture with faculty project mentor led workshops/labs
How is this class to be staffed (i.e., instructor, GTAs, graders etc.)? 1 Instructor/coordinator, 1 to 4 GTAs (1 GTA per 40 enrollees), 6 to 25 faculty project mentors (1 faculty per team of 6 students), 1 Admin. Assistant for events, purchasing and travel, 1 lab manager for studio/lab time
COVER SHEET (Categories: Check All That Apply)
FOR VOLUNTEER CORE COURSE APPROVAL

Please check all that apply:

<table>
<thead>
<tr>
<th>Category</th>
<th>Areas in which this course is already approved</th>
<th>Applying for inclusion in these categories for General Education through the 2020-2021 catalog</th>
<th>Applying for inclusion in these categories for Volunteer Core (starting with the 2021-2022 catalog)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written Communication (WC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal Communication (OC)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Applied Oral Communication (AOC)</td>
<td>N/A</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Arts &amp; Humanities (AH)</td>
<td></td>
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<tr>
<td>Applied Arts and Humanities (AAH)</td>
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<tr>
<td>Natural Sciences (NS) – Lab</td>
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<tr>
<td>Natural Sciences (NS) – Non-lab</td>
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<tr>
<td>Quantitative Reasoning (QR)</td>
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<tr>
<td>Social Sciences (SS)</td>
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<td></td>
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<tr>
<td>Global Citizenship-International (GCI)</td>
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<tr>
<td>Global Citizenship-US (GCUS)</td>
<td>N/A</td>
<td></td>
<td></td>
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<tr>
<td>Engaged Inquiries (EI)</td>
<td>N/A</td>
<td>X</td>
<td></td>
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<tr>
<td>Cultures &amp; Civilization (CC)</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

*Please attach proposal forms and materials appropriate to the categories checked above.*
APPLICATION

To Submit: Please place all documents (i.e., cover sheet, proposal form, syllabus, and supporting documents) into a folder named with course subject and number (e.g., PSYC 101) and put in the folder at http://tiny.utk.edu/VolCoreProposalDrop. If you have any problems, please contact the chair of the General Education Committee.

Example form: For an example completed proposal form, see the Vol Core AOC website.

Course subject, number, suffix (S [service], R [research], N [internship]) and title:

| Engineering Fundamentals, EF 438, Interdisciplinary Senior Design |

NOTES:

- We strongly encourage the oral communication general education requirement used in your program serve as a pre-requisite for this course (e.g., CMST 210, 240; CE 205; Phil 244).
- Courses with an S (service), R (research), or N (internship) designation will be equivalent to their base course for the Effective Communication and Expanded Perspectives Volunteer Core categories. The base course and suffix courses will be considered as different courses for Engaged Inquiries.

Please check yes or no on each line:

Yes ____ No _X__ Course is currently approved as an OC course.

Yes _X__ No ____ Applying for inclusion in AOC for Volunteer Core, which starts with the 2021-2022 catalog.

Yes _X__ No ____ This is a new course. (Approval for general education will be contingent on curricular approval.)

Contact Information (please print or type):

Name: R. Keith Stanfill ____________________________________________

Department: Integrated Engineering Design/Tickle College of Engineering __________

Email: stanfill@utk.edu ____________________________________________

Phone: 865-974-9806 ____________________________________________

Applied Oral Communication

Effectively communicating ideas within a particular discipline or profession is a fundamental skill that all students should acquire and demonstrate. Applied Oral Communication (AOC) courses will expand upon OC course skills to promote understanding of and engagement with targeted audiences and stakeholders in a variety of communication contexts, such as interpersonal, small group, and team communication; nonverbal and cross-cultural communication; communication of discipline-specific or professional information both within and outside the discipline or profession; conversational communication in formal and informal settings; and active listening.
APPLIED ORAL COMMUNICATION (AOC)
PROPOSAL FOR VOLUNTEER CORE COURSE APPROVAL

Learning Outcomes

1. Students demonstrate the ability to communicate clearly and effectively within a disciplinary area or profession.
2. Students demonstrate the ability to locate and use relevant, credible evidence to support ideas in accordance with disciplinary or professional standards.
3. Students demonstrate the ability to effectively analyze potential audiences to shape message, organization, language choices, and delivery techniques in accord with disciplinary or professional purpose.
4. Students engage in communication consistent with the ethical responsibilities of communicators within their respective disciplinary or professional contexts.
5. Students model respect for diversity and cross-cultural verbal and nonverbal communication practices when interacting with targeted audiences.

Answer all questions below with respect to the description and learning outcomes given above.

Questions:

I. Answer a, b, and c for each learning outcome:

   a. How does the course meet each of the learning outcomes for the appropriate category of the Volunteer Core requirement? Note: All Learning Outcomes must be met by every course.

   b. What specific assignments or activities throughout the course of the semester meet this learning objective? (The combination of assignments for all the objectives must total at least 20% of the final grade.)

   c. Provide a short description of how this course will be assessed for the Volunteer Core outcomes. According to the revised General Education guidelines, all approved Volunteer Core courses must be assessed according to the guidelines and timeline set by the General Education Committee. For the review, this course will need to provide quantifiable data and results detailing how successful the students were in mastering each learning outcome. With that in mind, please be as specific as possible in your plan to measure each of the learning outcomes below.* (You can refer to the Volunteer Core assessment document and rubrics on the Volunteer Core website.)

   | Outcome 1: Students demonstrate the ability to communicate clearly and effectively within a disciplinary area or profession. |
   |---|---|
   | a. How does the course meet this learning outcome? |
   | Students will be presenting to a variety of technical and non-technical audiences. Subject Matter Expert faculty will conduct design reviews, students will present to peers, faculty and industry audiences in formal presentations, and students will explain posters and demonstrate prototype systems to the public, peers, faculty, and engineers, managers and executives. This is a multidisciplinary course with multidisciplinary teams. Students will generally present content indicative of their home discipline. |
   | b. What specific assignments or activities throughout the course of the semester meet this learning objective? (The combination of assignments for all the objectives must total at least 20% of the final grade.) |
c. What is the assessment plan* for this Volunteer Core outcome?

1. Provide a description of the (most likely one example of) student work that will be used to assess this learning objective.

   The item most likely to be used for assessment is the final design project presentation. It will include a combination of people (i.e., the sponsors, deans/department heads/faculty, advisors, and students are invited to attend). The presentation may be a prototype, poster, and/or traditional oral presentation with formal business attire and follows disciplinary presentation norms.

2. Provide a description of how you will obtain the sample of student work.

   In the required assessment semester, all student presentations will be recorded. If there are fewer than 50 students, all student work will be evaluated using the AOC Vol-Core approved rubric. If there are more than 50 students enrolled in that semester, a sample of 20% of those students will be randomly be chosen to be evaluated using the AOC Vol-Core approved rubric. Trained evaluators (e.g., faculty, staff, and/or GTAs) will use the AOC Vol-Core assessment rubric, which differs from the one used to assign a grade to the assignment. The results of these assessments will be reported to the Associate Dean for Academic and Student Affairs and two Tickle College of Engineering department heads, or their designees, such as the UG curriculum committee chair) that utilize senior design for AOC credit (e.g., Electrical Engineering and Computer Science, Industrial and Systems Engineering, and Materials Science and Engineering).

Outcome 2: Students will demonstrate the ability to locate and use relevant, credible evidence to support ideas in accordance with disciplinary or professional standards.

a. How does the course meet this learning outcome?

   Students will make numerous presentations justifying design decisions—especially those related to the selection of technological approaches, algorithms, hardware or process elements—all backed up with relevant specifications, national standards, and realistic constraints.

b. What specific assignments or activities throughout the course of the semester meet this learning objective? (The combination of assignments for all the objectives must total at least 20% of the final grade.)

   Project Plan QRB presentation 2.6%
c. What is the assessment plan* for this Volunteer Core outcome?

1. Provide a description of the (most likely one example of) student work that will be used to assess this learning objective.

   The item most likely to be used for assessment is the final design project presentation. It will include a combination of people (i.e., the sponsors, deans/department heads/faculty, advisors, and students are invited to attend). The presentation may be a prototype, poster, and/or traditional oral presentation with formal business attire and follows disciplinary presentation norms.

2. Provide a description of how you will obtain the sample of student work.

   In the required assessment semester, all student presentations will be recorded. If there are fewer than 50 students, all student work will be evaluated using the AOC Vol-Core approved rubric. If there are more than 50 students enrolled in that semester, a sample of 20% of those students will be randomly chosen to be evaluated using the AOC Vol-Core approved rubric. Trained evaluators (e.g., faculty, staff, and/or GTAs) will use the AOC Vol-Core assessment rubric, which differs from the one used to assign a grade to the assignment. The results of these assessments will be reported to the Associate Dean for Academic and Student Affairs and two Tickle College of Engineering department heads, or their designees, such as the UG curriculum committee chair) that utilize senior design for AOC credit (e.g., Electrical Engineering and Computer Science, Industrial and Systems Engineering, and Materials Science and Engineering).

Outcome 3: Students will demonstrate the ability to effectively analyze potential audiences to shape message, organization, language choices, and delivery techniques in accord with disciplinary or professional purpose.

a. How does the course meet this learning outcome?

   This course will prepare students to summarize their project in a concise elevator pitch format and develop a series of stories to make their project accessible to multiple audiences.

b. What specific assignments or activities throughout the course of the semester meet this learning objective? (The combination of assignments for all the objectives must total at least 20% of the final grade.)

   Storytelling Workshop (in-class activity, not graded)
   Project Plan QRB presentation 2.6% (audience: subject matter experts)
   Prototype Results QRB presentation 2.6% (audience: subject matter experts)
   Elevator Pitch Video 2.6% (audience: peers, the public, and client engineers, managers and executives)
   Project Teaser Video 2.5% (audience: peers, the public, and client engineers, managers and executives)
Project Infomercial Video 5.2% (audience: peers, the public, and client engineers, managers and executives)
Minimum Viable Product Demonstration 2.6% (audience: peers and subject matter experts)
Final Design Report/Review Presentation 2.5% (includes peer assessment; audience: peers, the public, subject matter experts, and client engineers, managers and executives)
In-class Deliverable Presentations (up to 5) 13% (audience: peers)

c. What is the assessment plan* for this Volunteer Core outcome?

1. Provide a description of the (most likely one example of) student work that will be used to assess this learning objective.

The item most likely to be used for assessment is the final design project presentation. It will include a combination of people (i.e., the sponsors, deans/department heads/faculty, advisors, and students are invited to attend). The presentation may be a prototype, poster, and/or traditional oral presentation with formal business attire and follows disciplinary presentation norms.

2. Provide a description of how you will obtain the sample of student work.

In the required assessment semester, all student presentations will be recorded. If there are fewer than 50 students, all student work will be evaluated using the AOC Vol-Core approved rubric. If there are more than 50 students enrolled in that semester, a sample of 20% of those students will be randomly chosen to be evaluated using the AOC Vol-Core approved rubric. Trained evaluators (e.g., faculty, staff, and/or GTAs) will use the AOC Vol-Core assessment rubric, which differs from the one used to assign a grade to the assignment. The results of these assessments will be reported to the Associate Dean for Academic and Student Affairs and two Tickle College of Engineering department heads, or their designees, such as the UG curriculum committee chair) that utilize senior design for AOC credit (e.g., Electrical Engineering and Computer Science, Industrial and Systems Engineering, and Materials Science and Engineering).

Outcome 4: Students engage in communication consistent with the ethical responsibilities of communicators within their respective disciplinary or professional contexts.

a. How does the course meet this learning outcome?

The engineering profession holds ethical behavior in the highest regard. Engineers have professional obligations to be truthful and hold public safety paramount—even if alerting leaders or outside authorities will cost them their job. During design reviews engineers will be required to honestly present accurate assessments of the performance, safety, cost, and timeline for their work. Students will have multiple opportunities to practice communicating these elements throughout the course.

b. What specific assignments or activities throughout the course of the semester meet this learning objective? (The combination of assignments for all the objectives must total at least 20% of the final grade.)

Engineering Leadership Module: Professional Credibility (in-class activity, not graded)
APPLIED ORAL COMMUNICATION (AOC)
PROPOSAL FOR VOLUNTEER CORE COURSE APPROVAL

Project Plan QRB presentation 2.6%
Prototype Results QRB presentation 2.6%
Minimum Viable Product Demonstration 2.6%
Final Design Report/Review Presentation 2.5%

c. What is the assessment plan* for this Volunteer Core outcome?

1. Provide a description of the (most likely one example of) student work that will be used to assess this learning objective.

The item most likely to be used for assessment is the final design project presentation. It will include a combination of people (i.e., the sponsors, deans/department heads/faculty, advisors, and students are invited to attend). The presentation may be a prototype, poster, and/or traditional oral presentation with formal business attire and follows disciplinary presentation norms.

2. Provide a description of how you will obtain the sample of student work.

In the required assessment semester, all student presentations will be recorded. If there are fewer than 50 students, all student work will be evaluated using the AOC Vol-Core approved rubric. If there are more than 50 students enrolled in that semester, a sample of 20% of those students will be randomly be chosen to be evaluated using the AOC Vol-Core approved rubric. Trained evaluators (e.g., faculty, staff, and/or GTAs) will use the AOC Vol-Core assessment rubric, which differs from the one used to assign a grade to the assignment. The results of these assessments will be reported to the Associate Dean for Academic and Student Affairs and two Tickle College of Engineering department heads, or their designees, such as the UG curriculum committee chair) that utilize senior design for AOC credit (e.g., Electrical Engineering and Computer Science, Industrial and Systems Engineering, and Materials Science and Engineering).

Outcome 5: Students model respect for diversity and cross-cultural verbal and nonverbal communication practices when interacting with targeted audiences.

a. How does the course meet this learning outcome?

*Implicit bias/social justice and emotional intelligence workshops are planned for this course. A written reflection will be required from each student addressing how they can minimize the impact of bias in their career and project team interactions. Essentially, the course aims to raise awareness of these issues so that students can adapt their approaches to communications and teamwork for maximum inclusivity.

b. What specific assignments or activities **throughout the course of the semester** meet this learning objective? (The combination of assignments for all the objectives must total at least 20% of the final grade.)

*Implicit Bias/Social Justice Workshop (in-class activity, not graded)*
*Engineering Leadership Module: Emotional Intelligence (in-class activity, not graded)*
*Project Plan QRB presentation 2.6%*
*Prototype Results QRB presentation 2.6%*
c. What is the assessment plan* for this Volunteer Core outcome?

2. Provide a description of the (most likely one example of) student work that will be used to assess this learning objective.

   The item most likely to be used for assessment is the final design project presentation. It will include a combination of people (i.e., the sponsors, deans/department heads/faculty, advisors, and students are invited to attend). The presentation may be a prototype, poster, and/or traditional oral presentation with formal business attire and follows disciplinary presentation norms.

3. Provide a description of how you will obtain the sample of student work.

   In the required assessment semester, all student presentations will be recorded. If there are fewer than 50 students, all student work will be evaluated using the AOC Vol-Core approved rubric. If there are more than 50 students enrolled in that semester, a sample of 20% of those students will be randomly be chosen to be evaluated using the AOC Vol-Core approved rubric. Trained evaluators (e.g., faculty, staff, and/or GTAs) will use the AOC Vol-Core assessment rubric, which differs from the one used to assign a grade to the assignment. The results of these assessments will be reported to the Associate Dean for Academic and Student Affairs and two Tickle College of Engineering department heads, or their designees, such as the UG curriculum committee chair) that utilize senior design for AOC credit (e.g., Electrical Engineering and Computer Science, Industrial and Systems Engineering, and Materials Science and Engineering).

II. What process is used to monitor/oversee that each section of this course is meeting the learning outcomes if multiple sections are taught to ensure consistency semester to semester?

   The course will be taught in a hybrid format with a centralized lecture supported by online textual and video content. The course coordinator is expected to be stable over a number of years (intent is to hire someone specifically for this program). The course planning taskforce is working with OIT Instructional Design to develop rubrics for all course assignments—including peer, GTA and faculty-based assessment of oral presentation skills. The rubrics will improve the consistency of feedback on learning outcomes from year to year.

Attachments:

Please attach:

- a representative course syllabus (including a clear indication that the course is a Volunteer Core course and course objectives that include the Volunteer Core student learning outcomes) and
- a sample of at least one significant assignment for the course.
Summary of attachments for EF 438 proposal

<table>
<thead>
<tr>
<th>File name (all in pdf)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-EF438-Syllabus</td>
<td>Syllabus with required Gen Ed content</td>
</tr>
<tr>
<td>02-EF 437_438 Weekly Schedule AOC</td>
<td>Weekly course schedule with AOC content highlighted</td>
</tr>
<tr>
<td>03-Module 22- Implicit Bias-Diversity in the workplace-Canvas.pdf</td>
<td>Sample Canvas module with discussion on implicit bias and diversity in the workplace. We expect to have a STRIDE workshop leader come and talk to class. This will tee up awareness of implicit bias and how we might work in the student groups to edit written and oral presentation materials to minimize impacts.</td>
</tr>
<tr>
<td>04-Elevator Pitch Video-assignment</td>
<td>Example assignment required for each student to quickly summarize their project in an elevator pitch that is appropriate for technical and non-technical audiences.</td>
</tr>
<tr>
<td>05-QRB-instructions.pdf</td>
<td>The students will present their project progress to a panel of faculty experts (bad cops!) for technical feedback.</td>
</tr>
<tr>
<td>06-Draft Videos for In-class Review-assignment.pdf</td>
<td>Student teams will produce infomercial videos for their projects and receive verbal and written feedback from their peers.</td>
</tr>
<tr>
<td>07-Module 31- FDR &amp; Prototype Demo Day-Canvas</td>
<td>Sample Canvas module that introduces the final presentations to industry and senior design showcase where they demonstrate their prototype systems and present their project posters.</td>
</tr>
<tr>
<td>08-Final Design Presentation-assignment</td>
<td>The final presentation assignment</td>
</tr>
<tr>
<td>09-FDR-sample-deliverable</td>
<td>A sample final presentation with speakers identified</td>
</tr>
<tr>
<td>10-example-GenEd-Team Feedback_Redacted.pdf</td>
<td>An example report showing how feedback from multiple sources can be combined to provide individual and team-based assessment for outcomes that include ABET (accreditation) and Gen Ed.</td>
</tr>
</tbody>
</table>

* The answer to the assessment question should include:

1. **A description of the student work** that will be used to assess each learning objective. The student work may be an exam, an essay, a lab report, a reaction paper, a set of homework problems, a short-answer response provided on a mid-term exam, selected multiple-choice questions from a quiz, etc. More than one learning outcome can be assessed by the same student work. The assignment/exam/paper/etc. does not have to be made specifically for the purpose of this assessment. In fact, it is preferable that the student work be an assignment or test that is a normal part of the course.

2. **The sampling method to be used for the assessment.** If it is expected that there will be multiple sections of the course, you may choose to sample 20% of the sections of the course or 20% of the students in each section. This 20% should be at least 50 students. If the course is expected to have one section or a total of 50 students or less, you should collect work from all students.
APPLIED ORAL COMMUNICATION (AOC)
PROPOSAL FOR VOLUNTEER CORE COURSE APPROVAL

SAMPLE ATTACHMENTS

01-EF438-Syllabus

EF 438 Honors Interdisciplinary Senior Design 2, Spring 2020
University of Tennessee, Knoxville

CRN: 33203
Course Section: 001
Meeting Time and Place: M 5:05 to 6:45 p.m., W 5:05 to 5:55 p.m., TBD
(Exceptions: TBD)
Course Credit Hours: 3

Faculty Contact Information

Instructor: R. Keith Stanfill, Ph.D., P.E.
Edwards Assistant Dean
Director of Integrated Engineering Design
865-974-9806 (o), after hours emergency: 352-538-2546 (c) call or text
stanfill@utk.edu
design.utk.edu

Office: 201 Perkins Hall
Office hours: M 9:00 a.m. to 10:00 a.m., Th 11:00 a.m. to 12:00 p.m.
additional time available via appointment, email mcopley@utk.edu to arrange

GTA: TBD

Admin: Meghan Copley
mcopley@utk.edu
865-974-9810 (o)

Office: 206a Perkins Hall
Course Description: The second part of the EF 437/EF 438 sequence where teams of students from both the Tickle College of Engineering and Haslam College of Business partner with industry sponsors to design and build authentic products and processes. Working closely with an industry liaison engineer and a faculty coach, students gain practical experience in teamwork and communication, problem-solving and engineering design, and develop leadership, management and people skills. Weekly workshop activities adapt lecture topics to individual projects. Students learn firsthand how to develop products and processes that meet customer requirements on time and within budget. The sequence is serving students in the Heath Integrated Business and Engineering Program (Heath IBEP) and others within the two colleges.

Prerequisites: EF 437
Co-requisites: None

Required Course in Heath IBEP Curriculum, senior design option for other participants

Outcomes of Instruction
- The student will be familiar with all phases of the systems engineering design process
- The student will design, build and test authentic prototype systems
- The student will be familiar with the basic aspects of professional practice, including project management (traditional and Agile), teamwork, communications (including report generation and presentation), business decision making, safety, ethics, social justice (implicit bias, preventing sexual harassment, etc.), intellectual property, non-disclosure agreements, patents, and export controls

GenEd Statement: This course fulfills the Applied Oral Communications (AOC) and Engaged Inquires (EI) General Education / Volunteer Core requirements.

ABET Criterion 5
This course satisfies ABET Criterion 5 (curriculum) part d: All engineering students must complete “a culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.”

ABET Criterion 3 Outcomes
ABET engineering student learning outcomes include demonstrating the following:
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

ABET computer science student learning outcomes include demonstrating the ability to:
1. analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program’s discipline.
3. communicate effectively in a variety of professional contexts.
4. recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. function effectively as a member or leader of a team engaged in activities appropriate to the program’s discipline.
6. apply computer science theory and software development fundamentals (UTK EECS Program Student Outcome)

note: underlined ABET criterion 3 outcomes will be reported to the home department of each participating student for accreditation purposes

Outcomes for EI Courses*:
1. Applied Learning: Students will engage in a process of proposing, implementing, and assessing the success of strategies, plans, or approaches to addressing questions in applied contexts. Students will apply skills and knowledge from the classroom in hands-on situations, real-world settings, or in independent/directed research or creative projects.
2. Collaborative Learning: Students will engage in a process of sharing ideas, making useful contributions, communicating effectively, understanding their role(s), planning, and implementing the plan to completion. Students will demonstrate the ability to engage effectively in a group to complete an investigative, creative, or practical work.
3. Reflective Learning: Students will reflect on their own thinking, learning, understanding, and competencies, to draw connections between the subject matter of the course and the students’ own experiences within a larger social or global context.
4. Integrative or Multidisciplinary Learning: Students will demonstrate the ability to draw on theories, knowledge, tools, and/or methods from at least two fields of study to investigate relevant issues.

Outcomes for AOC Courses*:
1. Students will demonstrate the ability to communicate clearly and effectively within a disciplinary area or profession.
2. Students will demonstrate the ability to locate and use relevant, credible evidence to support ideas in accordance with disciplinary or professional standards.
3. Students will demonstrate the ability to effectively analyze potential audiences to shape message, organization, language choices, and delivery techniques in accord with disciplinary or professional purpose.
4. Students will engage in communication consistent with the ethical responsibilities of communicators within their respective disciplinary or professional contexts**.
5. Students will model respect for diversity and cross-cultural verbal and nonverbal communication practices when interacting with targeted audiences.

**e.g. not advertising particular products, disciplinary standards of acknowledging sources, etc.

* This course is part of a 2-semester sequence where General Education outcomes for Engaged Inquires (EI), Oral Communications (OC), Applied Oral Communications (AOC), and Communication through Writing (WC) will be monitored over the sequence. The OC and WC course credits will be earned through successful completion of EF437, while AOC and EI course credits will be earned through successful completion of EF 438, the second course in the sequence.

By virtue of its inherent focus on contemporary issues and solutions, this course sequence satisfies the Volunteer Difference Graduation Requirement.

Learning Environment:

The classroom will be used for the following activities:

- lectures, seminars and workshops on relevant to product and process design and development, and professional development
- interactive, in-class, hands-on activities
- team and individual presentations for various project deliverables and work products
- giving and receiving feedback from peers, faculty and staff

Conference and meeting rooms will be used for the following:

- web and teleconferences with project sponsor liaisons and suppliers
- team meetings
- design reviews

Laboratories and workshops (i.e. the ICS in S01 Perkins Hall) will be used for the following:

- prototype product and process development and testing
- experimentation
- fabrication and assembly
- feasibility feedback
- safety training

Sponsor facilities will be used for the following:

- professional networking
- data collection
- progress reporting
- training
- implementation of products and processes

Course Communications:

Course-related email shall be handled through the Canvas course portal. Expect a response within 24 hours (during M-F). If there is something urgent on the weekend, text the instructor and send an email with details. Due to the nature of team-based design projects that include shared responsibility for creation of work products, you may be contacted outside of normal business hours by your teammates, your faculty project coach, the instructional team, and on rare occasions by the sponsor company liaison. This contact may include
Canvas messaging, email, voice, SMS text messaging or project collaboration applications (i.e. Slack). For technical issues, contact the OIT HelpDesk via phone (865) 974-9900 or online at http://help.utk.edu/.

Confidentiality and Social Media:

All students participating on the Interdisciplinary Senior Design course will sign a non-disclosure agreement (NDA). The purpose of the NDA is to allow all members of the ISD program to discuss projects freely during the normal classroom and laboratory settings with other members of the ISD program. Under this NDA arrangement, such project discussions will not be perceived as public disclosures. In certain circumstances, premature public disclosure of patentable technology can invalidate a patent or otherwise prevent an idea from being patented. Some project sponsors may require participating students to sign a second NDA directly with the sponsor. Students that choose not sign either the ISD NDA or the sponsor’s NDA will be required to participate in their departmental capstone course in lieu of the ISD course sequence. Refer to the Confidentiality Agreement Primer for more details about NDAs.

Sponsor company and project technical, financial and proprietary process information, includes, but is not limited to, requirements, specifications, drawings, schematics, source code, reports, presentations, labor rates, margins, unit costs, CAD models, analyses, process photos/videos, and material properties. None of the aforementioned materials regarding any of the ISD projects may be stored on personal cloud storage such as Google Drive, GoogleDocs, etc. Further, none of the aforementioned materials may be posted or shared on any public facing social media platform (includes but is not limited to: Facebook, Snapchat, Instagram, LinkedIn, etc.). Public disclosure of information covered under NDA will not be tolerated. Always ask permission!

How to Be Successful in This Course:

Students that average at least 10 hours per week outside of class contributing to project-related work products will have the most success in this course. Design is learned by understanding the problem, ideating solutions, building the solution, testing it, addressing the flaws, and repeating. Failure is an important part of design. “Fail fast, fail cheap” and “fail fast to succeed sooner” are popular mantras.

Student’s Responsibility
- Be prepared for all classes
- Be respectful of others
- Acknowledge email requests quickly even if only to provide a target time to fully respond to the request
- Actively contribute to the learning activities in class
- Ask questions, especially “what if?” and “why not?”
- Suspend judgement during ideation sessions—say “yes and …” rather than “no”
- Invest time in self-improvement; identify competencies that you wish to achieve and seize opportunities to practice (i.e. if you are weak in public speaking, then find opportunities to speak frequently to audiences)
- When asked, close down laptops and put away phones and tablets. Exceptions will be made for notetaking.
- Abide by the UT Honor Code

Instructor’s Responsibility
- Be prepared for all classes
- Evaluate all fairly and equally
- Be respectful of all students
- Create and facilitate meaningful learning activities
• Behave according to University codes of conduct

Texts/Resources/Materials:

The following are optional, but very useful texts:


Required Equipment:
Laptop computer

Course Resources:

The course materials will be accessible through the Canvas site: [Spring 2020 Interdisciplinary Sr Design 2](#). As this is the pilot offering, course materials will be provided in a Just-in-Time (JIT) fashion. Major resources will include the following:

1. Engineering Design Handbook
2. Writing Style Guide
3. Professional Guide

Course Requirements, Assessments, and Evaluations:

Evaluators will include the course instructor, GTA and faculty project coach. The sponsor company liaison will be consulted for feedback on overall team performance. Final course grade will be a composite of individual performance (30%) and team performance (70%). Attendance will be included in the individual performance.

<table>
<thead>
<tr>
<th>Element</th>
<th>Instructor</th>
<th>Coach</th>
<th>Total points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team work products and performance</td>
<td>1470</td>
<td>500</td>
<td>1970</td>
<td>68.4%</td>
</tr>
<tr>
<td>Individual work products and performance (includes 100 points for attendance)</td>
<td>410</td>
<td>500</td>
<td>910</td>
<td>31.6%</td>
</tr>
<tr>
<td>Total</td>
<td>1880</td>
<td>1000</td>
<td>2880</td>
<td>100%</td>
</tr>
</tbody>
</table>

Written communications will account for a minimum of 50% of the course grade. Written communications includes content, style, structure, grammar and spelling. Content will be the dominant grading component. Oral communications will account for a minimum of 20% of the course grade. Oral communications includes content, delivery, style, structure, grammar and spelling (on presentation materials such as PowerPoint slides). Content will be the dominant grading component. There is a significant overlap between the written and oral content for reports and deliverables.

Grade scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>92</th>
<th>89</th>
<th>86</th>
<th>82</th>
<th>79</th>
<th>76</th>
<th>72</th>
<th>69</th>
<th>66</th>
<th>62</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
<td>C+</td>
<td>C</td>
<td>C-</td>
<td>D+</td>
<td>D</td>
<td>F</td>
</tr>
</tbody>
</table>

Notes

Ver. 3 - REV. 2021
Grades will be rounded up
Assignment grades may be appealed with a professionally written email and that includes rationale
Assignment due dates for a given team can be extended provided that a professionally written email and that includes rationale is sent in advance (target 48 hours notice)

Attendance:
Students may miss three periods without penalty. Attendance will be taken at each class meeting and may be taken twice on Mondays.
Unexcused absences: 2 class periods, afterwards 20 points off the attendance grade
Email (via Canvas) the instructor with documentation (i.e. interview invitation) prior to class; email after the class for illness and provide documentation (i.e. note from the clinic). For family emergencies email when you can.

Major Assignments and Exams (names and due dates)
- No exams.
- Low stakes quizzes will be embedded in video assignments as learning checks.
- Major reports will include submissions of outlines and drafts to gather feedback

<table>
<thead>
<tr>
<th>Report</th>
<th>Due</th>
<th>Word count</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Level Design Report</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final version with client revision</td>
<td>~1/28</td>
<td>4000</td>
<td>100</td>
</tr>
<tr>
<td>Final Design Report Outline (all volumes)</td>
<td>~3/6</td>
<td>300</td>
<td>50</td>
</tr>
<tr>
<td>Final Design Report Draft 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume 1 – Summary Report</td>
<td>~3/27</td>
<td>2500</td>
<td>100</td>
</tr>
<tr>
<td>Volume 2 – Product &amp; Process Design</td>
<td>~3/27</td>
<td>3000</td>
<td>100</td>
</tr>
<tr>
<td>Volume 3 – Acceptance Test</td>
<td>~3/27</td>
<td>2000</td>
<td>100</td>
</tr>
<tr>
<td>Final Design Report Draft 2 for sponsor review</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume 1 – Summary Report</td>
<td>~4/9</td>
<td>2500</td>
<td>100</td>
</tr>
<tr>
<td>Volume 2 – Product &amp; Process Design</td>
<td>~4/9</td>
<td>3000</td>
<td>100</td>
</tr>
<tr>
<td>Volume 3 – Acceptance Test</td>
<td>~4/9</td>
<td>2000</td>
<td>100</td>
</tr>
<tr>
<td>Final Design Report</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume 1 – Summary Report</td>
<td>~4/24</td>
<td>2500</td>
<td>100</td>
</tr>
<tr>
<td>Volume 2 – Product &amp; Process Design</td>
<td>~4/24</td>
<td>3000</td>
<td>100</td>
</tr>
<tr>
<td>Volume 3 – Acceptance Test</td>
<td>~4/24</td>
<td>2000</td>
<td>100</td>
</tr>
<tr>
<td>Volume 4 – Product/Process Manual</td>
<td>~4/24</td>
<td>2000</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>team: 30,300</td>
<td></td>
<td></td>
<td>1350</td>
</tr>
<tr>
<td>indiv: 4000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Major written reports for the project sponsor-client will be accompanied by team-based oral presentations; the presentations will be peer reviewed prior to delivery to the sponsor-client; speaker’s notes included in the word count
### APPLIED ORAL COMMUNICATION (AOC)

**PROPOSAL FOR VOLUNTEER CORE COURSE APPROVAL**

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Due</th>
<th>Word count</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualification Review Board (QRB) 1</td>
<td>1/13</td>
<td>250</td>
<td>100</td>
</tr>
<tr>
<td>Qualification Review Board (QRB) 2</td>
<td>3/2</td>
<td>250</td>
<td>100</td>
</tr>
<tr>
<td><strong>Note:</strong> minimum of 75 words contributed by each team member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showcase Poster</td>
<td>~4/6</td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>Draft for peer review</td>
<td>4/17</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>Final Design Report</td>
<td>4/20</td>
<td>250</td>
<td>25</td>
</tr>
<tr>
<td>Draft for peer review (~20 slides)</td>
<td>4/23</td>
<td>350</td>
<td>100</td>
</tr>
<tr>
<td>Final for client (25-35 slides)</td>
<td><strong>Note:</strong> minimum of 100 words contributed by each team member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>team: 1500</td>
<td>indiv: 200</td>
<td>475</td>
</tr>
</tbody>
</table>

- Individual and team work products (deliverables) will be due weekly

<table>
<thead>
<tr>
<th>Individual work products and deliverables</th>
<th>Due</th>
<th>Word count</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevator Pitch Video</td>
<td>~1/27</td>
<td>300</td>
<td>50</td>
</tr>
<tr>
<td>Performance Review Action Plan Memo</td>
<td>~2/21</td>
<td>300</td>
<td>100</td>
</tr>
<tr>
<td>Team Member (Peer) Evaluations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eval 1</td>
<td>~2/12</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Eval 2</td>
<td>~3/18</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Eval 3</td>
<td>~4/22</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td><strong>Note:</strong> evaluated for content and completion only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Review Presentation Evaluations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Design Review</td>
<td>~4/20</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td><strong>Note:</strong> evaluated for content and completion only</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>indiv: 1000</td>
<td>230</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Various team work products &amp; deliverables</th>
<th>Due</th>
<th>Word count</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project update Quad Chart</td>
<td>~weekly starting 1/16</td>
<td>12x300=3600</td>
<td>12x10=120</td>
</tr>
<tr>
<td><strong>Note:</strong> minimum of 400 words contributed by each team member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical deliverable presentations (~6 slides)</td>
<td>~biweekly starting 1/27</td>
<td>5x120=600</td>
<td>5x50=250</td>
</tr>
<tr>
<td><strong>Note:</strong> minimum of 100 words contributed by each team member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MVP2 prototype demonstration</td>
<td>~3/9</td>
<td>N/A</td>
<td>100</td>
</tr>
<tr>
<td>Project Management Messaging and Discussions (frequent and informal on platforms like slack, trello, asana, etc.)</td>
<td>Not turned in</td>
<td>600</td>
<td>Not graded</td>
</tr>
<tr>
<td><strong>Note:</strong> minimum of 100 words contributed by each team member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting Minutes (rotational assignment: 15 meetings, 200 words)</td>
<td>Not turned in</td>
<td>3000</td>
<td>Not graded</td>
</tr>
</tbody>
</table>
Course Feedback:

Feedback on written and oral deliverables will be provided using rubrics and document markups. Peers will provide feedback on presentations and team member performance; however, peer assessment will not be directly factored into grades. Team member performance surveys will be administered three times during the semester. After the first survey, students will meet individually with their coach for a 20-minute performance review.

University Policies

Academic Integrity:
“An essential feature of the University of Tennessee, Knoxville is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the university, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.”

University Civility Statement:
Civility is genuine respect and regard for others: politeness, consideration, tact, good manners, graciousness, cordiality, affability, amiability, and courteousness. Civility enhances academic freedom and integrity, and is a prerequisite to the free exchange of ideas and knowledge in the learning community. Our community consists of students, faculty, staff, alumni, and campus visitors. Community members affect each other’s well-being and have a shared interest in creating and sustaining an environment where all community members and their points of view are valued and respected. Affirming the value of each member of the university community, the campus asks that all its members adhere to the principles of civility and community adopted by the campus: http://civility.utk.edu/.

Disability Services:
“Any student who feels s/he may need an accommodation based on the impact of a disability should contact Student Disability Services in Dunford Hall, at 865-974-6087, or by video relay at, 865-622-6566, to coordinate reasonable academic accommodations.

Your Role in Improving Teaching and Learning Through Course Assessment:
At UT, it is our collective responsibility to improve the state of teaching and learning. During the semester, you may be requested to assess aspects of this course either during class or at the completion of the class. You are encouraged to respond to these various forms of assessment as a means of continuing to improve the quality of the UT learning experience.

Key Campus Resources for Students:
- Center for Career Development (Career counseling and resources; HIRE-A-VOL job search system)
- Course Catalogs (Listing of academic programs, courses, and policies)
- Hilltopics (Campus and academic policies, procedures and standards of conduct)
- OIT HelpDesk (865) 974-9900
- Schedule of Classes/Timetable
- Student Health Center (visit the site for a list of services)
- Student Success Center (Academic support resources)
- Undergraduate Academic Advising (Advising resources, course requirements, and major guides)
University Libraries (Access to library resources, databases, course reserves, and services)

**Wellness/Student Counseling Center:**
Diminished mental health, including significant stress, mood changes, excessive worry, or problems with eating and/or sleeping can interfere with optimal academic performance. The source of symptoms might be strictly related to your course work; if so, please speak with me. However, problems with relationships, family worries, loss, or a personal struggle or crisis can also contribute to decreased academic performance.

The University of Tennessee provides mental health services to support the academic success of students. The Mental Health Clinic, a part of the Student Counseling Center, offers free, confidential psychological services to help you manage personal challenges that may threaten your well-being. The Student Counseling Center is the university’s primary facility for personal counseling, psychotherapy, and psychological outreach and consultation services. The Center for Health Education and Wellness manages 974-HELP, the distressed student protocol, case management, the Sexual Assault Response Team, and the Threat Assessment Task Force.

In the event I suspect you need additional support, I will express my concerns and the reasons for them, and remind you of resources (e.g., Counseling Services, Career Services, Dean of Students, etc.) that might be helpful to you. It is not my intention to know the details of what might be bothering you, but simply to let you know I am concerned and that help, if needed, is available.

Getting help is a smart and courageous thing to do—for yourself and for those who care about you. For more information, visit [https://counselingcenter.utk.edu/](https://counselingcenter.utk.edu/) and [http://wellness.utk.edu/](http://wellness.utk.edu/)

**Course Outline/Assignments:**
Refer to Canvas

Class will not be held on the following dates:
1/20 MLK holiday
3/16-20 Spring Break

**Technical topics addressed:**
- Introduction to Qualification Review Boards
- Design for X
- Design for the environment, sustainability
- Fundamentals of Green Design and Life Cycle Assessment
- Confidence intervals and hypothesis testing
- Prototype results and report
- Leadership in engineering: emotional intelligence
- Final design report, review and showcase

**Business/professional topics addressed:**
- Leadership: professional credibility
- Implicit bias, diversity in the workplace
- Financial concepts (statement, ROI, time value of money)
- Scaling up manufacturing (target cost, sourcing materials)
- Marketing plan (target market, competitors, channel distribution)
• Project accounting
• Business analytic/statistics
• Leadership: emotional intelligence

Communications topics addressed
• The elevator pitch
• Introduction to the final design report
• Storytelling
• Introduction to poster and video design
• Prototype demonstrations

The final examination consists of a team-based final report and oral presentation. The class The oral presentation will be part of an event that will include industry visitors and food. All teams will participate in the Senior Design Showcase (April 23, 2020)

The instructor reserves the right to revise, alter or amend this syllabus as necessary. Students will be notified in writing / email of any such changes

02-EF 437_438 Weekly Schedule AOC
Version: Weekly Schedule 11-Jan-19  Highlighted area indicate AOC content

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Technical Topic</th>
<th>Professional Topic</th>
<th>Deliverables</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>6-Jan</td>
<td>Design for Test (DFT) (*classes begin on Wed. Jan 8)</td>
<td>Diversity, Implicit Bias &amp; Social Justice Workshop</td>
<td>SLDR Industry Review Follow-up Memo</td>
<td>* Paul Frymier is a STRIDE trainer</td>
</tr>
<tr>
<td></td>
<td>13-Jan</td>
<td>Qualification Review Board 1: Project Plan Review</td>
<td>QRB 1 Presentation; QRB Feedback Summary Memo</td>
<td></td>
<td>* QRB: &quot;Shark Tank&quot;</td>
</tr>
<tr>
<td></td>
<td>20-Jan</td>
<td>Design for Manufacturing &amp; Assembly</td>
<td>Team Reflective Memo on Project Societal Impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>27-Jan</td>
<td>Confidence Intervals</td>
<td>Introduction to Final Design Report</td>
<td>Revised SLDR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-Feb</td>
<td>Hypothesis Testing</td>
<td>Storytelling Workshop</td>
<td>FDR Outline; Team Member Performance Assessment 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10-Feb</td>
<td>Life-cycle Assessment</td>
<td>Video &amp; Poster Design</td>
<td></td>
<td>* get help from TCE Office of Communications</td>
</tr>
<tr>
<td></td>
<td>17-Feb</td>
<td>Design for the Environment</td>
<td>Business Model Canvas</td>
<td>Analytical &amp; Experimental Report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24-Feb</td>
<td>FDA Design Controls</td>
<td>Leadership: Emotional Intelligence</td>
<td></td>
<td>* Mary could teach this FDA module; consider pulling it into the fall semester</td>
</tr>
<tr>
<td></td>
<td>2-Mar</td>
<td>Qualification Review Board 2: Prototype Results</td>
<td>QRB 2 Presentation; QRB Feedback Summary Memo</td>
<td></td>
<td>* QRB: &quot;Shark Tank&quot;</td>
</tr>
<tr>
<td></td>
<td>9-Mar</td>
<td>MVP 2 Prototype Inspection Day</td>
<td>Functioning Prototype, Team Member Performance Assessment 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16-Mar</td>
<td>Spring Break</td>
<td>Leadership: Professional Credibility</td>
<td>FDR Draft Report</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>23-Mar</td>
<td>No scheduled class</td>
<td>Individual Reflective Memo on Discipline Skills Applied to the Project</td>
<td></td>
<td>* ABET: &quot;how has your previous course work prepared you to complete your capstone design? What skills have you used and</td>
</tr>
<tr>
<td></td>
<td>30-Mar</td>
<td>No scheduled class</td>
<td>Video &amp; Poster In-class Review</td>
<td>Draft Poster &amp; Video</td>
<td></td>
</tr>
</tbody>
</table>

Ver. 3 - REV. 2021
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Final Design Report Presentation Peer Review</td>
</tr>
<tr>
<td>33</td>
<td>Design Showcase</td>
</tr>
</tbody>
</table>

Final Poster, Team Member Performance Assessment 6

* consider turning in the report earlier—no weak reports allowed!
03-Module 22-Implicit Bias-Diversity in the workplace-Canvas
Implicit Bias/Diversity in the Workplace & Design for Environment and Sustainability

Overview

Implicit social cognition deals with thoughts and feelings outside of conscious awareness and control. All humans are subject to unconscious bias—so called implicit bias. The way we form our social groups, hire subordinates, treat coworkers and judge strangers are shaped by our implicit biases. As a professional, it is important to be aware of your implicit biases and to develop strategies for minimizing the impact of these biases on our decisions.

Decisions that engineers make impact the environment through selection of processes and systems that deplete natural resources, generate waste streams, and modify land, air and water quality. Design for the Environment methodologies enable engineers to design economically and environmentally sustainable systems.

Student Learning Objectives

At the end of this module, you will be able to:

- Identify one or more of your implicit biases
- Formulate a strategy for minimizing the impact of your implicit biases
- Incorporate Design for the Environment considerations in design decisions

Before Class

Read

- Intro to the Implicit Association Test (http://blindspot.fas.harvard.edu/IAT)
APPLIED ORAL COMMUNICATION (AOC)
PROPOSAL FOR VOLUNTEER CORE COURSE APPROVAL

1/11/2019

Recommended articles:
- Why Design Education Must Change [PDF]
- More Women in Science

Complete
- Module 21 Weekly Status Memo

Continue Working On
- Your project... of course.
- Analytical and Experimental Report
- Draft Videos for In-class Review
- Draft Poster for In-class Review

During Class

Topics
- Available class slides:
  - Dr. Indarawis’ presentation on Sustainability and LCA
  - Storytelling handouts: Party of Three and 6-Frame Comic
  - Sarah Gebretsadik’s presentation on Implicit Bias

After Class

Complete:
- Strategies for handling Implicit Bias
- Module 22 Weekly Status Memo

Continue Working On
- Your project... of course.
- Draft Videos for In-class Review
- Draft Poster for In-class Review
Supplemental Content

LCA and Green Engineering resources from Dr. Indarawis

- The EPA document I mentioned that breaks down how to conduct an LCA in more detail

- A breakdown/brochure of the ISO 14000 Family of Standards relating to Environmental Management

- The original article published in Environmental Science and Technology defining the 12 Principles of Green Engineering and describing each one in more detail

- A document that goes in more detail about environmental labeling (according to the corresponding ISO standard in the 14000 Family of Standards)

- A few examples of Environmental Product Declaration (EDPs) and how LCAs are used in those declarations to show “true” environmental impact of the product/processes

1. EPD_Bombardier Innovia APM 300.pdf

2. EPD_Folkhem-concept-building.pdf

3. EPD_Spaceloft Aerogel Insulation.pdf

4. EPD_Steel-Hot rolled coil Australasia.pdf

- Student Resources

- Resources for Poster & Video Design
04-Elevator Pitch Video-assignment

This is an individual assignment that typically requires the student to iterate numerous times to get it right. This assignment supports OC and AOC Gen Ed requirements. The work product is assessed by peer feedback. Each student should get 3 sets of feedback from peers. Rubric and assignment will be modified to include accessibility elements.

Elevator Pitch Video

An elevator pitch is a short speech that can be delivered from memory by any team member in less than a minute (for this assignment the target will be 30 seconds). The concept behind the elevator pitch is that you happen to step on the elevator at the same time as Bill Gates (any wealthy tech investor). Bill is headed to the penthouse suite and you have an opportunity to sell your project to him. During the ride, you have a golden opportunity to convince Bill to invest in your project. You have to define the problem you are solving, and the form, function and benefit of your solution. Be sure to provide a hook to make your pitch memorable.

Assignment

Create a script for your speech. Your target time is 30 seconds and consider that you can speak at a pace of about 140 words per minute. Note: it is acceptable for the team to create one speech for all members to use, however; it will be easier to deliver the pitch if it is in your own words.

1. Record yourself giving your speech. Be sure to make eye contact (look into the camera), sound enthusiastic (smile and bring your positive energy), and modulate your voice so that you don’t sound monotone. Use a lamp if necessary to insure your face is lit and your expressions are visible. Landscape orientation is preferred.
2. Copy your speech into the comment field of the assignment and upload an .mp4 of your video.

Follow up

Each of you will be required to provide feedback on two submissions—help your classmates improve their elevator pitches. Complete the rubric after watching the elevator pitch. You may add comments to each rubric element. Please indicate in the assignment comments your favorite part of the video and what the speaker can do to improve.

Example elevator pitch

"[Problem] Consumer steam irons damage fabric due to uneven heating, are hard to operate by arthritic users, and are prone to leaking. [Form] The IronHeads have developed a low-cost digital steam iron [Function] that heats fast and evenly, utilizes low-effort controls, and is leak free, [Benefit] saving consumers time, frustration and cash."

Points 10
Submitting a media recording

Due Jan 24, 2018 For Everyone Available from - Until Jan 31, 2018 at 11:59 pm

Elevator Pitch Video

You’ve already rated students with this rubric. Any major changes could affect their assessment results.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ratings</th>
<th>Pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem being solved is clear</td>
<td>5.0 pts</td>
<td>5.0 pts</td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0 pts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Marks</td>
<td></td>
</tr>
<tr>
<td>The pitch includes a hook</td>
<td>5.0 pts</td>
<td>5.0 pts</td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0 pts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Marks</td>
<td></td>
</tr>
<tr>
<td>The form of the solution is evident</td>
<td>5.0 pts</td>
<td>5.0 pts</td>
</tr>
<tr>
<td></td>
<td>Full Marks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0 pts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Marks</td>
<td></td>
</tr>
</tbody>
</table>

Ver. 3 - REV. 2021
The function of the solution is evident | 5.0 pts | Full Marks | 0.0 pts | No Marks | 5.0 pts
---|---|---|---|---|---
The benefit of the solution is evident | 5.0 pts | Full Marks | 0.0 pts | No Marks | 5.0 pts
I understood the speaker | 5.0 pts | Full Marks | 0.0 pts | No Marks | 5.0 pts
The speaker was engaging | 5.0 pts | Full Marks | 0.0 pts | No Marks | 5.0 pts
---|---|---|---|---|---
Total Points: 35.0

Rubric will be modified to include captioning and/or other accessibility elements.

05-QRB-instructions

Peer, Faculty, and Sponsor Reviews

5.3.3 Final Design Review

The FDR is held on the UF campus in conference-style format. All the sponsors, plus UF deans, department chairs, faculty, advisors, and students are invited to attend. The review features a breakfast networking session, 20-minute team presentations in three or more room simultaneously, a poster and prototype demonstration session, and a banquet luncheon with a keynote speaker. Dress for the FDR is business formal. The review is held about two to three weeks prior to final exams.

5.4 Qualification Review Boards

(See Overview: Project Roadmap.) Qualification Review Boards (QRBs) are special project reviews held before faculty expert panels. The QRBs occur in the second half of the IPPD program. The QRBs consist of project coaches with subject matter expertise in particular aspects of your project. The panel is responsible for helping each project team identify and mitigate project risks. For the process to work, it requires that the project teams openly share project risks, and be open to constructive criticism.

The reviews last thirty minutes and are held in private conference rooms. Teams should arrive ten minutes early and wait quietly in the hall outside the conference room.

Important:
- Use PowerPoint for these presentations
- Reuse the back-up slides from the SLDR and previous deliverables
- Prepare hardcopies of the presentation for the review committee (print the slides 2 or 3 to a page)-- including the MS Project Gantt chart
- Assign one or more note takers

5.4.1 Project Plan Review Session

The purpose of the project plan review session is to determine if your project is on track, to identify weaknesses and to recommend corrective actions. The following items and questions will be covered during a detailed review of your project status. The project review will last 30 minutes. Plan on speaking to the following items for at least 20 minutes:
- Concise summary of project including key requirements, proposed solution and major scope changes
- Time line of major activities in the future (through April)
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- Status of proof of concept (including software prototypes), experiments, Design of Experiments
- Status of Detail Design (Hardware and Software)
- Status of prototype:
  - Where will it be manufactured?
  - Who will manufacture it?
  - Who will fund it?
  - When will it be manufactured? (time line)
  - Where are we going to assemble and test it?
  - Are parts on order? When will they be ordered?
  - Will parts be available on time? Do we have commitments?
- Prototype (Hardware & Software) Test Plan
  - What are our objectives?
  - Do we have a (comprehensive test) plan?
  - Where will it be tested?
  - What equipment do we require?
  - How are we going to test against product specifications?
  - Are we trained to test it? Do we need special training?
- Risks and risk mitigation strategy
- Resource limitations
- Liaison engineer support and frequency of contact

Provide the reviewers with softcopies via e-mail at least four hours prior to the presentation.

06-Draft Videos for in-class Review-assignment

Draft Videos for In-class Review

Deliverable applicability

This deliverable applies to all project teams.

Sample content

Presentation on videos: Let's Get Visual_poster and video presentation.pptx

Storyboarding: Storyboard-In-Class-Assignment.pdf

Sample videos in the Module 22: Story Telling and Intro to Poster & Video Design (Week 22) (%24CANVAS_OBJECT_REFERENCE%24/modules/e2ec36f416e6a1b604fe246f4a2f338b)

Instructions
- Complete a draft of the ~20second project teaser video and 2minute full video as described in the lecture Let's Get Visual_poster and video presentation.pptx.
- Important
  - use a tripod!
  - formats must be compatible with vlc player--.mp4 with H264 encoding works well
  - spellcheck carefully, especially all names and the word "liaison"
  - Use the following file naming convention: <team name>-teaser-draft<#>.<ext> and <team name>-video-draft<#>.<ext>, where # is the draft number and ext is an acceptable video format.

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- shoot in landscape, use a tripod (IPPD has several, including phone grips), use a digital mic if voices are important (IPPD has a digital mic)
- do not store video projects on GIT or the team OneDrive sites
- provide credits for any externally sourced audio and video clips

- For this assignment, we will use the Office 365 Video Channel for IPPD
- Do not delete files from other teams—this is a channel available to all IPPDers!
- Each IPPD participant will be providing peer feedback on 3 sets of teasers and videos. To facilitate the peer feedback, you will upload links to the video channel content on Canvas.

Submit

- upload the videos to the Office 365 Video Channel for IPPD site and copy the links. Use the following naming conventions for your files:
  - <team name>-teaser-draft<#>.<ext> (i.e. ReverseAirteaserdraft1.mp4)
  - <team name>-video-draft<#>.<ext> (i.e. ReverseAvideodraft2.mp4)
  - where # is the draft number and ext is an acceptable video format such as .mp4
- name the videos once uploaded to the Office 365 Video Channel using the following naming convention:
  - <team name> Teaser Draft (i.e. Reverse Air Teaser Draft)
  - <team name> Video Draft (i.e. Reverse Air Video Draft)
- Respond to the Canvas assignment with the 2 links to the videos on the Office 365 Video Channel for IPPD site

Peer Review Instructions

Provide comments and recommendations to the team on the content and style of the videos.

Content considerations:
- Do the videos help convey the story of the project?
- Are sound levels appropriate? Can you understand the narrators/actors? Good audio is hard!
- How is the lighting and steadiness (was a tripod used)?
- Any typos?

Style considerations:
- Do the videos get and keep your attention?
- Does it move too fast, too slow, just right?
- Any suggestions?

Points 50

<table>
<thead>
<tr>
<th>Submitting</th>
<th>a text entry box</th>
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<tbody>
<tr>
<td>Due</td>
<td>For</td>
</tr>
<tr>
<td>Mar 27, 2018 at 12 pm</td>
<td>Everyone else</td>
</tr>
<tr>
<td>Mar 30, 2018</td>
<td>16-Bolt Rehab</td>
</tr>
<tr>
<td>Apr 2, 2018</td>
<td>18-Quench</td>
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Full Length and Teaser Video Rubric

You’ve already rated students with this rubric. Any major changes could affect their assessment results.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Ratings</th>
<th>Pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaser: Storyline relates to the project</td>
<td>This area will be used by the assessor to leave comments related to this criterion.</td>
<td>5.0</td>
</tr>
<tr>
<td>The story depicted in the teaser video helps convey the purpose of the project.</td>
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<td></td>
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</table>
## Applied Oral Communication (AOC)

### Proposal for Volunteer Core Course Approval

<table>
<thead>
<tr>
<th>Teaser: Sound levels are appropriate</th>
<th>This area will be used by the assessor to leave comments related to this criterion.</th>
<th>5.0 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actors in the teaser can be clearly heard. Background noise, including music does not interfere or distract from the dialog.</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Teaser: Lighting and steadiness</th>
<th>This area will be used by the assessor to leave comments related to this criterion.</th>
<th>5.0 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video is bright enough to make out important details, but not over saturated. A tripod was used to minimize shake.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teaser: Spelling</th>
<th>This area will be used by the assessor to leave comments related to this criterion.</th>
<th>2.5 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teaser is free from spelling errors.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teaser: Attention grabbing</th>
<th>This area will be used by the assessor to leave comments related to this criterion.</th>
<th>5.0 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teaser has an effective hook and keeps one’s attention.</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Teaser: Pace</th>
<th>This area will be used by the assessor to leave comments related to this criterion.</th>
<th>2.5 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teaser is not too fast or too slow.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>2-minute video: Storyline relates to the project</th>
<th>This area will be used by the assessor to leave comments related to this criterion.</th>
<th>5.0 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>The story depicted in the 2-minute video helps convey the purpose of the project.</td>
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</table>

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<tr>
<th>2-minute Video: Sound levels are appropriate</th>
<th>This area will be used by the assessor to leave comments related to this criterion.</th>
<th>5.0 pts</th>
</tr>
</thead>
<tbody>
<tr>
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<th>This area will be used by the assessor to leave comments related to this criterion.</th>
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<td>The 2-minute video is free from spelling errors.</td>
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</table>

| Total Points: 50.0 | | |

Rubric to be modified to include accessibility elements (e.g., captioning)

07-Module 31-FDR & Prototype Demo Day-Canvas

The FDR & prototype Demonstration Showcase utilized at the University of Florida will be adapted for use at UT. This activity has a number of AOC elements, including adapting presentation style for highly technical, non-technical, and adolescent audiences, using a variety of formal and informal presentation techniques including PowerPoint presentations, poster presentations, and product demonstrations, and following best practices for inclusive and ethical communications.
Overview

The Final Design Review and Prototype Demonstration Showcase is an opportunity for all project teams to prove their project satisfies customer requirements and demonstrate the key system functionality to an audience of engineers, managers, executives, faculty and peers. The event is held in the Reitz Union, utilizing the Grand Ballroom and the Auditorium. The dress code is business formal.

Teams set up their poster, prototype demonstration area, and load their 12-minute presentations during a scheduled morning set-up time. Guest check in begins at 1:00 p.m. with networking and snacks. The formal event welcome session starts at 3:00 p.m. and includes sponsor recognitions and a keynote speaker. Team update presentations follow the Welcome Session in several rooms simultaneously. Food and the Prototype Demonstration Showcase begin at 5:30 p.m. and conclude at 7:00 p.m. Project videos may be shown continuously during the Showcase. Clean up and event knock down will wrap up around 8:00 p.m.

Student Learning Objectives

The purpose of the FDR is to prepare you to:

- Prepare and deliver a professional 12-minute summary of an 8-month long design project, including the following
  - an elevator pitch summarizing the form, function and benefit of the solution to a defined problem
  - key requirements, specifications and Technical Performance Measures
  - descriptions of the major components, subsystems and product
  - results of product acceptance testing
  - summaries and action plans for any unmitigated risks
  - recommendations for the sponsoring company

- Prepare and deliver a professional poster presentation and prototype demonstration one-on-one to an audience of technical and non-technical people

Event Planning and Preparation

Teams will be required to complete three main tasks to help IPPD staff prepare for the FDR:

1. Complete the FDR Tech Needs Form
   - Complete the FDR Tech Needs Form
   - This assignment will help us determine what supplies need to be packed and help us plan transportation and materials logistics ahead of time. This is due one week before the FDR.

2. Stage demonstration materials in the IPPD lab the day before the FDR.
   - On Monday, the lab manager will go rent a moving truck and park it behind NEB. Throughout the day, they will be loading it with your projects and the other physical supplies that we need for the event. During this time, you may still work on your projects, but anything which is not ready to be loaded by 4PM you will need to transport to the Reitz Union on your own!
   - We will place blue boxes out in the IPPD lab for your teams to place any items from your lockers that you wish to be taken to Reitz. We will move those with the truck on the morning of the event and they will be waiting for you when you arrive for setup on Tuesday. Gather materials for your demonstration and have them loaded in the IPPD-provided container no later than Monday, April 16, 4:00 PM in NEB 154.
   - Contact the Lab Manager ASAP if you have particularly heavy equipment, need items picked up from other buildings on campus, or have other special transportation or setup requirements.

3. Come to the Reitz Grand Ballroom the morning of the FDR to setup your prototype and load your presentation onto the laptops we will be using for the presentation.
   - Parking will be provided in the Reitz Union Parking Deck for Non-UF Guests ONLY. Students will not
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- Check the setup schedule and arrive at your designated timeslot.
- Setup your demo area and ensure your demo is functioning properly.
- Load your team’s FDR presentation on the IPPD laptop designated for your presentation room and test the presentation to insure fonts, graphics, videos and animations work as intended. Our IT specialist will be on-hand to assist with troubleshooting and answer any questions you may have.
  - Please bring your presentation on a flash drive, as we cannot guarantee that the WiFi will be working in Reitz. Keep this in mind for any videos you plan to show, and embed all videos within your presentation. Do not hyperlink content in your presentation.

Other items to consider in preparing for the event:
- Dress code is business formal. Dry clean/wash items as needed; polish shoes.
- Dinner (heavy finger food) will be served during the showcase after the presentations, so eat a good lunch before you arrive.
- You may want to wear more flexible clothes to setup your prototype, then change into your formal clothes for the event. Again, we will have a Bag Check where you can store a small gym bag if needed.

When you arrive for the event

The event schedule can be found here.

NOTE: Industry sponsors will arrive around 1PM to start check-in. You may arrive at this time and network, but the sponsors will be in a closed meeting from 2:00-2:45pm, so you will not have much to do during this time. Plan accordingly.
1. Go to the lobby in front of the Grand Ballroom on the 2nd Floor of the Reitz Union.
2. The first student to arrive from each team will receive ALL of their team’s name tags and will be responsible for distributing them to the rest of the team.
3. BAG CHECK will be provided so that you do not have to carry around your backpacks during the event. They will be stored in a locked room for the duration of the event and can be returned to you at any time by visiting the check-in desk.

What to expect during the event

1. Light refreshments will be served in the lobby outside of the ballroom prior to the presentations.
2. Presentations will be in an almost identical format to the SLDR, but you will only have 12 minutes to present. 8 Minutes will be for Q&A and changeover for the next team.
3. Following the presentations, everybody will adjourn to the Grand Ballroom for the prototype demonstrations, which will be held in a tradeshow format. Attendance could reach several hundred people, so be prepared for a crowd and spectators from engineering and non-engineering fields. *Journalists and University Administration are frequent attendees of this portion of the event.*
  - This is when we will feed you!!!

Wrap-up

We will wrap-up around 8pm, at which time you will be expected to pack up your area and return it to the condition in which you found it. IPPD staff will then load the moving truck and return your items to NEB.
- Large prototypes which are brought from other locations on campus will be returned the following day in the morning. Please plan accordingly.

Following the FDR, complete the following items:
- Module 31 Weekly Status Memo
- Final Design Report
End of Semester Items

At the end of the semester, you will be expected to complete the final team checkout process. To summarize:

1. Return Project boxes given to you at the beginning of the semester
2. Clean out your lockers and arrange for items to be delivered to sponsor
3. Return all items loaned from the IPPD Inventory
4. Inventory all purchases made for your project.

All project materials that you purchased need to be returned to your sponsor at the end of the semester. This include 3-D printed items.

There is an assignment associated with this process to be completed with more information.

08-Final Design Presentation-assignment

Final Design Presentation

Deliverable applicability
This deliverable applies to all project teams.

Instructions
2. This presentation should be the copy of what you present to your sponsor at the FDR event
3. Upload the presentation to the final_documents folder in your Git repository or OneDrive site
4. Manually upload this file and the associated video content (if any) to the presentation room computer to be used during the Final Design Review. Complete this upload, in the Reitz Union Grand Ballroom Salon BCFG, during your scheduled appointment time, but no later than 11:30 AM on the day of the review (i.e. April 11)

Submit
1. Upload the final version of the presentation file to Canvas

Points 100
Submitting a file upload
File Types pdf, ppt, and pptx

<table>
<thead>
<tr>
<th>Due</th>
<th>For</th>
<th>Available from</th>
<th>Until</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr 17, 2018 at 8 am</td>
<td>Everyone</td>
<td>-</td>
<td>Apr 17, 2018 at 11 am</td>
</tr>
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</table>

The Final Design Presentation format utilized at the University of Florida will be adapted for use at UT. This activity has a number of AOC elements, including adapting presentation style for a mixed audience of technical and non-technical adults, and ethical communication practices.