Engineering Communications and Societal Integration (ENGR 301)

Syllabus and Handbook

Spring 2019
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Course Description
ENGR 301 Engineering Communications and Societal Integration (3+0) 3 credits; course is for credit only. ENGR 301 is designated as a service learning course; completion of service learning activity and associated forms are required.

Researching and applying science and technology in societal context; integrating and synthesizing knowledge; communicating information and knowledge via oral, written, and visual presentation. Course must be taken in residence; substitutions or waivers are not permitted.

Prerequisites: ENG 102 and PHYS 181 with a "C" or better; CH 201 or 202; CH 203; junior or senior standing

Satisfies: Core Capstone; CO9 (Science, Technology, & Society); CO13 (Integration & Synthesis); ABET Criteria 3, 4, 5, 6, and 7

Instructors
Candice Bauer and Nicholas Maus
Office Phone: 775-784-7521
E-mail Address: cbauer@unr.edu and nmaus@unr.edu (ENGR 301 in the subject line; WebCampus messaging not used)
Office: SEM 131; meetings are by appointment only and must be scheduled during coaching sessions

Teaching Assistants
Amaya Davis, Jamie Fry, Walid Ghani, and Cayler Miley
E-mail Address: engr301@gmail.com (WebCampus messaging not used)
Office: SEM 131; meetings are by appointment only and must be scheduled during coaching sessions

Required Course Material and Resources
Website: http://wolfweb.unr.edu/~cbauer/engr301/
No textbook is required.
Folders and Binders: SEM 131 Foyer

Required course material: computer, printer, and internet access; Microsoft Office; team meetings and classroom visits outside of specified class time; USB drive; camera; note taking materials; PDF reader; professional attire; project supplies as determined by student team; photo identification; video viewing access; WebCampus access

Methods for communicating with students outside the classroom regarding matters such as class cancellations, meeting times, or room changes will be done via WebCampus announcements or e-mail unless already posted on the UNR website or through the UNR campus-wide alert system.
Student Learning Objectives

Core Objective 9 (Science, Technology, & Society): Students will be able to connect science and technology to real-world problems by explaining how science relates to problems of societal concern; be able to distinguish between sound and unsound interpretations of scientific information; employ cogent reasoning methods in their own examinations of problems and issues; understand the applications of science and technology in societal context.

1. Students will have an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. [integrates CO2; CO3]
   a. Students will distinguish between sound and unsound interpretations of scientific information.

2. Students will have 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. [integrates CO11; CO12]
   a. Students will explain how science relates to a problem of societal concern.
   b. Students will employ cogent reasoning methods in their own examinations of problems and issues.
   c. Students will describe how scientific and technological developments affect society and the environment.
   d. Students will integrate, synthesize, and apply knowledge of the relationship between science/technology and societal issues in focused and broad interdisciplinary contexts.
   e. Students will identify the societal impacts of contemporary issues (such as sustainability, energy problems, water quality, and information science).
   f. Students will identify and analyze the scientific debates and ethical concerns.
   g. Students will identify the multiple ethical interests at stake in a real-world situation or practice.
   h. Students will articulate what makes a particular course of action ethically defensible.
   i. Students will assess their own ethical values and the social context of problems.
   j. Students will identify ethical concerns in research including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects.
   k. Students will demonstrate knowledge of ethical values in non-classroom activities: service learning.
   l. Students will integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research.

Core Objective 13 (Integration & Synthesis): Students will be able to integrate and synthesize Core knowledge, enabling them to analyze open-ended problems or complex issues.

3. Students will have 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. [integrates CO1]

4. Students will have an ability to communicate effectively with a range of audiences. [integrates CO1]

5. Students will have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
Semester Project and Course Deliverables
Students will be placed in groups of three or four. They will be responsible for developing a design contest or project for elementary, middle, or high school students to teach them an engineering and scientific principle. As part of the service learning criteria, students are required to visit a K-12 classroom to conduct their project. Students will complete the course in eight phases: document control; proposal; revision; technical briefing; design review; professional development; final exam; self-review.

All material must be in hard copy and typed. All rough drafts must also be in hard copy. When requested, material must be submitted to the TurnItIn function of WebCampus.

Attendance and Late Policies
Attendance is required. If the teaching team is notified via phone or e-mail one week prior (or 24 hours if due to a medically related incident) to an absence, the teaching team will attempt to make reasonable accommodation which may include requiring the student to attend an alternative lab session (no more than two accommodations can be requested). If reasonable accommodations cannot be made, zero points will be awarded for the corresponding assignment. If the absence occurs on a scheduled deadline, no accommodations will be made, and zero points will be awarded for that assignment. Additionally, if there are more than two absences, failure in the course may result.

On-time arrival to class is required. If the teaching team is notified via phone or e-mail one week prior to a late arrival, the teaching team will attempt to make reasonable accommodation which may include requiring the student to attend an alternative lab session (no more than two accommodations can be requested). More than two late arrivals may result in course grade reductions of five points for each subsequent incident.

Leaving class before being dismissed will be documented as an absence and may negate the grades earned for that class period.

Leaving class and returning is considered disruptive and will be documented as unprofessional behavior negating the grades earned for that class period. Excessive disturbances may result in course failure.

Late assignments will not be accepted. Students are encouraged to submit material for major written assignments early. Medical, transportation, work obligation, family obligations, or other excuses will not be accepted for major assignments. Formal, written documentation may be requested before arrangements for accommodations are created.

All major deadlines are defined herein; thus, deadline extensions are not available for any assignment for any reason.

Course Structure and Schedule
ENGR 301 follows a “hybrid structure.” Students are required to watch the assigned videos and learn the material presented in the videos before attending labs and lectures.
The schedule for major due dates is in Table 1. Material is due at the beginning of the registered lab or lecture session unless otherwise specified. Impromptu assignments have various due dates which are not listed; students are required to document impromptu assignment due dates and are held responsible for noting the discussion of those assignments during class. The course website details when the content of the videos is required to be learned. The foyer of SEM 131 is open during normal business hours; students should make plans to pick up and drop off material during operating hours.

Table 1: Students should record and observe all major due dates (no accommodations).

<table>
<thead>
<tr>
<th>Date</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week of Jan. 21 (during lab)</td>
<td>Forms*</td>
</tr>
<tr>
<td>Jan. 30 by 5:00 p.m.</td>
<td>Discrimination/Harassment Training*</td>
</tr>
<tr>
<td>Week of Feb. 11 (lab)</td>
<td>Phase I: Document Control</td>
</tr>
<tr>
<td>Week of Feb. 18 (lab)</td>
<td>Journal Paper Selection Approval Process for Phase IV</td>
</tr>
<tr>
<td>Week of Feb. 25 (lab)</td>
<td>Phase II: Proposal</td>
</tr>
<tr>
<td>Mar. 8 – Apr. 18</td>
<td>K-12 Project** (Field Days – Week of Mar. 11)</td>
</tr>
<tr>
<td>Week of Apr. 1 (lab)</td>
<td>Phase III: Revision</td>
</tr>
<tr>
<td>Week of Apr. 8 (lab)</td>
<td>Phase IV: Technical Briefing</td>
</tr>
<tr>
<td>Week of Apr. 22 (lab)</td>
<td>Phase V: Design Review</td>
</tr>
<tr>
<td>Throughout Term</td>
<td>Phase VI: Professional Development</td>
</tr>
<tr>
<td>Week of Apr. 29 (lab)</td>
<td>Phase VII: Final Exam</td>
</tr>
<tr>
<td>May 10 (no later than 7:10 p.m.)</td>
<td>Phase VIII: Self-Review</td>
</tr>
</tbody>
</table>

*Failure to complete will result in administrative withdrawal from the course.
**Failure to attend the service learning project field day (classroom visit day and time as determined by team and community partner) will result in course failure. There are no exceptions. If medically related, students are encouraged to go to the hospital to obtain proper documentation to seek a medical withdrawal from the course.

Lab Sessions
Students will register for a lab session. The lab section numbers, meeting times, and locations are listed in Table 2. Students must place their section number on all assignments.

Table 2: The lab section numbers are listed. The section number is required on all assignments.

<table>
<thead>
<tr>
<th>Lab Section Number</th>
<th>Meeting Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tuesday 1:30-2:45</td>
<td>OB 101</td>
</tr>
<tr>
<td>2</td>
<td>Tuesday 3:00-4:15</td>
<td>OB 101</td>
</tr>
<tr>
<td>3</td>
<td>Tuesday 4:30-5:45</td>
<td>OB 101</td>
</tr>
<tr>
<td>4</td>
<td>Wednesday 1:00-2:15</td>
<td>OB 101</td>
</tr>
<tr>
<td>5</td>
<td>Wednesday 2:30-3:45</td>
<td>OB 101</td>
</tr>
<tr>
<td>6</td>
<td>Wednesday 4:00-5:15</td>
<td>OB 101</td>
</tr>
<tr>
<td>7</td>
<td>Wednesday 5:30-6:45</td>
<td>OB 101</td>
</tr>
<tr>
<td>9</td>
<td>Thursday 1:30-2:45</td>
<td>OB 101</td>
</tr>
<tr>
<td>10</td>
<td>Thursday 3:00-4:15</td>
<td>OB 101</td>
</tr>
</tbody>
</table>
Grading Criteria

The grading criteria are shown in Table 3. All grade disputes on assignments must be addressed within one week of the assignment being returned; no grade disputes will be accepted after noon on May 8. Grading errors will be corrected; however, unprofessional behavior will not be tolerated and may result in a reduction of the final course grade. Seeking a grade change based on contentions (such as needing a better grade for scholarships) other than a documented error is considered a violation of this policy. The amount of effort and time dedicated to an assignment are invalid contentions for seeking a grade increase. No extra credit is available.

Table 3: The grading criteria illustrate the point-by-point grading system for each assignment.

<table>
<thead>
<tr>
<th>Element</th>
<th>Maximum Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I: Document Control</td>
<td>5.0</td>
</tr>
<tr>
<td>Phase II: Proposal</td>
<td>15.0</td>
</tr>
<tr>
<td>Phase III: Revision</td>
<td>15.0</td>
</tr>
<tr>
<td>Phase IV: Technical Briefing</td>
<td>15.0</td>
</tr>
<tr>
<td>Phase V: Design Review</td>
<td>20.0</td>
</tr>
<tr>
<td>Phase VI: Professional Development</td>
<td>20.0</td>
</tr>
<tr>
<td>Phase VII: Final Exam</td>
<td>5.0</td>
</tr>
<tr>
<td>Phase VIII: Self-Review</td>
<td>5.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Grading Scale

The grading scale is shown in Table 4.

Table 4: A standard grading scale based on 100.0 points is used.

<table>
<thead>
<tr>
<th>Points</th>
<th>Grade Point Average (Letter Grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.0 to 94.0</td>
<td>4.0 (A)</td>
</tr>
<tr>
<td>93.9 to 90.0</td>
<td>3.7 (A-)</td>
</tr>
<tr>
<td>89.9 to 87.0</td>
<td>3.3 (B+)</td>
</tr>
<tr>
<td>86.9 to 84.0</td>
<td>3.0 (B)</td>
</tr>
<tr>
<td>83.9 to 80.0</td>
<td>2.7 (B-)</td>
</tr>
<tr>
<td>79.9 to 77.0</td>
<td>2.3 (C+)</td>
</tr>
<tr>
<td>76.9 to 74.0</td>
<td>2.0 (C)</td>
</tr>
<tr>
<td>73.9 to 70.0</td>
<td>1.7 (C-)</td>
</tr>
<tr>
<td>69.9 to 67.0</td>
<td>1.3 (D+)</td>
</tr>
<tr>
<td>66.9 to 60.0</td>
<td>1.0 (D)</td>
</tr>
<tr>
<td>59.9 to 0.0</td>
<td>0.0 (F)</td>
</tr>
</tbody>
</table>
**Letter Grade Expectations**

In order to communicate the expectations of the class, Table 5 compares the letter grade to the level of achievement required. Grades relate to the objective of creating a globally competitive education.

Table 5: Comparison of letter grade to course requirements communicates expectations.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Expectation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Significantly exceeds minimum requirements in all assignments; demonstrates innovative, creative, and effective content to engage and inspire audiences while being concise and adhering to all requirements; displays advanced understanding of all concepts; masters course content and is able to instruct others on the material; engages in critical thinking; if entering a room anywhere in the world, student will be one of the best speakers and writers in the room.</td>
</tr>
<tr>
<td>B</td>
<td>Exceeds minimum requirements in some areas but not all; effectively uses creativity to develop engaging content while being concise; learns the course content sufficiently enough to develop examples; usually engages in critical thinking; if entering a room anywhere in the world, student will be either one of the best speakers or writers and will show proficiency in the other form.</td>
</tr>
<tr>
<td>C</td>
<td>Uses examples as templates; does not attempt to achieve anything greater than accomplishing the defined task; develops bland or fluffy content; neglects details; learns the course content sufficiently enough to regurgitate; sometimes engages in critical thinking; if entering a room anywhere in the world, student will perform as an average speaker and writer.</td>
</tr>
<tr>
<td>D/F</td>
<td>Does not meet standards.</td>
</tr>
<tr>
<td>+/-</td>
<td>Adjustments to reflect variations within letter grade category.</td>
</tr>
</tbody>
</table>

**Academic Dishonesty:** The University Academic Standards Policy defines academic dishonesty, and mandates specific sanctions for violations. Students are to refer to the University Academic Standards policy: UAM 6,502. Cheating, plagiarism, or otherwise obtaining grades under false pretenses constitute academic dishonesty according to the code of this University. Using material prepared by anyone other than the enrolled student is cheating (e.g., the use of “frat files” is considered cheating). Copying the material of another student is plagiarism. Plagiarism includes copying words, figures, or data from another author (including family members or other students) without properly citing the source or using proper notation and formatting. Failure to attend the classroom visit or team meetings while submitting associated assignments constitutes obtaining grades under false pretenses. Academic dishonesty will not be tolerated, and penalties can include canceling a student's enrollment without a grade, giving an F for the course, or giving an F for the assignment. An objective of this course is to learn professional, ethical, and respectful behavior. Regardless of credit earned on assignments, failure to adhere to the Student Code of Conduct or the learning objectives may result in course failure. The UNR General Catalog details these policies.

**Disability Services:** Any student with a disability needing academic adjustments or accommodations is requested to visit the Disability Resource Center (Pennington Student Achievement Center, Suite 230) as soon as possible to arrange for appropriate accommodations. This course may leverage third party web/multimedia content; if students experience any issues accessing this content, they must notify the instructors.

**Academic Success Services:** Student fees include the usage of the Math Center (784-4433 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring/), and University Writing Center (784-6030 or http://www.unr.edu/writing_center/). These centers support classroom
learning; it is the student’s responsibility to take advantage of their services. Seeking help outside of class is the sign of a responsible and successful student. The University Math Center (UMC) is focused on helping students with mathematical and statistical concepts. While mathematics is used extensively in engineering, the UMC does not have the resources to help students with engineering courses. Engineering students are encouraged to use the UMC for help in their math classes, and they are welcome to use its computer lab and study area any time – regardless of course. However, UMC tutors cannot answer questions regarding engineering courses.

Audio and Video Recording: Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may be given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded. The instructors may record presentations for grading, assessing, and lesson plan usage.

Learning Environment: The University of Nevada, Reno is committed to providing a safe learning and work environment for all. If students believe they have experienced discrimination, sexual harassment, sexual assault, domestic/dating violence, or stalking, whether on or off campus, or need information related to immigration concerns, students should contact the University's Equal Opportunity & Title IX office at 775-784-1547. Resources and interim measures are available to assist students. More information is available on the Equal Opportunity and Title IX page (https://www.unr.edu/equal-opportunity-title-ix).

General Requirements: Office hours and coaching sessions are designed for supplemental instruction and learning. Office hours and coaching sessions are not designed for proofreading, technical edits, personal tutoring, private tutoring, nor “pre-grading.” Advice given is in no way considered complete nor a guarantee of a specific grade. Students should come prepared with specific questions.

Students are expected to behave as professionals both inside and outside of the classroom. Teammates are to be treated professionally and respectfully during all interactions. While in class, students are expected to refrain from cell phone use, playing video games, engaging in side conversations, and other behavior that is disruptive to the learning process. Students are expected to take notes, learn the material, and be prepared for class. Students are expected to manage their time appropriately.

Students are expected to behave professionally while in the foyer of SEM 131 and in the hallway. SEM 131 is a place of business. Students should speak quietly, should not create a congested area, should not use offensive language, should not have “temper tantrums,” and should not ask office staff for office supplies.

Material subject to change.
Student Learning Objectives Related to Accreditation

Student learning objectives (SLOs) are the goals set by the teacher of a course to communicate what students should learn. Accreditation bodies use SLOs to ensure that universities are teaching what is claimed and that students are learning. The programs within the College of Engineering are required to conform to the accreditation requirements of Accreditation Board of Engineering and Technology (ABET) and Northwest Commission on Colleges and Universities. These entities, along with the University of Nevada, Reno Silver Core Curriculum Board, have defined specific SLOs. ENGR 301 is designed as a Core Capstone class. As a Core Capstone, the course must integrate specific Core Objectives (CO). The following will detail the SLOs, their relationship to the COs, and how the lesson plans address the SLOs.

Silver Core SLOs Relevant to ENGR 301

CO1: (Effective Composition & Communications) Students will be able to effectively compose written, oral, and multimedia texts for a variety of scholarly, professional, and creative purposes.

CO2: (Quantitative Reasoning) Students will be able to apply quantitative reasoning and mathematical analysis methodologies to understand and solve problems.

CO3: (Critical Analysis & Use of Information) Students will be critical consumers of information, able to engage in systematic research processes, frame questions, read critically, and apply observational and experimental approaches to obtain information.

CO9: (Science, Technology, & Society) Students will be able to connect science and technology to real-world problems by explaining how science relates to problems of societal concern; be able to distinguish between sound and unsound interpretations of scientific information; employ cogent reasoning methods in their own examinations of problems and issues; and understand the applications of science and technology in societal context.

CO11: (Global Context) Students will apply and evaluate modes of academic inquiry, creative expression, or results of research to problems in historical and contemporary global contexts. Students will articulate connections among local, national, and international contexts and evaluate the ways that historical and contemporary global influences affect their current situations.

CO12: (Ethics) Students will demonstrate understanding of the ethical principles in general or in application of specialized knowledge, results of research, creative expression, or design processes. Students will demonstrate an ability to recognize, articulate, and apply ethical principles in various academic, professional, social, or personal contexts.

CO13: (Integration & Synthesis) Students will be able to integrate and synthesize Core knowledge, enabling them to analyze open-ended problems or complex issues.
ABET Criteria Relevant to ENGR 301

3. Students will have an ability to communicate effectively with a range of audiences.
4. Students will have 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. Students will have 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. Students will have an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Students will have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Student Learning Objectives (SLOs) for ENGR 301

The Student Learning Objectives for ENGR 301 are detailed on Page 2.

Lesson Plans as Related to Student Learning Objectives

Introduction [CO1; CO9; CO13; ABET 4 & 7; SLO 2 & 5]
Students learn about the course syllabus and classroom management policies. Professional decorum (such as “no call, no show is grounds for termination”) is related between class policies and societal expectation of behavior. Students learn that the skills that they have obtained will be further developed, integrated, and synthesized.

Project Discussion, Grammar, and Writing Skills [CO1; CO12; CO13; ABET 3 & 4; SLO 2, & 4]
Students learn to reduce common grammatical errors which includes real-life examples and a review of the course grading rubric. Students learn the unique characteristics of writing technical content and using technical writing practices (such as “de-fluffing” their writing to be clear, precise, and concise). Students learn best practices for readability and techniques to ensure that both technical and non-technical audiences can easily read and comprehend their writing. Previously developed core skills are integrated. Students learn to identify ethical concerns in research including academic integrity, use and citation of sources, and the objective presentation of data.

Networking [CO1; CO9; CO13; ABET 3, 4, 5, & 7; SLO 2, 3, 4, & 5]
Students learn techniques to “break the ice” in a variety of situations. The goal is to establish both a technical and personal connection in order to develop trusting and understanding relationships with members in society. The students learn techniques to discuss highly technical and scientific concepts in relatable ways. Previously developed core skills are integrated.

Speaking Skills [CO1; ABET 3; SLO 4]
Students learn the elements of general speaking and presentation skills: professional attire (expectations for engineers and scientists conducting business within society); poise and posture (to illustrate confidence in material being presented and gain trust with audience); pace, tone, and articulation (to
ensure high energy and enthusiastic style; techniques to ensure coherency and understanding when delivering highly technical content to diverse audiences.

_Visual Aids [CO1; ABET 3; SLO 4]_

Students learn how to create high quality and effective visual aids. Students learn proper techniques for communicating data via graphs, figures, and tables in presentations to more effectively transmit the technical information to diverse audiences. Students also learn techniques of how to interpret data from graphs, figures, and tables. Students learn templates and techniques to organize their presentations coherently and effectively to best deliver technical content.

_Audience Skills [CO1; CO9; CO13; ABET 3 & 5; SLO 3 & 4]_

Students take a test to determine what their learning style is. Then, students are separated so that they can all see that there are diverse learning styles, and the students learn that it is necessary to diversify one’s presentation to accommodate all learning styles. This lesson illustrates how to communicate science and technology to all of society. Previously developed core skills are integrated.

_Technical Briefings [CO1; CO3; CO9; CO11; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]_

Students are assigned to create a two-minute “elevator” presentation and a written report to communicate a critique of an engineering journal paper. The students are challenged to research that topic and relate its impact in a global, economic, environmental, and societal context. Audience members are held accountable to pay attention to each presentation so that they are exposed to a wide variety of topics. Because the course is multidisciplinary, students learn about several topics. Further, the students make connections from previous coursework.

_Grammar Review [CO1; ABET 3; SLO 4]_

Students are held accountable for having learned from the grammar workshop. Students engage in taking an individual quiz.

_Proposal Skills [CO1; CO2; CO3; CO9; CO11; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]_

The semester project is introduced. Students are assigned to develop a design project to teach K-12 students an engineering or scientific principle. The students then engage in researching the educational system in the U.S. They compare the education of STEM globally. In their research, they distinguish between sound and unsound interpretations of the data; students synthesize and analyze the data. They also have to develop their own problem statement, conduct research as to how others have addressed improving STEM education, and must apply their knowledge. As part of the service learning aspect of the course, the students visit a K-12 classroom and conduct the design project with those K-12 students. Students learn how to develop a problem statement, craft a design concept, perform a literature search, and develop an evaluation plan. In performing a literature search, students understand the interaction among different disciplinary fields.

_Team Building [CO1; CO9; CO11; CO12; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]_

Students learn the stages of teams, how to resolve conflict, work with different personality types, understand why and how a team achieves its objectives, know how to start a team, use tools like decision
matrices, and recognize pitfalls in the team process. Additionally, students develop an understanding of the importance of teams in the scientific and engineering community. They learn how to work with non-scientists on their teams and how to relate content to them. Students learn how to interact in a global context by learning different cultures, ethical considerations, and work styles.

Document Control [CO1; CO12; CO13; ABET 3 & 5; SLO 2, 3, & 4]
Students are instructed to draft a team charter which details the rules and consequences for poor team behavior. For example, if a student is late to a team meeting, that student must bring donuts for the teammates. The development and enforcement of the team charter relates the need to communicate professional decorum, ethical requirements, and expectations for all team members (those that are in scientific fields and those that are not). By interacting with their peers, the students learn to critically examine their own worldview and ethical values and how it interacts and impacts others. Students engage in multiple project management strategies including the development and use of decision matrices, Gantt charts, and role statements.

Brainstorming [CO1; CO9; CO13; ABET 3 & 7; SLO 4 & 5]
Students are asked to learn new directions. Then, they are quizzed on it. The exercise illustrates that preconceived notions are detrimental to the brainstorming process. Rules to help with the brainstorming process are then given. Brainstorming is a common practice for problem solving in society. Students learn these techniques so that they can properly communicate in a diverse workplace. Students also learn the benefit of using brainstorming to employ cogent reasoning methods in their own examinations of problems and issues. Students develop their ability to synthesize concepts and to critically examine their own perspective and how it impacts others.

Effective Meetings [CO1; ABET 3, 4, & 7; SLO 2, 3, & 5]
Students read a few scripts of bad meetings. They are then taught tools and techniques as well as their own responsibilities in a meeting to make it effective. Students learn the five pre-meeting questions to answer before calling a meeting: why should we have this meeting; what should we do; who really needs to be there; when will this take place; where is the meeting? Students apply these questions to the development of an objective and an agenda. Next, students learn the main pitfalls of meetings: aggression, repression, and tangents. They learn techniques to address these common conflicts in order to reunite the participants, keep the group moving forward, and refocus the group. Contemporary techniques for meetings are also explored. For example, students learn how to meet in non-face-to-face situations using tools like Skype, FaceTime, conference calls, online chats, and database sharing software.

Listening [CO1; ABET 3; SLO 4]
Students learn techniques to eliminate poor listening habits. The students learn the need to show that they are actively listening and not passively hearing.

Questioning Skills [CO1; CO3; ABET 3; SLO 4]
Students learn how to answer questions and how to ask effective questions. Students learn how to properly host a questions and answer session including how to control hecklers and deal with difficult
situations. Students also learn that the way they ask the question is directly related to the answer that is received. Students learn how to ask strategic, creative, and open-ended questions.

*Questions [CO1; CO3; CO9; CO13; ABET 3, 4, & 7; SLO 2, 4, & 5]*

Students are asked to define complex vocabulary into non-technical language.

*Confetti Factory [CO1; CO9; CO12; CO13; ABET 3, 4, 5 & 7; SLO 3 & 4]*

Students are assigned a role that stereotypes typical corporate situations (such as a CEO that travels the majority of the time, a co-worker with poor communications skills, a micro-manager, a tyrant boss, a sleeping co-worker, etc.). The students are then challenged to produce confetti while playing the role to which they were assigned. A discussion on how each personality type or situational circumstance contributed to the destruction of the corporation ensues. The students learn techniques to prevent or to resolve such situations. The case study format allows students to apply theories from a variety of disciplines. Further, the format allows students to identify the multiple ethical interests at stake in a real-world situation.

*Pause [CO1; CO9; CO13; ABET 3 & 7; SLO 4]*

Students learn techniques to reduce their number of fillers, how to recover if material is forgotten, and proper presentation techniques.

*Team Presentation Skills [CO1; CO13; ABET 3 & 5; SLO 3 & 5]*

Students learn the special considerations that are needed to have an effective team presentation.

*Peer Edit Proposals [CO1; CO2; CO3; CO9; CO13; ABET 3, 4, 5, 6 & 7; SLO 1, 2, 3, 4, & 5]*

Rough drafts of the students' written reports are due, and a peer edit session is hosted. The peer editing allows both for the review of grammar and format as well as the review of content. Reviewing the content of a peer's work exposes the student again to the lessons addressed in “Proposal Skills.” Specifically, students learn how to distinguish between sound and unsound interpretations of scientific information as they review their peers’ conclusions. Students critically examine their peers’ work, and by identifying gaps in their peers’ work, the students show insight and gain new knowledge.

*Proposal Presentations [CO1; CO2; CO3; CO9; CO11; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]*

Teams deliver their presentation. In order to keep audience members engaged, peer editors are responsible for asking their partner a question. It also ensures that each presenter receives a question and is able to practice that skill. The lessons of “Proposal Skills” are again re-enforced. Additionally, students are further exposed to the content developed by their peers as they learn more about connecting science and technology to real-world problems by learning how their peers relate science to problems of societal concern. They can compare their peers’ reasoning methods to their own in the examinations of problems and issues. Finally, students understand the applications of science and technology in societal context by being exposed to and engaged with diverse perspectives of their peers.
Design Review Skills [CO1; CO2; CO3; CO9; CO11; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]
Students learn the requirements for the Design Review assignments. As part of the service learning aspect of the course, the students visit a K-12 classroom and conduct the design project with those K-12 students. The UNR students learn how to setup methods to evaluate their performance. The students then synthesize the experience and report their findings. By performing the service learning aspect, students directly observe how science and technology influence society. The assignment requires that students identify and summarize current scholarly conversations within their engineering field, in business, and in education.

Lab Reports & Documentation [CO1; CO2; CO3; CO9; CO12; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]
Students learn the aspects of doing documentation versus lab reports. Students learn to develop an abstract, criteria, testing procedure, observations, analysis, error analysis, and recommendations. Students learn both the legal and ethical implication of poor or inaccurate documentation. Students learn to identify ethical concerns in research by understanding the objective presentation of data. A game of Clue is played in which each student has a different clue/piece of data and must all eventually work together to solve the case. The game simulates and allows students to practice the ability to distinguish between sound and unsound interpretations of scientific information and employ cogent reasoning methods in their own examinations of problems and issues.

Experimental Design [CO1; CO2; CO3; CO9; CO12; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]
The steps to design an experiment are illustrated in connection to the semester project. Students learn how apply knowledge of the relationship between science and technology and societal issues in a broad interdisciplinary context. Specifically, the students learn how to design an experiment to assess their own performance in teaching K-12 students the principles of science, technology, and engineering. The students learn the techniques of using surveys and interviews to analyze how science, technology, and engineering affect society. The students also learn the ethical requirements to design experiments including not manipulating data and special considerations when working with human subjects.

Marketing [CO1; CO2; CO3; CO9; CO11; CO13; ABET 3, 4, 5, 6, & 7; SLO 2, 3, 4, & 5]
Students learn marketing techniques by using group discussion and exercises. The students learn how science and technology are communicated and “sold” to society. They also learn the ethical and legal implications of miscommunicating the details or misdirecting the public in advertisements. Students learn that an important aspect of properly marketing products and services is to articulate ways in which society can be transformed by that product or service of science and technology. Students engage in case studies where they learn about elements of technology that have changed cultures. International markets are also compared. Students also learn how to create a SWOT analysis and use it to define strategies.

Budgets [CO1; CO2; CO3; CO9; CO12; CO13; ABET 3, 4, 5, & 7; SLO 2, 3, 4, & 5]
Students learn how to present budgets. They also learn how budgets impact the amount of service and safety they can deliver. Misappropriated budgets can lead to significant societal impacts. Students engage in case studies which show how when scientists and engineers make budget errors, the quality of projects
can suffer (for example, if the amount of concrete is underestimated, the roadway could become unsafe). A discussion regarding the ethical and legal impact of underestimating or overestimating budgets ensues.

**Instruction Manuals** [CO1; CO3; CO9; CO13; ABET 3, 4, 5, & 7; SLO 2, 3, 4, & 5]
Students create a design and an instruction manual. The students learn how their scientific decisions can impact their audience.

**Team Communication** [CO1; CO2; CO3; CO9; CO11; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]
Students are held accountable for learning all aspects of the proposal and final review assignments. The lesson teaches the need to understand the project as a whole and how all the pieces fit together. The students also practice advanced presentation skills.

**Legal & Security** [CO1; CO3; CO9; CO11; CO12; CO13; ABET 3, 4, 5, & 7; SLO 2, 3, 4, & 5]
Students learn how science, technology, and engineering have impacted legal and security issues. Additionally, students learn how legal and security issues have impacted science, technology, and engineering. These legal issues are related to the impact on society as a whole. Students learn how to conduct a case law analysis on science, technology, and engineering related court cases to learn how court decisions have impacted society. Students learn about manufacturing and design liability. They also learn the elements of contracts. Students learn case scenarios in which product safety was not held to the highest standards and resulted in deaths and injury. Legal and ethical considerations as they affect society are reviewed. International laws and ethics are also discussed. Students learn how to articulate what makes a particular course of action ethically and legally defensible.

**Field Day** [CO1; CO2; CO3; CO9; CO11; CO12; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]
Students visit K-12 classrooms to try out their newly designed projects which teach engineering, technology, and scientific principles. Students are also instructed to encourage the K-12 students into pursuing STEM related fields by illustrating how STEM affects society. The cliché that “to master something, one must teach it” is utilized in the assignment. The students learn and teach how and why science, technology, and engineering affect society. (Note: K-12 Outreach Section further details components.)

**Resumes and Interviews** [CO1; ABET 3 & 7; SLO 4 & 5]
A resume workshop is conducted where students bring in a rough draft of their resume and make corrections. Interview techniques are also reviewed. Students learn how to properly communicate their skills.

**Non-verbal Communication & Impromptu Body Language** [CO1; ABET 3 & 7; SLO 4 & 5]
Students watch a series of videos to learn what experts have to say about non-verbal communication (aka, body language). The videos include an analysis of politicians and how their body language is analyzed. Videos also show the differences in cultures throughout the world. Then, the students get experience by playing a game of charades where the whole audience tries to guess ridiculous phrases with pop culture content.
Ethics Introduction [CO11; CO12; ABET 4; SLO 2]
The National Society of Professional Engineers’ Fundamental Canons of the Code of Ethics is introduced to the students. The students learn how to apply case scenarios to the Canons. The students engage in several case studies which illustrate how not applying the Code of Ethics in engineering, scientific, and technology decisions has caused devastating results in society. The students learn that as engineers, their number one obligation is to protect the health, safety, and welfare of society. Ethics is also reviewed in a global context. Students learn how to identify and analyze an ethical issue, to identify the multiple ethical interests at stake in a real-world situation, and to articulate what makes a particular course of action ethically defensible.

Peer Edit Design Reviews [CO1; CO2; CO3; CO9; CO11; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]
Rough drafts of their written reports are due, and a peer edit session is hosted. The peer editing allows both for the review of grammar and format as well as the review of content. Reviewing the content of a peer’s work exposes the student again to the lessons addressed in “Design Review Skills.” Specifically, students learn how to distinguish between sound and unsound interpretations of scientific information as they review their peers’ conclusions.

Design Review Presentations [CO1; CO2; CO3; CO9; CO11; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]
Team deliver their presentation. In order to keep audience members engaged, peer editors are responsible for asking their partner a question. It also ensures that each presenter receives a question and is able to practice that skill. The lessons of “Proposal Skills” are again re-enforced. The UNR students are able to compare how they setup methods to evaluate their performance versus how their peers’ approached the same problem. The students are exposed to the different techniques that their peers used to synthesize the experience and report their findings. Finally, the students are exposed to how their peers analyzed how science and technology influence society.

Etiquette [CO1; CO11; CO9; CO12; CO13; ABET 3, 4, & 5; SLO 2, 3, & 4]
Basic business etiquette is reviewed. Common questions about business lunches, political correctness, and international travel are addressed. Students learn how to respectfully communicate the principles of science, technology, and engineering by embracing differences in culture and ethics. For example, students learn that in some cultures, working with religious and non-scientific leaders is of vital importance to bring in products and services.

Idol [CO1; CO2; CO3; CO9; CO11; CO12; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]
Modelled after “American Idol,” the students prepare a two-minute speech about a contemporary engineering, technology, or science topic. The students must identify a contemporary issue, develop a problem statement, illustrate the impact on society, and develop recommendations to solve the issue while giving consideration to the legal and ethical impact of the solution. Immediately after the speech, the instructor gives feedback. At the end, the whole class votes for whom their Idol is. This technique is used to ensure that the entire audience is actively engaged in listening and learning about all of these issues and impacts.
Career Panel [CO13; ABET 7; SLO 4 & 5]
Alumni from the class are invited back to talk about their first few years of employment or graduate school. The students are allowed to ask whatever questions that they would like.

Ethics [CO1; CO12; CO13; ABET 3, 4, & 5; SLO 2, 3, & 4]
Case study and scenario questions relate engineering, technology, and science to impacting society. By analyzing these case studies, students apply ethical theories to their field of study. Discussion for each question ensures that students assess their own ethical values in a societal context and compare their views with their colleagues and the Code of Ethics.

Professional Development [CO1; CO9; CO13; ABET 3, 4, 5, 6, & 7; SLO 5]
Students engage in acquiring knowledge and using appropriate learning strategies as they are required to participate in in-class activities. Students engage in self-reviews of the presentation and a reflection on their course knowledge. They give impromptu speeches regarding a topic learned in the course. The technique allows for instantaneous grading. The students also prepare a written assignments.

K-12 Outreach – Service Learning Component [CO1; CO2; CO3; CO9; CO11; CO12; CO13; ABET 3, 4, 5, 6, & 7; SLO 1, 2, 3, 4, & 5]
In order to assist the strategic plan of K-12 Outreach, the course project is based on service learning. In ENGR 301, each student team must develop a hands-on project which teaches an engineering principle. Then, the student teams go to K-12 classrooms to conduct their projects with those students. The service learning component requires students to demonstrate knowledge of ethical values in non-classroom settings as the students must convey their obligations to serve society, ensure the safety of the K-12 students, and educate the K-12 students on how to responsibly apply scientific knowledge.

Unwritten Laws of Engineering
In 1944, W. J. King published, “The Unwritten Laws of Engineering,” in the Mechanical Engineering Magazine. Students are encouraged to purchase a revised version available at the following website: https://www.asme.org/products/books/unwritten-laws-revised-and-updated. Many of the principles along with course specific policies are taught throughout the course to assist students in developing their professional persona. The teaching team is dedicated to ensuring that all students are engaged in a positive learning environment. As such, the teaching team tries to act in a “coaching” capacity as well as in a “supervisory” role. As such, the teaching team will require students to behave in a professional manner. Students may disagree with the policies of the course and the “Unwritten Laws”; however, it is the duty of the teaching team to ensure that the students understand the learning objectives and adhere to the course policies. Thus, when the disagreements change from opinion to negative or disrespectful action, consequences related to the course grade may occur. In some cases, misconduct charges may be filed with the University. The following “Unwritten Laws” are written and documented for the purpose of preventative measures, communicating expectations, and explaining why some of the “Unwritten Laws” exist. Mr. King’s Laws are italicized with commentary about how each applies to class:

1. However menial and trivial your early assignments may appear, give them your best efforts. The course engages in development curriculum. Development curriculum is where assignments (big
and small) help to advance skills and build upon the previous lessons. When assignments or lessons are dismissed, the successful completion of future assignments will be impacted.

2. **Demonstrate the ability to get things done: initiative, resourcefulness, ingenuity, persistence, and tenacity.** Modern resources such as the internet, smartphones, and computers are excellent tools that provide instant information, but they are not substitutes for actively engaging and learning the course material. Time and effort along with innovation, creativity, efficiency, accuracy, and attention to detail are all needed to successfully complete assignments.

3. **Strive for conciseness and clarity in oral or written reports; be extremely careful of the accuracy of your statements.** Engineers are held to high standards of accuracy in all work, discussions, and statements. All of which should be well supported with data and research. Care to select credible resources and references is also necessary. For example, open sourced sites like Wikipedia, blogs, opinion pieces, and many news articles are not reliable sources. The internet provides thousands of pages to support any opinion that anyone has. However, those pages may not be peer reviewed by experts in the field or supported by actual facts. Engineers must learn to distinguish between fact and opinion.

4. **One of the first things you owe your supervisor is to keep him/her informed of all significant developments.** Similar to a supervisor, the teaching team wants all students to be successful. As such, when problems arise, students must inform the teaching team. The teaching team will make all efforts to resolve the situation. If the issue is hidden from the teaching team, severe consequences may occur.

5. **Do not overlook the steadfast truth that your direct supervisor is your "boss" and has earned that position.** All students have excellent skills and accomplishments. The entire teaching team does as well. Students are expected to be respectful to the teaching team. The material taught within the course has been well researched, is peer-reviewed by panels of experts, and is award winning.

6. **Be as particular as you can in the selection of your mentor.** Many cultural elements such as TV shows and movies create the image that being "cool" equates to being rude and mean. These fictional characters should not be considered role models. Students are expected to be professional and respectful in all interactions with their peers and the teaching team.

7. **Cultivate the habit of seeking other peoples’ opinions and recommendations.** Students will engage in peer editing sessions to receive recommendations from their colleagues. Students are also encouraged to use the Writing Center, use grammar editing software, and meet with the teaching team for supplemental help and learning.

8. **Promises, schedules, and estimates are necessary and important instruments in a well-ordered business.** The teaching team does not engage in micro-managing. Students are expected to create their own schedules to accomplish assignments. The teaching team is not responsible for reminding students to be prepared for deadlines.

9. **In dealing with customers and outsiders, remember that you represent your company, ostensibly with full responsibility and authority.** When working with the K-12 students, the UNR students are expected to adhere to the County and School policies and represent UNR in a professional and respectful manner. Further, students are expected to conduct themselves professionally both inside and outside of the classroom. Students are to be professional and respectful while in the foyer of SEM 131.

10. **One of the most valuable personal traits is the ability to get along with all kinds of people.** All students will be working in multi-disciplinary teams. On-task conversations are expected to be
respectful and professional. Off-task conversations are discouraged and should be separated from team meetings.

11. *Never underestimate the extent of your professional responsibility and personal liability.* Students will be held to high standards in order to ensure a globally competitive education. Lackadaisical efforts or the excuse of ignorance will not be rewarded.

12. *Let ethical behavior govern your actions.* The University’s student conduct policies are strictly enforced.

13. *Be aware of the effect that your personal appearance and behavior have on others and, in turn, on you.* While many try to deny that appearance is a factor, branding and image communicate messages.

14. *Maintain your employability.* Whether going into industry or academia, students should seek to learn and not “just get through it.” Engineers must engage in professional development and embrace life-long learning.

**Folders and Feedback**

Portfolios are prepared for each student. The folders are designed to return material to students. The cabinet containing the folders is located in SEM 131. Upon entering the foyer, the cabinet is located by turning right and looking right (south end of foyer). Students are welcome to take the material out of their individual folders, but folders must remain in the cabinet. Students who choose not to have their folders in the cabinet must make appointments to retrieve and drop-off their folders. Listed are a few methods to help ensure efficient grading and feedback.

1. Students must include their names as well as their section and team numbers on all material. (With hundreds of students, these details ensure material is not misplaced.)
2. Presentation slides must be in handout format with six slides per page. The slides should also have names, section, and team number on the first slide.
3. All assignments and documentation unless otherwise specified must be typed and in hard copy.
4. All instructions should be read and followed. Students are held responsible for knowing submittal instructions.
5. Feedback is given on the submitted, hard copy and the associated rubrics. Feedback is not given through WebCampus.
6. WebCampus is only used for the posting of grades and to submit material to TurnItIn.
7. For submissions into the team binder, no bindings (such as staples) are needed; otherwise, staples may be used for binding submitted documents.

**Grammar Basics**

Language and grammar are constantly evolving and changing. Students are encouraged to engage in continuous education in the English language. Grammar Basics reflects recent modifications and updates from the Modern Language Association, reminders of how to address common errors, common practices in the business and engineering fields, and a foundation for the objective grading of written work. Students are reminded to always check with the publishing editor, supervisor, client, or vendor for grammar and language requirements. For ENGR 301, Grammar Basics serves as the authority on requirements, and students are held to the listed standards.
Subject / Verb Agreement
The subject and verb must agree in number.

- A singular subject needs a singular verb while a plural subject needs a plural verb.
  - We are trying a new approach.
  - I am trying a new approach.
- Ignore phrases and clauses that separate a subject from the verb.
  - The computers in the box are fragile.
  - The director, along with the customers, is at the meeting.
- If multiple subjects are joined with or, use a singular verb. When the subjects have different numbers, make the verb agree with whichever is closest (hint: singular first, it sounds better).
  - The engineers or the manufacturer drafts the changes.
  - The manufacturer or the engineers draft the changes.
- A singular verb should be used after each, everyone, everybody, nobody, somebody, every, one, another, and much.
  - Every engineer is required to be on time.
- A plural verb should be used after both, few, many, others, and several.
  - Several were upset with the new policy.
- If a group is acting as unit, a singular verb is used. If the members of the group are acting separately, a plural verb should be used.
  - The Board of Directors has the final vote.
  - The board members were not in agreement.

Noun / Pronoun Agreement
In technical writing, the first person (I, me, my, mine, myself, we, us, our, ours, and ourselves) must be avoided. Third person is acceptable. Addressing the reader (second person: you, your, yours, and yourselves) must be avoided. Table 6 illustrates the pronoun cases and first, second, or third person.

<table>
<thead>
<tr>
<th>Case</th>
<th>First</th>
<th>Third</th>
<th>Third</th>
<th>First</th>
<th>Third</th>
<th>Relative</th>
<th>Second</th>
<th>Generic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>I</td>
<td>he</td>
<td>she</td>
<td>we</td>
<td>they</td>
<td>who</td>
<td>you</td>
<td>it</td>
</tr>
<tr>
<td>Objective</td>
<td>me</td>
<td>him</td>
<td>her</td>
<td>us</td>
<td>them</td>
<td>whom</td>
<td>you</td>
<td>it</td>
</tr>
<tr>
<td>Possessive</td>
<td>my</td>
<td>his</td>
<td>hers</td>
<td>our</td>
<td>ours</td>
<td>their</td>
<td>whose</td>
<td>your</td>
</tr>
<tr>
<td>Reflexive</td>
<td>myself</td>
<td>himself</td>
<td>herself</td>
<td>ourselves</td>
<td>themselves</td>
<td>yourselves</td>
<td>itself</td>
<td></td>
</tr>
</tbody>
</table>

- If I, he, she, we, or they can be exchanged, use who or whoever.
  - Who was chosen? (He was chosen.)
- If me, him, her, us, or them can be exchanged, use whom or whomever.
  - Whom did you ask? (I asked him.)
- Pluralize to avoid gender issues.
  - Each engineer must meet with his interns.
  - Engineers must meet with their interns.
- Reflexive tense appears if the subject is mirrored in the sentence.
  - You must see it for yourself.
The subject and pronoun must agree in number.
- A singular subject needs a singular pronoun while a plural subject needs a plural pronoun.
  - Correct: The student must submit his work. [singular subject; singular pronoun]
  - Correct: The students must submit their work. [plural subject; plural pronoun]
  - Incorrect: The student must submit their work. [singular subject; plural pronoun]

Passive versus Active Voice
There are disadvantages and advantages. Disadvantages of using the passive voice are that it is wordy, confuses the meaning, hides the doer, and is boring. Advantages of using the passive voice are that the doer does not have to be known, the doer is unimportant, and it tends to be more tactful. While engineers seek to de-humanize the work, active voice should be used whenever possible; however, technical writers are careful to avoid using the first and second person pronouns.
- Passive voice is when the verb contains a derivation of “to be.”
  - Passive: The results were presented by the manager.
  - Active: The manager presented the results.
- Passive voice is when the main verb is written in the past form.
  - Passive: It was recommended to accept the proposal.
  - Active: The manager recommends the acceptance of the proposal.
- The sentence often contains a prepositional phrase beginning with “by.”
  - Passive: The results were presented by Lilly.
  - Active: Lilly presented the results.

Punctuation

Quotation Marks
- Use quotation marks when the exact words of the speaker are used.
  - Dr. Joe said, “The exam is tomorrow.”
- Use quotation marks when words or phrases are being used as expressions.
  - Mark the envelope “Confidential.”
- Periods and commas always go inside the quotation marks. Colons and semicolons always go outside of the quotation marks. Question marks and exclamation points can go either place.
  - The speaker asked, “How many people like Six Sigma?”
  - When will the speaker stop saying “um”?

Commas
- Use a comma where there is a list of three or more items. Do not use a comma if there are only two items.
  - The dog, cat, and bird ran.
  - The cat ran and jumped.
- Use a comma in a sentence where two complete thoughts are used and separated by and, or, but, for, nor, so, or yet.
  - The scientists found the results, but the engineer disagreed.
- Use a comma to set off an introductory dependent clause.
  - Because the results were wrong, the project was rejected.
- Use a comma to set off parenthetical information.
  - Dr. Joe, the professor, was late to class.
• Use a comma between consecutive adjectives where the *and* is eliminated.
  o It is difficult to go to class on a clear, sunny day.
• Use a comma if addressing someone by name.
  o Be sure to lock the door, John, before you leave.
• Use a comma to separate the year from the day, but a comma is not used to separate the year from the month.
  o December 30, 2019
  o December 2019

Semicolons
• Use a semicolon instead of a coordinating conjunction (*and, or, but, for, nor, so, or yet*).
  o The scientist found the results; the engineer disagreed.
• Use a semicolon when two independent clauses are joined by a transition expression (however, furthermore, therefore, accordingly, etc.).
  o The scientist found the results; however, the engineer disagreed.

Colons
• Use a colon after a salutation in a business letter.
  o Dear Dr. Joe:
• Use a colon to separate a title from a subtitle or hours and minutes.
  o *Grammar for Engineers: A Complete Guide*
  o 1:10
• Use a colon to represent to word “to” in a ratio.
  o 5:1
• Use a colon for a long list.
  o The part list includes the following items: speakers, CD player, keyboard, mouse, and monitor.

Dashes
• Use a dash to indicate emphasis.
  o We should diagnose—before calling maintenance—the problem.

Parentheses
• Use parentheses to de-emphasize information.
  o The managers (all engineers) were successful in winning the proposal.

Apostrophes
• Use apostrophes to show possession.
  o Woman’s, women’s
• Apostrophes can be used for contractions; however, in technical writing, contractions are not allowed.
• Use an apostrophe to form a plural if the omission of it would be confusing.
  o Instead of “dotting the is,” it would be “dotting the i’s.”
Hyphens

- Use hyphens when a compound noun does not have a noun as one of its elements (two-by-four), ends with a prepositional phrase (jack-of-all-trades), has a single letter in front of it (x-ray or e-mail), and when two nouns signify one thing (editor-publisher).

Capitalization

- Capitalize all official titles of honor and respect when they precede personal names. Do not capitalize the title if the name follows it or is set off by commas.
  - President Joe
  - Joe, the president, is over there.
- Capitalize the first, last, and all principal words of books, plays, and television programs. Articles, conjunctions, and short prepositions (fewer than five letters) are not capitalized; unless, they are at the beginning of the title.
  - Fiddler on the Roof
  - Going Through Changes
- Capitalize the full and shortened names of government agencies, departments, etc.
  - Please contact the Department of Defense.
- Capitalize all academic degrees that follow a name, whether they are abbreviated or written out.
  - Joe Bob, Ph.D.
- Capitalize all academic and religious titles such as doctor, professor, dean, and bishop when they precede a name, but do not capitalize them if they stand alone.
  - Doctor Joe is over there.
  - The doctor will be here in five minutes.
- Capitalize trade names.
  - Post-it notes
- Capitalize official names of buildings, streets, and other public places.
  - The Palmer Engineering building is on Record Street.
- Do not capitalize seasons or time (a.m. or p.m.).
- Always capitalize the following:
  - Days of the week, months, holidays, periods (events in history), special events, official documents, formal epithets, geographical names, sections of a country, landforms, bodies of water, and public places.

Misused Words

Affect / Effect

- Affect: to influence, to change
- Effect: impression, results

Imply / Infer

- Imply: to throw out a hint or suggestion
- Infer: to take in a hint or suggestion

Among / Between

- Among: used for more than two things
- Between: used for only two things

Less / Fewer

- Less: used for quantities
- Fewer: used for individual units, numbers

Farther / Further

- Farther: physical measure of distance
- Further: degree or extent

Principal / Principle

- Principal: main (person)
- Principle: a theory, idea, or law
Common Errors
[Soskey, G. “Grammar Police: 25 of the Most Common Grammatical Errors We All Need to Stop Making.” HubSpot, 2015.]

1) They’re vs. Their vs. There
“They’re” is a contraction for "they are"; “their” refers to something owned by a group; “there” refers to a place.

2) Your vs. You’re
The difference between these two is owning something (your) versus actually being something (you’re; which is a contraction for you are).

3) Its vs. It’s
"Its" is possessive and "it’s" is a contraction of "it is."

4) Dangling Modifiers
This mistake happens when a descriptive phrase does not apply to the noun that immediately follows it.

5) i.e. vs. e.g.
Lots of people use the terms interchangeably when trying to elaborate on a point, but they really mean two different things: "i.e."
roughly means "that is" or "in other words," while "e.g."
means "example given" or "for example."

6) Peek vs. Peak vs. Pique
• Peek is taking a quick look at something -- like a sneak peek of a new film.
• Peak is a sharp point -- like the peak of a mountain.
• Pique means to provoke or instigate -- like pique interest.

7) Assure vs. Ensure vs. Insure
All of these words have to do with "making an outcome sure," which is why they are so often mixed up. However, they are not interchangeable.
• "To assure" means to promise or say with confidence. For example, "I assure you that he is good at his job."
• "To ensure" means to make certain. For example, "Ensure you are free when I visit next weekend."
• "To insure" means to protect against risk by regularly paying an insurance company. For example, "I insure my car because the law requires it."

8) En Dash vs. Em Dash
Both "—" and "—" are versions of the dash: "—" is the en dash, and "—" or "--" are both versions of the em dash. Either the en dash or the em dash to signify a break in a sentence or set off parenthetical statements. The em dash can also be used to represent time spans or differentiation, such as, "That will take 5–10 minutes." The en dash, on the other hand, can be used to set off quotation sources, such as, ""To be, or not to be, that is the question." —Shakespeare."
Numbers
Basic Rule: Numbers from zero to ten are expressed as words. Numbers from 11 and above are expressed as figures (the digit format).

Express as Words
- If the number begins a sentence.
- If two numbers are being used together (use smaller of two)
  - Two 3-pocket file folders
- For approximations
  - About a thousand
- If using ordinals
  - The eleventh person
- If the word “o’clock” is understood
  - It is five.

Express as Figures (Digit Format)
- For dates and times
- If the number follows a noun such as page, chapter, etc.
- If a unit follows the number

Consistency with Numbers
For example, “two-by-four inch piece of wood” and “2 in. x 4 in. wood” are correct, but those methods cannot be mixed together. For example, “2 by 4 inches” is incorrect. Units are always abbreviated and separated by the number with a space. It is 5 m long. Units should always be given in the SI terms. If there is a reason for choosing unusual SI units because they make sense when they are in U.S. units, that detail should be noted. For example, “a piece of wood with the dimensions of 5.08 cm x 10.16 cm (2 in. x 4 in.) is chosen for this project.” Non-SI units are followed by a period (they are considered abbreviations); SI units do not have a period (they are considered symbols).

Tips for Proofreading
Proofreading tips include
- Reviewing important or technical material at least twice.
- Reading numbers digit by digit backwards.
- Using a yellow sheet of paper to go line-by-line.
- Reading the material backwards. This technique prevents the mind from filling in missing information.
- Checking all calculations in tables.

Formatting Requirements
All editors, publishing agents, corporations, and academics have different formatting requirements. For ENGR 301, there are also specific formatting requirements. Publishing manuals such as MLA, APA, and Chicago are not utilized. Students should not rely on automatic formatting software.
Style Notes
Proper formatting includes these elements:

- Unless otherwise specified, all assignments must be in memorandum format with the heading being “To, From, Date, and Subject.” Handwritten initials are required next to the “from” line.
- Team and section numbers are required on all assignments.
- Block style (justified at both left and right margins) with no paragraph indents.
- New paragraphs are denoted with a line space.
- Single spacing.
- One-inch page margins.
- Line space to offset tables and figures from text.
- Font size is 12. Times New Roman, Calibri, or Arial are acceptable.
- Consistent with fonts for headings and subheadings.
- Numbered pages except for the first page.
- Figures and tables are properly numbered throughout the entire paper (there should be one Fig. 1 and one Table 1).
- For submission into documentation control binder, no other bindings (such as staples) should be used.
- For other submissions, a staple is the only binding needed.

References
In engineering, references serve as evidence. All contentions must be well supported with evidence. Use of a reference without citing it defines plagiarism and will result in course failure. The references in the Reference Section must match the references in the text. The in-text citation must be the same words in the reference section to ensure the reader can find the appropriate reference. High quality references (“sound data”) may include peer-reviewed articles and publishing companies taking responsibility for the accuracy of the content. Low quality references (“unsound data”) may include media reports, blogs, and opinion pieces. When low quality references are used, students should caution the reader that the references may be considered “unsound.” Students must engage in a reflection of source to determine potential bias. Such bias must be fully disclosed.

In-text Citations
The format for books, journals, and articles consists of using square brackets, the first author’s last name, a comma, and the year [Bauer, 2018]. For information obtained on a website, it should be formatted with the name of the home page followed by the word, “website” [ENGR 301, website].

Reference Section
After the Conclusion or Acknowledgement section but before the Appendix, the Reference section should appear and be titled, “References.” “Works Cited” or other variations are not permitted. A few examples of how to prepare references for the Reference Section are detailed.
Journal Article in Print
Last Name, First Initial. (repeat for each author with a comma separating each name) “Title of Article.” Name of Journal, Vol. #, Ed. #. Publishing Year.


Book
Last Name, First Initial. (repeat for each author with a comma separating each name) Title of Book. Placed published: publisher. Year.


Website (including material obtained from a website)
Name of Home Page (website). Retrieved from (give address without hyperlink underline or color change).

ENGR 301 (website). Retrieved from http://wolfweb.unr.edu/~cbauer/engr301/

Notes
For references from the same author and year but a different publication, the in-text citation would be "[Maus, 2018a]" and "[Maus, 2018b]." In the reference section, the full citation would be "Maus, N. (a) Title. Year." If it is a website, the in-text would be "[ENGR 301, website (a)]," and the full citation would be "ENGR 301 (website, a). Retrieved from address."

For references from the same website but on different pages, it is necessary to reference the main homepage. Each individual web page does not need to be a reference.

Figures
In order to place a figure in the text, proper formatting is necessary. First, the figure should be a graphic, picture, or chart. The figure should be as close to the text as possible, but it should never be presented before the figure is discussed in the text. If referring to Fig. 1 in the text, it should be abbreviated as demonstrated. The only time that the word is spelled out is when it starts a sentence. Figure 1 shows how a picture should look in text. The figure should always be described in the text. If the figure is not original or part of a free use agreement, the figure must be referenced. The caption of the figure is centered at the bottom of the figure. The caption must be a complete sentence.

Fig. 1: Racecar safety requires roll bars, seatbelts, and helmets; all of which combine to ensure driver and passenger safety [MS Office, website].
Tables
A table is similar to a figure. However, the word “table” is always spelled out. Tables should be referenced in the text. The text should detail the result of the table. Most tables are used to list something, such as a budget. It is necessary to discuss the budget’s total. For example, the total budget as illustrated in Table 7 is about $15. The caption for a table is centered above the table. Units are necessary in the table. Illustrated in Table 7 are two ways that units can be presented (for illustrative purposes only, but one technique should be selected. The table should be centered. The caption must be a complete sentence.

Table 7: The budget projections illustrate a cost-effective project.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Cost [$]</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Shoe</td>
<td>2</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

Equations
Equations must be written properly. Microsoft’s Equation Writer is a tool available to ensure the proper formatting. Alternatively, equations written in programs such as MathCAD can be copied and pasted into the document. Equations should be introduced, discussed, labeled, and explained in the text. Force is described in Eq. (1):

\[ F = m \cdot a \]  

(1)

where \( F \) is force, \( m \) is mass, and \( a \) is acceleration. If units are needed (not following standard SI) in the text, the units can be written, “where \( F \) is force in Newton, \( m \) is mass in grams, and \( a \) is acceleration in meters per second squared.”

Appendix
An appendix is its own independent document: if the appendix is removed from the paper, it should be coherent within itself.

The appendix begins with a cover sheet that has the appendix letter and title. The cover sheets are numbered consecutively with the main text of the paper: if the main text ends on Page 12, Appendix A cover sheet is Page 13, Appendix B cover sheet is Page 14, and the pattern continues. Within the appendix, the first page would be labeled with the letter and page number, but because the first page is never labeled, the second page of Appendix A is A-2. Figure and table numbers restart beginning at Fig. A-1 and Table A-1 and are numbered consecutively after that. Figure 2 illustrates a diagram of page numbering for a report including an appendix.

A helpful compiling hint includes creating the main text with the appendix coversheets as one document and then having each appendix as a separate document. Instead of compiling within the software, the material can be printed (allowing the software to automatically produce the page numbers) and then compiled by hand.
Fig. 2: The page numbers for an appendix cover sheet continue with the page numbers of the main report; the page numbers within the appendix restart.

If a reference is used in the appendix, that appendix must have its own reference section.

The order of the appendices must be the same order in which they are introduced and discussed within the main text. For example, the first appendix discussed in the text must be Appendix A. All appendices must be thoroughly described and discussed in the main text.

Technical Writing Overview

Technical writing is unlike creative writing. Characteristics of creative writing include allowing the audience to infer meaning or draw their own conclusions, offering opinions, lengthening the text and adding descriptions for the sake of storytelling, using pictures, being persuasive, and providing opinions as evidence. Technical writing uses the concept of "PACTUS": Precise, Analysis, Concise, Tables/Figures, Unbiased, and Supported.

Technical writing is precise and accurate. Students should avoid creating deception or exaggerating contentions. For example, making statements like "the most important thing is..." or "it is a huge problem..." are misleading and hyperbolic.

Technical writing uses analysis not opinions. Using the technique of "copy, paste, and change a few words" is not engaging in analysis. Engineers are valued for their ability to do more than regurgitate what is already there. Technical writing reflects the innovation and creativity of engineers.

Technical writing uses clear, plain, and simple vocabulary. Sentences must be structured to allow for clarity and coherency. Overly long and complicated structures will lead to error. Complex vocabulary will be ignored.

Tables and figures must be used to enhance the content of the paper. When describing something using words, if a table would help to clarify, the technical writer must choose to use a table. For example, if doing a comparison of products, a comparison table must be used to compliment the text. The importance of tables and figures and their descriptive captions in a written report should not be
underestimated. There are not enough figures and tables unless the reader can understand 80% of the report by doing nothing other than looking at the tables and figures and reading the captions.

Technical writing is unbiased. While the report may be used to recommend a course of action, the writing should not hide the consequences nor disadvantages. Contentions must be supported with high quality evidence. That evidence must consist of data not opinions.

Written Report Grading Rubric
The written report grading criteria (e.g., rubric) are detailed. Notes for the standards are described. A box left blank on the rubric indicates passing that standard satisfactorily. A dash indicates that the standard was unsatisfactory. There are 25 standards on the rubric. The written report grading rubric is divided into three categories. The standard is indicated with a solid bullet point. Suggestions and best practices to meet the standard are indicated with an open bullet point.

Mechanics
- Demonstrates proper grammar and punctuation
  - Follows grammar rules as detailed in this document
  - Uses proper technical writing techniques
- Selects proper vocabulary and avoids slang
  - Uses “students” not “kids”; “places” students into groups and does not “split” or “break” them
- Avoids addressing the reader and using personal pronouns
  - Avoids addressing the audience when using engineering tone (e.g., “as shown in Fig. 1”; not “see Fig. 1”); ensures vocabulary is audience appropriate; checks format requirements to ensure proper audience selection; avoids the use of I, we, our, etc.
- Uses a formal style with a professional tone
  - Avoids contractions and clichés (such as “sparks interest”)
- Adapts writing style to correct audience
  - Selects proper vocabulary and word use for audience
  - Adjusts selection and depth of material appropriately for audience
- Transitions well between sections
  - Uses first and last sentences of each section contribute to overall flow of paper; does not abruptly change subjects
- Responds to review corrections / suggestions
  - Makes appropriate changes per the direction of the peer editor or teaching team member
- Develops and follows team themes

Formatting
- Uses memo and block style formatting
  - Follows formatting requirements as detailed in this document
- Numbers figures, tables, and pages properly
  - Uses numbers and iterates numbers correctly
  - If tables or figures are not used, this standard is not met
- Uses sufficient and descriptive headings and subheadings
  - Consistently formats with teammates
  - Adds enough headings to allow audience to quickly locate key information
  - If no headings and subheadings are used, this standard is not met
- Formats tables and figures appropriately
  - Follows formatting requirements as detailed in this document
  - If no figures or tables are used, this standard is not met
- Formats in-text and full references correctly
  - Follows formatting requirements as detailed in this document
  - If no references are used, this standard is not met

Content Styling
- Develops content completely
  - Content must be thorough and concise
  - All components of assessment rubric are addressed
  - Clearly states and supports contention; does not rely upon inference
- Develops content accurately
  - Content must be correct
  - Content should not contain errors or misinterpretations
  - Content should not be exaggerated or overstated
  - Content should not be biased
  - Data is properly and consistently displayed (e.g., decimal points and significant figures)
- Uses figures and tables to enhance content and discusses in text
  - Uses at least one figure or table (meeting a minimum requirement does not necessarily meet the standard; using irrelevant figures or tables for the sake of being there will not meet the standard)
  - Ensures that all content that can be enhanced by a figure or table is enhanced
  - Discusses, describes, and references the figure or table in the text
  - Ensures that the figure or table is legible and clear
- Develops descriptive and conclusive captions for figures and tables
  - Captions must describe what the figure or table is, what the audience member should conclude by looking at it, and how it is relevant to the content
  - Captions must be complete sentences
- Provides sufficient evidence via use of references to support contentions
  - Uses references for paraphrasing and direct quotes
  - Uses references for non-original artwork (clip art is excluded)
  - Supports contentions with data and proof not opinion
  - Uses high quality references not opinion pieces
  - Uses primary sources where publishers take responsibility for accuracy of content and content is peer-reviewed by experts in the field
- Proves knowledgeable about subject matter
  - Is able to creatively expand on content and not simply regurgitate material
  - Contributes original thought and analysis of researched material
  - Fulfills all components of assessment rubric
• Organizes content logically and coherently
  o Order of sections makes sense for the project / paper as a whole
  o Order of paragraphs contributes to flow and enhances understanding of content
  o Figures and tables appear appropriately close to the discussion of their content
  o Sentence structure is not awkward; avoids the “not only….but” structure
• Provides sufficient illustrations and examples
  o Ensures that all content on assessment rubric is well detailed
  o Uses multiple and diverse examples to support contentions
• Stays focused on topic
  o Avoids going off on tangents
  o Ensures paragraphs are topical
  o Avoids irrelevant content
  o Ensures content is concise
• Creates, supports, and develops thesis statements completely
  o Paragraphs begin with a thesis statement; the paragraph stays focused on that one thesis statement; thesis statement is supported with examples and evidence
  o Paragraphs longer than 15 lines are at a higher risk of not being coherent or focused on the thesis statement
• Demonstrates engineering analysis
  o Proves unbiased
  o Avoids using direct quotes (paraphrase and cite)
  o Avoids overstating results and findings
• Demonstrates coordinated team effort
  o Ensures that all team members agree on related issues such as the name of the project, criteria, and materials
  o Content contributes to the betterment of the paper as a whole

Technical Presentation Overview
Technical writing and technical presentations are opposite in style. Presentations are meant to be engaging, entertaining, interactive, and informative. Presentations must be more concise than reports. Not all material in a report should be presented. Key components and highlights must be extracted from a written report and re-styled to become the content for a presentation.

Presentation Grading Rubric
The presentation grading criteria (e.g., rubric) are detailed. Notes for the standards are described. A box left blank on the rubric indicates passing that standard satisfactorily. A dash indicates that the standard was unsatisfactory. There are 50 standards on the rubric. The presentation grading rubric is divided into five stages. The standard is indicated with a solid bullet point. Suggestions and best practices to meet the standard are indicated with an open bullet point.
Stage 1 Preparation

- Arranging room appropriately
  - Ensure podium is at correct height; leaves nothing on stage over which to trip or fall; does not stand with shoulder to audience
- Preparing presentation notes and media in advance
  - Completes assignment before arriving to class; uploads presentation onto classroom computer (use USB drive; do not download from sites like GoogleDocs)
- Displaying practiced and rehearsed characteristics
  - Does not excessively exceed time constraints; prepares for presentation; does not “just wing it”
- Following presentation notes
  - Speaks on the same content as what is being displayed on the slide
- Staying focused on topic
  - Avoids going off on tangents
- Being a good audience member
  - Avoids texting, video game playing, sleeping, heckling, and other disrespectful behavior
- Demonstrating good teamwork skills
  - Clearly shows that the team rehearsed together and coordinated content
  - Not applicable for technical briefing
- Supporting teammates
  - Remains actively engaged during non-speaking role
  - Not applicable for technical briefing
- Organizing stage entrance
  - Coordinates stage positioning
- Dressing appropriately
  - Wears professional attire

Stage 2 Basic Presentation Skills

- Projecting voice
  - Changes pitch and tone; has proper volume
- Maintaining an appropriate pace
  - Does not go too fast or too slow
- Enunciating clearly
  - Articulates words correctly
- Maintaining eye contact
  - Looks at audience
- Maintaining good posture
  - Keeps hands by side when not speaking or gesturing; does not lean; avoids resting hands on podium
- Establishing professional presence
  - Exhibits proper professional behavior
- Being knowledgeable on subject
  - Illustrates confidence in material and is able to make adaptations
• Having high quality visual aids
  o Has professional looking aids and minimal errors; font size is large and legible; colors do not clash
• Providing proper introductions
  o States name at the beginning of the presentation
• Defining objectives clearly
  o Has an overview slide; states learning goals at the beginning

Stage 3 Enhancing Audience Experience
• Greeting and recognizing the audience
  o Welcomes audience using a salutation
• Showing good energy and enthusiasm
  o Is not bland or monotone
• Maintaining positive facial expressions
  o Smiles at audience at appropriate times; does not look grumpy
• Gesturing with hands and arms
  o Uses general hand gestures; does not hold wrist or restrict hand movement; does not hold hands in front of or behind self
• Using lots of illustrations and examples
  o Gives more than one scenario or definition when explaining difficult concepts
• Managing time well
  o Completes presentation within time allotted
• Concluding appropriately
  o Gives summary statements; does not simply list topics; has a conclusion slide
• Using several pictures
  o Balances use of words, graphs, tables, and figures on slides
• Using aids effectively
  o Slides are not wordy; animations and background are not distracting
• Repeating participants’ questions
  o Repeats the question or answers in complete sentence with keywords
  o Not applicable for technical briefing

Stage 4 Interacting with Audience
• Avoiding excessive use of fillers
  o Avoids multiple uses of ums, uhs, or other fillers
• Using appropriate humor
  o Use age-appropriate humor for audience; uses humor to enhance content, not to be a distraction
• Making smooth transitions between topics
  o Uses full sentences to introduce a new topic
• Engaging audience
  o Interacts with the audience; knows audience’s background; makes presentation interesting for the audience
• Demonstrating overall audience awareness  
  o Reacts to the audience: slows down if audience appears confused or speeds up if audience gets restless  
• Moving around room with energy  
  o Does not cling to podium  
• Organizing content logically  
  o Ensures content is presented coherently; does not go back and forth  
• Showing no detected nervousness  
  o Avoids swaying or fidgeting  
• Limiting use of prompts  
  o Avoids using notes; avoids prolonged staring at screen or monitor  
• Developing content completely and accurately  
  o Adjusts content completeness for time management; content is not excessively repetitious among teammates; content is correct and consistent among teammates  

Stage 5 Advanced Presentation Skills  
• Avoiding fillers  
  o Does not use fillers  
• Pausing for effect  
  o Uses pause for drama and emphasis  
• Maintaining direct eye contact  
  o Targets all audience members; looks directly into eyes  
• Using body language to convey additional information  
  o Uses defined hand gestures to create visual aid  
• Soliciting audience response  
  o Asks audience a content related question or to do an action to show participation and involvement  
• Controlling audience  
  o Indicates how audience should respond  
• Involving all participants  
  o Integrates audience’s answers into content; adjusts to audience’s needs  
• Accepting participants’ ideas and suggestions  
  o Avoids arguing with audience members  
  o Not applicable for technical briefing  
• Providing positive reinforcement  
  o Acknowledges audience members for asking questions  
  o Not applicable for technical briefing  
• Performing proper stage exit  
  o Pauses and accepts applause before leaving stage or closing presentation
Phase I: Document Control
Each team is required to maintain and regularly update a team binder. Phase I: Document Control begins the process.

Grading of Phase I
Phase I is graded as a team assignment. Table 8 details the evaluation status as converted to a grade.

Table 8: Phase I evaluation status is equated to a grade on the point scale.

<table>
<thead>
<tr>
<th>Status</th>
<th>Grade Equivalent (points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meets standards needs slight revision</td>
<td>5.0</td>
</tr>
<tr>
<td>Meets standards needs minor revision</td>
<td>4.0</td>
</tr>
<tr>
<td>Meets standards needs major revision</td>
<td>3.0</td>
</tr>
<tr>
<td>Approaching standards needs substantial revision</td>
<td>2.0</td>
</tr>
<tr>
<td>Fails to meet standards</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Content Requirements
The content for Phase I consists of the following sections: a team charter, statement of collaboration and inclusiveness, role statement, communication strategy, meeting plans, goal statements, list of objectives, list of tasks, Gantt chart, decision matrix, project name and theme summary, signature page, and evidence of communication with assigned teacher. These items should be compiled into one report that is in memo format. Each team member should initial in the heading of the memo and sign on the signature page.

Team Charter
The team charter reflects the establishment of the team. The charter must state the policies and consequences on absences, deadlines, and late arrivals. Additional policies are at the discretion of the team.

Statement of Collaboration and Inclusiveness
A statement of collaboration and inclusiveness is required. The statement must acknowledge the need for collaboration and inclusiveness and briefly outline the methodology that will be used to achieve them. Team members should acknowledge that complete consensus is not necessary to achieve the goals; however, when the team makes decisions, all members must agree to not undermine those decisions. Team members should reflect on and plan how to engage in active listening, manage conflict, and create a safe environment.

Role Statement
A recognition of assigned roles to each team member is required. Each team member is assigned a role statement. Each team member is required to write and present on the assigned sections. Switching role statements is not permitted and will result in failure of the assignment. If team members withdraw during the semester, the teaching team may make modifications to the role statements. To accommodate for teams of three, the introduction, the statement of need, and the reflection sections are not assigned. At the discretion of the team, students may also assign team members to do an overview (presentation),
title slide (presentation), conclusion (presentation), and question solicitor (presentation). The role statement for each team member is detailed in Table 9.

Table 9: Role statements show required assignments for K-12 project.

<table>
<thead>
<tr>
<th>Role Statement</th>
<th>Phase II: Proposal</th>
<th>Phase III: Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Member A</td>
<td>statement of need (written and presentation) and introduction (written)</td>
<td>reflection (written and presentation) and introduction (written)</td>
</tr>
<tr>
<td>Team Member B/E</td>
<td>design concept (written and presentation) and abstract (written report)</td>
<td>analysis (written and presentation) and reference section compilation (written)</td>
</tr>
<tr>
<td>Team Member C/F</td>
<td>literature search (written and presentation) and reference section compilation (written)</td>
<td>dissemination (written and presentation) and abstract (written report)</td>
</tr>
<tr>
<td>Team Member D/G</td>
<td>evaluation (written and presentation) and conclusion (written)</td>
<td>broader impacts (written and presentation) and conclusion (written)</td>
</tr>
</tbody>
</table>

Communication Strategy
The team must develop a communication strategy that includes the establishment of tools (e.g., Google Docs, Slack, Discord, etc.) and expectations. Expectations include the response rate (e.g., within 24 hours).

Meeting Plans
The team must develop a plan to meet both in a face-to-face environment (in-class meetings and out-of-class meetings) and in indirect environments (e.g., cyberspace).

Goal Statements
The team must establish at least one goal. Goals are considered primary outcomes. This section must include a table which contains the goals, expected completion date, and status (when status is “complete,” that column must include the date of completion). As part of the submission of each subsequent phase, this table must be updated.

List of Objectives
The team must create a list of objectives. Objectives are measurable steps that move the team to ultimate achievement of the stated goals. This section must include a table which contains the objectives, expected completion date, and status (when status is “complete,” that column must include the date of completion). As part of the submission of each subsequent phase, this table must be updated. The objectives must be matched to the goals.
List of Tasks
The team must develop a list of tasks. Tasks are specific action items that move the team to completion of an objective. This section must include a table which contains the tasks, buffer deadlines, required deadlines, and status (when status is “complete,” that column must include the date of completion). As part of the submission of each subsequent phase, this table must be updated. The tasks must be matched to the objectives.

Gantt Chart
The team must design a Gantt chart which details the list of tasks and deadlines. The Gantt chart should reflect which tasks can be completed in parallel and which must be done in a series. The critical path must be shown on the chart.

Decision Matrix
At least one decision matrix must be presented. The required decision matrix must be used to select the K-12 project. The team may include additional matrices at its discretion. The decision matrix must adhere to the format and style presented within the course.

Project Name and Theme Summary
For the K-12 project, the team must establish a project name and summarize the fun theme that will be incorporated throughout the duration of the project.

Signature Page
A signature page stating that all team members have reviewed and agreed to the content of Phase I is required. Team members must date, sign, and print their names as an indication of agreeing to the content of Phase I.

Evidence of Communication with Assigned Teacher
Evidence of communication with the assigned teacher is required. A printed copy of the teacher’s e-mail response is sufficient. The team must demonstrate that they have begun communication with the teacher. The communication must illustrate that there are ongoing discussions as to what curriculum standard, unit, and topics are required by the K-12 teacher.

Phase II: Proposal
Administration Details
Students will develop a design contest or hands-on design project for K-12 students. The goal is to teach the K-12 students an engineering principle, ensure that the K-12 students have fun with the lesson, and stimulate their interest in engineering, science, and technical fields.

The Proposal written report has the following sections: the statement of need, design concept, literature search, and evaluation. An abstract, introduction, conclusion, and reference section must be completed to reflect the contents of the Proposal report. The written report is a team report; however, each person is required to write an equal amount. Each main section must include at least one figure or table and at
least one reference (formal citation from a publication). Additionally, the mechanics of the paper are divided among the team members. The mechanics include the abstract, introduction, conclusion, and references. The written report must follow the formatting requirements set forth in Grammar Basics.

The Proposal presentation consists of the mechanics of a presentation (title slide, overview, and conclusion) and the following main sections: the statement of need, design concept, literature search, and evaluation plan. The presentation is a team presentation; however, each person is required to speak for an equal amount of time. The total presentation length is not to exceed 12:00 minutes including questions. Professional attire and visual aids are required. Students must speak about their designated main section. Additionally, team members should be selected to present the title slide, overview, introduction, and conclusion. Presentation mechanics (title slide, etc.) should be per team not per individual. For the Proposal presentation, time management points will be deducted if the presentation exceeds 12:30 minutes; the team may be stopped at 14:00 minutes with additional point deductions.

Peer Edit Sessions
Peer editing workshops will be conducted during class. Students are required to bring a copy of their sections (not compiled) in draft format to class for editing. A hard copy is required. After the peer edit, students will complete a final edit of the paper and compile the paper.

Editing
Editing team members’ sections without their active participation in the process is not permitted. Peer edits may be conducted, but all students are responsible for making their own edits. While some students may think they are helping their teammates, those students are hindering the learning opportunities of their peers. Additionally, because the papers have an individual grade, if the paper is edited incorrectly, that original author is held responsible.

Classroom Visit Form
Due along with the Proposal is the classroom visit form. The form will be distributed in class. Failure to complete and submit these forms may result in zero credit being awarded for the course.

Submittal Instructions
After the Phase II tab in the team binder, the classroom visit form must be placed. Following the classroom visit form is a handout copy of the team’s presentation slides. After the slides, the compiled, final draft of the Proposal is to be submitted. Students are reminded to update the status tables from Phase I.

Students must submit an individual final draft of only their assigned sections to WebCampus for processing through TurnItIn. The report is due to WebCampus 15 minutes prior to the start of the lab section. If there are differences in the drafts, the draft which earns the lowest score will become the final grade. Papers not submitted to TurnItIn will result in zero points being earned for that assignment. Students who submit papers which fail the plagiarism or cheating threshold will fail the course and be charged with misconduct (there are no resubmittal opportunities).
Grading of Phase II

Rubrics

The presentation and written report rubrics will be used in the evaluation of the Proposal material. Additionally, assessment rubrics are used to compare the content of the presentation or written report to the Student Learning Objectives and give content feedback. Addressing the components of the assessment rubric will help focus the content of the presentation and written reports while optimizing the content requirements on the grading rubric.

Proposal Written Report

Even though the Proposal written report is compiled as a team report, the paper is graded individually. Each part of the report will be evaluated using the grading and assessment rubrics. The rubrics will be returned to individual student folders while the team binder will be returned to the team after evaluation and grading. Table 10 illustrates the grade point conversion based on the status of the report.

Table 10: Phase II evaluation status is equated to a grade on the point scale for the written report.

<table>
<thead>
<tr>
<th>Status</th>
<th>Grade Equivalent (points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meets standards needs slight revision</td>
<td>5.0</td>
</tr>
<tr>
<td>Meets standards needs minor revision</td>
<td>4.0</td>
</tr>
<tr>
<td>Meets standards needs major revision</td>
<td>3.0</td>
</tr>
<tr>
<td>Approaching standards needs substantial revision</td>
<td>2.0</td>
</tr>
<tr>
<td>Fails to meet standards</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Proposal Presentation

Even though the Proposal presentation is given as a team, the presentation is graded individually. Based on the presentation grading rubric, the grade is calculated using Eq. (2):

\[
\frac{50 - \text{number of dashes}}{50} \times \text{maximum points} = \text{points earned}
\]  

Content Requirements

Abstract

The Abstract should be written last. It must highlight the “wow” factors. Anything that is a result must be in the Abstract Section. In general, it should be at least one sentence per section. The audience for this whole paper is a fellow engineering colleague. The Abstract should not be an advertisement or focused on only one section.

Introduction

The Introduction should briefly introduce the basic concept of the design project. The Introduction should be in present tense (for example, “the Design Concept reviews...”). In general, the Introduction should be one sentence per section.
**Statement of Need**

In the Statement of Need Section, a thorough description of the problem or need must be described. Aspects include what is missing in the current curriculum for students, how STEM education in the U.S. compares globally and nationally, and how these issues impact society in general. The Statement of Need Section must include sub-section headings, at least one reference, and at least one figure or table.

**Proposal Presentation Assessment Rubric for the Statement of Need:**
- States clearly and specifically a problem statement
- Includes aspects of what is missing in current curriculum
- Has more than one example (test score, entrance into STEM, etc.)
- Shows how problem impacts society
- Illustrates global understanding by comparing education with several countries

**Written Report Assessment Rubric for the Statement of Need:**
- States clearly and specifically a problem statement
- Includes aspects of what is missing in current curriculum
- Has more than one example (test score, entrance into STEM, etc.)
- Shows how problem impacts society
- Illustrates global understanding by comparing education with several countries
- Conducts research as to how others have addressed improving STEM education
- Distinguishes between sound and unsound interpretations of the data; synthesizes and analyzes the data

**Design Concept**

In the Design Concept Section, a thorough description of the design project must be described. Aspects include who will be the audience for the design project, what lessons will be taught, what some initial requirements and restrictions are, what the agenda for the classroom visit will be, and what materials are needed. The specific Next Generation Standard which the project addresses must be identified (http://www.nextgenscience.org/search-standards). The Design Concept Section must include an appendix, sub-section headings, at least one reference, and at least one figure or table.

**Proposal Presentation Assessment Rubric for Design Concept:**
- Defines who will be the audience for the design project
- Details hands-on project that the K-12 students will be conducting
- Defines what lessons will taught (includes curriculum standard)
- Includes what the agenda for the classroom visit will be
- Details a budget and material needs to conduct the project

**Written Report Assessment Rubric for Design Concept:**
- Details hands-on project that the K-12 students will be conducting
- Includes such aspects as who will be the audience for the design project
- Outlines a lesson plan (includes curriculum standard)
- Includes what the agenda for the classroom visit will be
• Details a budget and material needs to conduct the project
• Illustrates how the lesson will be conducted (including setup); lecture notes or scripts plus visual aids may be included as an appendix
• Understands the interaction between engineering and education

Literature Search
The Literature Search Section must discuss what has been done in the past. The author must research projects that are similar to the project that the team is proposing. Previous projects must be analyzed by discussing what made those projects successful and how improvements or changes could be made. Details as to how the proposed project is different are needed to illustrate that the proposed project is not “stealing” intellectual property and to prove that the projects are not competing for the same audience. The Literature Search Section must include sub-section headings, at least one reference, and at least one figure or table.

Proposal Presentation Assessment Rubric for Literature Search:
• Researches projects that are similar to the project being proposed
• Shows how the projects have been successful or not successful
• Shows how the proposed project is different and original
• Compares more than one contest/project or lesson
• Defines clearly what projects are being compared

Written Report Assessment Rubric for Literature Search:
• Researches projects that are similar to the project that being proposed
• Shows how the projects have been successful or not successful
• Shows how the proposed project is different and original
• Compares more than one contest/project or lesson
• Defines clearly what projects are being compared
• Distinguishes between sound and unsound interpretations of the data; synthesizes and analyzes the data
• Understands the interaction between engineering and education

Evaluation
The Evaluation Section defines the methodology for how the project will be evaluated. The evaluation plan must include a survey, interview plan, and assessment instruments. The Evaluation Section must include sub-section headings, at least one reference, and at least one figure or table. Blank copies of the surveys, worksheets, or other material must be included as an appendix.

Proposal Presentation Assessment Rubric for Evaluation:
• Highlights the plan to conduct a survey with sample questions
• Details the plan to conduct interviews with sample questions
• Includes the assessment plan to ensure students learned lesson
• Defines the criteria for the survey, interview, and assessment instruments
• Briefly describes how the survey, interview, and assessment instruments will be analyzed
Written Report Assessment Rubric for Evaluation:

- Defines the evaluation plan and sets the criteria (level of success) for the survey, interview, and assessment instruments
- Details the procedure to conduct and analyze the survey
- Includes a blank copy of the survey as an appendix
- Details the procedure to conduct and analyze the interview plan
- Includes a list of interview questions that will be asked as an appendix
- Details the procedure to conduct and analyze the assessment process
- Includes assessment instruments (such as worksheets) as an appendix

**Conclusion**

The paper should be concluded with at least one summary sentence from each section. A list of topics reviewed is not sufficient. The statements must be summations.

**References**

The Reference Section appears at the end of the paper after the conclusion but before the appendices. The first words of the citation must match the first words of the in-text citation. All references must be cited in the paper. Listing references without proper in-text citations is considered plagiarism. References must follow the formatting requirements for ENGR 301. MLA, APA, or other such formatting will not be accepted. If a reference is used only in an appendix, that appendix must have its own Reference Section; that reference should not be listed in the Reference section of the main text. The references must be sorted alphabetically.

**Phase III: Revision**

Phase III - Revision consists of revising Phase I – Document Control and Phase II - Proposal; students submit revisions of the Document Control and Proposal written reports. The revisions of the reports must address all feedback given during initial grading of the phases. After the Phase III tab in the team binder, the compiled, final drafts of the revised Document Control and Proposal are to be submitted. A WebCampus submission is not required. Table 11 illustrates the grade point conversion based on the status of the report. If no errors are corrected (there appears to be no revision of the material) or there is no submission, an extra 15.0 points will be deducted from the overall course grade.

<table>
<thead>
<tr>
<th>Status</th>
<th>Grade Equivalent (points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New errors</td>
<td>one-point deduction per incident (dash)</td>
</tr>
<tr>
<td>Repeated errors</td>
<td>two-point deduction per incident (dash)</td>
</tr>
<tr>
<td>No submission</td>
<td>-15.0</td>
</tr>
</tbody>
</table>
Phase IV: Technical Briefing

The Technical Briefing is a journal paper critique. The content of this phase is not related to the K-12 project, but it is designed to show competency as an engineer. The assignment is individual. The goals of the Technical Briefing include learning technical writing styles and critically analyzing experts and references. Each student is assigned a journal paper to read and critique.

Journal Paper Selection Process
Students will select a journal paper to critique. The journal paper must be from a peer reviewed journal, published within the past year, be ten or more pages (single space), and propose an engineering solution. Students are encouraged to review the assignment requirements to ensure the paper selected will be adequate. Stating that the paper does not fit the criteria of the assignment will result in zero points being earned. Students must submit a hard copy of the journal paper for the approval process and for final submission. The teaching team’s approval means that the journal paper is of proper length and publication date. The teaching team’s approval does not mean that the content of the paper is endorsed or make any guarantees of content appropriateness. Students are responsible for journal papers matching to the grading rubric.

Technical Briefing Written Report
The journal paper must be reviewed for evaluation of the engineering solution discussed in the paper. The Technical Briefing written report must be no more than three pages including references (references are place immediately after the conclusion and should not be separated onto a new page). The report must follow the ENGR 301 standards including being in memo format. Following the memo heading, the paper should show the citation of the paper reviewed as illustrated in Fig. 3. The content of the paper should follow the citation. Headings are required. The paper should include a brief introduction and conclusion. If additional references are needed, a reference section should follow the conclusion.

Fig. 3: Example of the formatting of the Technical Briefing includes the citation of the paper being reviewed at the beginning.

Students must submit the report to WebCampus for processing through TurnItIn. The report is due to WebCampus 15 minutes prior to the start of the lab section. If there are differences in the drafts, the draft which earns the lowest score will become the final grade. Papers not submitted to TurnItIn will
result in zero points being earned for that assignment. Students who submit papers which fail the plagiarism or cheating threshold will fail the course and be charged with misconduct (there are no resubmittal opportunities).

Students must submit a hard copy of both the report and the journal paper.

The report is graded on the following standards and components. Each standard is evaluated as meets standard (1.0 points), approaching standard (0.5 points), or fails to meet standard (0.0 points). To meet the standard, the content must be complete and accurate. The written report is a maximum of ten points. The rubric for evaluation is detailed.

- Demonstrates proper formatting and grammar.
- Cites the journal paper being reviewed and other references if used.
- Summarizes the engineering solution being presented in the paper.
- Reflects on the paper’s engineering solution and evaluates it against the Code of Ethics; determines if the solution is ethically defensible.
- Evaluates the professional and legal implications of the engineering solution; identifies the applicable regulatory agencies, codes, and standards.
- Evaluates how the engineering solution could be implemented globally and how the solution would affect the world (reflects on global cultural and political issues).
- Evaluates the short-term and long-term economic impact of implementation of the engineering solution (benefits and consequences).
- Evaluates the environmental impact of implementing the engineering solution and the infrastructure needed to support the solution (benefits and consequences).
- Evaluates the societal impact of implementing the engineering solution (reflects on local culture and political issues).
- Evaluates the paper’s overall strengths and weaknesses.
  - For example, students could consider the authors’ tone, word choice, grammar, writing style, use of figures and tables, use of support evidence, and methodology.

Technical Briefing Presentation
The Technical Briefing presentation is a presentation to convince the audience to accept or to reject the engineering solution proposed in the journal paper. The presentation is a maximum of two minutes, professional attire is not required, and visual aids are not permitted. The presentation is an “Idol Experience.” Students will present their content to the audience. A teaching team member will serve as the “Idol judge” and give immediate feedback. After all students in the section have presented, the students will vote for their “Idol,” the winning presentation. The assignment is graded as “pass” or “fail” where a “pass” is received when the student demonstrates adequate preparation and technique. Full points are awarded for a “pass.” The presentation is a maximum of five points.
Phase V: Design Review

Administration Details

The Design Review written report has the following sections: reflection, analysis, dissemination, and broader impacts. An abstract, introduction, conclusion, and reference section must be completed to reflect the contents of the Design Review report. The written report is a team report; however, each person is required to write an equal amount. Each main section must include at least one figure or table and at least one reference (formal citation from a publication). Additionally, the mechanics of the paper are divided among the team members. The mechanics include the abstract, introduction, conclusion, and references. The written report must follow the formatting requirements set forth in Grammar Basics.

The Design Review presentation consists of the mechanics of a presentation (title slide, overview, and conclusion) and the following main sections: reflection, analysis, dissemination, and broader impacts. The presentation is a team presentation; however, each person is required to speak for an equal amount of time. The total presentation length is not to exceed 12:00 minutes including questions. Professional attire and visual aids are required. Students must speak about their designated main section. Additionally, team members should be selected to present the title slide, overview, introduction, and conclusion. Presentation mechanics (title slide, etc.) should be per team not per individual. For the Design Review presentation, time management points will be deducted if the presentation exceeds 12:00 minutes; the team will be stopped at 12:30 minutes with additional point deductions.

Peer Edit Sessions

Peer editing workshops will be conducted during class. Students are required to bring a copy of their sections (not compiled) in draft format to class for editing. A hard copy is required. After the peer edit, students will complete a final edit of the paper and compile the paper.

Editing

Editing team members’ sections without their active participation in the process is not permitted. Peer edits may be conducted, but all students are responsible for making their own edits. While some students may think they are helping their teammates, those students are hindering the learning opportunities of their peers. Additionally, because the papers have an individual grade, if the paper is edited incorrectly, that original author is held responsible.

Classroom Visit Form

The classroom visit form must be reviewed and updated as necessary.

Evaluation Visit Form

Due along with the Design Review is the teacher evaluation visit form. The form will be distributed in class. Failure to complete and submit these forms may result in zero credit being awarded for the course.

Project Closeout Form

The Project Closeout Form consists of two components: collection and sign-off. First, team members acknowledge that they must collect their individual folders from the cabinet in SEM 131 the week of May 13. Any material left in the cabinet after May 17 will be collected, shredded, and recycled. Students who
did not select the option to have their folders in the cabinet must schedule an appointment with the teaching team for collection; otherwise, the material will be shredded and recycled.

Second, team members must decide what to do with their team binder. Teams must submit the Project Closeout form which will be distributed in class. The form includes a statement for the team to select one of the following options:

- The team wishes for the content of their team binder to be shredded and recycled.
- The team has agreed to release the team binder to (insert team member name) 
  ____________________________________________

The form also includes the following statements:

In accordance with the University Administrative Manual, 6,502: Academic Standards, I understand that distributing my work to other students is considered academic dishonesty, and I may be charged with misconduct. The Standard states that “assisting in the act of plagiarism by allowing one's work to be used” is considered a violation of policy. I understand that allowing another person access to any of the class material (commonly known as a “frat file”) is considered unauthorized and a violation of this Standard.

In accordance with the University Administrative Manual, 6,502: Academic Standards, I did not engage in disruptive behavior nor academic dishonesty including cheating or plagiarism. I did not use any unauthorized material (including but not limited to material obtained from another student or author, such as a “frat file,” or online sources like Chegg or Reddit). I acknowledge that all work submitted has been my own.

All team members must print and sign their names on the form. The form also includes the section-team number. Refusal or neglect to sign the form indicates that the student has chosen to engage in “Academic Dishonesty Level 3” which will result in course failure.

*Submittal Instructions*

After the Phase V tab in the team binder, the evaluation form must be placed. Following the form is a handout copy of the team’s presentation slide. After the slides, the compiled, final draft of the Design Review is to be submitted. Students are reminded to update the status tables in Phase I. The Project Closeout form must be placed after the report.

Students must submit an individual final draft of only their assigned sections to WebCampus for processing through TurnItIn. Report is due to WebCampus 15 minutes prior to the start of the lab section. If there are differences in the drafts, the draft which earns the lowest score will become the final grade. Papers not submitted to TurnItIn will result in zero points being earned for that assignment. Students who submit papers which fail the plagiarism or cheating threshold will fail the course and be charged with misconduct (there are no resubmittal opportunities).
Grading of Phase V

Rubrics
The presentation and written report rubrics will be used in the evaluation of the Design Review material. Additionally, assessment rubrics are used to compare the content of the presentation or written report to the Student Learning Objectives and give content feedback. Addressing the components of the assessment rubric will help focus the content of the presentation and written reports while optimizing the content requirements on the grading rubric.

Design Review Written Report
Even though the Design Review written report is compiled as a team report, the paper is graded individually. Each part of the report will be evaluated using the grading and assessment rubrics. The rubrics will be returned to individual student folders while the team binder will be returned to the team after evaluation and grading. Table 12 illustrates the grade point conversion based on the status of the report.

Table 12: Phase V evaluation status is equated to a grade on the point scale for the written report.

<table>
<thead>
<tr>
<th>Status</th>
<th>Grade Equivalent (points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meets standards with slight errors</td>
<td>10.0</td>
</tr>
<tr>
<td>Meets standards with minor errors</td>
<td>8.0</td>
</tr>
<tr>
<td>Meets standards with major errors</td>
<td>6.0</td>
</tr>
<tr>
<td>Approaching standards with substantial errors</td>
<td>4.0</td>
</tr>
<tr>
<td>Fails to meet standards</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Design Review Presentation
Even though the Design Review presentation is given as a team, the presentation is graded individually. Based on the presentation grading rubric, the grade is calculated using Eq. (3):

$$\frac{50 - \text{number of dashes}}{50} \cdot \text{maximum points} = \text{points earned}$$  \hspace{1cm} (3)

Content Requirements

Abstract
The Abstract should be written last. It must highlight the “wow” factors. Anything that is a result must be in the Abstract Section. In general, it should be at least one sentence per section. The audience for this whole paper is a fellow engineering colleague. The Abstract should not be an advertisement or focused on only one section.

Introduction
The Introduction should briefly introduce the basic concept of the design project. The Introduction should be in present tense (for example, “the Reflection reviews...”). In general, the Introduction should be one sentence per section.
Reflection

The Reflection Section consists of documenting the classroom visit in its entirety. The section must reflect on the observations made during the classroom visit and the results of the students’ project (e.g., if a paper airplane contest, must include a table of the distance each airplane flew). The appendix must consist of survey and assessment samples. An appendix, reference, sub-section headings, and figure or table are required for the Reflection Section.

Design Review Presentation Assessment Rubric for Reflection:
- Details the set-up utilized during the classroom visit (must include pictures of classroom)
- Gives a brief overview of how the team conducted the lesson plan
- Discusses the instructions given to the students and the students’ ability to follow the directions
- Highlights overall observations of the classroom visit
- Provides a review of the work produced by the students (must include pictures of the students’ projects)

Written Report Assessment Rubric for Reflection:
- Details the set-up utilized during the classroom visit (must include pictures of classroom)
- Describes in detail how the team conducted the lesson plan
- Illustrates why that particular lesson is important for the class (e.g., curriculum standards) and how the project fit into the overall class curriculum
- Analyzes work produced by the students (must include pictures of the students’ projects and results of project success)
- Includes samples of completed surveys and assessment instruments and sample transcripts of interviews as an appendix

Analysis

For the Analysis Section, the elements of formal documentation are required. The content of the Analysis Section consists of defining the criteria (numerical level of success for surveys; interview response goals; achievement levels for the assessment technique), providing the results, comparing the results against the criteria, and analyzing the error. A reference, sub-section headings, and figure or table are required for the Analysis Section.

Design Review Presentation Assessment Rubric for Analysis:
- Discusses the criteria (details numerical value for surveys; level of success on assessment)
- Summarizes the analysis of the results of survey; compares the criteria setup prior to the classroom visit with the results obtained
- Summarizes the analysis of the results of interview; compares the criteria setup prior to the classroom visit with the results obtained
- Summarizes the analysis of the results of assessment; compares the criteria setup prior to the classroom visit with the results obtained
- Highlights some key components of error analysis
Written Report Assessment Rubric for Analysis:
- Performs in-depth analysis of the results of survey; compares the criteria setup prior to the classroom visit with the results obtained
- Performs in-depth analysis of the results of interview; compares the criteria setup prior to the classroom visit with the results obtained
- Performs in-depth analysis of the results of assessment; compares the criteria setup prior to the classroom visit with the results obtained
- Discusses error analysis and includes acknowledgement of unsound data
- Details a future plan to validate the results and ensure sound data

**Dissemination**
In the Dissemination Section, a reflection on how the project could be implemented in the future is detailed. Further, the section must include an instruction manual for a future facilitation. An appendix, reference, sub-section headings, and figure or table are required for the Dissemination Section.

Design Review Presentation Assessment Rubric for Dissemination:
- Highlights recommendations for a future iteration of the project
- Shows examples of how the lesson plan and project could be modified based on the recommendations
- Explains how lesson plan fits into curriculum standard and overall STEM education of K-12 students
- Highlights key details from the instruction manual designed for a future facilitator
- Reflects on the societal impacts of the project

Written Report Assessment Rubric for Dissemination:
- Details recommendations for a future iteration of the project
- Illustrates how the lesson plan and project could be modified based on recommendations
- Highlights key details from the instruction manual in the main text
- Demonstrates how lesson plan fits into curriculum standards and overall STEM education of K-12 students
- Fully documents an instruction manual for a future facilitator in the appendix:
  - Includes a title and overview
  - Includes a budget detailing how much it will cost to conduct the project
  - Includes an agenda for the day of the project (must include timeframe)
  - Details a schedule to set up the project (must include timeframe)
  - Details steps clearly and completely

**Broader Impacts**
In the Broader Impacts Section, the marketing and distribution strategies must be detailed. The strategy should begin with a Strength, Weaknesses, Opportunities, and Threats (SWOT) analysis designed for school administrations to understand why they should invest in bringing the lesson plan to their schools. A reference, sub-section headings, and a figure or table are required for the Broader Impacts Section.
Design Review Presentation Assessment Rubric for Broader Impacts:

- Identifies the customer (who would be interested in the project)
- Highlights a few key components of the SWOT analysis
- Outlines the strategy based on the SWOT analysis to market the project and lesson plan
- Illustrates how the project and lesson plan may be modified for a different age group (adaptability)
- Discusses the contribution of service learning projects to the community and how that benefits the field of engineering

Written Report Assessment Rubric for Broader Impacts:

- Identifies regulatory bodies and legislation steps necessary to implement project (defines the customer)
- Constructs a detailed SWOT analysis
- Develops a strategy based on the SWOT analysis to market project and lesson plan
- Illustrates how the project and lesson plan may be modified for different age groups (adaptability) including relevant curriculum standards
- Demonstrates the contribution of service learning projects to the community and how that benefits the field of engineering

Conclusion

The paper should be concluded with at least one summary sentence from each section. A list of topics reviewed is not sufficient. The statements must be summations.

References

The Reference Section appears at the end of the paper after the conclusion but before the appendices. The first words of the citation must match the first words of the in-text citation. All references must be cited in the paper. Listing references without proper in-text citations is considered plagiarism. References must follow the formatting requirements for ENGR 301. If a reference is used only in an appendix, that appendix must have its own Reference Section; that reference should not be listed in the Reference Section of the main text. The references must be sorted alphabetically.

Phase VI: Professional Development

Phase VI is not related to the K-12 project content but reflects mastery of the course content. The assignment is individual. Professional development consists the accumulation of in-class assignments (also known as impromptu improvements).

Impromptu improvement assignments are designed to assist students in learning specific skills. An impromptu is defined as doing an activity without preparation. Impromptu assignments reflect the day-to-day expectations of people in industry and academia.

Many assignments, reports, meetings, and discussions are done without time to prepare or to create a formal communication strategy. For example, supervisors may ask their employees to give an update on a project during the meeting. The employees would be expected to immediately answer in a clear,
concise, and coherent way. Some of the impromptu assignments simulate these types of situations. Some impromptu assignments must be completed immediately and submitted in-class. Some impromptu assignments are detailed in the posted videos, and students are held responsible for knowing the instructions for the in-class assignments.

Many assignments, reports, meetings, and discussions are given a minimal amount of preparation time, and the requirement or instructions are given during the class discussion. As another example, administrators in academia may ask researchers to provide data for a donor. The administrators may give the researcher verbal instructions and only a few days to collect the information. Thus, some impromptus are designed to simulate these types of situations. Students are expected to document the parameters of the assignment and due date in-class or in the video lectures knowing that those details will not be made available again.

Up to 20.0 points may be earned with in-class assignments. No extra credit is available. Because there are more than 20 opportunities to earn points, accommodations or make-ups for missed classes or missed opportunities are not available. The teaching team will document and record impromptu assignment grades throughout the semester. These grades will be posted after the final submission.

Phase VII: Final Exam

The Final Exam is designed for students to demonstrate course knowledge; it is a course content speech. No visual aids are allowed. Students will have one minute for preparation in which they may use their notes (paper or electronic). It is a one-minute speech. During the speech, notes are not permitted. The order of presentation is random, and there will be a random selection of topic. Table 13 illustrates the potential topics and serves as a study guide. Professional attire is not required. Grading is based on an introduction, content complete, content accurate, conclusion, and overall presentation style. If content is incomplete or inaccurate, no points will be earned.

<table>
<thead>
<tr>
<th>Table 13: The course content speech topics are listed; students should be prepared to discuss all topics.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boilerplate clauses on contracts.</td>
</tr>
<tr>
<td>Business dining and table manner techniques.</td>
</tr>
<tr>
<td>Components and application of a decision matrix.</td>
</tr>
<tr>
<td>Components of meeting minutes.</td>
</tr>
<tr>
<td>Core competence (marketing) definition and application.</td>
</tr>
<tr>
<td>Differences among commas, dashes, and parenthesis.</td>
</tr>
<tr>
<td>Difference between law and case law.</td>
</tr>
<tr>
<td>Difference between misrepresentation and fraud.</td>
</tr>
<tr>
<td>Examples of non-verbal communication.</td>
</tr>
<tr>
<td>Five question in pre-meeting planning.</td>
</tr>
<tr>
<td>Formatting a budget.</td>
</tr>
<tr>
<td>Fundamental Canons of the Code of Ethics.</td>
</tr>
<tr>
<td>Mistakes to avoid on a resume.</td>
</tr>
<tr>
<td>Networking conversation tips.</td>
</tr>
<tr>
<td>Non-speaking role activities (team presentation).</td>
</tr>
</tbody>
</table>
Phase VIII: Self-Review

Phase VIII – Self-Review is a written reflection. The paper reviews the presentation skills developed throughout the course, participation in the impromptu improvement exercises, and reflection of service learning activity.

The paper may be no longer than two pages and must follow ENGR 301 formatting standards; however, writing in the first person is acceptable. The paper is written in business letter format (fictional addresses are acceptable). The section-team number must be placed in the upper right corner of the paper. Table 14 illustrates the grade point conversion based on the evaluation of the paper.

Students must submit the paper to WebCampus for processing through TurnItIn. A hard copy submission of the assignment is required and must be submitted to the box labeled, “ENGR 301” in SEM 131. Submissions will be accepted beginning at noon on “preparation day” though the final posted day and time. Early submissions are encouraged.

Table 14: Self-review evaluation status is equated to a grade on the point scale.

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Grade Equivalent (points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shows mastery of content and reflection</td>
<td>5.0</td>
</tr>
<tr>
<td>Meets standard by showing adequate knowledge of content and reflection</td>
<td>4.0</td>
</tr>
<tr>
<td>Approaching standard by showing some knowledge of content and reflection</td>
<td>3.0</td>
</tr>
<tr>
<td>Fails to demonstrate knowledge of content and reflection</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Video Review

The reflection begins with a review of the video recordings of the formal presentations of the Proposal and Design Review. Students must identify three skills performed well during Design Review presentation, three skills improved from Proposal to Design Review presentations, and three presentation skills upon which to continue to improve. To meet the standard, students must completely and accurately document the skills.

Impromptu Reflection

Students reflect upon their participation and completion of the impromptu speeches and written assignments. Students should document if any impromptu assignments were missed or performed poorly and the action taken to ensure they learned the content and developed the skill. Students should briefly summarize two skills learned or enhanced from the impromptu improvement activities. To meet the standard, students must completely and accurately document their impromptu participation and skill development.
Service Learning Activity

Students will reflect on their service learning activity. Students may select one of the four categories to focus their reflection:

1. What did you learn during your service that relates to your course?
2. What problems did you help solve by enhancing our community?
3. How has your experience affected your thinking about the community, its problems, and the solutions to those problems?
4. How has your experience affected your thinking about your goals (personal, academic, or career) and future community involvement?

To meet the standard, students must completely and accurately document their answer to one of these four questions.

Reconsideration Policy

Students may resubmit their assignments for reconsideration until noon on preparation day. The instructors recognize that the curriculum is developmental and that there may have been personal difficulties that students encountered during the term. As such, students may submit material to try to prove that they have developed and learned the course material. For example, students may submit summaries of all lectures and videos, resubmission of assignments, or a portfolio showing development.

The instructors will review the submitted material before assigning the final course grade to determine if the student has proven sufficient course content knowledge to justify an increased grade. If students submit material for reconsideration, they agree to the following terms: no points will be formally awarded, reconsideration is not considered extra credit, there are no guarantees of grade changes, the submitted material may not be returned, and reconsideration decisions are final and not eligible for negotiation. Students should further understand that if granted, grade changes will be slight (for example, increasing from a C- to a C); entire letter grade changes will not likely occur (i.e., grades will not go from a C- to a B).
Example of a Business Letter

1664 North Virginia St.
Reno, NV 89557

January 22, 2019

Joe Bob, Ph.D.
1313 Disneyland Dr.
Anaheim, CA 92802

Dear Dr. Bob:

The mechanics of how to write a business letter are detailed. First of all, this business letter will be written in block style. Please notice that everything is aligned to the left of the page.

The business letter begins with the return address. Notice that the name of the sender does not appear. There is a line space, and then the date is inserted. The full date should be given. There is another line space, and the name and address of the receiver are placed in the document. After one more space, the salutation is given. Please note that a colon, not a comma, is used for business letters.

The text of the business letter then follows.

The business letter concludes with closing remarks. Four line spaces are left between the closing and the printed name so that a signature can be placed above the printed name.

Sincerely,

Jane Smith
Example of a Memorandum (Memo)

To: ENGR 301
From: Donald Mouse (15-6)
Date: January 22, 2019
Subject: How to write a memo

The formatting needed to write a memorandum, “memo,” is detailed. Please take note of how the header should appear. For ENGR 301, the section and team number must appear in parenthesis in the From line. For example, “(15-6)” indicates that I am in Section 15 and Team 6. Note the initial next to the sender name; after printing a memo, initialing it is needed to document your approval of the contents of the copy. The date should be spelled out using standard format. The subject should be informative.

Memos can be several pages long. The first page is not numbered, but every page after that should be.

If using the default settings in Word, to get single space for the heading, click on the bottom corner arrow for the Paragraph icons. In the Spacing Section, select “0 pt” for “Before” and “After.” Also, for “Line Spacing,” select “Single.”

Traditionally, the memo is written in block style where all of the text is aligned to the left and right.

Memos do not have salutations or closing remarks.

If a memo is mailed electronically, a signature is not needed. If a memo is handwritten, a signature is not needed. If the memo is typed, the senders should initial by their name with a blue or black pen.
Code of Ethics for Engineers - National Society of Professional Engineers (NSPE)

[https://www.nspe.org/resources/ethics/code-ethics]

Preamble

Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

I. Fundamental Canons

Engineers, in the fulfillment of their professional duties, shall:

1. Hold paramount the safety, health, and welfare of the public.
2. Perform services only in areas of their competence.
3. Issue public statements only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

II. Rules of Practice

1. Engineers shall hold paramount the safety, health, and welfare of the public.
   a. If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate.
   b. Engineers shall approve only those engineering documents that are in conformity with applicable standards.
   c. Engineers shall not reveal facts, data, or information without the prior consent of the client or employer except as authorized or required by law or this Code.
   d. Engineers shall not permit the use of their name or associate in business ventures with any person or firm that they believe is engaged in fraudulent or dishonest enterprise.
   e. Engineers shall not aid or abet the unlawful practice of engineering by a person or firm.
   f. Engineers having knowledge of any alleged violation of this Code shall report thereon to appropriate professional bodies and, when relevant, also to public authorities, and cooperate with the proper authorities in furnishing such information or assistance as may be required.

2. Engineers shall perform services only in the areas of their competence.
   a. Engineers shall undertake assignments only when qualified by education or experience in the specific technical fields involved.
   b. Engineers shall not affix their signatures to any plans or documents dealing with subject matter in which they lack competence, nor to any plan or document not prepared under their direction and control.
   c. Engineers may accept assignments and assume responsibility for coordination of an entire project and sign and seal the engineering documents for the entire project, provided that each technical segment is signed and sealed only by the qualified engineers who prepared the segment.
3. Engineers shall issue public statements only in an objective and truthful manner.
   a. Engineers shall be objective and truthful in professional reports, statements, or testimony. They shall include all relevant and pertinent information in such reports, statements, or testimony, which should bear the date indicating when it was current.
   b. Engineers may express publicly technical opinions that are founded upon knowledge of the facts and competence in the subject matter.
   c. Engineers shall issue no statements, criticisms, or arguments on technical matters that are inspired or paid for by interested parties, unless they have prefaced their comments by explicitly identifying the interested parties on whose behalf they are speaking, and by revealing the existence of any interest the engineers may have in the matters.

4. Engineers shall act for each employer or client as faithful agents or trustees.
   a. Engineers shall disclose all known or potential conflicts of interest that could influence or appear to influence their judgment or the quality of their services.
   b. Engineers shall not accept compensation, financial or otherwise, from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed and agreed to by all interested parties.
   c. Engineers shall not solicit or accept financial or other valuable consideration, directly or indirectly, from outside agents in connection with the work for which they are responsible.
   d. Engineers in public service as members, advisors, or employees of a governmental or quasi-governmental body or department shall not participate in decisions with respect to services solicited or provided by them or their organizations in private or public engineering practice.
   e. Engineers shall not solicit or accept a contract from a governmental body on which a principal or officer of their organization serves as a member.

5. Engineers shall avoid deceptive acts.
   a. Engineers shall not falsify their qualifications or permit misrepresentation of their or their associates' qualifications. They shall not misrepresent or exaggerate their responsibility in or for the subject matter of prior assignments. Brochures or other presentations incident to the solicitation of employment shall not misrepresent pertinent facts concerning employers, employees, associates, joint venturers, or past accomplishments.
   b. Engineers shall not offer, give, solicit, or receive, either directly or indirectly, any contribution to influence the award of a contract by public authority, or which may be reasonably construed by the public as having the effect or intent of influencing the awarding of a contract. They shall not offer any gift or other valuable consideration in order to secure work. They shall not pay a commission, percentage, or brokerage fee in order to secure work, except to a bona fide employee or bona fide established commercial or marketing agencies retained by them.

III. Professional Obligations
1. Engineers shall be guided in all their relations by the highest standards of honesty and integrity.
   a. Engineers shall acknowledge their errors and shall not distort or alter the facts.
   b. Engineers shall advise their clients or employers when they believe a project will not be successful.
   c. Engineers shall not accept outside employment to the detriment of their regular work or interest. Before accepting any outside engineering employment, they will notify their employers.
   d. Engineers shall not attempt to attract an engineer from another employer by false or misleading pretenses.
   e. Engineers shall not promote their own interest at the expense of the dignity and integrity of the profession.
2. Engineers shall at all times strive to serve the public interest.
   a. Engineers are encouraged to participate in civic affairs; career guidance for youths; and work for the advancement of the safety, health, and well-being of their community.
   b. Engineers shall not complete, sign, or seal plans and/or specifications that are not in conformity with applicable engineering standards. If the client or employer insists on such unprofessional conduct, they shall notify the proper authorities and withdraw from further service on the project.
   c. Engineers are encouraged to extend public knowledge and appreciation of engineering and its achievements.
   d. Engineers are encouraged to adhere to the principles of sustainable development in order to protect the environment for future generations.
3. Engineers shall avoid all conduct or practice that deceives the public.
   a. Engineers shall avoid the use of statements containing a material misrepresentation of fact or omitting a material fact.
   b. Consistent with the foregoing, engineers may advertise for recruitment of personnel.
   c. Consistent with the foregoing, engineers may prepare articles for the lay or technical press, but such articles shall not imply credit to the author for work performed by others.
4. Engineers shall not disclose, without consent, confidential information concerning the business affairs or technical processes of any present or former client or employer, or public body on which they serve.
   a. Engineers shall not, without the consent of all interested parties, promote or arrange for new employment or practice in connection with a specific project for which the engineer has gained particular and specialized knowledge.
   b. Engineers shall not, without the consent of all interested parties, participate in or represent an adversary interest in connection with a specific project or proceeding in which the engineer has gained particular specialized knowledge on behalf of a former client or employer.
5. Engineers shall not be influenced in their professional duties by conflicting interests.
   a. Engineers shall not accept financial or other considerations, including free engineering designs, from material or equipment suppliers for specifying their product.
   b. Engineers shall not accept commissions or allowances, directly or indirectly, from contractors or other parties dealing with clients or employers of the engineer in connection with work for which the engineer is responsible.
6. Engineers shall not attempt to obtain employment or advancement or professional engagements by untruthfully criticizing other engineers, or by other improper or questionable methods.
   a. Engineers shall not request, propose, or accept a commission on a contingent basis under circumstances in which their judgment may be compromised.
   b. Engineers in salaried positions shall accept part-time engineering work only to the extent consistent with policies of the employer and in accordance with ethical considerations.
   c. Engineers shall not, without consent, use equipment, supplies, laboratory, or office facilities of an employer to carry on outside private practice.
7. Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice, or employment of other engineers. Engineers who believe others are guilty of unethical or illegal practice shall present such information to the proper authority for action.
   a. Engineers in private practice shall not review the work of another engineer for the same client, except with the knowledge of such engineer, or unless the connection of such engineer with the work has been terminated.
   b. Engineers in governmental, industrial, or educational employ are entitled to review and evaluate the work of other engineers when so required by their employment duties.
c. Engineers in sales or industrial employ are entitled to make engineering comparisons of represented products with products of other suppliers.

8. Engineers shall accept personal responsibility for their professional activities, provided, however, that engineers may seek indemnification for services arising out of their practice for other than gross negligence, where the engineer's interests cannot otherwise be protected.
   a. Engineers shall conform with state registration laws in the practice of engineering.
   b. Engineers shall not use association with a nonengineer, a corporation, or partnership as a "cloak" for unethical acts.

9. Engineers shall give credit for engineering work to those to whom credit is due, and will recognize the proprietary interests of others.
   a. Engineers shall, whenever possible, name the person or persons who may be individually responsible for designs, inventions, writings, or other accomplishments.
   b. Engineers using designs supplied by a client recognize that the designs remain the property of the client and may not be duplicated by the engineer for others without express permission.
   c. Engineers, before undertaking work for others in connection with which the engineer may make improvements, plans, designs, inventions, or other records that may justify copyrights or patents, should enter into a positive agreement regarding ownership.
   d. Engineers' designs, data, records, and notes referring exclusively to an employer's work are the employer's property. The employer should indemnify the engineer for use of the information for any purpose other than the original purpose.
   e. Engineers shall continue their professional development throughout their careers and should keep current in their specialty fields by engaging in professional practice, participating in continuing education courses, reading in the technical literature, and attending professional meetings and seminars.

Footnote 1 "Sustainable development" is the challenge of meeting human needs for natural resources, industrial products, energy, food, transportation, shelter, and effective waste management while conserving and protecting environmental quality and the natural resource base essential for future development.

As Revised July 2007
By order of the United States District Court for the District of Columbia, former Section 11(c) of the NSPE Code of Ethics prohibiting competitive bidding, and all policy statements, opinions, rulings or other guidelines interpreting its scope, have been rescinded as unlawfully interfering with the legal right of engineers, protected under the antitrust laws, to provide price information to prospective clients; accordingly, nothing contained in the NSPE Code of Ethics, policy statements, opinions, rulings or other guidelines prohibits the submission of price quotations or competitive bids for engineering services at any time or in any amount.

Statement by NSPE Executive Committee
In order to correct misunderstandings which have been indicated in some instances since the issuance of the Supreme Court decision and the entry of the Final Judgment, it is noted that in its decision of April 25, 1978, the Supreme Court of the United States declared: "The Sherman Act does not require competitive bidding."
It is further noted that as made clear in the Supreme Court decision:
   1. Engineers and firms may individually refuse to bid for engineering services.
   2. Clients are not required to seek bids for engineering services.
3. Federal, state, and local laws governing procedures to procure engineering services are not affected, and remain in full force and effect.

4. State societies and local chapters are free to actively and aggressively seek legislation for professional selection and negotiation procedures by public agencies.

5. State registration board rules of professional conduct, including rules prohibiting competitive bidding for engineering services, are not affected and remain in full force and effect. State registration boards with authority to adopt rules of professional conduct may adopt rules governing procedures to obtain engineering services.

6. As noted by the Supreme Court, "nothing in the judgment prevents NSPE and its members from attempting to influence governmental action . . ."

NOTE: In regard to the question of application of the Code to corporations vis-à-vis real persons, business form or type should not negate nor influence conformance of individuals to the Code. The Code deals with professional services, which services must be performed by real persons. Real persons in turn establish and implement policies within business structures. The Code is clearly written to apply to the Engineer, and it is incumbent on members of NSPE to endeavor to live up to its provisions. This applies to all pertinent sections of the Code.
Student Learning Agreement and Waiver

University of Nevada Reno

WAIVER, RELEASE, AND INDEMNIFICATION AGREEMENT
For ENGR 301: Engineering Communication and Societal Integration

I, __________________________, am a student enrolled at the University of Nevada, Reno ("UNR"), a member institution of the Nevada System of Higher Education ("NSHE"). I understand and hereby acknowledge that my participation in the Service-Learning Project (the "Activity") and my agreement to the academic requirements of my field of study are voluntary. I understand and agree that the Service-Learning Project involves certain risks which include, but are not limited to, the following:

1. Traveling to and from the Activity (transportation is not provided by UNR).
2. Manual labor, including lifting, reaching, stretching, and moving objects — individuals should be aware of own physical limitations.
3. Inclement weather that can impact safety (rain, cold, wind, heat).
4. Steep slopes, uneven terrain, loose rocks and gravel, slippery conditions.
5. Working with other volunteers from organizations outside of UNR.
6. Exposure to common childhood illnesses.

Knowing this information and the risks related to this Activity, in consideration of my participation in Service-Learning Project, I express[ly and knowingly agree as follows:

RULES AND REQUIREMENTS: I agree to conduct myself in accordance with UNR policies and procedures, including those listed in the UNR Student Code of Conduct. I further agree to abide by all the rules and requirements of the Activity. I acknowledge that UNR has the right to terminate my participation in the Activity if it is determined that my conduct is detrimental to the best interests of the group, my conduct violates any rule of the Activity, or for any other reason in UNR’s discretion.

INFORMED CONSENT: I have been informed of and I understand the various aspects of the Activity, including the dangers, hazards, and risks inherent in the Activity, including but not limited to transportation to and from campus via private vehicle, participation in the rehearsals, recreational activities, and classroom activities, weather conditions, conditions of equipment, facility conditions, negligent first aid operations or procedures, and in any activities I undertake as an adjunct to the Activity. In addition, I understand that as a participant in the Activity, I will engage in activities, including lifting, reaching, stretching, and moving objects during which I could sustain personal injuries, illness, and/or property damage. I understand that as a participant in the Activity I could sustain serious personal injuries, property damage, or even death as a consequence of not only UNR’s actions or inactions, but also the actions, inactions, negligence or fault of others or myself, and that there may be other risks not known to me or not reasonably foreseeable at this time. I further understand and agree that any injury, property damage, disability or death that I may sustain by any means is my responsibility except for those occurrences due to UNR’s negligence or intentional acts.

RELEASE AND WAIVER OF LIABILITY: To the extent authorized by law, I, individually, and on behalf of my heirs, executors, administrators, personal representatives, successors and assigns, hereby release, forever discharge and agree not to sue NSHE and UNR and their officers, employees, agents, volunteers and representatives, from any and all liability, loss, claims, demands, causes of actions (known or unknown), suits, judgments, cost, expense or attorneys’ fees, including, but not limited to, those arising from injury, loss or damage to my person or property, which arise out of, occur during, or are in any way the result of or connected with my participation in the Activity, REGARDLESS OF WHETHER THE INJURY, LOSS OR DAMAGE IS CAUSED BY NSHE OR UNR, UNLESS THE INJURY, LOSS OR DAMAGE IS CAUSED BY NSHE OR UNR’S NEGLIGENCE OR INTENTIONAL ACTS, AND REGARDLESS OF WHETHER THE INJURY, LOSS OR DAMAGE OCCURS WHILE IN, ON, UPON, OR IN TRANSIT TO OR FROM THE PREMISES WHERE THE ACTIVITY OCCURS.
OR IS BEING CONDUCTED. I further agree that NSHE and UNR are not in any way responsible for any injury or damage that I sustain as a result of my own acts.

ASSUMPTION OF RISK: I understand that there are potential dangers incidental to my participation in the Activity, some of which may be dangerous and which may expose me to the risk of personal injuries, property damage, or even death. I understand that there are potential risks as a consequence of my participation in the Activity which include, but are not limited to the following: travel to and from University property via private vehicles, weather conditions, facility conditions, equipment conditions, first aid operations or procedures, and other risks that are unknown at this time. I KNOWINGLY AND VOLUNTARILY ASSUME ALL SUCH RISKS, BOTH KNOWN AND UNKNOWN, EVEN IF ARISING FROM THE ACTS OF NSHE OR UNR, UNLESS THEY ARISE FROM NSHE OR UNR’S NEGLIGENT OR INTENTIONAL ACT, and I assume full responsibility for my participation in the Activity.

INDEMNITY: I, individually, and on behalf of my heirs, successors, assigns and personal representatives, hereby agree to indemnify, defend, and hold harmless NSHE and UNR and their employees, agents, and representatives, from any and all liability whatsoever for any and all damages, losses, or injuries (including death) I sustain to my person or property or both, including but not limited to any claims, demands, actions, causes of action, judgments, expenses and costs, including attorneys’ fees, which arise out of, result from, occur during, or are connected in any manner with my participation in the Activity.

INSURANCE: I understand that neither the NSHE nor UNR will provide health insurance coverage to me during any aspect of my participation in the Activity. I understand that the University does not extend workers' compensation coverage to students participating in University-related or University-sponsored community service programs and I further understand that the organization I perform my service-learning or civic engagement opportunity with may not be required to provide workers’ compensation coverage for me and may not have accident insurance for volunteers. I understand that it is my responsibility to have personal health insurance to cover my medical care. I further acknowledge that I am responsible for the cost of any and all medical and health services I may require as a result of participating in the Activity.

CONTROLLING LAW: To the extent that I, individually, or my heirs, successors, assigns, or personal representatives bring a claim of any kind whatsoever against NSHE and/or UNR and/or their employees, agents, and representatives, I agree that this Waiver, Release and Indemnification Agreement is to be construed under the laws of the State of Nevada, including the provisions of Nevada Revised Statutes Chapter 41.

SEVERABILITY: If any term or provision of this Agreement shall be held invalid, illegal, unenforceable, or in conflict with any law governing this Agreement the validity of the remaining portions of the Agreement shall continue in full legal force and effect.

I hereby acknowledge that I have read this entire document, that I understand its terms, that by signing it I am giving up substantial legal rights I might otherwise have, and that I have signed it knowingly and voluntarily.

Participant’s Name: __________________________________________

Participant’s Signature: __________________________________________

Dated: ___________________________________________________________________________________

If participant is a minor:

I am the parent or legal guardian of the Participant. I hereby acknowledge that I have read this entire document, that I understand its terms, that by signing it I am giving up substantial legal rights that I or the Participant might otherwise have, and that I have signed it knowingly and voluntarily. I allow Participant to participate in this Activity. I understand that I am responsible for the obligations and acts of Participant as described in this document. I agree to be bound by the terms of this document.
Student Agreement
Course: ENGR 301
Professors: Candice Bauer and Nich Maus

(Student), is enrolled as a student at the University of Nevada, Reno (the “University”), a member institution of the Nevada System of Higher Education (NSHE). Student understands and hereby acknowledges that Student shall be participating in a University Service-Learning and Civic Engagement Program and course (“Service-Learning Program”) offered through the College of Engineering. In consideration for being allowed to participate in the Service-Learning Program, Student hereby agree as follows:

1. Purpose. The purpose of the Service-Learning Program is to provide students an experiential learning opportunity within the community to enhance their University experience and help address community-identified needs. Ideally a service-learning placement or engagement opportunity will be offered in an area related to the student’s interest or course objectives. In return, the students will learn the importance of the non-profit/public sector and prepare the students for service and/or engagement in a community.

2. Assignments and Conduct. Student agrees to comply with the course syllabus and satisfy all course assignments, including successfully completing all service hours as well as fulfilling all tasks assigned by the faculty member or site supervisor for the University (“Site Supervisor”). When performing the Service-Learning Program at the organization (the “Organization”), Student shall act in an ethical and professional manner and shall be a positive representative of the University.

3. Compliance with Organization’s Rules and Procedures. Student shall comply with the Organization’s policies, procedures, rules or professional codes/standards, including protection of all proprietary information and data, including but not limited to personnel information, institutional information, and any information deemed by the Intern Site as sensitive or private. All material, information, and data related to the Intern Site shall be kept confidential.

Student understands that the Organization may require Student to get a background check, attend training, be fingerprinted or get a tuberculosis test as part of the placement with the Organization.

4. Discipline of Students. Student understands that the Organization may remove Student or ask Student to leave the Organization if Student violates its policies, procedures, rules or professional codes/standards. The Intern Site shall consult with the University before final action. The University shall have full responsibility for any student disciplinary proceedings and shall conduct the same in accordance with all applicable codes, policies, rules, regulations and laws.

5. Safety. Student is choosing to enter the community voluntarily. The health and safety of the Student is the Student’s responsibility and Student understands that the University is not liable if Student is injured during the placement or during transportation to and from the Organization. If a negative experience arises or if Student feels uncomfortable or unsafe, Student should promptly notify the Service-Learning Coordinator for the Program or Department.
6. **Transportation.** Student agrees to provide their own transportation to and from the Organization. Student shall not transport any person related to the Service-Learning Engagement Program on or behalf of the Organization, unless the Organization has liability coverage for students or gets a written waiver from the University’s Risk Management.

7. **Insurance.** Student understands that the University does not extend workers’ compensation coverage to students participating in University-related or University-sponsored community service learning programs. Student further understands that the Organization may not be required under Nevada law or another state’s law to provide workers’ compensation insurance coverage to volunteers and may not have volunteer accident insurance for students performing volunteer activities. It is Student’s responsibility to secure and pay for any personal health care insurance to cover Student’s personal medical care. It also is Student’s responsibility to pay for any personal health care services Student receives which is not covered by any personal health insurance. The University does maintain a secondary student accident insurance policy that may apply in some cases upon request of the Student.

8. **Status of Student.** Student understands that as a student participating in a learning activity at the Organization, Student is not a volunteer, officer, employee, agent or independent contractor of the University or the Organization. Student shall be treated as a volunteer of the Organization. Student is not entitled to any wage, salary, or compensation of any kind for service or participation provided by the student.

9. **Authorization to Release Employment and Educational Records.** Student authorizes the Organization to release to the University, all employment information, data and records and all educational information, data and records pertaining to Student, Student’s employment at the Organization and Student’s participation in the Service-Learning Program.

10. **Sexual Harassment or Discrimination by Student.** While performing service-learning or engagement at the Organization, Student shall not discriminate against any employee, agent, officer or member of the Organization on the basis of a person’s age, disability, whether actual or perceived by others (including service-connected disabilities), gender (including pregnancy related condition), military status or military obligations, sexual orientation, gender identity or expression, genetic information, national origin, race or religion. Similarly, while performing service-learning or working at the Organization, Student shall not make any unwelcome verbal or physical conduct that is sexual in nature, personally offensive and interferes with performance in the workplace against any employee, agent, officer or member of the Organization.

11. **Sexual Harassment or Discrimination of Student.** No employee or student, either in the workplace or in the academic environment, should be subject to unwelcome verbal or physical conduct that is sexual in nature. Similarly, no employee or student, either in the workplace or in the academic environment, should be discriminated against on the basis of age, disability, whether actual or perceived by others (including service-connected disabilities), gender (including pregnancy related condition), military status or military obligations, sexual orientation, gender identity or expression, genetic information, national origin, race or religion. If Student has been subjected to sexual harassment or discrimination by anyone at the Organization, Student should promptly notify the Service-Learning Coordinator for the Department or Program or the Director of the Equal Opportunity and Title IX Office at the University.
12. **Required Sexual Harassment And Discrimination Prevention Training.** As part of the academic course, Student shall participate in University training on sexual harassment and discrimination prevention designed for Service-Learning Programs. Student shall not start the Service-Learning placement until proof of participation in the training has been submitted in WebCampus.

13. **Waiver, Release and Indemnification.** Student agrees to sign a waiver, release and indemnification agreement on behalf of the University in connection with the Service-Learning Program and this Student Learning Agreement.

14. **Media Consent:** Student gives the University authority to use service-learning or engagement photos, videos, art or other media, which Student is in or has created. Student also gives the University authority to use the pre-survey and post-survey answers taken in connection with this course or program, for both on and off campus uses.

15. **University-Intern Site Agreement.** Prior to the beginning of each Service-Learning Program, Student shall read the Organization Agreement between the University and the particular Organization.

I hereby acknowledge that I have read, understand and agree to the terms of this Student Learning Agreement.

<table>
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<tr>
<th>Participant</th>
<th>Date</th>
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Please Print Name

**If participant is a minor:**

I am the parent or legal guardian of the Student. I hereby acknowledge that I have read this entire document, that I understand its terms and that I have signed it knowingly and voluntarily. I allow Student to participate in this Service-Learning Program. I understand that I am responsible for the obligations and acts of Student as described in this document. I agree to be bound by the terms of this document.

Guardian’s Name: ____________________________________________

Guardian’s Signature: _________________________________________

Dated: _____________________________________________________