Engineering Communications
and
Societal Integration
(ENGR 301)

Syllabus and Handbook

Summer 2019
Table of Contents

Syllabus.................................................................................................................................1
Student Learning Objectives.................................................................................................2
Semester Project and Course Deliverables ...........................................................................3
Attendance and Late Policies .................................................................................................3
Course Structure and Schedule ............................................................................................4
Lab Sessions ..........................................................................................................................4
Grading Criteria .....................................................................................................................5
Grading Scale ........................................................................................................................5
Letter Grade Expectations .....................................................................................................6
Policies and Statements .........................................................................................................6
Student Learning Objectives Related to Accreditation .......................................................8
Folders and Feedback ............................................................................................................9
Grammar Basics ..................................................................................................................9
Formatting Requirements .....................................................................................................15
Technical Writing Overview .................................................................................................19
Written Report Grading Rubric ............................................................................................20
Technical Presentation Overview ..........................................................................................22
Presentation Grading Rubric .................................................................................................22
Proposal ...............................................................................................................................25
Revision .................................................................................................................................30
Technical Briefing ..................................................................................................................31
Design Review ......................................................................................................................33
Professional Development ....................................................................................................39
Final Exam ............................................................................................................................40
Self-Review ..........................................................................................................................40
Reconsideration Policy ..........................................................................................................41
Example of a Business Letter ...............................................................................................42
Example of a Memo ...............................................................................................................43
Code of Ethics .......................................................................................................................44
Course Description
ENGR 301 Engineering Communications and Societal Integration (3+0) 3 credits; course is for credit only.

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: General Education courses (CO1-CO8) completed; Junior or Senior standing; PHYS 181 with a "C" or better.

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

Instructor
Candice Bauer
Office Phone: 775-784-7521 (only for emergency use; do not contact via phone for course material)
E-mail Address: cbauer@unr.edu (ENGR 301 in the subject line; WebCampus messaging not used)
Office: SEM 131; meetings are by appointment only and after students make use of coaching sessions

Teaching Assistant
Jamie Gutual
E-mail Address: engr301@gmail.com (WebCampus messaging not used)
Office: SEM 131; meetings are by appointment only and after students make use of 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 four or five. They will be responsible for developing and evaluating a recommendation that addresses one of the 14 Engineering Grand Challenges. Students will complete the course in seven components: 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 is more than one absence, the overall course grade will be reduced by five points for each subsequent absence. Absences may result in course failure.

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 the lowering of the course grade.

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>May 20</td>
<td>Forms*</td>
</tr>
<tr>
<td>May 30</td>
<td>Proposal</td>
</tr>
<tr>
<td>June 3</td>
<td>Journal Paper Selection Approval Process for Technical Briefing</td>
</tr>
<tr>
<td>June 6</td>
<td>Revision</td>
</tr>
<tr>
<td>June 11</td>
<td>Technical Briefing</td>
</tr>
<tr>
<td>June 17</td>
<td>Design Review</td>
</tr>
<tr>
<td>Throughout Term</td>
<td>Professional Development</td>
</tr>
<tr>
<td>June 20</td>
<td>Final Exam</td>
</tr>
<tr>
<td>June 20</td>
<td>Self-Review</td>
</tr>
</tbody>
</table>

*Failure to complete will result in administrative 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>MTWR 10:10-12:10</td>
<td>SEM 347</td>
</tr>
<tr>
<td>2</td>
<td>MTWR 1:00-3:00</td>
<td>SEM 347</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 June 19. 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>Proposal</td>
<td>15.0</td>
</tr>
<tr>
<td>Revision</td>
<td>10.0</td>
</tr>
<tr>
<td>Technical Briefing</td>
<td>15.0</td>
</tr>
<tr>
<td>Design Review</td>
<td>30.0</td>
</tr>
<tr>
<td>Professional Dev</td>
<td>20.0</td>
</tr>
<tr>
<td>Final Exam</td>
<td>5.0</td>
</tr>
<tr>
<td>Self-Review</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100.0</strong></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>
<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 video 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.

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>theirs</td>
<td>whose</td>
<td>your</td>
<td>its</td>
</tr>
<tr>
<td></td>
<td>mine</td>
<td></td>
<td></td>
<td>ours</td>
<td></td>
<td></td>
<td>yours</td>
<td></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></td>
<td>itself</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 the 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 en dash can also be used to represent time spans or differentiation, such as, "That will take 5–10 minutes." The em 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.
- Printing on one side of page only.

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>
<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><strong>GRAND TOTAL</strong></td>
<td></td>
<td><strong>$13</strong></td>
<td></td>
</tr>
</tbody>
</table>

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

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):

\[ F = ma \quad (1) \]

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. The written report grading rubric is divided into four categories: Mechanics, Format, Convention, and Content. 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
- Demonstrate proper grammar and punctuation
  - Follow grammar rules as detailed in this document
  - Use proper technical writing techniques
- Select proper vocabulary and avoids slang
  - Ensure vocabulary is audience appropriate
- Avoid addressing the reader and using personal pronouns
  - Avoid addressing the audience when using engineering tone (e.g., “as shown in Fig. 1”; not “see Fig. 1”); checks format requirements to ensure proper audience selection; avoid the use of I, we, our, etc.
- Use a formal style with a professional tone
  - Avoid contractions and clichés (such as “sparks interest”)
- Adapt writing style to correct audience
  - Select proper vocabulary and word use for audience
  - Adjust selection and depth of material appropriately for audience
- Transition 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
  - Make appropriate changes per the direction of the peer editor or teaching team member

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

Convention
• Use figures and tables to enhance content
  o Use 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)
  o Ensure that all content that can be enhanced by a figure or table is enhanced
  o Discuss, describe, and refer to the figure or table in the text
  o Ensure that the figure or table is legible and clear
• Develop descriptive and conclusive captions for figures and tables
  o 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
  o Captions must be complete sentences
• Provide sufficient evidence via use of references to support contentions
  o Use references for paraphrasing and direct quotes
  o Use references for non-original artwork (clip art is excluded)
  o Support contentions with data and proof not opinion
  o Use high quality references not opinion pieces
  o Use primary sources where publishers take responsibility for accuracy of content and content is peer-reviewed by experts in the field
• Organize 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
• Create, support, and develop 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
• Demonstrate coordinated team effort
  o Ensure that all team members agree on related issues
  o Content contributes to the betterment of the paper as a whole
Content Styling
Specific content is detailed within each assignment. The content is evaluated based on the following standards.

- Develop 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

- Develop 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)

- Prove knowledgeable about subject matter
  - Is able to creatively expand on content and not simply regurgitate material
  - Contribute original thought and analysis of researched material
  - Fulfill all components of assessment rubric

- Provide sufficient illustrations and examples
  - Ensure that all content on assessment rubric is well detailed
  - Use multiple and diverse examples to support contentions

- Stay focused on topic
  - Avoid going off on tangents
  - Ensure paragraphs are topical
  - Avoid irrelevant content
  - Ensure content is concise

- Demonstrate engineering analysis
  - Prove unbiased
  - Avoid using direct quotes (paraphrase and cite)
  - Avoid overstating results and findings

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. The presentation grading rubric is divided into six 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.
Preparation

- Arranging room appropriately
  o Ensure podium is at correct height; leaves nothing on stage over which to trip or fall; does not stand with shoulder to audience
- Displaying practiced and rehearsed characteristics
  o Does not excessively exceed time constraints; prepares for presentation; does not “just wing it”
- Being a good audience member
  o Avoids texting, video game playing, sleeping, heckling, and other disrespectful behavior
- Demonstrating good teamwork skills
  o Clearly shows that the team rehearsed together and coordinated content
- Supporting teammates
  o Remains actively engaged during non-speaking role
- Organizing stage entrance
  o Coordinates stage positioning
- Dressing appropriately
  o Wears professional attire
- Managing time well
  o Completes presentation within time allotted

Basic Presentation Skills

- Projecting voice
  o Changes pitch and tone; has proper volume
- Maintaining an appropriate pace
  o Does not go too fast or too slow
- Enunciating clearly
  o Articulates words correctly
- Maintaining eye contact
  o Looks at audience
- Maintaining good posture
  o Keeps hands by side when not speaking or gesturing; does not lean; avoids resting hands on podium
- Establishing professional presence
  o Exhibits proper professional behavior
- Being knowledgeable on subject
  o 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
Enhancing Audience Experience

- Greeting and recognizing the audience
  - Welcomes audience using a salutation
- Showing good energy and enthusiasm
  - Is not bland or monotone
- Maintaining positive facial expressions
  - Smiles at audience at appropriate times; does not look grumpy
- Gesturing with hands and arms
  - Uses general hand gestures; does not hold wrist or restrict hand movement; does not hold hands in front of or behind self
- Concluding appropriately
  - Gives summary statements; does not simply list topics; has a conclusion slide
- Using several pictures
  - Balances use of words, graphs, tables, and figures on slides
- Using aids effectively
  - Slides are not wordy; animations and background are not distracting
- Repeating participants’ questions
  - Repeats the question or answers in complete sentence with keywords
  - Not applicable for technical briefing

Interacting with Audience

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

Content Styling
Specific content is detailed within each assignment. The content is evaluated based on the following standards.

- Following presentation notes
  o Speaks on the same content as what is being displayed on the slide
- Staying focused on topic
  o Avoids going off on tangents
- Using lots of illustrations and examples
  o Gives more than one scenario or definition when explaining difficult concepts
- 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

Proposal
Administration Details
Students will select one of the 14 Engineering Grand Challenges. The project goal is to develop a practical and detailed recommendation. The proposal focuses on establishing a recommendation, creating a strategy to research the recommendation to fully develop it, and developing a management plan.
The Proposal written report consists of Recommendation and Project Management sections. 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 sub-section of the Recommendation 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 requirements set forth in Grammar Basics and Formatting Requirements.

The Proposal presentation consists of the mechanics of a presentation (title slide, overview, and conclusion) and the following main sections: Grand Challenge, Current Work, Problem Statement, Recommendation, and Team Qualifications. 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 15:00 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 15:30 minutes; the team may be stopped at 17:00 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.

Submittal Instructions
Submission of the Proposal is both in hard copy and online. The hard copy is submitted into the team binder. After the Proposal tab in the team binder, a handout copy of the team’s presentation slides. After the slides, the compiled, final draft of the Proposal is to be submitted.

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 be charged with misconduct (there are no resubmittal opportunities).
Grading of Proposal

Rubrics
The presentation and written report rubrics are 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. The report is 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. The components of the Proposal consist of Skill Set and Content. The Skill Set includes Mechanics, Format, and Convention. The Content includes Recommendation and Management. Each component is evaluated as detailed in Table 8.

Table 8: Each component is equated to a grade on the point scale for the Proposal written report.

<table>
<thead>
<tr>
<th>Status</th>
<th>Grade Equivalent (points) for Skill Set</th>
<th>Grade Equivalent (points) for Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meets standards needs slight revision</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Meets standards needs minor revision</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Meets standards needs major revision</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Approaches standards needs substantial revision</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Fails to meet standards</td>
<td>0.0</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. The presentation is 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. The components of the Proposal consist of Skill Set and Content. The Skill Set includes Preparation, Basic Presentation Skills, Enhancing Audience Experience, Interacting with Audience, and Advanced Presentation Skills. The Content includes Statement of Need, Decision-making Process, Recommendation, Originality, and Evaluation Plan. Each component is evaluated as detailed in Table 9.

Table 9: Each component is equated to a grade on the point scale for the Proposal presentation.

<table>
<thead>
<tr>
<th>Status</th>
<th>Grade Equivalent (points) for Skill Set</th>
<th>Grade Equivalent (points) for Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters standards</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Meets standards</td>
<td>0.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Approaches standards</td>
<td>0.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Fails to meet standards</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Content Requirements for Proposal Written Report
The content requirements for the Proposal written report consists of an Abstract, Introduction, Recommendation, Project Management, Conclusion, and References.

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 an introduction. The abstract must be reflective of the entire report.

Introduction
The Introduction should briefly introduce the background and motivation of the project. Additionally, the Introduction should acquaint the reader with expectations for each main section. The Introduction should be in present tense (for example, “the Evaluation Plan reviews…”). In general, the Introduction should be one sentence per section.

Recommendation
In the Recommendation, a thorough description of the recommendation and the problem must be described. The Recommendation Section must include sub-section headings, at least one reference, and at least one figure or table.

Written Report Assessment Rubric for the Recommendation:
- **Statement of Need <Role Statement E>**
  - Define problem statement
  - Illustrate impact of problem
  - Support with evidence and data
- **Decision-making Process < Role Statement D>**
  - Define decision-making process
  - Justify process
  - Develop decision matrix
- **Recommendation < Role Statement C>**
  - Define recommendation
  - Illustrate recommendation’s match to Grand Challenges classification
  - Show viable business potential of recommendation
- **Originality < Role Statement B>**
  - Summarize current work
  - Show similarities to recommendation
  - Illustrate differences to recommendation
- **Evaluation Plan < Role Statement A>**
  - Match recommendation to Design Review content
  - Discuss tools and resources to be used in research of recommendation
  - Set constraints on recommendation
Project Management

In the Project Management Section, a thorough description of the how the project and course components will be managed and scheduled must be described.

Written Report Assessment Rubric for Project Management:
- Team Charter < Role Statement E>
  - Set policies and consequences for absences
  - Set policies and consequences for late arrivals
  - Set policies and consequences for deadlines
- Statement of Collaboration and Inclusiveness < Role Statement D; if a team of four, Team Charter elements must be briefly reviewed>
  - Define process to engage in active listening
  - Define process to manage conflict
  - Demonstrate the creation of a safe environment
- Communication and Meeting Plan < Role Statement A>
  - Develop communication strategy including tools and expectations
  - Develop face-to-face meeting plan
  - Develop plan for indirect environments
- Goals, Objectives, and Tasks < Role Statement C>
  - Define goals for course as a whole
  - Define objectives and match to goals
  - Define major tasks to achieve objectives
- Schedule and Gantt Chart < Role Statement B>
  - Create a Gantt chart for entire course
  - Develop a critical path
  - Create a schedule for each major task

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.
Content Requirements for Proposal Presentation

The content requirements for the Proposal presentation consist of Title, Overview, Grand Challenges, Current Work, Problem Statement, Recommendation, Team Qualifications, and Questions.

- **Title**
  - detail project name, section-team number, and team member names
- **Overview**
  - list and introduce main topics
- **Grand Challenge < Role Statement E>**
  - define Grand Challenge
  - discuss significance and impact
- **Current Work < Role Statement D>**
  - review two current projects which address that challenge
  - illustrate difference between news article (unsound data) and journal article (sound data)
- **Problem Statement <Role Statement C; if a team of four, Grand Challenge must be briefly introduced>**
  - define project specific problem statement
  - detail significant and impact of specific problem statement
- **Recommendation < Role Statement B>**
  - summarize recommendation and match to Grand Challenge
  - discuss plan to research recommendation
- **Team Qualifications < Role Statement A>**
  - review team members' majors and career goals
  - highlight key experiences and preparation of team members
- **Conclusion**
  - summarize presentation content
- **Question and Answer Session**
  - receive questions from the audience

Revision

The Revision consists of revising the Proposal; students submit revisions of the Proposal written reports. The revisions of the report must address all feedback given during initial grading of the phases. After the Revision tab in the team binder, the compiled, final draft of the revised Proposal is to be submitted. A WebCampus submission is not required. Table 10 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 10.0 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</td>
</tr>
<tr>
<td>Repeated errors</td>
<td>two-point deduction per incident</td>
</tr>
<tr>
<td>No submission</td>
<td>-10.0</td>
</tr>
</tbody>
</table>
Technical Briefing

The Technical Briefing is a journal paper critique. Each student is to select a journal paper that supports the Grand Challenge assigned to the team and defines an engineering solution. The assignment is individual. The goals of the Technical Briefing include learning technical writing styles and critically analyzing experts and references.

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 five years, be ten or more pages (single space), and be related to the assigned Grand Challenge. Team members may not use the same paper. 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. 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 assessment and 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.
Design Review

Administration Details

The Design Review written report has the following sections: Professional, Legal, and Ethical Consideration; Global and Societal Impact; Economic Impact and Business Plan; Environmental Impact Assessment. 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. Some components require 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 requirements set forth in Grammar Basics and Formatting Requirements.

The Design Review presentation consists of the mechanics of a presentation (title slide, overview, conclusion, and questions) and the following main sections: Legal and Ethical Considerations; Societal Impact; Economic Impact; Environmental Impact; Team Reflection. 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 15:00 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 15:00 minutes; the team will be stopped at 15:30 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.

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 June 24. Any material left in the cabinet after June 28 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 Design Review tab in the team binder, the Project Closeout 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 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 Design Review**

**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 and 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. The report is 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. The components of the Design Review consist of Project Closeout Form, Skill Set, and Content. If the Project Closeout Form is submitted, one point will be added to the report. If the Project Closeout Form is not submitted, 100 points will be deducted from the report. The Skill Set consists of Mechanics, Format, and Convention. The Content consists of the following: Professional, Legal, and Ethical Consideration; Global and Societal Impact; Economic Impact and Business Plan; Environmental Impact Assessment. Each component is evaluated as detailed in Table 11.

**Table 11**: Design Review 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) for Skill Set</th>
<th>Grade Equivalent (points) for Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meets standards with slight errors</td>
<td>1.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Meets standards with minor errors</td>
<td>0.8</td>
<td>3.0</td>
</tr>
<tr>
<td>Meets standards with major errors</td>
<td>0.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Approaches standards with substantial errors</td>
<td>0.4</td>
<td>1.0</td>
</tr>
<tr>
<td>Fails to meet standards</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Design Review Presentation**

Even though the Proposal presentation is given as a team, the presentation is graded individually. The presentation is 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. The components of the Proposal consist of Skill Set and Content. The Skill Set includes Preparation, Basic Presentation Skills, Enhancing Audience Experience, Interacting with Audience, and Advanced Presentation Skills. The Content includes the following: Legal and Ethical Considerations; Societal Impact; Economic Impact; Environmental Impact; Team Reflection. Each component is evaluated as detailed in Table 12.

**Table 12**: Each component is equated to a grade on the point scale for the Proposal presentation.

<table>
<thead>
<tr>
<th>Status</th>
<th>Grade Equivalent (points) for Skill Set</th>
<th>Grade Equivalent (points) for Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters standards</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Meets standards</td>
<td>0.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Approaches standards</td>
<td>0.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Fails to meet standards</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Content Requirements for the Design Review Written Report

The content requirements for the Design Review written report includes the following: Abstract, Introduction, Professional, Legal, and Ethical Consideration; Global and Societal Impact; Economic Impact and Business Plan; Environmental Impact Assessment; Conclusion; References. Some components must include at least one figure or table and at least one reference (formal citation from a publication). Using references and figures or tables for other components is encouraged. Some components require an appendix. The appendix must be briefly introduced in the main text, but the main content will be in the appendix itself. The audience for the main text is an engineering colleague. Appendices require writing to a different audience as noted.

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 an introduction. The abstract must be reflective of the entire report.

Introduction
The Introduction should briefly introduce the recommendation. Additionally, the Introduction should acquaint the reader with expectations for each main section. The Introduction should be in present tense (for example, “the Environmental Impact Assessment reviews…”). In general, the Introduction should be one sentence per section.

Professional, Legal, and Ethical
The Professional, Legal, and Ethical Section consists of documenting the applicable regulations associated with implementing the recommendation. The Section should be placed into subsections and include the following information.

- U.S. Regulation <Role Statement A>
  - identify codes, standards, and regulatory bodies within U.S.
  - create strategy for compliance
  - include at least one figure or table and at least one reference

- Global Regulation <Role Statement B>
  - identify political and legislative regulations globally
  - create strategy for compliance
  - include at least one figure or table and at least one reference

- Debates <Role Statement C>
  - identify and analyze the scientific debates and ethical concerns of implementation
  - include at least one figure or table and at least one reference

- Intellectual Property <Role Statement D>
  - Prepare an intellectual property (patent, copyright, and trademark) clearance report as an appendix (appendix audience is a legal professional)
  - include at least one figure or table and at least one reference
• **Code of Ethics <Role Statement E>**
  o illustrate ethically defensible by applying all Canons of the Code of Ethics as an appendix (appendix audience is an Ethics Review Board)
  o include at least one figure or table and at least one reference

**Global and Societal Impact**
The Global and Societal Impact Section should be placed into subsections and include the following information. Global discussions must include a discussion of two World Trade Organization (WTO) members and one WTO observer. Teams must ensure same countries are selected for discussion. Local or societal discussions must include county, state, and federal.

• **Global Reflection <Role Statement D>**
  o reflect on global cultural and political issues of implementing the recommendation
  o include benefits and consequences of global implementation
• **Global Strategy <Role Statement C>**
  o develop a strategy for global implementation
• **Societal Reflection <Role Statement E>**
  o reflect on local cultural and political issues
  o include benefits and consequences
• **Societal Strategy <Role Statement B>**
  o develop a strategy for local implementation
• **Education Plan <Role Statement A>**
  o develop an education plan to address issues as an appendix (appendix audience is a non-technical decision maker)

**Economic Impact and Business Plan**
The Economic Impact and Business Plan Section should be placed into subsections and include the following information.

• **Market Analysis <Role Statement B>**
  o define the customer
  o analyze the market (number of customers and demographics of customer)
• **Marketing Plan <Role Statement E>**
  o develop an advertisement strategy
• **Organization Management (business or non-profit) <Role Statement A>**
  o define the potential to be a for-profit or non-profit business
• **Business Strategy <Role Statement D>**
  o create a SWOT diagram
  o develop a strategy based on SWOT analysis
• **Financial Projections <Role Statement C>**
  o estimate costs and selling price; create a breakeven analysis as an appendix (appendix audience is an investor)
Environmental Impact Assessment
The Environmental Impact Assessment Section should be placed into subsections and include the following information.

- Impact <Role Statement D>
  - summarize environmental impact (benefits and consequences)
  - define use of natural resources
  - detail energy use
- Infrastructure <Role Statement A>
  - detail construction or existence of infrastructure
  - describe emission of pollutants, noise, vibration, light, heat, radiation, creation of nuisances, and the disposal and recovery of waste
- Mitigating Measures <Role Statement C>
  - detail the measures and techniques that will be used to mitigate environmental impact
- Monitoring Plan <Role Statement E>
  - detail a plan to ensure mitigating measures are completed
  - detail a plan to support sustainability, reuse, and recycling
- Non-technical Summary (NTS) <Role Statement B>
  - create a non-technical summary of impact, infrastructure, and mitigating measures as an appendix (appendix audience is a non-technical community member)

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.

Appendices
Compile the appendices in order of main text discussion. Appendices must follow formatting requirements.

Content Requirements for the Design Review Presentation
The content for the Design Review presentation consist of the following: Title; Overview; Legal and Ethical Considerations; Societal Impact; Economic Impact; Environmental Impact; Team Reflection; Conclusion; Questions.
• Title
  o detail project name, section-team number, and team member names
• Overview
  o summarize recommendation
  o list and introduce main topics
• Legal and Ethical Considerations <Role Statement D>
  o highlight legislative regulations
  o highlight ethical adherence
• Societal Impact <Role Statement C>
  o summarize how recommendation affects society (benefits and consequences)
• Economic Impact <Role Statement B>
  o summarize the economic impact (benefits and consequences)
• Environmental Impact <Role Statement A>
  o summarize the environmental impact (benefits and consequences)
• Team Reflection <Role Statement E>
  o employ cogent reasoning methods in team’s own examination of defined problem and recommendation (define initial perceptions of problem, Grand Challenge, and how that perception developed through research and understanding of how scientific and technological developments affect society)
• Conclusion
  o Summarize presentation content
• Question and Answer Session
  o Receive questions from the audience

Professional Development
Professional Development is not directly related to the 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 term. These grades will be posted after the final submission.

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 13: The course content speech topics are listed; students should be prepared to discuss all topics.

<table>
<thead>
<tr>
<th>Boilerplate clauses on contracts.</th>
<th>Obligations of the Question Solicitor (team presentation).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business dining and table manner techniques.</td>
<td>PACTUS writing techniques.</td>
</tr>
<tr>
<td>Components and application of a decision matrix.</td>
<td>PRIDE principles (team building).</td>
</tr>
<tr>
<td>Components of meeting minutes.</td>
<td>Reasons why interview candidates get rejected.</td>
</tr>
<tr>
<td>Core competence (marketing) definition and application.</td>
<td>Seven steps to design an experiment.</td>
</tr>
<tr>
<td>Differences among commas, dashes, and parenthesis.</td>
<td>Stages of a team.</td>
</tr>
<tr>
<td>Difference between law and case law.</td>
<td>Steps to write to prompts.</td>
</tr>
<tr>
<td>Difference between misrepresentation and fraud.</td>
<td>Tips for answering questions.</td>
</tr>
<tr>
<td>Examples of non-verbal communication.</td>
<td>Tips for dealing with a micromanager.</td>
</tr>
<tr>
<td>Five question in pre-meeting planning.</td>
<td>Tips for e-mail etiquette.</td>
</tr>
<tr>
<td>Formatting a budget.</td>
<td>Tips for writing an instruction manual.</td>
</tr>
<tr>
<td>Fundamental Canons of the Code of Ethics.</td>
<td>Traits of strategic questions.</td>
</tr>
<tr>
<td>Mistakes to avoid on a resume.</td>
<td>Types of visual aids.</td>
</tr>
<tr>
<td>Networking conversation tips.</td>
<td>VARK techniques to diversify presentations.</td>
</tr>
<tr>
<td>Non-speaking role activities (team presentation).</td>
<td>Ways to overcome &quot;pretending to listen.&quot;</td>
</tr>
</tbody>
</table>

Self-Review
The Self-Review is a written reflection. The paper reviews the presentation skills developed throughout the course and a reflection of achievement of SLOs. The paper is an individual assignment; however, teams must coordinate the selection of the SLO as it cannot be repeated within a team.
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 in class.

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.

SLO Reflection
Students must select one SLO (cannot be repeated within a team) and reflect on how the student achieved that SLO. 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 June 19. 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

May 20, 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: May 20, 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 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.