

# Engineering Innovation & Leadership

EL 1301- Spring 2023

Draft Syllabus

CRN 26228

## Teaching Team:

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## Location:

E-LEAD Studios -CRBL 201

## Office:

Department of Engineering Education and Leadership (E-230)

## Times & Dates:

9:30-10:20 AM & 10:30-11:20 AM  
Sections on MWF – 50 minutes each class

## Office Hours:

TBA via Blackboard. Also via email and Calendly: [calendly.com/petergolding](https://calendly.com/petergolding)

## Assessment and Evaluation: Grading

Being & Doing	15 %
Financial Literacy	15 %
Written and Bus. Communication	15 %
Project 1: Team Project Final Pres.	20 %
Project 2: Inside Out Final Pres.	15 %
Deliverables	15 %
Final Analysis	5 %

Total class points/ percentage: 100 %

Grades will be comprised of points gained through individual and teamwork activities. Grades will be determined according to the list below.

A = 90 - 100  
B = 80-89  
C = 70-79  
D = 60-69  
F = < 59

## Course Materials & Readings:

- We will provide online access to all needed resources through documents, text, and video.
- Please also download access to the following program.  
**Autodesk Fusion 360 Software**
- A Canvas account will be needed for assignment/project submission:  
**<https://canvas.instructure.com/register>**

## Course Description:

Self-development, with the goal of students becoming more effective leaders and team players, is a primary goal of 21st Century universities providing value, such as UTEP. Innovation and leadership skills learned in this course have application to personal and professional relationships, work and lifelong learning goals. Through this course students will learn about themselves, about others, and about innovations (change) and engineering sciences. Students will learn through inquiry of the process by which arts, business, science and mathematics are utilized to develop critical thinking competencies, and though engaging in creative thinking will enhance their self-learning and future success. The empirical results of cognitive science will be used to illustrate the importance of understanding preconceptions, cognitive frameworks, and metacognition. Students will be able to apply this inquiry-based framework to research, scholarship, and learning with the goal of using UTEP Edge experiences to build success in their future in engineering.

This course advances individual leadership development through providing a framework for understanding the elements of innovation and organization's leadership development system. The course provides students with the foundations of leadership and innovation capacity in organizations. This course ties together and integrates many initiatives stemming from different areas of expertise with the primary goal to be to present knowledge in a way that students can use in their efforts to create leadership development experiences. We will specifically focus on how leadership skills effect the outcomes of engineering processes and engineering teamwork to enhance both individual and organizational leadership capacity.

## Goals of this Course:

Through the Engineering Innovation and Leadership course, students will gain a foundation of knowledge of innovation, technological and leadership advancement in modern society, develop principles of personal, professional, and social responsibility for living in a diverse world, and advance intellectual and practical skills that are essential for all learning.

### Foundational Component Area:

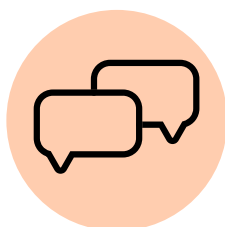
Science, Technology, Engineering, Arts, Mathematics, and Culture.

### Foundational Component Area Intent:

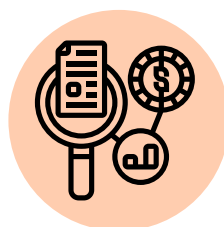
The EL 1301 core curriculum course includes foci on all six TCC Core Objectives:



*Critical Thinking Skills (CT)*



*Communication Skills (COM)*



*Empirical and Quantitative Skills (EQS)*



*Teamwork (TW)*



*Social Responsibility (SR)*



*Personal Responsibility (PR)*

## Course Objectives:

### Critical Thinking:

EL 1301 content is designed to develop students' critical thinking skills by teaching them engineering design thinking and mathematical problem solving skills. Students will be prompted to explain their reasoning when working through engineering problems and ask critical questions about another students' work. Students will also think critically about the role of engineers in society, innovation, and leadership practices.

### Communication:

EL 1301 will emphasize communication of student reasoning in both oral and written form. The ability to communicate and be open, honest, and respectful is a vital aspect of Engineering Innovation and Leadership Education. Students will always be encouraged to explain problems orally and empathetically and will be required to provide written explanations of scientific and mathematical reasoning at times. Class discussions will be used to encourage student collaboration and communication. Students will complete individual and team project presentations.

### Empirical and Quantitative Skills:

EL 1301 will utilize manipulation and analysis of numerical data to evaluate innovative alternatives and use observable facts resulting in informed conclusions. Engineering calculations engineering development propositions will include business analytics, accounting and reliability functions, systems of equations, and engineering design matrix calculations. The course content is focused on developing students' empirical and quantitative skills.

### Teamwork Competencies:

EL 1301 will emphasize the value of teamwork, which is common in technical or engineering environments. Whether it's a project team, product development, a production line, a maintenance team or a manufacturing cell, effective teamwork is the basis for most modern engineering innovation and technical operations. Students will understand teamwork promotes:

- Increased morale, as people believe they have a stake in something, are supported by others and if stuck, can seek assistance to get the job done.
- Enables more challenging problems to be tackled faster by drawing on the team's collective skills, experience, and knowledge.
- Often solutions proposed by the team have greater credibility and therefore are more likely to be accepted. Proposals tend to be thorough, having drawn on the collective experience and skills of the group, as well as being scrutinized by all team members.
- Working collaboratively helps team members to learn and develop, as they share ideas and experiences.
- Teamwork encourages communication, trust, support, and a positive working environment – all important for improved business productivity.

## Social Responsibility:

EL 1301 will emphasize the social responsibility of the Engineering profession in terms of the commitment to place public safety and interest ahead of all considerations. Students will learn that the engineering professional considers and shows due regard for the consequences of their conduct for wellbeing of others as well as the impact of their work on society. Students will value intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities. Students will become aware of the role of professional societies, and diversity and equity initiatives arising therefrom.

## Personal Responsibility:

EL 1301 will assist students to develop the ability to connect choices, actions and consequences to ethical decision-making of engineers. Students in training to be engineers will know engineering personal responsibility initiatives are categorized as follows:

- Environmental responsibility.
- Human rights responsibility.
- Philanthropic responsibility.
- Economic responsibility.

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.

## Learning Outcomes:

### *Developing Leaders Key Components:*

Students will demonstrate personal responsibility, social responsibility, and decision making within a framework of understanding leader development systems, how one learns from critical thinking, communication and teamwork experience. The value of networking, professional society engagement, and interdisciplinary knowledge and connectedness is established, through team projects and leadership challenges.

### *Developing Leaders Empirical, Quantitative and Integrative Measures:*

Students will be able to articulate how leader development coincides with social identify, leader development in times of change, democratization of leader development and evaluating leader development.

### *Developing Leadership for Organizational Challenges:*

Students will demonstrate an ability to apply empirical and quantitative skills, and synthesis developing (a) teamwork and leadership capacity, (b) strategic leadership, (c) globally responsible leadership, (d) intergroup leadership, and (e) independent leadership.

## Academic Integrity:

Students are expected to uphold the highest standards of academic integrity and achieve excellence in the quality of work produced as an individual.

Students are to adhere to standards of integrity and ethical work. Avoid acts of dishonesty such as cheating, plagiarism, et cetera.

Refer to OSCCR: <https://www.utep.edu/student-affairs/osccr/student-conduct/academic-integrity.html>

## Class Management:

a) Attendance: Students are encouraged to actively participate in all class sessions. Absences are allowed for emergencies but must be justified/documented with the teaching team. Late assignments will not be accepted unless explained. Participation will be part of the course grade. Two unexcused absences will account for a 10-point deduction.

b) Electronic devices: Use of mobile computers and phones is allowed during the class. Students will be asked to research topics, on occasion, during class. Please do not abuse the access: texting and answering emails et cetera is discouraged, enabling you to concentrate on the topics at hand.

c) Students that have a disability or need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at phone 747-5148 or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit them in UTEP Union Building East, Room 106. See Additional Syllabus Statements below.

d) The dates for research analyses, and the due date for homework and journal and report submission will be provided in advance.

e) Presentations will be informal, formal, individual, and team based. They may be announced or unannounced.

f) Communicating, in person, and in written communications (reports) is critical

g) Due referencing is an important aspect of graduate studies. When using articles, texts, websites of agencies or looking for information on the internet, reports, or any publication; written responses need to include references. Use APA referencing and Times New Roman font style, 12-point font size and double space.

## Additional Syllabus Statements:

### **Make-up Policy:**

No makeup exams will be allowed except with proper documentation, i.e. doctor's note, hospital's note, or UTEP excused absence document.

### **Attendance Policy:**

Students must attend every class and attend all lectures. Attendance will be taken. A student may be dropped if he/she misses 3 classes (being unexcused absences). Students are to arrive to class on time. It is the student's responsibility to make up missed assignments as determined by their instructor.

### **Civility Statement:**

Please do not use smart phones, smart watches, iPads, Bluetooth or any smart device during quizzes and exams. Cell phones and tablets should be set to silent or vibrate, and any calls should be taken outside of class. Please do not wear headsets or Bluetooth devices during class. Cell phone calculators may not be used on quizzes or exams. Calculators may not be shared during quizzes and exams. Active participation in class is expected, teamwork in class will be implemented. Video or pictures of lectures must have written consent from the instructor and student(s).

### **Disability Statement:**

If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.utep.edu/CASS](http://www.utep.edu/CASS). CASS' Staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.

### **Returning to Campus:**

For the latest COVID-19 information see <https://www.utep.edu/resuming-campus-operations/>