

**The University of Texas at Tyler  
Department of Electrical Engineering**

**EENG 4115 Senior Design I (Required)**

**Syllabus**

**Catalog Description:**

Establishment of goals and planning and proposal phases of a capstone design project required of all seniors in Electrical Engineering. Includes the selection of a suitable project, an analysis of the design problem, the planning required to reach the desired goals, the preparation of a project preliminary design document, and preparation and delivery of an oral presentation. Projects are defined in cooperation with representatives from industry when possible. Three hours of Design Studio Lab per week.

**Prerequisites:** EENG 4307, EENG 3308, EENG 4309, and EENG 4109

**Pre or Co-requisites:** SPCM 1315 or SPCM 1311

**Credits:** ( 0 hours lecture, 3 hours laboratory per week )

**Text(s):** No text required.

**Additional Material:** None

**Course Coordinator(s):** Mukul Shirvaikar, Yasser Mahgoub

**Topics Covered:** (paragraph of topics separated by semicolons)

Creativity and design methodologies, teambuilding, leadership, economic justification, codes and standards, project management, conflict resolution, enhanced communication techniques.

**Evaluation Methods:** (only items in dark print apply):

1. Examinations / Quizzes
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

**Course Learning Objectives:**<sup>1</sup> By the end of this course students will be able to:

1. Write target specifications for a complex engineering project and produce a preliminary design including final specifications [3].
2. Evaluate alternative design solutions using multiple criteria including public health, safety, and welfare, global, cultural, social, environmental, and economic factors [3].
3. Produce a professional-quality preliminary design document and/or an oral presentation of the design project [3, 6].

4. Apply relevant professional ethics in the design process taking into account the impact of the design solutions in global, economic, environmental, and societal contexts [3].
5. Develop a project plan and deliver a solution by working as a project team with a written team contract [8].
6. Apply appropriate simulation methods to validate design choices, using modern engineering tools including modeling and simulation software and virtual instruments [3].
7. Collect and analyze new technical information and acquire knowledge as necessary in the design of the project [3].
8. Incorporate appropriate engineering standards and multiple constraints in the design process [3].
9. Utilize knowledge and skills acquired in earlier course work [3].

<sup>1</sup> Numbers in brackets [ ] indicate the method(s) of evaluation of achievement of Course Learning Objectives.

**Relationship to Student Outcomes (only items in dark print apply)<sup>2</sup>:** This course supports the following Electrical Engineering Student Outcomes, which state that our graduates will:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics [1, 9].
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors [2, 8].
3. An ability to communicate effectively with a range of audiences [3].
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts [4].
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives [5].
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions [6].
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. [7].

<sup>2</sup>Numbers in brackets refer to Course Learning Objective(s) that address the Program Outcome.

**Contribution to Meeting Professional Component: (in semester hours)**

Mathematics and Basic Sciences:		hours
Engineering Sciences and Design:	1	hours
General Education Component:		hours

<b>Prepared By:</b>	David M. Beams	<b>Date:</b>	8 Aug 2016
	Mukul Shirvaikar		22 August 2018
	James Vasil		9 November 2018
	Prabha Sundaravadivel		August 2019
	Mukul Shirvaikar		13 August, 2020
	Mukul Shirvaikar		17 August, 2021

**The University of Texas at Tyler  
Department of Electrical Engineering**

**EENG 4115: Senior Design I  
2021 Fall Semester**

**COURSE OUTLINE**

Course Coordinator: Dr. Mukul Shirvaikar  
Electrical Engineering  
Office: RBN 2014  
Phone: 903-565-5620  
E-mail: mshirvaikar@uttyler.edu

Class Location/Time: RBN2007 2:00-4:45PM W / Zoom (Two-way interactive)

Office Hours: Zoom (Two-way interactive) / 10:00AM-11:00AM T R  
4:00PM-5:00PM W or by appointment

Grading Policy:

Team Grade Component	%	Individual Grade Component	%
Team Contract	5	Activity reports	15
Design Reviews	25	Class/team attendance	5
Subsystem Simulation	10		
Final PDD	30		
Presentation	10		
<b>MAXIMUM TEAM GRADE</b>	<b>80</b>	<b>MAXIMUM INDIVIDUAL GRADE</b>	<b>20</b>

**SEMESTER GRADE = TEAM GRADE x Peer/Instructor Evaluation Factor + INDIVIDUAL GRADE**

Note: Students are required to submit all required work to obtain a passing grade in the class. Instructor reserves the right to modify the above grading policy including final grade thresholds at any point of time.

Semester Schedule:

Mtg.	Date	Topic	Deliverables / Activities
1	25-Aug	Course introduction; team and project selection criteria	Class on Zoom
	30-Aug		Team formation deadline (self-selection)
2	1-Sep	Team meeting: Project Proposal Development	
	6-Sep		Project Proposal due
3	8-Sep	Finalize team and project selection; team contracts	Class followed by team meeting
	13-Sep		Team contracts due

4	15-Sep	Team meeting	
	20-Sep		Peer evaluation #1 due
5	22-Sep	Team meeting	
	27-Sep		PDD part # 1 due
6	29-Sep	<b>Design Review 1: PDD part # 1</b>	30-minute meeting with the instructor followed by team meeting time
	4-Oct		Activity report # 1 due
7	6-Oct	Team meeting	
	11-Oct		PDD part # 1 (revised) due
8	13-Oct	Team meeting	
	18-Oct		Peer Evaluation #2 due
9	20-Oct	Team meeting	
	25-Oct		PDD part # 2 due
10	27-Oct	<b>Design Review 2: PDD part # 2</b>	30-minute meeting with the instructor followed by team meeting time
	1-Nov		Activity report # 2 due
11	3-Nov	Team meeting	
	8-Nov		PDD part # 2 (revised) due
12	10-Nov	Team meeting	
	15-Nov		PDD part # 3 due
13	17-Nov	<b>Design Review 3: PDD part # 3</b>	30-minute meeting with the instructor followed by team meeting time
	22-Nov		Activity report # 3 due
-----	24-Nov	Thanksgiving holiday	
	1-Dec		Final PDD due
14	1-Dec	Team presentations	Peer Evaluation #3 due
Finals	11-Dec	Course wrap-up	No meeting this week

#### Class Policies:

1. Classes will be held face-to-face and online via Zoom.
2. All students MUST utilize the full class meeting time (2:00 – 4:40 PM) every week. You must be available should we need to schedule a meeting during official class time. DO NOT schedule work or other activities during this time.
3. Deliverables are due on CANVAS by 5 PM on the dates indicated unless otherwise noted.
4. PDD reports are to be submitted through CANVAS as .docx or .doc documents by 5 PM on the Tuesday preceding the Design Review. To be accepted, reports must use the template provided and follow the specified file-naming convention.

#### Computer Equipment Policy:

In order to take this class, integrated laboratory sessions and quizzes/exams, you will need the following items as specified below:

- Windows 10 Computer or Mac running Windows virtualization software
- High-speed Internet connection

- Webcam (internal or external)
- NI Multisim software

Type	Minimum	Recommended
Web Camera	640×480 resolution	1280×720 resolution
PC Users	Windows Vista	Windows 10 (10 S is not supported)
Mac Users	OS X 10.5 or higher	OS X 10.13 High Sierra
Internet Download Speed	.768 Mbps	1.5 Mbps
Internet Upload Speed	.384 Mbps	1 Mbps
RAM	1024 MB	2 GB
Ports	1935, 843, 80, 443, 61613, UDP/TCP	1935, 843, 80, 443, 61613, UDP/TCP

### Homework, Examination and Lab Project Policy:

Homework and project reports will be due in Canvas one week after assignment. Project reports should be written as per the guidelines provided. A 25% penalty will be assessed for missing the submission deadline and an additional 25% penalty will apply per week for late project reports and homework. Any deviation from this rule will be at the sole discretion of the instructor.

**All submissions are required to be in Microsoft Word format with machine readable text and not images or other representations of text. This rule will be applied to all sections of the report including the appendices and program code with comments. All flowcharts and diagrams must be prepared using Microsoft Office and not by hand. Any attempts to defeat the plagiarism checking software by submission of documents that include images instead of body text or any other mechanism will result in a grade of zero. The instructor or responsible grader reserves all rights to make this judgement and reject a project report if the above rules are not followed. Any violations may result in ACADEMIC DISHONESTY charges to be filed against the student.**

Student waives all rights to a make-up exam if they miss a scheduled testing date. Any make-up testing will be at the sole discretion of the instructor.

### Academic Integrity:

Students should be aware that absolute academic integrity is expected of every student in all undertakings at The University of Texas at Tyler. Failure to comply can result in strong university-imposed penalties. **All lab reports and assignments will be verified using plagiarism checking software and violations will result in a grade of zero for the lab report or assignment at a minimum, and possibly stronger penalties such as a failing grade in the course and a scholastic dishonesty report submitted to the university.**

### Proctoring

The assessments in this course may be proctored using ProctorU or two-way interactive Zoom sessions. Beyond the cost of initial equipment needed (e.g. a camera for your computer), there will not be any additional cost for proctoring. You will need to create a ProctorU account and install the ProctorU extension before attempting any assessment.

To create a ProctorU account, follow the ProctorU tool within Canvas. Please make sure you are using the current version of Chrome or Firefox and download the ProctorU extension available at <http://bit.ly/proctoruchrome> or <https://www.proctoru.com/firefox>.

In order to use ProctorU, you will need the following:

- High-speed Internet connection
- Webcam (internal or external)

- Windows, Mac, or Chrome Operating System
- Up-to-date Chrome or Firefox browser and ProctorU extension installed
- Valid photo ID
- Quiet environment to take your assessment

You can visit the Test Taker Resource Page for additional information at <https://bit.ly/ProctorMe>

### **UT Tyler Honor Code**

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

### **Students Rights and Responsibilities**

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>

### **Campus Carry**

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

### **UT Tyler a Tobacco-Free University**

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.

Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit [www.uttyler.edu/tobacco-free](http://www.uttyler.edu/tobacco-free).

### **Grade Replacement/Forgiveness and Census Date Policies**

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

### **State-Mandated Course Drop Policy**

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

### **Disability/Accessibility Services**

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application.

The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

### **Student Absence due to Religious Observance**

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

#### **Student Absence for University-Sponsored Events and Activities**

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

### **Social Security and FERPA Statement**

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

### **Emergency Exits and Evacuation**

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

### **Student Standards of Academic Conduct**

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic

- advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
- ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.
- iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
- iv. All written work that is submitted will be subject to review by plagiarism software.

#### **UT Tyler Resources for Students**

- [UT Tyler Writing Center](mailto:writingcenter@uttyler.edu) (903.565.5995), [writingcenter@uttyler.edu](mailto:writingcenter@uttyler.edu)
- [UT Tyler Tutoring Center](mailto:tutoring@uttyler.edu) (903.565.5964), [tutoring@uttyler.edu](mailto:tutoring@uttyler.edu)
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- [UT Tyler Counseling Center](mailto:saroffice@uttyler.edu) (903.566.7254)

#### **Important Covid-19 Information for Classrooms and Laboratories**

Students are expected to wear face masks covering their nose and mouth in public settings (including classrooms and laboratories). The UT Tyler community of Patriots views adoption of these practices consistent with its [Honor Code \(Links to an external site.\)](#) and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff.

Students who are feeling ill or experiencing symptoms such as sneezing, coughing, digestive issues (e.g. nausea, diarrhea), or a higher than normal temperature should stay at home and are encouraged to use the [UT Tyler COVID-19 Information and Procedures \(Links to an external site.\)](#) website to review protocols, check symptoms, and report possible exposure. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email [saroffice@uttyler.edu](mailto:saroffice@uttyler.edu).

#### **Recording of Class Sessions**

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.