

ENGR 270/ 470: EPICS: Engineering Projects in Community Service

Brief Course Description

The emphasis of this course is to enable upper and lower level engineering students to participate in an interdisciplinary team effort to apply engineering principles to solve open-ended problems that will have some significant societal impact.

Educational Objectives

Students who complete the course will be able to

1. Formulate and compose solutions for open-ended, real-life, various small to large scale problems
2. Value the concept of applying theory to practice
3. Describe and practice professional and ethical responsibility
4. Improve written and verbal presentation
5. Demonstrate the ability to function in interdisciplinary teams
6. Incorporate engineering standards and realistic constraints while working on a societal project. Some of the engineering standards may include:
 - i. Economic analysis pertaining to
 - a. design alternatives
 - b. modeling and optimization
 - c. cost estimation
 - d. potential savings
 - ii. Environmental analysis in the context of
 - a. Impact on site selection for new facility (if applicable)
 - b. Recycling and scrap disposal in the system
 - c. Evaluate alternatives for positive and negative environmental impact
 - iii. Sustainability analysis
 - a. Ability to sustain the proposed changes
 - b. Funding strategies for new solutions
 - c. Improving product lifetime and recyclability
 - d. Evaluate the feasibility of the proposed processes
 - e. Life Cycle Analysis
 - iv. Ethical issues
 - a. Significance of non disclosure agreements
 - b. Impact of proposed solutions for different constituencies of the organization – debt holders, stock holders, workers, customers
 - c. ADA compliance issues
 - d. Information sharing with different constituencies

- v. Health and Safety analysis
 - a. Evaluation of potential hazards
 - b. Public safety, fire safety issues
 - c. Ergonomic design consideration to minimize worker injuries
 - d. Solutions that can be applied by non-professionals with relative ease
- vi. Social Issues
 - a. Impact on community of the location of new facility (if applicable)
 - b. Impact on worker morale on new management practices
 - c. Diversity analysis
 - d. Addressing grievance
- vii. Political issues
 - a. Tax breaks from community for new facility (if applicable)
 - b. Retraining people for new positions from eliminated positions
 - c. Easy availability of resources
 - d. Potential ties with other communities in the state, nation and globally

Prerequisites

ENGR470: Upper level engineering classification

ENGR270: Lower level engineering classification

Instructors and Project Advisors

Dr. Frank Shipman (CSCE), shipman@cs.tamu.edu; office hours before/after class and by appointment.

Teaching Assistant (CSCE), to be named

Project Advisors will be associated with each project

Class Schedule

Monday 1:50-2:40; other times to be arranged as required.

Room: HRBB 204

Text Book and Other References

Handouts, reference material and instructions will be provided as needed.

Course Tentative Schedule

The schedule is subject to change as guest speakers will be arranged during the semester.

Wk1 – 1/23	Orientation - Course expectations, project overviews, team set-up
Wk2 - 1/30	Project brainstorming day
Wk3 - 2/6	Revisions to assignment of the projects, team building activity
Wk4 – 2/13	Project updates from the teams, issues, project charters due; project specifications document description
Wk5 – 2/20	Project discussions, Presentation or TBA
Wk6 – 2/27	Project Specification Document due; Project updates in class
Wk7 – 3/5	Project discussions, Presentation or TBA
Wk8 – 3/19	Project web page review
Wk9 – 3/26	Effective presentations; structure for presentation; Project Conceptual Design Report due
Wk10 – 4/2	Project discussions, Presentation or TBA
Wk11 – 4/9	Project web page review
Wk12 - 4/16	Initial presentation run through or team building activities
Wk13 - 4/23	Agree on roadmap for next semester; review draft of final report
Wk14 - 4/30	Final oral presentations, presentation to clients
Wk14 - 5/4	Final corrected report due (no class)

Deliverables and Grading Criteria

Component	Weight	Tentative Dates
Project Charter	5%	Week 4
Project Specifications Document	10%	Week 6
Project Conceptual Design Report	10%	Week 9
Final Written Report	40%	Week 14
Final Presentation	20%	Week 14
Web Page	15%	Ongoing throughout the semester

Grade	Expectations
A	<p>Demonstrates and thoroughly documents excellence in individual accomplishments and learning outcomes appropriate for course level, major, semester in EPICS, and number of credits. Sets ambitious goals; meets or exceeds goals. Maintains excellent individual notebook and synthesizes all relevant work into digitally archived design documents. Demonstrates initiative exemplary for the year and number of credits. Actively adds to skill base through independent work and study. High level of participation in class and group work. High level of understanding in relevant discipline-specific issues for course level and major. Demonstrates excellent teamwork, willingness to work with other members to accomplish team goals and leads when appropriate. Promotes team unity. Consistently produces professional quality work. For juniors and seniors: Drives the direction of the design or research. Makes major contributions to team projects and has a major impact on deliverables. Assists others to learn new skills.</p>
B	<p>Demonstrates and completely documents good achievement in individual accomplishments and learning outcomes appropriate for course level, major, semester in EPICS, and number of credits. Sets and meets appropriate goals. Maintains good individual notebook and sufficiently synthesizes relevant work into digitally archived design documents. Takes some initiative. Good attendance and level of participation in class and group work. Good understanding of discipline-specific issues for course level and major. Participates consistently in team activities. Demonstrates regular progress in the project. Completes all required work. Has a significant impact on deliverables.</p>
C	<p>Demonstrates and documents adequate achievement in individual accomplishments and learning outcomes appropriate for course level, major, semester in EPICS, and number of credits. Develops appropriate goals and meets a minimum level of competency. Maintains adequate individual notebook and synthesizes a minimum relevant work into digitally archived design documents. Participates in groups but does not take active role. Documents work at an acceptable level. Provides information and contributes, but does not normally take initiative. Completes work on project, but does not take any lead on the design or project. Completes all required work, but at minimal level. Good to fair attendance.</p>
D	<p>Does not demonstrate or document adequate achievement in individual accomplishments and learning outcomes appropriate for course level, major, semester in EPICS, and number of credits. Fails to advance, and possibly hinders through action or inaction, the project toward delivery stage. Meets minimal outcomes, but did a very poor job with course requirements. Accomplishes little without significant assistance</p>

	and often lacks success. Does not complete all required work. Provides incomplete or partial project documentation. Made minimal contributions to team activities. Poor attendance. Poor individual notebook and minimal digitally archived documentation.
F	Fails to meet minimum achievement and documentation in individual accomplishments and learning outcomes appropriate for course level, major, semester in EPICS, and number of credits. Clearly hinders, through action and inaction, advancement of project toward delivery stage. Failed to demonstrate one or more outcomes. Minimal or no accomplishments. Incomplete documentation. Has not completed required assignments, attendance, teamwork limited.

Americans with Disabilities Act (ADA) Policy Statement

The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall or call 845-1637.

Aggie Honor Code

“An Aggie does not lie, cheat, or steal or tolerate those who do.”

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System.