ECE 495c and ECE 495d ECE Design Syllabus[[1]](#footnote-1)

Fall 2014

Professor: Dr. Harackiewicz 495c, 495d Office: EGR E-120

Email: fran@engr.siu.edu Office Phone: 453-7031

Office Hours 495cd: M 10-12; TR 9:15-10:15; TR 2:15-3:15

Communications Instructor 495c: Dr. V Gupta; MWF 8:30-9:30 and TR 9-10, EGR E 212

Mechanical Engineering Professor 495a/b: Dr. A. Weston; M: 1-4 TR 10-11, 12-1, EGR B110

Lecture: TR 11AM-12:15PM A111 for 495a/c; TR 1-2:15PM for 495b/d

Lab/Team Meetings: TR 2:15-3:15PM EGR A111; and/or as scheduled for labs (e.g. E215)

Grading/Evaluation:

Each student’s grade in the course depends partially on the evaluation of his/her performance of his/her assigned individual tasks, but primarily on the evaluation of the team’s accomplishments.

Any member of the College of Engineering faculty or staff or interested parties outside the university may witness and review both written and oral reports. However, the course evaluation will be done by the course instructors and the team faculty technical advisor (FTA).

Evaluation of your performance will be according to SEC Policy and Procedures Manual

**Classroom Policies:**

1. **Attendance Policy:** Attendance is mandatory for all classes (aka SEC staff meetings) and team meetings. Absenteeism adversely affects your grade unless your absence is excused by your course professors. Attendance will be taken throughout the semester, and it will be counted toward the final grade. Students are responsible for all announcements made in class and/or posted to D2L.
2. **Late work/Missed Exams:** Late work is not accepted. If an exam is missed for a legitimate reason, a grade will be assigned based on the remaining homework/exams.
3. **Mobile Technology Policy:** Students are expected to polish their professional skills in this course. Mobile technology should not be used unless specifically required for a presentation.
4. **Course number and name**: ECE 495c and ECE 495d ECE Design I and II
5. **Credits and contact hours**: 3, 3 credits, Two 75-minute sessions per week, Two-four hours of scheduled lab per week plus at other times as needed
6. **Course Committee**: Harackiewicz, Tragoudas, Ramaprasad
7. **Text book(s), title, author, and year**:

[1] Clive L. Dym and Patrick Little, *Engineering Design: A Project Based Introduction*, Wiley 2008.

[2] *Saluki Engineering Company Policy and Procedures Manual Version 6.3*, K. Purcell, I. Margon, M. Blankenship, A. Weston, F. Harackiewicz, and W. Osborne [Online: available on Desire2Learn], August 2010

[3] Design Notebook: Laboratory Notebook by National Brand 0-73333-43649-5, 100 carbonless numbered sets or spiral bound Student Lab Notebook by Hayden McNeil 978-1-930882-74-4 or http://shopping.netsuite.com/s.nl/c.ACCT107430/sc.23/category.92/.f Bookfactory Wire-O Bound Carbonless Duplicate Laboratory Notebook

**References or other supplemental materials:**

[1] The Entrepreneurial Engineer, David E. Goldberg, Wiley 2006.

[2] Stuff You Don’t Learn in Engineering School, C Selinger, IEEE Press, 2004

[3] Writing in the Technical Fields: A Step-by-Step Guide for Engineers, Scientists and Technicians, M.Markel, IEEE Press, 1994

[4] Electrical Engineering Design Compendium, R. L McConnell, N. T. Middleton, W. L. Cooley, Addison-Wesley, 1992

[5] The Little Brown Compact Handbook, 3rd Edition, J. E. Aaron, Longman, New York, 1998

1. **Specific course information**
2. (catalog descriptions): (i) Engineering communications including resumes, literature reviews, memos, letters, proposals, reports, specifications, user guides and oral presentations. Selection of Senior Design projects and team assignments. (p) Team approach in engineering projects. Understanding & analyzing a request for proposals. Identification of tasks, assignment of tasked team organization. Work plan, time scheduling. Feasibility analysis, cost-benefit analysis. Ethics & professionalism issues related to engineering projects in general & to the specific project assigned. Team coordination and documentation of team member efforts. (d) Team approach in engineering projects. Work plan/time scheduling. Design options & cost-benefit analysis. Development of the final decision. Team coordination & documentation of team member efforts, design stages, team communications & team decision making processes. Implementation of the design (if the project warrants). Evaluation of final product. Written, oral & poster presentation of final design.
3. prerequisites or co-requisites: Not for graduate credit. Restricted to senior standing in Electrical and Computer Engineering, ECE495i, ECE495p
4. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program: Required for EE and CpE majors
5. Professional Component {Credit Hours}

Mathematics 0 Sciences 0 General Ed. 0   
Eng. Science 0 Eng. Design 3, 3

1. **Instructional Objectives (with SO’s), ex. The student will be able to explain the significance of current research about a particular topic. (a, b, h)**

The student is expected to be able to:

* 1. Prepare a functional resume and cover letter, present self in interview and with an elevator pitch (g)
  2. Take the practice FE exam or other university exam (a,f,i,j)
  3. Follow prescribed steps of an iterative design process to complete a project that meets the needs of a client and management: scope, and define project producing a QFD house of quality document, specifications sheet, trade study tables, block diagrams, flow chart, diagrams, drawings and schematics (c)
  4. Individually and collaboratively document and present engineering work professionally using IEEE style in written, oral, and digital formats for various audiences: literature and patent review, proposal, design review, business plan if appropriate, design report, poster, demonstration, technical manual and user’s manual. (c,d,g,h,i,j)
  5. Use the soft skills necessary to do engineering design in a team environment by creating and maintaining weekly action item lists, semester timelines, daily design notebook entries, as-needed memos, and agendas. Attend weekly meetings and seek technical expertise and conduct independent learning (d,e,f,g)
  6. Articulate within deliverable reports the ethical, cultural, societal, and professional issues that impact the engineering design for their project, such as intellectual property, labor and employee relations, and services of professional societies. (c)
  7. Apply mathematical, scientific, and engineering knowledge and skills as well as modern engineering tools (e.g. from hand calculations to computer simulations) to formulate and solve a complex engineering problem in a team environment. Design and conduct experiments and provide demonstrations of prototypes as needed. (a,b,c,d,e,f,k)
  8. Produce and maintain a budget and an estimated cost and schedule for an engineering project. (c)
  9. Articulate the intellectual property, ethical, health, safety, environmental, economic, and societal issues related to their project. (c,h,j)
  10. Recognize when they need to learn a new skill or acquire more knowledge, and then learn that they can find out what they need to know in order to complete a project even if they have never had any formal training or class work in the subject. (i)
  11. Evaluate work of self and others and self-assess learning (d,f,g,i)

1. **Brief list of topics (class, lab and project) to be covered (with hours)[[2]](#footnote-2)**

a. Classroom Topic (Hours)

* Introduction, Design Notebooks, Welcome Back and HTML (3)
* Project Menu, Team Assignments, and Project Management (3)
* Memos, Resumes, Style Guide, and Career Services (2)
* Literature Reviews, Library Services, Proposals, Design Reviews, Design Reports (5)
* Professional Ethics (2)
* Guest Lectures (4)
* Orals, Demonstrations (11-13)
* Finishing Up (3)
* Management Meetings, Project and Communication Reviews (50)
* Exams (2)
* Dean’s Address (2)

b. Laboratory Topics (Hours)

1. Various Labs designed by teams as needed for project (75)

c. Projects (Hours)

1. Vary by team. The project type is either entrepreneurial, business, research, competition or humanitarian. (150)

1. **CAD and Computer Tools Used: (varies per project)** Excel,MATLAB, Multisim, Simulink, pSpice, Xilinx, AutoCAD, CST, Ansoft, C++, java script, visual basic, LABVIEW, Cadence, PLC, python, …
2. **Assessment of the Contribution to Student Outcomes**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Outcome 🡺 | a | b | c | d | e | f | g | h | i | j | k |
| Assessed 🡺 | x | x | x | x | x | x | x | x | x | x | x |

Student Outcomes (ABET criteria a-k) are quoted here:

(a) an ability to apply knowledge of mathematics, science, and engineering

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to function on multidisciplinary teams

(e) an ability to identify, formulate, and solve engineering problems

(f) an understanding of professional and ethical responsibility

(g) an ability to communicate effectively

(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

(i) a recognition of the need for, and an ability to engage in life-long learning

(j) a knowledge of contemporary issues

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**For University Policies, Dates and Resources, see the Syllabus Attachment in a separate file.**

1. Pages 2 and 3 are for ABET [↑](#footnote-ref-1)
2. subject to change at the instructor’s discretion. Students are responsible for announcements made in class and on D2L. [↑](#footnote-ref-2)