

**University of Massachusetts Amherst**  
**Department of Electrical and Computer Engineering**

# *SDPO3*

Ver. 3 30 Sept 02

## **ECE 415 - Senior Design Project I - Fall 2002 - 2 cr**

### **Description:**

ECE 415 - With Lab. Principles of engineering design process. Consideration of the ethical and social implications of technology as well as basic concepts of business. Small groups of students design small electronic systems to faculty specifications. Preliminary paper design followed by hardware or software prototype. Students must complete project in ECE 416.

Credits: 2

Prerequisites: ECE 323, ECE 313, ECE 222 or 353. For EE and CSE majors only.  
(This description was modified to reflect inclusion of CSE majors in SDPO3.)

### **Objectives:**

After successfully completing this course, a student should be able to:

1. Prototype an electronic and/or software system to meet given specifications.
2. Integrate knowledge from across the core CSE or EE curriculum.
3. Take a systems approach to problem solving.
4. Work productively in a team environment.
5. Effectively communicate technical ideas and concepts.

### **SDP Coordinators:**

C. V. Hollot, Professor and Associate Department Head  
KEB 209E, hollot@ecs.umass.edu

T. Baird Soules, Lecturer and Undergraduate Program Director  
210 Marcus Hall, soules@ecs.umass.edu

### **SDP Technician:**

Francis Caron, 9B Marcus Hall, fkcaron@ecs.umass.edu,  
Hours: 7:30 A.M. - 3:30 P.M., Mon - Fri

### **Project Management:**

In order to facilitate team organization and communication each team will have one member who is designated at the project manager. Each advisor, after having solicited private input from each team member, will assign one team member to be the project manager. It is reasonable for those students with a specific interest in this role to make that known to the advisor. The advisor will inform the SDP course coordinators and team members of his or her choice during the week of 30 Sept 02.

Responsibilities of the project manager include:

- function as liaison between the team and the advisor
- insuring that deadlines are met
- insuring that the team is prepared for the weekly advisor meetings
- responsible for assembling weekly team report
- responsible for logistics and confirmations associated with weekly team meetings, weekly advisor meetings, the PDR and the MDR. This includes room and presentation equipment reservations.

It should be noted that other team members will have areas of responsibility defined as the project moves forward. The role of project manager is clearly defined early in the process due to the general logistical nature of the role. The project manager offers

general support of the design effort while the other roles will be tailored to project-specific needs.

### **Organization:**

**All-course meetings:** Five Mondays, 1:25 P.M., SOM Building, Room 133

All course participants along with ECE 499Y (Departmental Honors) students will meet together five times this semester: the first three Mondays and then on 28 Oct 02 and 02 Dec 02. Other optional events will be scheduled for this time slot. Keep it open.

### **Weekly Team Meetings:**

Weekly team meetings are for the team members to meet with each other. This can be either before or after the weekly advisor meetings, but meeting the day before the advisor meeting is encouraged in order to be prepared to make best use of the time with the advisor. It is the project manager's responsibility to set up these meetings.

### **Weekly Advisor Meetings:**

Each project team will have a weekly team meeting with their project advisor. The purpose of each meeting is to have each team member report on progress that has been made, barriers that have been identified and clarification of short- and long-term goals. It is the project manager's responsibility to set up these meetings with the project advisor.

### **Required Text:**

The Mayfield Handbook of Technical and Scientific Writing; Leslie C. Perelman, James Paradis, Edward Barrett. (Available on ECS PCs in hypertext form.)

This is the same text that is used in ENGL 351, Technical Writing.

### **Schedule, Fall 2002:**

Besides the weekly team meetings and advisor meetings, the schedule includes the following milestones:

1. **Week of 30 Sep 02:** Team advisor informs the team and SDP course coordinators (via email) whom she or he has chosen as the project manager.

Project Title and Specification refined and agreed upon by advisor and team. Project manager sends refined Project Title and Specification to advisor, team members and SDP course coordinators via email.

2. **Week of 21 Oct 02:** Preliminary Design Review (PDR): Presented to Project Advisor. Project manager sends MDR prototype specification to SDP course coordinators.

3. **Monday, 28 Oct 02,** SOM Building, Room 133: All-course mandatory meeting. Present very short summary of PDR in-class. One team member presents one summarizing overhead slide including the MDR prototype specifications.

4. **Monday, 02 Dec 02,** SOM Building, Room 133: All-course mandatory meeting.

5. **Week of 09 Dec 02:** Mid-course Design Review (MDR): Presented to SDP Review Board and Project Advisor.

### **Preliminary Design Review (PDR)**

The Preliminary Design Review (PDR) will occur during the week of 21 October 02. The twofold purpose of the PDR is for the team to present their preliminary design and receive feedback from their advisor on that design. At the PDR each team will turn in a written report and deliver a Powerpoint presentation to their team advisor. Each team member will participate in the preparation of the report as well as the preparation and delivery of the Powerpoint presentation. The report and presentation will include project specifications, project background, at least one preliminary design as well as the team's proposed MDR prototype specifications. The advisor will modify the MDR prototype specifications at the PDR. The MDR prototype specifications should be substantial and complete enough to demonstrate that the team has successfully tackled one or more of the core technical design challenges of the overall project. The MDR prototype specifications will be included in the team presentation to the class on 28 Oct 02. The MDR prototype specifications will be sent to the SDP course coordinators by the project manager.

It is the project manager's responsibility to schedule the PDR in an ECE conference room. Reservations should be made during the weeks prior to PDR week. A sample PDR report and Powerpoint presentation will be made available.

### **Mid-course Design Review (MDR)**

The Mid-course Design Review (MDR) will take place before the SDP Review Board and the team advisor during week of 09 Dec 02. The twofold purpose of the MDR is for the team to present a prototype (and it's associated design) and to receive feedback from the SDP Review Board and the team advisor on that design. The hardware and/or software prototype presented should demonstrate that the chosen design path is likely to lead to a completed project in April which meets or exceeds the project specifications.

The role of the SDP Review Board is to provide independent feedback to the advisors and team members. The review board will consist of ECE faculty members and will participate in all MDRs.

Each team will turn in a written report and deliver a Powerpoint presentation at the MDR. Each team member will participate in the preparation of the report as well as the preparation and delivery of the Powerpoint presentation. The MDR report and presentation will include project specifications, project background, and an explanation and demonstration of the design goals that were met this semester.

It is the project manager's responsibility to schedule the MDR in an ECE conference room. Reservations should be made during the weeks prior to MDR week. A sample MDR report and Powerpoint presentation will be made available.

### **Grading:**

Team members will be graded individually by their SDP project advisors. After the Mid-course Design Review, the Design Review Board will recommend semester grades for each team member based on the report and oral presentation. The project advisors will take this feedback into account when assigning the semester grade.

The team members may receive different letter grades. Your performance on your portion of the project, contributions towards progress reports and your participation level in the weekly meetings will impact your final grade.

The importance of each member's preparedness and participation in the weekly meetings is crucial to the success of the projects. To that end, the course coordinators are recommending a simple weekly grading scheme in which a team advisor can assign a weekly grade corresponding to the progress reported by individuals and degree of participation in the meeting. A grade of 0 (unacceptable contribution, 1 (satisfactory) or 2 (exemplary) would be assigned to each member each week.

**Report Formats:**

The PDR and MDR reports will conform to the Progress Report format described in section 2.4.5 of the Mayfield Handbook. It is required that each team member contribute to these reports. Individual contributions should be noted in the reports. A recommended format for a brief weekly progress report will be provided.

**Academic Dishonesty:**

Any form of academic dishonesty (see definition in the Undergraduate Rights and Responsibilities booklet) will not be tolerated. Academic dishonesty will lead to a failure in the assignment in question, failure in the course, and/or further disciplinary action at the university level. Cases of academic dishonesty will be reported to the Department Head, the Asst. Dean and the University Academic Honesty Board.

**Relationship to Program Outcomes:**

The ECE undergraduate program as a whole has ten educational program outcomes. This course contributes towards meeting those outcomes. The table below shows how the five course objectives above relate to the program outcomes.

PROGRAM OUTCOMES	COURSE OBJECTIVES				
	1	2	3	4	5
1. Well grounded in the fundamental concepts of math, physics, chemistry, computer science, and engineering science	Y	Y	Y	N	N
2. Able to identify, formulate and solve problems in ECE	Y	Y	Y	N	N
3. Able to design and conduct experiments, and to analyze and interpret measured data	Y	Y	Y	N	N
4. Capable of designing analog and digital systems, components, and processes to meet desired needs	Y	Y	Y	N	N
5. Proficient in using modern engineering techniques and computing tools for effective engineering practice	Y	Y	Y	N	N
6. Experienced in engineering teamwork, and in solving technically diverse and multidisciplinary problems	Y	Y	Y	Y	Y
7. Able to communicate effectively orally and in writing, and through symbolic and graphical expression	Y	N	Y	N	Y
8. Aware of professional and ethical responsibilities as engineers	Y	N	N	Y	Y
9. Aware of the impact of ECE technology and decisions on society	Y	Y	Y	N	N
10. Motivated about the importance of lifelong learning, scholarship and professional development	N	N	N	N	N

Professional component: Credits of engineering science: 0; Credits of engineering design: 2  
 Prepared by: T. Baird Soules and C. V. Hollot Date: Sept. 2002