

Senior and Junior Engineering Clinic I
ENGR01.302 and ENGR01.402
Spring 2010

Section NN	Place	Meeting Times	Discipline Managers
01	Rowan Hall Betty Rowan Auditorium	T: 12:15-3:00 Th: 12:15-3:00	ChE Farrell & Slater
02	Rowan Hall Betty Rowan Auditorium	T: 12:15-3:00 Th: 12:15-3:00	CE Everett & Riddell
03	Rowan Hall Betty Rowan Auditorium	T: 12:15-3:00 Th: 12:15-3:00	ECE Mandayam & Head
04	Rowan Hall Betty Rowan Auditorium	T: 12:15-3:00 Th: 12:15-3:00	ME Bhatia & Von Lockette

Course web site: <http://engineering.rowan.edu/courses/Clinic/index.html>

Catalog Description:

This course is a continuation of the clinic sequence. Research and/or design projects are selected in keeping with program objectives. Projects are supported by external sponsors when possible and are expected to incorporate program goals where practical. These include multidisciplinary teamwork, entrepreneurship, vertical integration of juniors and seniors and an emphasis on communication skills.

Prerequisites:

Junior Engineering Clinic 1: Undergraduate level ENGR 01202 Minimum Grade of D- and Undergraduate level MATH 01236 Minimum Grade of D- and (Undergraduate level CHE 06302 Minimum Grade of D- or Undergraduate level ECE 09311 Minimum Grade of D- or Undergraduate level ENGR 01272 Minimum Grade of D-)

Junior Engineering Clinic 2: Undergraduate level ENGR 01301 Minimum Grade of D-

Senior Engineering Clinic 1: Undergraduate level ENGR 01302 Minimum Grade of D-

Senior Engineering Clinic 2: Undergraduate level ENGR 01401 Minimum Grade of D-

Engineering Clinic Objectives:

At the conclusion of the course, students will

- (i) Demonstrate expanded knowledge of the general practices and the profession of engineering through immersion in an engineering project environment of moderate to high complexity.
- (ii) Demonstrate an ability to work effectively in a multidisciplinary team.
- (iii) Demonstrate acquisition of new technology skills through use or development of appropriate computer hardware, software, and/or instrumentation.
- (iv) Demonstrate business and entrepreneurial skills which may include developing a business plan, market plan, venture plan, or other approved instrument.
- (v) Demonstrate effective use of project and personnel management techniques.
- (vi) Identify and meet customer needs.
- (vii) Integrate engineering professionalism, ethics, and the environmental in their work and as it relates to the context of engineering in society.
- (viii) Demonstrate improved communication skills including written, oral, and multimedia. This may include both patent and literature searches as well as writing a patent disclosure for novel work.

Required Texts & Supplies:

- Laboratory notebook w/ numbered pages, duplicate page sets; e.g., Boorum #09-9088.
- Appropriate safety equipment as specified by your faculty project manager in the initial HAZOP analysis of your project. Individual work areas in Rowan Hall require specified personal protective equipment (e.g. machine shops and chemical related laboratories). If required by the project manager or working area designation, students are expected to purchase their own safety glasses.
- Handout materials.

Course Withdraw Schedule¹

Dates	Designations on Transcript	Signature(s) Required
Jan 26 - Mar 8, 2010	W	Student, PM
Mar 9 - April 05, 2010	WP/WF	PM, Dept. Chair
Apr 06 – May 08, 2010	WP/WF	PM, Dept. Chair, Dean

Common Grading Guidelines for Jr/Sr Engineering Clinic

The following are general guidelines for establishing grades for the Junior/Senior Engineering Clinic. These guidelines are further detailed in specific departmental grading guidelines and criteria that will be distributed by your Discipline Managers.

Your faculty project managers in consultation with your discipline manager will assign your grades. A grade of incomplete may be given if requested work is incomplete such as instrumentation and tools are not returned, waste is not properly disposed, laboratory area is not clean, laboratory notebooks and electronic files are not transferred to faculty.

Grade	Guidelines
A	<ul style="list-style-type: none"> • Exceed Expectations • Take charge of the project and generate tasks from goals and objectives. • Think independently, ask questions and make suggestions. • Develop original solutions by combining theory and/or analytical techniques that demonstrate a mastery of engineering science and/or design principles from one or more supporting engineering courses. • Demonstrate the ability to engage in lifelong learning by applying engineering science and/or design principles that are not covered in your supporting engineering courses. • Complete all project deliverables and objectives. • Effectively communicate (via written, oral, engineering drawings, etc.) project deliverables to your project manager and/or external sponsor. • Exhibit consistently strong team and individual performance in terms of project deliverables and objectives as well as laboratory safety, team skills, record keeping, punctuality, etc.
B	<ul style="list-style-type: none"> • Take charge of the project and do all of the work that you are asked to do. • Ask questions and make suggestions. • Develop solutions by applying theory and/or analytical techniques that demonstrate a mastery of engineering science and/or design principles from one or more supporting engineering courses. • Complete all project deliverables and objectives. • Effectively communicate (via written, oral, engineering drawings, etc.) project deliverables to your project manager and/or external sponsor. • Exhibit strong team and individual performance in terms of project deliverables and objectives as well as laboratory safety, team skills, record keeping, punctuality, etc.
C	<ul style="list-style-type: none"> • Do all of the work you are asked to do. • Develop solutions by applying theory and/or analytical techniques. • Complete all project deliverables and objectives. • Communicate (via written, oral, engineering drawings, etc.) project deliverables to your project manager and/or external sponsor. • Exhibit average team and individual performance in terms of project deliverables and objectives as well as laboratory safety, team skills, record keeping, punctuality, etc.
D	<ul style="list-style-type: none"> • Do some of the work what that you are asked to do.

¹ For a complete description of this procedure please refer to page 58 in the Rowan University Student Information Guide http://www.rowan.edu/studentaffairs/main_office/Publications/Infoguide.pdf

	<ul style="list-style-type: none"> • Complete some of the project deliverables and objectives. • Ineffectively communicate (via written, oral, engineering drawings, etc.) project deliverables to your project manager and/or external sponsor. • Exhibit poor team and individual performance in terms of project deliverables and objectives as well as laboratory safety, team skills, record keeping, punctuality, etc.
F	Do very little. Don't show up.

Grading:

This course is only offered for grade credit only. The grade is determined by evaluating work performed in the listed areas:

Project Management	Project Management/Professionalism (e.g. project implementation plan, status reports, web pages)	10%
	Design/Project Review	15%
Technical Communication	Writing Intensive Activities	10%
	Final Presentation	15%
	Final Report	25%
Final Project Evaluation	Technical Merit	25%

Total 100%

Project Management

Success of a project is critically dependent on the team member's ability to manage many concurrent tasks. Your project manager (PM) will want to be regularly informed of your progress through the use of an implementation plan, Gantt chart, status reports, information on your web page, and other mechanisms. ***A design/project review will be conducted in the 8th week of the semester.*** A typical Design/Project review might contain a clear explanation of the nature and scope of the problem, your preliminary analyses, outline a number of approaches considered, identify the selected alternative, and clearly explain the steps your team plans to take to be successful. ***It is your responsibility to invite one of your discipline managers (DMs) to attend this meeting.***

Technical Communication

Formal and informal presentation opportunities will be given throughout the semester. Informal project communication occurs at regularly scheduled project meetings. Formal presentations will consist of the Design/Project Review, and a Final Presentation. Your faculty Project Manager (PM) will specify the exact form of reporting; for example, some externally sponsored projects may require special presentations to sponsors. For the purposes of this grading scheme the Design/Project review is given a separate grade under the heading project management.

Writing Intensive Component

The spring cycle of junior/senior clinic includes added emphasis on written technical communication in keeping with the designation of Senior Engineering Clinic II as Writing Intensive (WI) in partial fulfillment of the University's General Education requirements. The course will include a significant formal written component that includes drafts and revisions prior to producing a final technical report. Your PM will provide more information about this process. A number of formats for reports are possible; for example, a technical report, a paper for publication in a journal, or an interactive user's manual.

Final Project Evaluation

Your project will be evaluated based on your reports (oral and written) and on its technical merit. The format of your final report is subject to the approval of your faculty project and discipline managers. Possible formats for this report include a written formal report, a paper for publication in a technical journal, or an interactive user's manual. Final project reports should contain information showing how the project goals were met and address additional areas of interest such as business, environmental.

Projects: Students apply for projects during the first week. After receiving a master list of projects sponsored by the four disciplines and attending a Project Showcase, an application is submitted for projects ranked from 1- 4

(1 signifying a combination of high interest and skills appropriate to the needs of the project). Project assignments will be made competitively based on stated interests, demonstrated skills (shown in resume), and to achieve appropriate discipline representation. You are required to provide your preference for at least 2 out-of-discipline projects. Each project has a faculty project manager (PM) who will manage students assigned to that project. A Co-PM may also assist on an as-needed basis and is typically from a supporting discipline. Regular project meetings will be held with the faculty PM in accordance to the format established by the PM. Responsibility for performing the student PM duties will be rotated among the team members so that all students gain project management experience.

Computer Usage:

The engineering computer skills to be applied in the course include a mixture of: (i) standard productivity tools (WP, SS, PP); (ii) computer-aided design capture; (iii) simulation; (iv) development of custom application code; (v) the use of application software; and (vi) use of a data acquisition/analysis/display environment.

Attendance Policy:

In keeping with published policy (see p. 40 in the Student Information Guide http://www.rowan.edu/studentaffairs/main_office/Publications/Infoguide.pdf or page 44 of the 2009-2010 *Rowan University Undergraduate Catalog*), attendance is required because substantial in-class material is presented and because attendance is needed to develop teamwork and cooperative learning skills, and accomplish project work. The instructor must be notified of an excused absence in advance of the class. Your project manager may require you to complete a work log to demonstrate your attendance.

Safety:

Attention to good safety practices is of critical importance. Safety will be stressed throughout this course. You will receive rules and guidelines that must be followed. Failure to follow safe laboratory practices can lead to accidents that can endanger you and other students. Throughout the semester your laboratory area must be kept organized and any waste materials properly disposed. Your grade will be reduced if you fail to follow proper safety procedures and you may be denied access to shop facilities.

Final Engineering Clinic Course Sections

After all students have been assigned a project and they are officially announced, then students must drop engineering clinic sections 1 through 4 and add the engineering clinic section designated by the your faculty project members (PM) name and CRN. This task must be completed by **11 PM on 25 January 2010**, since select sections will be officially cancelled.

Banner Process for Students

1. Using the Student Campus Portal cp.rowan.edu Click on the following links in order given:
 - a. Student Self Service
 - b. Access Banner Services (and then login by providing your User ID and PIN)
 - c. Student & Financial Aid
 - d. Registration
 - e. Add or Drop Courses
 - f. Term Selection (Spring 2008, and select Submit)
2. Perform Drop/Add:
 - a. Drop the current section (Section 01 – 04) of Junior or Senior Clinic
 - b. Add Classes worksheet (You will need to have the CRN for the faculty member who is the Principal Investigator of the project.)

Note: It might be worthwhile to have access to the Section Tally for Junior and Senior Clinic, which provides section assignment and CRNs: http://banner.rowan.edu/reports/reports.pl?task=Section_Tally

Honors Jr/Sr Engineering Clinic

The Jr/Sr Engineering Clinic can be taken as an honors course. Section 5 of both the Junior and Senior engineering clinic is designated as the honors section with Kauser Jahan, Honors Program Liaison for Engineering, as the designated instructor. Students who would like to take this course as an honors course, must obtain approval from both the faculty project manager and Dr. Jahan before enrolling in this section.

Important Milestones:

Week 1:	Course introduction and project fair/selection Submit project selections to discipline boxes located in Rowan Hall Room 312 on Wednesday January 20th at 9.00 am Team selection announcements and start work.
Week 8:	Project/Design reviews; Preliminary web site design. For out of discipline students, coordination with your DM is required. Clinic Project Summary due – Use the following link: http://engineering.eng.rowan.edu/clinicpages/
Week 12:	First submittal of written documentation due.
Week 14:	Faculty and/or Peer Evaluations of written documentation due.
Week 16:	Final Presentations. Faculty DM will schedule presentations. Final project documentation package due at time of presentation unless directed otherwise by your PM or DM.