<p style="text-align:center">Junior and Senior Engineering Clinics</p>

Catalog Description:
This course is part of the Junior / Senior engineering 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 Clinics taken twice for **Senior Engineering Clinics.**

Engineering Clinic Objectives:
At the conclusion of the course, students will demonstrate the following abilities:

1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to solve engineering research or design problems to produce solutions that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline.
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
4. An ability to communicate effectively with a range of audiences.
5. 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.
6. An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge.
7. An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment.

Required Texts & Supplies:
- Laboratory notebook
- Appropriate safety equipment and training 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 Withdrawal Schedule
Please refer to the Withdrawal Signature Schedule provided by the Office of Registrar for this term.

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 or your project manager. 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	• **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	• **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	• **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	• **Do some** of the work what that you are asked to do. • **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 following weights can be used as a guide. 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 mid-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 each discipline and student choices. Project assignments will be made based on stated interests, demonstrated skills/experience, and to achieve appropriate discipline representation, among other constraints. 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 university policy (see https://confluence.rowan.edu/display/POLICY), 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 the common engineering clinic section and add the engineering clinic section designated by the your faculty project members (PM) name and CRN. If you are taking the clinics as an *honors* course, select the appropriate section. **This task must be completed BEFORE Friday of the first week of class, 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 20XX, and select Submit)
2. Perform Drop/Add:
    a. Drop the current section of Junior or Senior Clinic
    b. Add Classes worksheet (Select the CRN for the faculty member PM)

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

Important Milestones:

Week 1	Course introductions and Project Selection Submit **project selections** with **field trip release forms** online by **Wednesday at 9:00 am.** Team selection announcements are made on **Thursday**. Begin working on your projects immediately.
Week 8 (or prior)	Project/Design reviews.
Week 12	First draft of written documentation due.
Week 16	Final Presentations. Faculty DM will schedule presentations. **Your finals will be scheduled during Junior AND Senior Clinic Exams. Do not make travel plans before discussing them with your advisor.** Final project documentation package due (further details provided by PM and/or DM).