COURSE SYLLABUS

1 ECE 3970 - Design Seminar - EE

2 Meeting Information

2 credits, 3 contact hours One 100-minute lecture per week

a. **Section 001:**
Lecture: Thursday from 10:00 am to 11:40 am, **Mendel 101**

3 Course Instructor(s), TA(s)

a. **Section 001:**

Class Instructor:	Robert H. Caverly
Office Hours:	Via Zoom appointment, or by appt.

TA(s):
Mr. George Simmons (Project Coordinator)
george.simmons@villanova.edu
Office Hours: Via Zoom appointment, or by appt.

4 Textbook

This course does not have a prescribed textbook

a. **Other Supplemental Materials:** Class notes and other material

5 Specific Course Information

a. **Catalog Description**
Areas and career paths in electrical engineering. Overview of required senior project courses and faculty project sponsors. Engineering design, project selection requirements, technical communications, information gathering. Requires selection of design project adviser, project topic, and a formal written project proposal.

b. **Prerequisites:** None; **Co-requisites:** None

c. **Required** for BS Electrical Engineering

6 Course-specific Goals

a. To learn about the ECE design process, to acquire knowledge of project planning and proposal writing, to perform preliminary design work and write a formal technical proposal for continued design effort next Fall, to develop skills in working on a team. The minimum outcome expected from students is to be able to perform the following in a team setting:

Develop design requirements and specifications for an open-ended design project.

Learn and apply techniques for development and evaluation of design alternatives, including ethical considerations 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 and relevant standards.

Learn and apply techniques for elementary program planning, scheduling, and management.

Write an acceptable proposal for the design of a system, machine, or other which incorporates the first three items above, and successfully defend the proposal in an oral presentation.

Oral AND Written Proposals will include (but are not limited to):

Background and State-of-the-Art Help the audience understand what you are doing and why you are doing it. Describe the proposed project. Describe why you selected the proposed design as your capstone project(challenge, interest, talent, importance to a "customer", etc.) Describe any history or background of related work you or other have done in the past. Describe the state of the art of the technology related to your project. Use well defined references to papers, books and web sources.

Design Specifications Develop functional and performance specifications for the proposed design. What will the design do? How well will it do it? Clearly identify "required" vs "desired" specifications. These specifications will be used as a checklist in your senior year to determine if you have reached your goals on the project, and will have a major impact on your grade in senior year.

Preliminary Designs Present at least two configurations for your design. Describe how your team evaluated the configurations and how you settled on a final design approach. Include a clear description of calculations, simulations, experiments, comparisons, surveys, prototypes, etc. you use in evaluating the alternative designs and selecting the final design.

Statement of Work. Develop the list of tasks your team will perform to create the design and a working prototype that meets the specifications. Describe the work that will be performed to accomplish each task. Convince the audience that each task is logical and your team can complete the tasks. Include descriptions of proposed research, analysis, experiments, prototypes, etc. that will be used in the conduct of the design, construction, assembly, test and refinement.

Resources, Schedule and Milestones Determine the duration of each task and the relationship of the tasks to one another versus time. Typically, at least ten tasks are required for a significant project. Develop an estimated person-power analysis detailing who is to do what and when. Develop a list of resources needed, including parts, and services; include estimated cost. Develop a list of clear, realistic, measurable milestones to provide an indication of progress.

A detailed proposal outline will be provided during the semester.

Progress Reports and Meetings:

Once projects have been selected, team will be required to meet with their advisors on a schedule defined by the advisor. It is strongly suggested that these meetings occur every week. In addition, biweekly progress reports will be submitted to the course instructors via Blackboard and to the project advisor(s). A format will be provided.

Out-of-Class Senior Design Project Work.

Each student is expected to spend a bare minimum of 60 hours outside of class on just the technical work of the project to receive a non-zero grade for the Technical Progress portion of the course grade. Consult with your advisor for specific requirements regarding the Technical Progress portion of the course grade.

Deadlines.

Late submission of any assignment may be subject to a deduction of 2 percentage points from the grade for the late assignment per business day per assignment. This penalty will be deducted from the assignment grade as determined by the other course requirements.

b.

ABET Student Outcomes						
1	2	3	4	5	6	7
X	X	X	X	X	X	X

The above student outcomes are defined by the Accreditation Board for Engineering and Technology (ABET) as:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. 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
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

7 List of Covered Topics

1. Introduction to the Senior Design Sequence
2. Areas and career paths
3. Overview of the design process
4. Overview of standards, constraints
5. Engineering design, project selection requirements, technical communications,
6. information gathering, project management
7. Team selection and team work

8 Tentative Schedule

Tentative schedules for all sections follow. Be sure to refer to the schedule for your specific section, if more than one is provided.

Tentative Schedule for **All Sections**

Week	Tentative Topic or Activity
10 January	Overview of course. Syllabus review. Design process.
17 January	Standards and proposal management presentation. Technical Skills for Design 1.
24 January	Intellectual Property Law.
31 January	Faculty Presentations of projects. Final submission of student-proposed projects
7 February	Faculty Presentations continued. Innovate. Project selection survey
14 February	Project Selection Surveys due by end of day. Technical Skills for Design 2
21 February	Proposal Writing Skills. Project assignments announced.
7 March	Weekly progress reports due to advisors and posted on Blackboard. No Class.
14 March	Weekly progress reports due to advisors and posted on Blackboard. No Class.
21 March	Weekly progress reports due to advisors and posted on Blackboard. No Class.
28 March	Weekly progress reports due to advisors and posted on Blackboard. No Class.
4 April	Weekly progress reports due to advisors and posted on Blackboard. No Class.
18 April	DRAFT presentation and written proposal to project advisor and upload to BlackBoard.
25 April	Final oral presentations. Final presentation slides due April 27.
2 May (due date)	Final written proposals submitted to Blackboard.

9 Grading Policy

The primary requirement for passing the course is to submit a design proposal (due May 2, 2022) that is acceptable to a panel of faculty advisers including your project advisor and course instructors. An acceptable proposal is a requirement for a passing grade, and if the proposal is acceptable, a course grade will be computed. Each student will receive a final grade based on individual and team performance. Your final grade will be determined from the following:

a. Preliminary Oral Presentation 10% (Advisor assigned grade)

b. Final Oral Presentation: 25% (Coordinator and Advisor assigned grade)

c. Final Written Proposal Document: 50% (Coordinator and Advisor assigned grade))

d. Biweekly Progress Reports and Other Assignments: 10%

e. Advisor's individual Team Contribution Grade: 5% (will be assigned by the project advisor based upon the individual's overall contribution to the project and professionalism)

Letter grade scale: A(93–100), A–(90–92), B+(87–89), B(83–86), B–(80–82), C+(77–79), C(73–76), C–(70–72), D+(67–69), D(63–66), D–(60–62), F(<60)

10 HW Assignment and Laboratory Report Submission Policy

All Progress Reports, PowerPoints and other assignments are due on the dates indicated on BlackBoard. Late reports will lose **2 percentage points per business day** after the due date. This penalty will be deducted from the assignment grade as determined by the other course requirements. There will be no final exam, only the final written and oral project proposals and PowerPoint presentation.

11 Attendance Policy

Attendance to all classes is mandatory.

Whenever possible, students should inform the instructor if they plan to be late or absent from class. In all cases, documentation is required to petition for *excused* absences to the Associate Dean for Student and Strategic Programs, Dr. Stephen Jones. The excused absence form is posted at: https://www1.villanova.edu/villanova/engineering/resources/undergraduates.html.

Excused absences do not count towards a failure in the course for first year students. Absence from class does not release the student from assigned work. Students who miss an in-class obligation such as an exam, a presentation, etc., due to an excused absence will not be penalized - the instructor may offer a make-up test, arrange an alternative time for a presentation, exempt a student from the assignment, or provide another arrangement. In the case of illness or injury, the form must be submitted within 24 hours of missing a class. The University's list of excused absences for all students includes the following:

1. Participation in NCAA athletic competitions
2. Participation in special academic events such as: conferences, field trips, project competitions, etc., and in official university business such as student representatives attending meetings related to university governance
3. Attendance at significant events of the immediate family such as: funerals, weddings, etc.
4. Religious holidays - see the University's policy on Religious Holidays
5. College-approved participation in placement activities such as: job interviews, graduate school interviews, job fairs
6. Legally required absence such as: jury duty, court appearance, short-term military service
7. Documented serious illness or disability

12 Examination Policy

The College of Engineering has adopted the following general examination guidelines:

1. Students must arrive before the start of the examination. Under exceptional circumstances a student may need to arrive late, but he/she can enter the examination room no later than five (5) minutes after the start of the exam.
2. Cell phones must be turned off until the student exits the examination room.
3. The official Villanova class attendance policy must be followed when requesting excuses for absences or lateness to an examination.
4. Each student must write and sign the following statement, "I have neither given nor received any unauthorized assistance in the completion of this examination."
5. For online examinations, the instructor may implement video proctoring or other measures to ensure academic integrity. For consent purposes, the instructor will inform students in advance if (s)he plans to use any form of video-proctoring and whether the examination will be recorded.

13 Academic Integrity Policy

The College of Engineering is committed to creating an environment of academic integrity and ethical decision-making that we hope is reflected in the actions of our students and graduates. As Villanova students, integrity is central to the University mission. As engineers, our code of conduct

requires us to place honor and integrity at the forefront of everything we do. As engineering students, it is expected that you will begin to adopt these values and instill them into your work habits. Students violating the academic integrity policy will receive a zero on that assignment or exam and the violation will be reported to the Associate Dean for Academic Affairs. The University's academic integrity policy can be found on the following web page:
https://www1.villanova.edu/villanova/provost/resources/student/policies/integrity.html.

14 Adherence to the Student Code of Conduct

Students are expected to act in a professional and respectful manner to their fellow students, faculty, and staff. Students should become acquainted with and understand the responsibilities set forth in the Student Handbook, especially those in the sections on Policy and Regulations. Adherence to university regulations is expected and required for successful completion of the program of studies. Enforcement within the classroom of policies regarding classroom behavior is the responsibility of the faculty member. All other discipline problems are to be referred to the Dean of Students.

15 Online Expectations

To foster a professional environment, please wear appropriate clothes, mute if you are not talking to cut down on background noise, refrain from eating, and select an appropriate setting when we are meeting online.

16 Inclusive Classroom

This classroom is a place where you will be treated with respect; we welcome individuals of all ages, backgrounds, beliefs, ethnicities, gender, gender identities and expressions, sexual orientation, and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment to allow all among us to learn and flourish.

17 Students with Disabilities

It is the policy of the university to make reasonable academic accommodations for qualified individuals with disabilities. If you are a person with a disability (non-physical) please register with the office of Learning Support Services (LSS) by emailing Learning.support.services@villanova.edu or by phoning 610-519-5176 as soon as possible. Registration is *required* in order to receive accommodations.

The Office of Disability Services (ODS) collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The ODS provides Villanova University students with physical disabilities the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact and register with Gregory Hannah, advisor to students with disabilities at 610-519-3209 or visit the office on the second floor of the Connelly Center.

18 Tutoring Services

Villanova's tutoring services include The Writing Center, The Learner's Studio, and The Center for Speaking and Presentation. These services are offered free of charge to students. Drop in as-

needed or book a regular weekly session to supercharge your academic success. Sessions can be 30 or 60 minutes in length.

Register for an account and book sessions in advance at villanova.mywconline.com. If you don't see your class listed, request a tutor for a missing subject at: tutorrequest.villanova.edu For more information, contact Juliana Struder at juliana.studer@villanova.edu or at 610-519-5862.

19 Electronics Policy

The use of electronic devices, such as phones, laptops, tablets, calculators, etc., during class is generally allowed, unless their use causes a disturbance to others. During examinations, the use of any electronic device is prohibited, unless it is expressly authorized by the instructor.

Students are prohibited from making any audio or visual recordings (including taking photographs) of lectures, discussions, or other classroom activities, unless a student (1) has written permission in advance from the instructor, or (2) is permitted to record under terms and conditions as approved by the University's Office of Disability Services or Learning Support Services. Students who have received approval to record classes as an academic accommodation must provide supporting documentation from the Office of Disability Services or Learning Support Services in advance of any recording. Students may use authorized recordings only for the purposes of individual study in the course, and may not disseminate or share them with a wider audience without explicit permission.

20 Copyright Policy

The materials used in Villanova University courses ("Course Materials") generally represent the intellectual property of course instructors, third parties and/or the university which may not be disseminated or reproduced in any form for public distribution (e.g., sale, exchange, etc.) without the written permission of the course instructor. Course materials include all written or electronic documents and materials, including syllabi, current and past examination questions/answers, and presentations such as lectures, videos, slides, etc., provided by a course instructor. Course materials may only be used by students enrolled in the course for academic (course-related) purposes.

Published course readings (book chapters, articles, reports, etc.) available in "Blackboard" are copyrighted materials. These works are made available to students through licensed databases or fair use. They are protected by copyright law, and may not be further disseminated or reproduced in any form for distribution (e.g. uploading to websites, sale, exchange, etc.) without the permission of the copyright owner.

Follow these links for more information on Intellectual Property, Copyright, and Computer Acceptable Use.

21 Professorial Duties

It is important to note that teaching is one of the many duties that professors perform as part of their job responsibilities. In addition to teaching, professors perform research, advise graduate students, edit journals and review journal articles, serve on committees for the university and professional societies, travel to conferences to remain abreast of current developments and to present their results... to name just a few commitments.