

ECE 3970 DESIGN SEMINAR – EE

1. **ECE 3970–DESIGN PROJECT EE**
2. Two credit hours – one 100-minute class per week.
3. Course Instructor
 - a. Robert Caverly, Ph.D. *, Course Instructor
433 Tolentine
610 -519-5660
robert.caverly@villanova.edu
Office Hours on Zoom by appointment
 - b. Mr. George Simmons, Project Coordinator
MDL, CEER 105
(610) 519 – 8762
george.simmons@villanova.edu
Office Hours on Zoom by appointment

4. SCHEDULE (TENTATIVE)

| | |
|-------------------|---|
| January 26, 2021 | Overview of course. Syllabus review. Design process. |
| February 2, 2021 | Standards, research and citation management presentation. Project management. Technical Skills for Design #1. |
| February 9, 2021 | Technical Skills for Design #2 |
| February 16, 2021 | Faculty Presentations of projects. Final submission of student-proposed projects |
| February 23, 2021 | Faculty Presentations of Projects and Programs (Innovate). |
| March 2, 2021 | Listing of projects. Project selection survey |
| March 9, 2021 | Project Selection Day. Selection surveys due by end of day |
| March 16, 2021 | Project assignments announced. Issues discussed. Start of weekly meetings with project advisors. (Working Break Day #2) |
| March 23, 2021 | Weekly progress reports due to advisors and posted on Blackboard. No Class. |
| March 30, 2021 | Weekly progress report due to advisor and posted on Blackboard. No Class. |
| April 6, 2021 | Weekly progress report due to advisor and posted on Blackboard. No Class. |
| April 13, 2021 | DRAFT PowerPoint presentation to project advisor and upload to BlackBoard. Exact date and time to be determined by the advisor and team. Must be completed by April 15. No Class. |
| April 20, 2021 | Final oral presentations during class time and recorded on Zoom. |
| April 27, 2021 | Final written proposals submitted to Blackboard. No Class. |

* Course Coordinator

5. TEXTBOOK

- a. Class Notes
- b. Class handouts

6. SPECIFIC COURSE INFORMATION

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..

- a. Prerequisites: None
- b. Required for B.S. Electrical Engineering (ECE3970)

7. 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:
- b. Develop design requirements and specifications for an open-ended design project.
- c. 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.
- d. Learn and apply techniques for elementary program planning, scheduling, and management.
- e. 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

f. ABET OUTCOMES

| Student Outcomes | | | | | | |
|-------------------------|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| X | X | X | X | X | X | X |

8. LIST OF TOPICS TO BE COVERED

1. Areas and career path
2. Overview of the design process
3. Overview of standards, constraints
4. Engineering design, project selection requirements, technical communications, information gathering, project management
5. Team selection and team work

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 three 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 offense. This penalty will be deducted from the assignment grade as determined by the other course requirements.

9. GRADING POLICY

The primary requirement for passing the course is to submit a design proposal 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: 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)
- f. The scale used to assign letter grades is:

| Numerical Grade | Letter Grade | Numerical Grade | Letter Grade |
|------------------------|---------------------|------------------------|---------------------|
| A | 93 to 100 | C | 73 to 76 |
| A- | 90 to 92 | C- | 70 to 72 |
| B+ | 87 to 89 | D+ | 67 to 69 |
| B | 83 to 86 | D | 63 to 66 |
| B- | 80 to 82 | D- | 60 to 62 |
| C+ | 77 to 79 | F | Less than 60 |

10. REPORT SUBMISSION POLICY

All reports 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.

11. EXAMINATION POLICY

There are no examinations in the course.

12. POLICIES MANDATED BY COLLEGE/UNIVERSITY: ACADEMIC INTEGRITY, STUDENT CODE of CONDUCT, ATTENDANCE, LSS & ODS ACCOMMODATIONS, LEARNER'S STUDIO.

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 here:

<https://www1.villanova.edu/villanova/provost/resources/student/policies/integrity.html>.

The College of Engineering has adopted the following exam guidelines:

- Students must arrive before the start of the exam. Under exceptional circumstances a student may need to arrive late, but he/she can enter the exam no later than 5 minutes after the start of the exam.
- All cell phones must be turned off and stored away until the student exits the exam room.
- The official Villanova class attendance policy must be followed when requesting excuses for absences or lateness to an exam.
- Each student must write and sign the following statement, "*I have neither given nor received any unauthorized assistance in the completion of this exam.*"
- Students can work together on homework, but each person must turn in a copy in their own handwriting.

Adherence to the Student Code of Conduct and the CARITAS Commitment

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.

Students, faculty, and staff are expected to comply with the [CARITAS Commitment](#). Students must wear masks, practice social distancing and good hygiene, wipe down their work area upon arrival and departure, and request an excused absence if they are not feeling well.

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.

Students with Disabilities

It is the policy of Villanova to make reasonable academic accommodations for qualified individuals with disabilities. If you are a person with a disability please contact me after class or during office hours to make arrangements.

If you have a non-physical disability you need to register with the Learning Support Office by contacting 610-519-5176 or at learning.support.services@villanova.edu as soon as possible. Registration is needed to receive accommodations.

The Office of Disability Services 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 @ 610-519-3209 or visit the office on the second floor of the Connelly Center.

The Learner's Studio

Villanova's Learners' Studio provides free 1:1 and small group (max of 10 students) content tutoring for over 100 courses on campus (excludes writing, math, and entry level VSB courses). From quick homework clarification questions to prep for final exams, we can help! Their peer tutors are each endorsed by two faculty members and are trained according to CRLA national standards. Pop in as-needed or book a regular weekly session to supercharge your academic success. Sessions can be 30 or 60 minutes in length. They are located in Old Falvey 301.

Walk-ins welcome, or book in advance online:

1. Visit Villanova.mywconline.com
2. Register for an account and select "The Learners' Studio" from the drop-down menu on the sign-in page
3. Use the "limit to" menu to locate your course by code (For example, PHY 2400). This feature will sort the schedule and show you all tutors approved to cover your class
4. White boxes represent available sessions. Click any white box to book

Don't see your class listed? Request a tutor for a missing subject with this link: tutorrequest.villanova.edu

For more information, contact juliana.studer@villanova.edu 610-519-5862.

Electronics Policy

The use of electronic devices, such as phones, laptops, tablets, etc., during class is generally fine, unless you become a disturbance to others. Use of these devices is not allowed during quiz or testing taking. 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.

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, PowerPoints, 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 material. 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 permission of the copyright owner.

Follow these links for more information about [intellectual property](#), [copyright](#), and [computer acceptable use](#).

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.

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.



VILLANOVA
UNIVERSITY

EMERGENCY PROCEDURES

GENERAL GUIDELINES

- **For general emergencies and to report a crime:**
 - Get to a safe place if possible
 - **Call (610) 519-4444**
- In an emergency evacuation (including but not limited to a fire alarm):**
 - Move quickly and safely to the nearest exit
 - Close doors and windows if time permits
 - Do not use elevators
 - Assist disabled individuals who cannot evacuate themselves by proceeding with them
 - Proceed with them to the nearest fire stairway or safe haven and wait inside with the doors closed until rescue personnel arrive to assist. Immediately get word to rescue personnel of the exact location of the disabled individual
 - Remain a safe distance from the building and be aware of responding emergency vehicles

MEDICAL EMERGENCIES

- - Do not move a seriously injured or ill person unless the situation is life threatening
 - Call Public Safety at (610) 519-4444
 - Give the dispatcher your name, location, and telephone number and as much information as possible regarding the nature of the injury or illness
 - Do not hang up until the dispatcher ends the call
 - Administer first aid if you are trained to do so. Otherwise remain with the victim until Public Safety or medical personnel arrive

SHELTER IN PLACE

- Shelter in place is design to keep you safe while indoors if dangerous environmental conditions exist, such as extreme weather or a hazardous materials release. **If a shelter in place is ordered:**
 - If outside, seek shelter in the nearest building, preferably in an interior room with few windows
 - Close all exterior doors, windows and any other openings to the outside
 - Avoid overcrowding by selecting several rooms if necessary
 - Monitor Nova Alert and email for further instructions
 - Report any emergency or unusual condition to Public Safety
 - Do not leave the building until receiving the "all clear" from a police officer, Public Safety officer, Nova Alert, email or website communication

UTILITY FAILURES AND ELEVATOR EMERGENCIES

- **Report utility failures to Facilities Management by calling (610) 519-4420 during normal business hours. After hours, report utility failures to Public Safety by calling (610) 519-4444.**

ALCOHOL EMERGENCIES

- Consuming too much alcohol can result in serious injury or even death. **Call Public Safety at (610) 519-4444 if a person:**
 - Cannot be roused by shaking or shouting
 - Has cold, clammy or bluish skin
 - Is disoriented, incoherent, or cannot stand, walk or talk
 - Sustained a blow to the head or any injury that caused bleeding
 - Has shallow or irregular breathing
 - Drank alcohol in combination with other drugs

IN AN ACTUAL FIRE

- - Activate the fire alarm system by pulling a fire alarm station on your way out of the building
 - Leave the building via the nearest exit
 - Do not use elevators
 - Feel doors before opening, and close doors and windows as you leave if safe to do so
 - Report the fire to Public Safety by calling (610) 519-4444 once outside
 - If trapped, keep the doors closed and place cloth under them to keep out smoke
 - Signal for help by hanging an object (e.g., such as a jacket or shirt) out window to attract attention

LOCKDOWN

- An imminent threat of violence may be cause for a lockdown of all or part of campus. Some exterior doors will lock automatically. Emergency responders will lock others manually. The goal is to limit exposure of students, faculty and staff to danger by preventing dangerous persons from entering campus buildings. **If a lockdown is ordered:**
 - Stay Inside! Do not leave the building unless an imminently dangerous situation arises inside. If outside, seek shelter in the nearest building
 - Take shelter in a lockable room if possible
 - Close windows, shades and blinds, and avoid being seen from outside the room if possible
 - Monitor Nova Alert and email for updates and further instructions. A description of the actor will be disseminated as soon as possible using these methods
 - Report any emergency or unusual condition to Public Safety
 - Use discretion in admitting anyone into a secure building. Require that all backpacks and other bags be left outside at least 30 feet from the building. Require that the person seeking shelter open all outer garments for visual inspection before allowing entry
 - Once in a secure location, do not leave until receiving the "all clear" from a police officer, Public Safety officer, Nova Alert, email or website communication

Nova Alert is Villanova University's primary emergency communication method. To sign up, go to alert.villanova.edu.