

College of Engineering and Architecture
Electrical Engineering and Computer Science
COURSE SYLLABUS

EECE401 Senior Design I

Instructor's full name: Charles Kim	CRN: 83550
Title: Senior Design I	Credit hours: 3 credits
Office location: LKD 3014	Class meeting days and hours: M 1 - 4 pm
Office/department phone: 202-806-4821	Classroom location: LKD3015
Office hours: TW 1 - 3	Semester and year: Fall 2022
Email address: ckim@howard.edu	Course website: www.mwftr.com/SD2223.html

COURSE DESCRIPTION

This course introduces the engineering design principles, “applying technical knowledge to meet people’s needs,” and the process of design to meet the needs. Also, students learn how to become an effective team member and an effective communicator by practice. Most of all, the main goal of the course is to give students the design experience. Emphasis of this course is the first part of the design process: problem formulation with design requirement and proposal writing/presentation based on the problem formulation. Also a new framework for faculty-student team research, vertically integrated projects (VIP), is introduced and applied by which the students in the class work together with a faculty advisor, graduate students, and other students in different disciplines and different levels.

Prerequisites or Co-requisites

Senior Standing (those who have acquired "90 or more credit hours")

Course Goals

1. Understanding the engineering design process
2. Team playing in group project environment
3. Formulation and solving engineering problems
4. Technical communication
5. Socially responsible engineering

Learning Objectives: Upon completion of the course, students attain

1. (ABET Outcome 2) 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.
2. (ABET Outcome 3) Ability to communicate effectively with a range of audiences
3. (ABET Outcome 4) 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.
4. (ABET Outcome 5) 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.
5. (ABET Outcome 7) Ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Instructional Methods

1. Lecture and class activities and discussion
2. Out-of-class team works and weekly meetings
3. Class Presentations
4. Public Presentations

TEXTBOOKS AND OTHER RESOURCES

Required (?): Vern Johnson and Reid Bailey, *Becoming a Technical Professional*, Kendal/Hunt Publishing Co. 3rd Edition. ISBN 13:978-0-7575-2765-4.

Supplementary: (a) Salt and Rothery, *Design for Electrical and Computer Engineers*, Wiley publication. (b) Ford and Coulston, *Design for Electrical and Computer Engineering*, McGraw-Hill.

COURSE OUTLINE

- I. Engineering Design Overview
- II. Problem Formulation
- III. Functional and Design Requirements under Constraints
- IV. Project Management
- V. Rule and Regulations and Standards
- VI. Technical Communication - Oral and Written

COURSE REQUIREMENTS *(What must students do to fulfill the objectives?)*

1. Class Attendance
2. Active Participation
3. Weekly Team Meeting
4. Ideation and Solution for Engineering Problem Solving
5. Writing Project Report
6. Project Note/Journal

7. Academic Integrity

The “Academic Code of Conduct” in the [H-Book](#) prohibits cheating, plagiarism, and copyright infringement. Penalties for violations range from a “0” for the assignment or exam to an “F” in the course or suspension. See CETLA’s [Plagiarism](#) webpage for more information about plagiarism as well as ways to avoid it. Please note that in this course I reserve the right to check your work using a plagiarism detector such as Turnitin or Blackboard’s Safe Assign.

8. Manuscript Conventions *(including required citation format)*

“Writing Matters” Statement

Writing is an essential tool for thinking and communicating in virtually every discipline and profession. Therefore, in this course I expect you to produce writing that is not only thoughtful and accurate, but also organized, clear, grammatical, and consistent with the conventions of the field. If your writing does not meet these standards, I may deduct points or ask you to revise. For assistance with your writing, go to the student section of the Writing across the Curriculum (WAC) website, <http://www.cetla.howard.edu/wac/students.aspx>.

COURSE POLICIES

1. Grading

Computation of Final Course Grade

Individual 25 %

- Ethics Essay – 10%
- Final Exam – 10%
- Team Participation (graded by team leader) – 5%

Team 75%

- Team Contract – 5%
- Problem Statement – 10%
- Design Requirements – 10%
- Solution Design Presentation – 20%
- Solution Design Report – 20%
- Other Team activities – 10%

Grading Criteria

Final individual grade = (individual score) + (team score) *(peer evaluation point) + attendance (5%)

Incomplete Grades and Withdrawals

A grade of Incomplete (I) is given only if you have fulfilled most of the course requirements prior to the Registrar's withdrawal deadline and an emergency prevents you from completing the course. Such an emergency must be documented by your dean or advisor. However, if you have not completed most of the coursework, make sure you withdraw before the deadline; otherwise, I will have to enter the grade you have earned thus far. Please note that if you receive an Incomplete, you can complete only the coursework you missed, and you must complete that work by the end of the following semester, in accordance with University policy.

Lateness

If you cannot submit homework on time because of an emergency, you should document the emergency. (For instance, submit a doctor's note.)

Missed Exams or Classwork

If you miss a quiz or other classwork because of an emergency, you should submit a documented excuse as explained above. Then I will determine whether to excuse you from the assignment or permit you to make up the missed work.

2. Class Participation

Attendance, Tardiness, and Class Participation

You are expected to attend classes regularly and promptly. If you are absent or tardy, you will miss not only valuable instruction but possibly credit as well. In either case, you are responsible for finding out from your classmates what was discussed, assigned, or distributed in class.

Electronic Devices

You are expected to conduct yourself during class time in a professional and respectful manner. Therefore, unless I instruct otherwise, please turn your cellphone off or put it on "vibrate" during class. Also, please refrain from surfing the Web, emailing, texting, tweeting, and engaging in other distracting activities during class time. If you engage in such activities, you will be required to turn off

the device or leave the classroom, forfeiting class participation points.

3. Communication

The best way to reach me is email or Slack. You may call my office, visit during my office hours, or make an appointment. However, please note that I check the discussion Slack, voicemail, and email only during business hours (M-F 8am – 4pm). If I receive a message, I will try to respond within 24 hours or the next business day.

SUPPORT SERVICES

1. American Disabilities Act (ADA)

Howard University is committed to providing an educational environment that is accessible to all students. In accordance with this policy, students who need accommodations because of a disability should contact [Special Student Services](#) (202-238-2420) as soon as possible after admission to the University or at the beginning of each semester. If you need a special accommodation required by the American Disabilities Act, please document and discuss your disability with me during the first week of classes.

2. Statement on Interpersonal Violence

Howard University takes sexual assault, dating violence, domestic violence, stalking and sexual harassment seriously. If a student reveals that he or she needs assistance with any of these issues, all Responsible Employees, which includes faculty, are required to share this information with the University Title IX Office (202-806-2550). Students can be referred for confidential services to the Interpersonal Violence Prevention Program (IVPP) (202 806-7647) or University Counseling Services (202 806-6870). For more information about these services, please go to www.CampusSafetyFirst.Howard.Edu.

2. Center for Academic Excellence

The Center for Academic Excellence provides tutors to assist undergraduates with a variety of General Education subjects. To request a tutor, go to <http://undergradsstudies.howard.edu/cae/tutor-clearinghouse>. The center also provides academic counselors and student success workshops to help you stay in school and excel.

3. Program for Academic Support Services (PASS)

The Graduate School's PASS program offers courses for international graduate students and other graduate students who need to improve their English writing skills. To seek assistance, go to <http://www.gs.howard.edu/pass/default.html>.

4. Writing Center [FOR ENGLISH, WAC, OR WRITING MATTERS COURSES]

For assistance with your writing, you may visit the English Department's Writing Center online or in Locke Hall (Room 100)—with or without a referral. At the Center you will find tutors and software to help you with a variety of problems—from lack of organization to lack of subject-verb agreement. However, the tutors will not proofread or edit for you. Instead, the tutors will do the following: identify your writing problems, teach you how to solve those problems, and evaluate your progress. To schedule an appointment on campus, go to <http://www.coas.howard.edu/writingcenter>. To enroll in the online site, go to <http://www.cetla.howard.edu/wac/students.aspx>. Remember, however, that you can also find assistance on the Writing across the Curriculum (WAC) website, <http://www.cetla.howard.edu/wac/students.aspx>.

5. Blackboard

See **Blackboard FAQ for Students** at http://www.cetla.howard.edu/teaching_resources/blackboard/BBStudentsFAQ.html if you need help navigating Blackboard. If you are unfamiliar with Blackboard, please complete the **hands-on orientation** described on the FAQs page.

6. Technical Support

If you encounter technical problems with your email, Blackboard, Bison Web, or some other University-wide technology, go to <http://itsupport.howard.edu> to open a ticket or email helpdesk@howard.edu. For information about computer labs, software distribution, IT security, printing, and other IT topics, see the **service catalogue** (http://www.howard.edu/technology/services/service_catalogue.html) on the website of Enterprise Technology Services (ETS). Also, for online learning resources, click the **e-Learning tab** when you log into Blackboard.

7. University Libraries

Go to <http://library.howard.edu/StudentLibraryInfo> to find out how to access resources and services at the Howard University Libraries. Be sure to check the “Research Help” portal at <http://library.howard.edu/searchportals>, and find out how to use the [Summon](#) search engine, the [RefWorks](#) bibliography manager, and [Ask a Librarian](#) to “chat” with a reference librarian.

OTHER COURSE-SPECIFIC POLICIES

1. Privacy

Video or Audio Recording

You are not permitted to record any of our classes without my written permission. If I authorize you to record a class, you may not distribute or disseminate the recording. If the Dean of Special Student Services has approved your request to record to accommodate a disability, I will require at least a week's notice to consider or prepare. Be advised that your voice or image may be recorded incidentally and shared with other persons interested in accessing the recording for educational purposes.

Student Writing

To build a learning community, I may ask students to read and critique one another's work. Not only can peer review provide student authors with helpful feedback, but it can also help them develop a “critical eye” to evaluate their own work. Therefore, please be advised that your coursework may be shared (online or in the classroom) with your classmates to improve everyone's learning. In addition, to improve teaching and learning, I may share sample student work with HU faculty or, anonymously, with other HU classes unless I receive a written request from a student to withhold his or her work. On the other hand, if I wish to publish student work, I will solicit permission from students via an Informed Consent Form. If you are asked, rest assured that your response will not affect your grade.

COURSE SCHEDULE (subject to change)

Important Due Dates (Tentative)

<i>Date</i>	<i>Assignment</i>
Oct 5	Team Contract Problem Statement and Design
Oct 12	Problem Statement & Design Requirement
Oct 19	Ideation and Initial Solution Design
Nov 16	Solution Design Report
Nov 30	Ethics Essay

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Schedule of Activities and Assignments (daily or weekly)

<i>Date</i>	<i>Topic</i>	<i>Assignment</i>
Week 1	Kick-off meeting	
Week 2	Introduction to Project	Assignment 1
Week 3	School Holiday	
Week 4	Design Process	Assignment 2 - Practice for writing problem statement
Week 5	Team and Teamwork	Team Contract
Week 6	Design Requirement	Problem Statement & Design Requirements
Week 7	Solution Generation	Section 1 of Solution Report
Week 8	Engineering Ethics	Ethics Essay
Week 9	Solution Generation -- continued	Section 2 of Solution Report
Week 10	Intellectual Property Right	
Week 11	Team Presentation	Section 3 of Solution Report
Week 12	Life Long Learning	Section 4 of Solution Report
Week 13	Peer Evaluation	Final Solution Report
Week 14	Solution Presentation 1	Team presentation
Week 15	Solution Presentation 2	Team presentation
Week 16	Final Exam	