

Course Syllabus

Textbook: Dally, J.W., et.al. Introduction to Engineering Design. Book 9, Fifth Edition: Engineering Skills and Hovercraft Missions. College House Enterprises, 2011.

Course Website: <https://umd.instructure.com>

Introduction to Engineering Design – ENES 100

Section	Instructor	Teaching Fellow	Recitation	Rec. Room	Lecture	Lec. room
0101	Syrmos, G.	TBD	MW 10- 11:50	JMP 1116	F 11- 11:50	EGR 1202
0102	Valente, E.	TBD	MW 10-11:50	JMP 1215	F 11- 11:50	EGR 1202
0201	Gomez, R.	TBD	TuTh 10-11:50	JMP 1116	F 11- 11:50	EGR 1202
0301	Valente, E.	TBD	MW 12- 12:50	JMP 1116	F 12- 12:50	EGR 1202
0401	Kamakaris, S.	TBD	TuTh 12- 1:50	JMP 1116	F 12- 12:50	EGR 1202
0501	Davis, C.	TBD	MW 2- 3:50	JMP 1116	F 12- 12:50	EGR 1202
0601	Sunderland, P.	TBD	TuTh 2- 3:50	JMP 1116	F 11- 11:50	EGR 1202
0602	Calabro, K.	TBD	TuTh 2- 3:50	JMP 1215	<i>Blended Learning Pilot</i>	
0701	Valente, E.	TBD	MW 4- 5:50	JMP 1116	F 12- 12:50	EGR 1202
1001	Wagman, N.					

Office Hour Schedule- TBD

Students may visit ANY of the instructors, TA's or TF's regardless of assigned section

	Monday	Tuesday	Wednesday	Thursday	Friday	Sunday
9-10						
10-11						
11-12						
12-1						
1-2						
2-3						
3-4						
4-5						
5-6						
6-7						
7-8						
8-9						
9-10						

(Mon., Tue., Thurs., and Sun. evening office hours located in the Keystone Center – JMP 1116)

Instructors: Mr. Kevin Calabro: JMP 2108, kcalabro@umd.edu, 405-2983
Dr. Christopher Davis: KEB 2124, davis@umd.edu, 405-3637
Dr. Romel Gomez: AVW 2313, rdgomez@umd.edu, 405-7755
Mr. Stephen Kamakaris: JMP 2108, skamakar@umd.edu, 405-5569
Dr. Peter Sunderland: JMP 3104E, pbs@umd.edu, 405-3095
Dr. George Symos: JMP 2105, symos@umd.edu, 405-3633
Mr. Evandro Valente: JMP 2108, egv@umd.edu, 405-5588
Mr. Nick Wagman: JMP 2108, nwagman@umd.edu, 410-962-4562

COURSE OBJECTIVES

*This course provides the new engineering student with the answer to one very basic question: What does it mean to be an engineer? This question is answered in this course (and in later courses throughout your curriculum) by focusing on **seven** fundamental engineering topics:*

1. Teamwork and group dynamics
2. Communication skills – oral, written, graphical
3. Computer applications
4. Scientific and technical principles
5. Analysis of experimental data
6. Ethics
7. **Sustainability**

This course introduces students to the engineering experience through the planning, investigation, design, manufacturing, assembly and evaluation of a product. These functions are achieved within the context of a team setting. You will be assigned to a team, and each team will be required to prepare reports and presentations on a product design, to build a working prototype of the product, and to summarize the design process and product performance. You will also be responsible for evaluating your performance and that of your teammates. Working successfully in teams and developing an understanding of group dynamics are important course objectives. During the course of the semester you will also learn some basic science and engineering principles and their application to the project at hand. You will develop your computer skills, including use of the Internet, and use of basic spreadsheet, word processor and graphical presentation software to assist in product design and development. Additional objectives include learning about the role engineers play in our modern society and engineering ethics. Throughout the course, there will be opportunities to develop and improve your communication skills, including oral, written and visual (engineering drawing) modalities.



This course has been revised as part of the Chesapeake Project to integrate sustainability into the classroom at the University of Maryland. As such, the course will be paperless to the fullest extent possible so the syllabus and other course documents will only be distributed electronically. Other course changes to achieve this will include adapting homework assignments for electronic submission and only conducting electronic review of project reports and team (web) logs.

Furthermore, sustainability learning objectives will be incorporated into the product design and development lectures to demonstrate how sustainability affects all engineering disciplines.

GRADING POLICY**Individual Grades**

Individual Contribution to Team / Attendance	20%
Homework	10%
Quizzes	<u>20%</u>
Subtotal	50%

Team Grades

MS 1: Product Development Plan Consultation	5%
MS 2: Preliminary Design Presentation	5%
MS 3: Preliminary Design Report	10%
MS 4: Prototype Fabrication Start	4%
MS 5: Preliminary Testing	6%
MS 6: Final Testing	5%
MS 7: ENES 100 Competition	-
MS 8: Final Design Report	10%
MS 9: Final Design Presentation	<u>5%</u>
Subtotal	50%

Total **100%**

Please note that the grading in this course will be based on relative performance. Additional points may be assigned to individuals for exceptional effort and performance. Likewise, little or no points may be assigned to students who do not actively participate in the completion of team assignments. Therefore the widely held belief that there is a default grading scale such that an average above 90.0% equals an "A," between 80.0% and 90.0% equals a "B," etc. does not apply to the grading of this course.

COURSE POLICIES**Academic Integrity**

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.shc.umd.edu>.

To further exhibit your commitment to academic integrity, remember to sign the Honor Pledge on all examinations and assignments: "I pledge on my honor that I have not given or received any unauthorized assistance on this examination (assignment)."

Attendance

Regular attendance and participation in this class is expected. Class sessions will be used for lectures, demonstrations, team meetings, and team building activities. If you miss class you are responsible for all information covered that day. In the event that a class must be missed due to an illness, the policy in this class is as follows:

1. For every medically necessary absence from class, a reasonable effort should be made to notify the instructor in advance of the class. When returning to class, students must bring a note identifying the date of and reason for the absence.

2. If you are absent more than 2 times, your instructor may require documentation signed by a health care professional.
3. If you are absent on a day when a test or other major assignment is due, you must notify your instructor in advance. Upon returning to class, you must bring documentation of the illness signed by a health care professional.

Quizzes

In lieu of a midterm examination, at least 4 quizzes will be administered throughout the semester during the recitation sessions. Additional quizzes beyond those identified on the course schedule may be given if your instructor deems it appropriate. You will be given 15 minutes to complete each quiz. Your final quiz grade will be determined by dropping your lowest quiz score and averaging the remaining quiz scores. No make-up quizzes will be administered. In the event the University dismisses classes on a day in which a quiz is scheduled, then the quiz will be given during the very next recitation session. Any requests for re-grading must be submitted in writing within two weeks of the assignment deadline.

Homework

Homework assignments are due at the beginning of the class period on the date due. Late homework will not be accepted, except in the case of unusual circumstances with submission of sufficient documentary evidence. Under no circumstance will late homework be accepted unless given pre-approval.

Guidelines for Homework:

Problem solution format is exceedingly important for developing good engineering skills. Each homework problem solution should have the following components:

- 1) *Basic Format:* Each problem should be started on a clean sheet of paper. You are not being graded on how little paper you can use or how small you can write! Use good quality paper, such as engineering graph paper or college-ruled paper, with NO spiral edges. Write in pencil on only one side of the paper. All pages should be stapled together and include your name, homework number, section number, and page number (e.g. 1/3 means 1 of 3) on each sheet. Work should be neat and easily legible. We reserve the option to return work ungraded if it does not meet these basic requirements.
- 2) *Problem statement:* A concise (re)statement of the problem should be given. It is not necessary to restate verbatim the problem question from the text, but enough detail is needed to define the problem, make clear what quantities are given, and what is being sought for the solution. Clearly list any additional assumptions not given in the problem statement (if necessary).
- 3) *Diagrams:* A diagram indicating the coordinate axes should be given, and equations should be applied consistently using the convention indicated in your diagram. All symbols need to be defined, including those given as initial conditions in the problem statement or new ones that are needed for the problem solution. A free body diagram must be included when appropriate. You may need more than a single figure for more complicated problems.
- 4) *Algebraic solution:* Start by stating the general equations you plan to use for the solution, which should also clearly relate to your stated known and unknown variables listed in steps (2) to (4). An algebraic solution of the problem (e.g. in symbolic format, no numbers plugged in) should be given whenever possible, with enough steps provided for someone to logically follow your work. Numbers should be plugged in to the algebraic solution at the end with appropriate units. Show all work required to obtain your solution (e.g. no work means no credit will be given).
- 5) *Numerical answer:* After substituting the numerical values into the algebraic solution, you should calculate and state the final numerical answer. Appropriate significant figures should be used (i.e. if your given variables only have 4 significant digits, your final solution should not have more than that). Your calculator can probably give you 14 significant digits when dividing

irrational numbers, but this does not mean you have the appropriate precision to report that many. The final answer must be boxed so that it can be easily identified.

- 6) *Final units:* You should include correct units on the final answer. This should follow consistently from the algebraic solution in step (5), and not simply appear with the final answer because you know what the units “should” be.

We expect to see all of the above components in every solution. At this stage in your development as an engineer, the problem-solving procedure is much more important than the numerical answer and problems will be graded accordingly. If the above guidelines are not followed, your TF will either reject the assignment outright, for extreme cases, or deduct points for items that do not conform to the specifications.

Team Logs

After you form your teams, each team will be required to keep a record of their meetings. ~~This record can either be in the form of a notebook or on~~ a web based log (blog). Each log is intended to document the team’s experience. Logs must include the names of the team members present at each meeting, their role on the team, minutes from the meeting, a list of action items (including who is responsible), and an update of what action items were accomplished from previous meetings (including who did the work).

The logs will provide a record of the team’s progress on the design, manufacturing and testing of the product. This is the team’s documentation of the time and effort spent on the project. Teams must bring their logs to each class and/or update a web-based blog prior to the start of class. Logs may be collected/viewed periodically with little or no forewarning. Note: if the team divides into subgroups, the subgroups should maintain separate notes, to be integrated into the main team log.

Peer Evaluations

No fewer than two peer evaluations will be given during the semester. The results will be summarized and made available to each individual student. The result of this evaluation, the recommendation of the Teaching Fellow, the instructor’s personal discretion, and information from the team logs will be used to determine the “Individual Contribution to Team” grade.

Financial Requirements

Each student will make a financial contribution to cover the costs of the design project. The total cost for final assembly of the team project must be less than or equal to \$350 and must be shared equally among team members. In order to establish the cost of your product, each team will be asked to produce receipts for materials and services used in the production of their project. As a suggestion, collect fees as early as possible to minimize the chance of forfeiting income in the event of a team member dropping the course.

To encourage building sustainable hovercrafts, materials which are salvaged from previous semester projects will be allowed “for free” with no effect on each team’s \$350 fair market value spending cap.

Assembly Room

Students must complete web-based safety training before they will be allowed to enter the assembly room. While in the assembly room, you will be permitted to sign out toolboxes and specialty tools using your student ID. You are responsible for the tool(s) that you check out. If you return a toolbox that is missing tools or if you maliciously break a tool, you will be charged for the replacement costs. You are responsible for cleaning up after yourself. Failure to do so will result in loss of assembly room use.

Keystone Center

The Keystone Center will be open throughout the semester on Sunday evenings from 4-10 PM and Monday/Tuesday/Thursday evenings from 7-10 PM in JMP 1116 (overflow in JMP 1215). This is a

place where you can go to work on homework, to use the computer labs, or to study for exams. It will be staffed at all times with upper level undergraduate students that can provide assistance in answering questions in ENES 100, 102, 220, 221, 232 and BIOE 120. The Keystone Center will be closed during spring break (Mar. 17th – Mar. 24th), final exams week (after May 9th), and any other times the university closes. Please refer this syllabus and any updated office hour schedules posted on your course website to ensure that someone proficient in your specific course will be available during your visit.

Accommodations

Religious observances: Students shall be given an opportunity whenever feasible to make up in a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the student's responsibility to inform the instructor of any intended absences for religious observances *no later than February 1, 2013*.

Disabilities: The University has a legal obligation to provide appropriate accommodations for students with disabilities. If you have a university registered special need related to a disability, please inform the instructor *no later than February 1, 2013* to arrange accommodations.

Academic Assistance

If you are experiencing difficulties in keeping up with the demands of your classes and schedule, contact the Learning Assistance Services, 2202 Shoemaker Building, 301-314-7651, or on the web at <http://www.counseling.umd.edu/LAS/>. Their educational counselors can help with time management, reading, note taking, and exam preparation skills.

CourseEvalUM

Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process. CourseEvalUM will open for you to complete your evaluations later this semester. Please go directly to the website (www.courseevalum.umd.edu) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing online, at Testudo, the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

Courtesies

You can help make the classroom conducive to learning if you:

1. Arrive for class on time
2. Do not prepare to leave until the instructor indicates the lecture is over
3. Silence your cell phone
4. Do not eat or drink in the labs