

## Mechanical Engineering Design 2

EML4501 12649 Section 3324

EML4501 12648 Section 125C

*Academic Term:* Fall 2024

### *Class Periods and Location*

Section	Tuesday	Thursday
Section 3324	Period 5 (11:45 AM - 12:35 PM) WM100	Period 5 - 6 (11:45 AM - 1:40 PM) FLG270
Section 125C	Period 8 (3:00 PM - 3:50 PM) FAB105	Period 8 - 9 (3:00 PM - 4:55 PM) FLG220

*It may become necessary to modify this syllabus during the semester.  
In this event, students will be notified, and the revised syllabus will be posted on Canvas.*

### ***Instructor:***

Name: **Dr. Umesh Persad**

Email Address: [upersad@ufl.edu](mailto:upersad@ufl.edu)

Office Address: MAE-C Room 102

Office Phone Number: 352-392-6743

Office Hours: 1-3pm on Wednesdays in MAE-C Room 102 (other times by appointment).

### ***Learning Assistants:***

The list of course learning assistants would be published on the Learning Management System.

### **Course Description**

Integrated design and presentation of a mechanical system.

Credits: 3

### **Course Pre-Requisites / Co-Requisites**

Prereq: EGN 3353C and EML 2322L and EML 3005 and (EGM 3401 with a minimum grade of C).

### **Course Objectives**

1. Solve engineering problems by applying STEM principles.
2. Apply appropriate engineering design methods to produce creative solutions that meet specified needs.
3. Communicate effectively with a range of audiences.
4. Function effectively on a creative, collaborative, and inclusive team that establishes goals, plans tasks, and meets objectives.

### **Materials and Supply Fees**

None

### **Relation to Program Outcomes (ABET):**

Students who successfully complete this course demonstrate the following outcomes in the context of mechanical engineering design theory and application:

<b>Outcome</b>	<b>Coverage*</b>
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
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	High
3. An ability to communicate effectively with a range of audiences	High
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	High
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	High
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	Low
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Low

\*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

### ***Required Computer***

Students must have their own computer whose specifications meet or exceed the capabilities required by:

1. The College

<https://www.eng.ufl.edu/students/resources/computer-requirements/>

2. The MAE Department

<https://mae.ufl.edu/academics/prospective/undergraduate/computer-requirements/>

### ***Recommended Books***

**1. Product Design and Development 7th Edition**

K. Ulrich, S. Eppinger and M. C. Yang, McGraw Hill, 2019

ISBN-10:1260043657, ISBN-13: 978-1260043655

**2. The Mechanical Design Process 6th edition**

D. G. Ullman 2017

ISBN-10: 0999357808, ISBN-13: 978-0999357804

**3. Shigley's Mechanical Engineering Design, 10th Ed.**

R. G. Budynas and K. J. Nisbett, McGraw-Hill, 2015

ISBN: 9780073398204

**4. Product Design: Techniques in Reverse Engineering and New Product Development**

K. Otto and K. Wood, Pearson, 2000

ISBN-10: 0130212717, ISBN-13: 978-0130212719

**5. Good to Great: Why Some Companies Make the Leap and Others Don't**

J. Collins, Harper Business, 2001

ISBN: 9780066620992

## Course Schedule

Wk	Tuesday	Thursday	Topic
1	-	<b>Aug 22</b> <i>Design Studio</i>	<b>Module 1: The Design Process</b> <i>What is the design process and how is it managed?</i>
2	<b>Aug 27</b> <i>Team Meetings</i>	<b>Aug 29</b> <i>Design Studio</i>	<b>Module 2: The Discover Phase</b> <i>How to understand user needs and find a problem to solve?</i>
3	<b>Sept 3</b> <i>Team Meetings</i>	<b>Sept 5</b> <i>Design Studio</i>	<b>Module 3: The Define Phase</b> <i>How to specify and model what the product must do?</i>
4	<b>Sept 10</b> <i>Team Meetings</i>	<b>Sept 12</b> <i>Design Studio</i>	<b>Module 4: Conceptual Design and Creativity</b> <i>How to come up with novel design concepts?</i>
5	<b>Sept 17</b> <i>Team Meetings</i>	<b>Sept 19</b> <i>Design Studio</i>	<b>Module 5: Concept Evaluation and Prototyping</b> <i>How to choose the best design concept among a range of concepts and prototype ideas?</i>
6	<b>Sept 24</b> <i>Team Meetings</i>	<b>Sept 26</b> <i>Design Studio</i>	<b>Module 6: Design Analysis</b> <i>How to analyze a design for its modes of failure and ensure its behavior satisfies requirements?</i>
7	<b>Oct 1</b> <b>Design Concept Review Presentations (Zoom Online)</b>	<b>Oct 3</b> <b>Design Concept Review Presentations (Zoom Online)</b>	<b>Design Concept Review</b>
8	<b>Oct 8</b> <i>Team Meetings</i>	<b>Oct 10</b> <i>Design Studio</i> <i>Mid Semester Peer Review</i>	<b>Module 7: Design for People</b> <i>How to design a product that is easy to use?</i>
9	<b>Oct 15</b> <i>Team Meetings</i>	<b>Oct 17</b> <i>Design Studio</i>	<b>Module 8: Design for Reliability and Safety</b> <i>How to design a product to be reliable and safe?</i>
10	<b>Oct 22</b> <i>Team Meetings</i>	<b>Oct 24</b> <i>Design Studio</i>	<b>Module 9: Design for Materials, Manufacturing and Assembly</b> <i>How to select appropriate materials, manufacturing processes, final dimensions and tolerances?</i>
11	<b>Oct 29</b> <i>Team Meetings</i>	<b>Oct 31</b> <i>Design Studio</i>	<b>Module 10: Product Costing</b> <i>How to develop a cost model for the product?</i>
12	<b>Nov 5</b> <i>Team Meetings</i>	<b>Nov 7</b> <i>Design Studio</i>	<b>Project Work</b>
13	<b>Nov 12</b> <i>Team Meetings</i>	<b>Nov 14</b> <i>Design Studio</i>	<b>Project Work</b>
14	<b>Nov 19</b> <b>Final Presentations (Zoom Online)</b>	<b>Nov 21</b> <b>Final Presentations (Zoom Online)</b>	<b>Final Presentations</b>
15			-- Thanksgiving Holiday Week: No Class --
16	<b>Dec 3</b> <b>Final Reports Due</b> <b>Peer Review Due</b>		

### ***Attendance Policy, Class Expectations, and Make-Up Policy***

This course is centered around teamwork. Therefore, it is extremely important to attend all design studio sessions to contribute to your team. If you miss a session, you are responsible for contacting your team lead to find out about your allocated tasks.

All course materials are available through the Learning Management System. Students are held responsible for knowledge of all scheduling and policy announcements made in class. Excused absences must be consistent with university policies in the undergraduate catalog and require appropriate documentation and advance communication with the instructor:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

## ***Policies on Clear Communication, “Ghosting”, Free Riding, Sources of Truth, & Assignment Grade Disputes***

### **1. Communication with the Teaching Team:**

Once students are assigned into teams, all emails to the EML4501 Teaching Team related to team business must clearly identify the team’s number and name. Communication can be via email or via Microsoft Teams (channels or chat).

### **2. Ghosting and Free Riding:**

Individuals who **fail to support their group or “ghost” the course**, as demonstrated by:

- Team Lead reports
- Group feedback
- Low/no participation in team meetings tracked by course TAs on Microsoft Teams

will earn a grade of **0 points/percent** in the:

- *Team Member Peer Review*
- *Project Presentation*
- *Project Report*

### **3. Course Platforms and Sources of Truth:**

Approved platforms for the course are Canvas and Microsoft Teams. Discussion platforms beyond these UF-sanctioned Learning Management Systems will not be monitored or curated by the instructor and learning assistants. Work or discussion evidence obtained from other external discussion platforms will not be considered as valid sources.

### **4. Grade Disputes:**

If an individual or group has an assignment grading dispute, the issue must first be addressed with the Teaching Team member who did the grading and the Course Manager. If individuals/groups can show where grading errors occurred, Teaching Team members will correct grades accordingly. Only after communication with a Teaching Team member and failure to resolve a grading dispute may the individual/group bring the dispute to the instructor.

## Evaluation of Grades

Assignment	Type	Total Points	Percentage of Final Grade
1. Quizzes and Exercises	Individual	5 – 20 each	40%
2. Team Member Peer Review	Individual	20	10%
3. Project Presentation	Group	20	10%
4. Project Report	Group	90	40%
<b>TOTAL</b>			<b>100%</b>

This course is graded. Grades are earned based on individual and group deliverables. Further descriptions will be given when assignments and assessments are announced in class. Additional resources supporting these assignments will be posted on the course Learning Management System.

## Grading Policy

The following is the course grading policy.

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on the UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### ***Students Requiring Accommodations***

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

### ***Course Evaluation***

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

### ***In-Class Recording***

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### ***University Honesty Policy***

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

### ***Commitment to a Safe and Inclusive Learning Environment***

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.



If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Jennifer Nappo, Director of Human Resources, 352-392-0904, [jpennacc@ufl.edu](mailto:jpennacc@ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto:nishida@eng.ufl.edu)

### ***Software Use***

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

### ***Student Privacy***

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

## **Campus Resources:**

### Health and Wellness

#### **U Matter, We Care:**

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

**Counseling and Wellness Center:** <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

#### **Sexual Discrimination, Harassment, Assault, or Violence**

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the [Office of Title IX Compliance](#), located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, [title-ix@ufl.edu](mailto:title-ix@ufl.edu)

#### **Sexual Assault Recovery Services (SARS)**

Student Health Care Center, 392-1161.

**University Police Department** at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

### Academic Resources

**E-learning technical support**, 352-392-4357 (select option 2) or e-mail to [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu).  
<https://lss.at.ufl.edu/help.shtml>.

**Career Connections Center**, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu>.

**Library Support**, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

**Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.  
<https://teachingcenter.ufl.edu/>.

**Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers.  
<https://writing.ufl.edu/writing-studio/>.

**Student Complaints Campus:** <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

**On-Line Students Complaints:** <https://distance.ufl.edu/state-authorization-status/#student-complaint>.