

# Introduction to Engineering Design and Programming

EGN 1935 Class #: 25836, 25895

**Class Periods:** Tuesday, 2:00 pm to 4:00 pm

**Location:** HA-105

**Academic Term:** Spring 2020

## Instructors:

Philip B. Jackson, Ph.D.

Department of Engineering Education

Office: NSC 202E

[philipbjackson@ufl.edu](mailto:philipbjackson@ufl.edu)

Office Phone: (352) 392-4521

Office Hours: Mon. and Wed., 1:00 pm to 3:00 pm

Andrea Goncher, Ph.D.

Department of Engineering Education

Office: NSC 501

[andreagoncher@eng.ufl.edu](mailto:andreagoncher@eng.ufl.edu)

Office Phone: (352) 392-5555

Office Hours: Tue. and Thu., 11:00 am to 1:00 pm

## Teaching Assistants:

Please contact through the Canvas website

- TBD

## Course Description

This course is designed to provide the new engineering student with experiences in problem solving, engineering design, programming, and technical communication skills that will provide a foundation for success at the University of Florida. Students will follow the complete life cycle of a typical engineering design project from the inception and idea generation stage all the way to manufacture, experimentation and re-evaluation.

Students will work on individual exercises and group projects in these topics where they will learn the importance of team work, project management, and planning. The skills learned throughout the semester will be applied to a final design project. Student groups will demonstrate the performance of their final projects at a final design review presentation.

## Course Pre-Requisites / Co-Requisites

None

## Materials and Supply Fees

None

## Professional Component (ABET) and Relation to Program Outcomes:

The contribution of the course to meeting the professional components of the ABET-accredited degree.

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	Medium
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	High
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	Medium
4. An ability to communicate effectively with a range of audiences	Medium
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must	Low

consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	
6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	Low
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	Medium

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

### **Required Textbooks and Software**

#### [Arduino Starter Kit](#)

There will be required reading assignments, handouts, and videos posted frequently on Canvas that students will be expected to review. Students will also be required to install various software packages as necessary to complete course assignments.

[OnShape](#) – Free, Register online

[Python](#) - Free Download

[Arduino](#) –Free Download

[Blender](#) –Free Download

### **Course Schedule**

<b>Week of</b>	<b>Topic</b>	<b>Assignments</b>
January 6	Introduction to human-centered design	
January 13	Ethics and Professionalism	
January 20	Solid modelling with OnShape	
January 27	Solid modelling with Onshape	
February 3	3d printing	
February 10	Digital animation with Blender	
February 17	Introduction to programming with Python	
February 24	Program flow control, flow charts	
March 2		No Class – SPRING BREAK
March 9	Functions, libraries, and algorithms	
March 16	Basic circuit design with Arduino	
March 23	Sensors and actuators	
March 30	Design, Build, Test	
April 6	Design, Build, Test	
April 13	Design, Build, Test	
April 20	Semester project presentations	
April 27	No final exam	

### **Class Policies**

1. There will be approximately five total homework assignments and five quizzes given throughout the semester and all of them will be posted to Canvas. Students are expected to check Canvas daily for new assignments, updates, in-class materials, and all required information for class.

- Homework assignments, project submittals, and quizzes will be completed online through Canvas. Assignments that are to be submitted online are due by the posted due date and time (usually 11:59 pm on the date due) with no exceptions.
- Collaboration on homework assignments and through group work is a vital part of the college learning experience. Each student, however, is responsible for submitting original work by their own efforts. The copying, or otherwise duplication, of assignments from peers, solutions manuals, or online sources is cheating and will be subject to university honor code sanctions.
- Treat your homework as a professional deliverable to an employer. Homework assignments and group project submittals are not only exercises through which to learn material, but also opportunities to demonstrate your ever-increasing mastery of the topic at hand. As such, even if your answers or conclusions are wrong, your work should be neat and completed with pride.

### ***Evaluation of Grades***

<b>Assignment</b>	<b>Total Points</b>	<b>Percentage of Final Grade</b>
Homework Sets (5)	100 each	20%
Quizzes (10)	100 each	20%
Participation	daily	20%
Design Project	100	40%
		100%

### ***Grading Policy***

The following is given as an example only.

<b>Percent</b>	<b>Grade</b>	<b>Grade Points</b>
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 UF grading policy may be found at:

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

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

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

### ***Course Evaluation***

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks

of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

### ***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/policies/student-honor-code-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
- Robin Bielling, Director of Human Resources, 352-392-0903, [rbielling@eng.ufl.edu](mailto:rbielling@eng.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:** <http://www.counseling.ufl.edu/cwc>, 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 Resource Center**, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.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://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

**On-Line Students Complaints:** <http://www.distance.ufl.edu/student-complaint-process>.