

## Facilities Planning and Work Design

EIN 4360C Section 17FC & 2F48

**Class Periods:** Tuesday and Thursday, Period 5-6, 11:45 AM to 1:40 PM

**Location:** Online/ Zoom

**Academic Term:** Fall 2020

**Instructor:** Wayne Giang, Ph.D. Industrial and Systems Engineering

**Email Address:** Wayne.Giang@ise.ufl.edu

**Office Hours:** Thursday (3:00-5:00pm) or by appointment

**Office Location:** Weil 479

### Course Description

This course introduces fundamental concepts in several main areas of industrial engineering such as facility planning, material handling systems, work analysis and design. Topics such as analysis and design of work space and flow, facility location and layout, material handling systems, motion and time studies and work sampling are covered. The course is worth 4 credits.

### Course Pre-Requisites / Co-Requisites

Prerequisites or Co-requisites are as follows: Prereq: EML 2023 (Computer Aided Graphics and Design), ENC3246 (Professional Communications), all with Minimum grades of C; Coreq: EIN4354 (Engineering Economy).

### Course Objectives

To gain an understanding of basics and principle methodologies relevant to facilities planning, materials handling, and work design. To obtain first-hand experience by identifying a project in an industrial or other business setting and by formulating, analyzing and solving the relevant professional problem. To learn working in teams and to gain the ability to make effective presentations.

### Required Textbooks

- Facilities Planning, by James A. Tompkins, et al. 4th edition, John Wiley & Sons, 2010. ISBN: 9780470444047.

### Professional Component (ABET):

This course contributes to ensuring that the following program educational objectives of our BSISE program are met:

Within 5 years of graduation, BSISE graduates...

- Are successful professionals using industrial and systems engineering skills;
- Acquire advanced knowledge through continuing education or advanced degree programs;
- Are active leaders in their profession and/or community.

### Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. Identify, formulate, and solve engineering problems	High

2. Apply engineering design ... consideration of public health, safety, and welfare as well as global, cultural, social, environmental, and economic factors	Medium
3. Communicate effectively with a range of audiences	
4. Recognize ethical and professional responsibilities ... impact of engineering solutions in global, economic, environmental, and societal contexts	Medium
5. Function effectively on a team ... provide leadership, create a collaborative and inclusive environment ...	Low
6. Develop and conduct appropriate experimentation, analyze, and interpret data ...	
7. Ability to acquire and apply new knowledge as needed ...	

### Course Schedule

	Dates	Tuesday	Thursday
Week 1	Sept- 1/3	Course Overview, Chapter 1: Intro	Examples & Chapter 2: Info Gathering, PP&S
Week 2	Sep- 8/10	Chapter 2: Info Gathering, PP&S Part 2 <b>(A1 Due: Sept 8, 11:59pm)</b>	Chapter 3: Flow and Activity Relationships
Week 3	Sep- 15/17	Chapter 3: Flow and Activity Relationships Part 2 <b>(A2 Due)</b>	Chapter 4 & 5: Layout Alternatives
Week 4 (Showcase)	Sep- 22/24	Chapter 7: Warehouse Layout <b>(A3 Due)</b>	Project 1: Overview and Class Time
Week 5	Sep- 29, Oct- 1	Chapter 6: Layout Planning Models and Algorithms	<i>Layout Planning Models and Algorithms Lab</i>
Week 6	Oct- 6/8	Chapter 8/9: Manufacturing Systems/ Facility Systems	Chapter 10: Fac Loc - Minisum/Minimax
Week 7	Oct- 13/15	<i>Facility Location Lab</i> <b>(End of Exam 1 Material)</b>	Review for Exam 1
Week 8	Oct- 20/22	<b>Exam 1</b>	Chapter 11: Evaluating and Selecting the Plan
Week 9	Oct- 27/29	Project Management and PERT	<i>AHP/PERT Lab</i>
Week 10	Nov- 3/5	Break Even Analysis	Project 2: Overview and Class Time <b>(P1 Due)</b>
Week 11	Nov- 10/12	Work Sampling	<i>Work Sampling/Break Even Lab</i>
Week 12	Nov- 17/19	Time Study Introduction	<i>Time Study Lab</i>

Week 13	Nov- 24/26	Cognitive Ergonomics Introduction	No Class - Thanksgiving
Week 14	Dec- 1/3	Ergonomics Lecture <b>(P2 Due)</b>	<i>Hand Tool Design and Cognitive Ergonomics Assignment</i> <b>(End of Exam 3 Material)</b>
Week 15	Dec- 8	Review for Final Exam	No Class - Reading Days
TBD		<b>Final Exam</b>	

### **Evaluation of Grades**

<b>Name</b>	<b>Technical Grade %</b>	<b>Date</b>
Class/Discussion board participation	5	Participating in breakout groups, in-class quizzes, and discussion board
Homework/In Class Assignments	35	Various – See Schedule
Exam 1	20	October 20 <sup>th</sup>
Exam 2	20	Final Exam period
Projects	20	Nov 3 <sup>rd</sup> , December 8 <sup>th</sup>

### **Grading Policy**

Term exam dates will be announced well in advance. Missing an exam without substantial **PRIOR** notification will result in a zero grade for that exam. Final Grades will be based on classroom participation, exams, projects, and homework assignments and it will be rounded off to the nearest integer, and assigned on the standard scale as follows:

<b>Percent</b>	<b>Grade</b>
93 - 100	A
90 - 92	A-
87 - 89	B+
83 - 86	B
80 - 82	B-
77 - 79	C+
73 - 76	C
70 - 72	C-
67 - 69	D+
63 - 66	D
60 - 62	D-
0 - 59	E

### **Top Hat**

We will be using the Top Hat ([www.tophat.com](http://www.tophat.com)) classroom response system in class. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. (\$20 - 4 months; \$30 - 12 months; \$55 - Lifetime)

You can visit the Top Hat Overview (<https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide>) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system. An email invitation will be sent to you by email, but if don't receive this email, you can register by simply visiting our course website:

Unique Course URL. Note: our Course Join Code is **069923**. Top Hat will require a paid subscription, and a full breakdown of all subscription options available can be found here: [www.tophat.com/pricing](http://www.tophat.com/pricing). Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email ([support@tophat.com](mailto:support@tophat.com)), the in app support button, or by calling 1-888-663-5491.

A portion of your final grade (5%) will be dependent on your participation in class activities using Zoom and Top Hat. Your grade for this portion of the course content will depend on you demonstrating consistent and effortful (but not necessarily perfect) engagement with the material presented through these in-lecture/discussion activities during the semester.

### ***E-Learning/Canvas***

Major announcements and important documents, such as homework assignments, and project handouts will be posted on Canvas. In addition, homework, projects, and assignments will also need to be submitted online. If you submit a scan or photo of handwritten work, it is your responsibility to ensure that the submitted document is legible, otherwise it will not be graded. Please follow any digital submission guidelines that are provided.

### ***Delivery***

Lectures will be held live during class times (Tuesday and Thursday, periods 5-6) through Zoom (links provided through Canvas) unless otherwise specified. Please expect to interact during lectures through text chat or voice during breakout groups. We will be using Top Hat during lectures to practice the content you are learning in-class and to track in-class participation.

There will be a series of "in-class" labs held throughout the semester. You will be provided time to work on these labs during class-times with an assigned partner. The instructor will be available to provide guidance and feedback during these class times, and the assignments will be due on the same day.

### ***Exam and Make-Up Policy***

To assess student learning, students will be given three Exams. The exams are scheduled in advance, please plan accordingly. Make-up tests will be given for unanticipated absences ONLY (e.g., illness with a doctor's report, death in family, but **NOT** for Employment interviews, employer events, weddings, vacations, etc.). Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation. If you missed an exam due to a health problem, you will need to provide documentation that indicates the date of the visit. A note indicating that you were seen at the health center the day of the exam is not sufficient documentation of a medically excused absence from an exam. The note must say that you were medically unable to take the exam. In case of an exam conflict, you will need to present evidence of the conflict to the instructor.

In-class assignments can only be made-up if the student alerts the instructor prior to the class period missed. Arrangements must be made PRIOR to the absence.

### ***Regrading Policy***

Requests for regrading of exams will be considered only with a written explanation and only within a one-week period from the time graded work is returned in class. Specifically, you need to prepare a written explanation for what specifically you want regraded and why you believe the original grade was incorrect. Attach this to the cover sheet of the exam booklet, and return it to the instructor or the TA. Grades will be posted on the course page on Canvas.

### ***Administrative Issues***

- Class will begin promptly. Please let the instructor know in advance if you have a planned absence from class.
- While in class, please stay muted on Zoom until called upon or in a breakout group.
- All exams are allowed (1) 8.5 x 11 inch. study sheet. Use of unauthorized aids on exams will result in a grade of zero; additional penalties may follow.
- I reserve the right to amend this syllabus as needed.

### ***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 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.aa.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.aa.ufl.edu/public-results/>.

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

All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a University of Florida student and to be honest in all work submitted and exams taken in this course and all others. If you conduct any dishonest act during an exam (e.g., cheating or using any extra material that you are not allowed to use during an exam), you will get a credit of 0 on that particular exam and your final grade for the class will be reduced by a full letter grade. If you have access to any old exam/homework/quiz material that the instructor has not made explicitly available to the entire class, you will get a credit of 0 on the particular exam for which you have not disclosed the material you have to the instructor and your final grade for the class will be reduced by a full letter grade. Your conduct will also be reported to the Dean of Students, as dictated by the rules of the University, will also be taken.

### ***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.

### ***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@ufl.edu](mailto:nishida@ufl.edu)

### ***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)

### ***Note***

I may revise the schedule to take advantage of guest speakers or tours if the opportunity should arise. We will stay as close to this schedule as possible; however, coverage will depend on overall class progress and discussion. Students must refer to the Canvas for up-to-date syllabus and schedule information and for the assignments pertaining to each class section. Students are responsible for any changes/additions to this syllabus announced in class.

### ***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: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

### ***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 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. <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>.