

# INSY 3800 – Manufacturing Systems I

Fall 2020, Rev 1

Auburn University, Department of Industrial & Systems Engineering

**Bulletin Description:** (3). Lec. 2. Lab. 1. *Prerequisites:* None. LEC. 2. LAB. 3. Introduction to the design, analysis, and operation of manufacturing systems, the first course in a required two-course sequence including Manufacturing Systems II. Required INSY curriculum course.

**Delivery mode:** Face-to-Face. Students can attend all the lectures in classroom with social distancing in place. All the lectures will be recorded and uploaded to Panopto. Students will either attend the class, attend the live zoom meeting, or watch the recorded video of the lecture via Panopto.

**Course Content:** Classical industrial and systems engineering related to the design and evaluation of manufacturing systems and the understanding of manufacturing processes. The course introduces the automated systems that will run the factories of the future.

## Student Outcomes:

- Students will work individually and in teams, on problems similar to those they will face in industry to build problem solving and team-work skills.
- Students will gain a basic understanding of controls, automation, and robotics.
- Students will learn the fundamentals of manufacturing, assembly & warehousing.
- Students will refine their project skills and cultivate design skills by developing an automated system design.

**Instructor:** Oguz Toragay, Shelby Center, Room #3339,

E-mail: [oguz@auburn.edu](mailto:oguz@auburn.edu) , Zoom: <https://auburn.zoom.us/my/ozt0008>

*Office Hours:* MW, 1:00 pm to 2:00 pm, Zoom Meeting ID for office hours: 921 3155 4424

## GTAs:

- **Alireza Farnoush**, Shelby Center, Room #3339, [azf0034@auburn.edu](mailto:azf0034@auburn.edu)  
*Office Hours:* Will be posted on Canvas. Most probably via Zoom.
- **Francy John Akkara**, Shelby Center Room #3336, [fzj0004@auburn.edu](mailto:fzj0004@auburn.edu)  
*Office Hours:* Will be posted on Canvas. Most probably via Zoom.

**Textbook:** *Automation, Production Systems and Computer Integrated Manufacturing.* (M.P. Groover) (5th Edition-Available on Canvas/RedShelf). ISBN-13: 978-0134632636

**All Access/RedShelf:** Information will be posted on Canvas. That will include all the necessary information about how you can register and access the e-book and the process you need for opting out. You will have free access to the e-book for two weeks. Please do not forget to opt out if you do not want to be charged for the textbook. (\$54.50)

## Evaluation:

Homework, Quizzes	15%	<ul style="list-style-type: none"><li>• <math>90 \leq \text{Grade}</math> → <b>A</b></li><li>• <math>80 \leq \text{Grade} &lt; 90</math> → <b>B</b></li><li>• <math>70 \leq \text{Grade} &lt; 80</math> → <b>C</b></li><li>• <math>60 \leq \text{Grade} &lt; 70</math> → <b>D</b></li><li>• <math>\text{Grade} &lt; 60</math> → <b>F</b></li></ul>
Labs	5%	
Robot Design Project	10%	
Exam #1	20%	
Exam #2	20%	
Final Exam (Cumulative)	30%	

- Final grade percentages are not rounded up.

- Late homework, in-class assignments, quizzes will not be accepted (unless an excused absence is provided).

## Lecture & Lab Schedule:

Class and Lab Schedule(Rev 1)							
week of	Day	Date	Lecture	Text	Assignment	Lab	
1	8/16/20	Mon	08/17/20	Course Overview + Introduction	Chapter 1, 2, 4	Read OSHA 3170-02R: Safeguarding Employees	Recorded Lectures
		Wed	08/19/20	Introduction to Automation			
2	8/23/20	Mon	08/24/20	Sensors	Chapter 5,6	Machine Guarding Quiz	Guarding and Light Curtains
		Wed	08/26/20	Sensors + Actuators			
3	8/30/20	Mon	08/31/20	PLCs	Chapter 9		PLC Part #1
		Wed	09/02/20	PLCs			
4	9/6/20	Mon	09/07/20	No Lecture(Labor Day)	Chapter 8,9	Quiz #1	Introduction to Project Management & Robot Project Kick-off
		Wed	09/09/20	Robotics and Automation			
5	9/13/20	Mon	09/14/20	Robotics and Automation	Chapter 8,9		PLC Part #2
		Wed	09/16/20	Robotics & Automation (Guest Speaker)			
6	9/20/20	Mon	09/21/20	EXAM # 1	Speaker notes	-	No Lab
		Wed	09/23/20	Materials (Guest Speaker)			
7	9/27/20	Mon	09/28/20	Casting, Forging, Stamping & Heat Treat	Speaker notes		Recorded Lectures
		Wed	09/30/20	Machining/CNC			
8	10/4/20	Mon	10/05/20	Machining/CNC	Chapter 7		Robot Project Status Meeting (ZOOM)
		Wed	10/07/20	CNC/ G-Code			
9	10/11/20	Mon	10/12/20	Material Handling	Chapter 10,11	Quiz #2	CNC #1
		Wed	10/14/20	Warehousing			
10	10/18/20	Mon	10/19/20	Misc. Warehousing (DIAC)	Chapter 10,11		CNC #2
		Wed	10/21/20	Factory Dynamics- WIP			
11	10/25/20	Mon	10/26/20	EXAM #2	Chapter 14	-	Robot Project Status Meeting (ZOOM)
		Wed	10/28/20	Littles Law/ Single-Station Manufacturing Cells			
12	11/1/20	Mon	11/02/20	Single-Station Manufacturing Cells/Assembly Lines	Chapter 14, 15		Line Balancing Practice (ZOOM)
		Wed	11/04/20	Assembly Lines/ Balancing			
13	11/8/20	Mon	11/09/20	Assembly Lines/ Balancing	Chapter 15,23	Quiz #3	Robot Project Status Meeting (Optional-ZOOM)
		Wed	11/11/20	Additive Manufacturing (Online)			
14	11/15/20	Mon	11/16/20	Manufacturing 4.0 (Guest Speaker)	Speaker notes		Final Robot Project Review (ZOOM)
		Wed	11/18/20	(Guest Speaker)			
15	11/22/20	Mon	11/23/20	Problem solving (Online)	Speaker notes		
		Wed	11/25/20	No Lecture(Thanksgiving)			
12/6/20	Thursday	12/03/20	Final Exam (Online)	<i>Time: 8:00am to 10:30am</i>			

\* Schedules subject to change based on topic coverage and unforeseen events.

**Extra Credit:** In this class, you may earn up to 4% extra credit, which will be added to your final grade for the course. To receive the extra credit, you must collect Extra Credit Stars (ECS) during the lectures by participating in the discussions and answering the questions that will be asked by the instructor.

**Attendance (Zoom participation Policy):** Lecture class meets on Monday & Wednesday from 10:00-10:50am in BROUN Room #238. The Lab sections will be online on Monday (12:00-2:00pm) and Friday (12:00-2:00pm) unless directed otherwise. Students will be allowed to make-up only one excused Lab absence before the first exam and one excused Lab absence before the second exam. The make-up lab opportunity will be given to students who have submitted a University approved excused absence. All unexcused absences and over one excused absence will result in a zero for that week's lab.

Attendance will be taken for a grade, on days with "Guest Speakers".

Classroom Zoom Meeting ID: 932 5896 4284

Pass Code: 3800\_vir

**Course Website:** All course material will be posted on Canvas. Students are encouraged to communicate with instructor, GTA, and each other via Canvas. If you miss a class, you are responsible for the material covered in class. Please review Canvas regularly for important information and announcements. I assume that when we place an announcement or assignment on Canvas, you see it, and read it. In addition, some other websites/software such as Zoom, Panopto, Honorlock, Kahoot etc. will be introduced and used for the course delivery purpose.

**Use of Cell Phones during Lecture/Lab:** I consider it disruptive for you to use your cell phone for making calls or texting during the lectures. Personal calls & texts should not be taken or made in the lecture or lab classroom. However, you need to have a personal device (Smart phone, Tablet, and/or Laptop) with you in class to be able to participate in class activities.

**Health and Safety (Social Distancing & Masks Policies):** *Face covering* is a covering that fully covers a person's nose and mouth, including without limitation, cloth face mask, surgical mask, towels, scarves, and bandanas.

In response to COVID-19, and in alignment with Auburn University's Presidential directives, and local, state, and national health official guidelines face coverings *are required at all times* while on campus, except when alone in a private office. This includes the classroom, laboratory, studio, creative space, or any type of in-person instructional activity, and public spaces. If you have a medical exception to the face covering requirement, please contact the Office of Accessibility to obtain appropriate documentation. This documentation will need to be presented to the instructor before attending a class meeting. Anyone who is not wearing a face covering will be asked to put one on or leave the class immediately. Individuals may also be asked to leave class if they remove their face covering during the class or have to be asked multiple times to wear it correctly.

Failure to comply with a request to leave class for not correctly wearing a face covering is a serious health issue, and may result in any/all the followings:

- Immediate cancellation of the entire class period or activity. All students will then be required to cover the material for that class or activity on their own.
- Submission of a complaint to Student Conduct concerning the incident and the individual's refusal to wear, or correctly wear, the required face covering.
- A final semester grade of an **F** for the course for the person refusing to wear, or correctly wear, the required face covering.

**Lab Teams and Grades:** Being a good team member is critical to an engineer's success in the workplace. One of the objectives of this class is to improve your skills in this regard. Groups are assigned by the Instructor and/or GTA. Every group member is expected to contribute equally. Specific roles may be assigned by the Instructor/GTA or by the group. Group members who do not participate fully, or who are unreliable or disruptive, should be identified early to the GTA. The situation will be dealt with individually and discretely but could include course failure or grade lowering for the dysfunctional member(s).

**Accommodations for Students with Disabilities:** Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).

**INSY Departmental Academic Honesty Policy:** All portions of the Auburn University student academic honesty code (Title X11) found in the Tiger Cub will apply to this class. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee. Violations include, but are not limited to:

*Cheating on an examination.* This includes such things as copying from another's paper, using unauthorized notes, calculators, cell phones, blue-tooth and/or wireless devices, PDAs, laptop/pen tablet, etc., or giving or receiving unauthorized aid, such as trading examinations, whispering answers, passing notes, or using electronic devices to transmit or receive information.

*Plagiarism.* This is using someone else's work without giving credit. It is, for example, using ideas, phrases, papers, laboratory reports, computer programs, data - copied directly or paraphrased - that you did not arrive at on your own. Sources include published works such as books, movies, web sites, and unpublished works such as other students' papers or material from a research service. In brief, representing someone else's work as your own is academically dishonest. The risk of plagiarism can be avoided in written work by clearly indicating, either in footnotes or in the paper itself, the source of any major or unique idea or wording that you did not arrive at on your own. Sources must be given regardless of whether the material is quoted directly or paraphrased. Copying another student's assignment and putting your name on it is plagiarism. Copying an answer key from an instructor's guide is plagiarism. Copying work from a previous semester of the class is plagiarism.

*Unauthorized collaboration.* This is working with or receiving help from others on graded assignments without the specific approval of the instructor. If in doubt, seek permission from the instructor before working with others. Students are encouraged to learn from one another: Form study groups and discuss assignments, but each assignment must be individual work unless specifically stated and turned in as a group assignment.

You are encouraged to talk to one another about your assignments, however, all assignments must be done by the student(s) whose name is (are) on it!

*Multiple submission.* This means using the same work to fulfill the academic requirements in more than one course. Prior permission of the instructors is essential.

*Calculator Policy.* As stated in the Tiger Cub, any violation of the academic honesty code will be reported to the Academic Honesty Committee. To avoid academic dishonesty, students are not to have calculators that store text and/or can connect to Bluetooth devices during class. The only calculators acceptable for in-class exams or quizzes are TI-30XA, TI-30XIIB, TI-30XIIS, and TI-34II.

**Diversity and Inclusion Statement:** It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, religion, sexuality, disability, age, socioeconomic status, veteran status, ethnicity, race, and culture. All students in this course are expected to respect their fellow classmates and actively participate in fostering an inclusive learning environment. If you experience anything in this class that makes you feel uncomfortable, please bring it to my attention and we will formulate a response. If you would prefer to remain anonymous you may complete a Bias Incident Report which will maintain your confidentiality at:

<http://studentaffairs.auburn.edu/bert/submit-a-report-of-bias/>

**Note:** Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.