Course Description:
This course is designed to be a capstone course for graduate students of manufacturing engineering. The student will be expected to use the appropriate analytical tools to formulate, model, and solve real-life manufacturing problems. At the end of course, the student will give an open presentation of the results of the term project.

Class Objectives:
- To be able to recognize different shop configurations, manufacturing scheduling problems, and performance measures.
- To be able to identify basic algorithms and procedures to use in different shop configurations.
- To provide understanding of alternative solution methodologies available while solving manufacturing scheduling problems.
- To make students aware of all significant factors in manufacturing scheduling.

Test Book

Other References

Topics to be covered:
PART I - DISCRETE SYSTEMS
Manufacturing and service systems are characterized by many factors: the number of machines or resources, their configuration and characteristics, the level of automation, the type of material-handling system, and so on. The differences in all these characteristics give rise to a large number of scheduling models.
1. Types of Manufacturing Systems and Processes
2. Project Scheduling Models
3. Job shop models
4. Flexible Manufacturing Systems
5. Reservation Systems and Timetabling Models

PART II - STOCHASTIC SYSTEMS
The manufacturing system is viewed as a system of service-providing workstations. Customers enter the system of servers, visit their required servers in turn, and then leave the system.
6. Differences between Discrete and Stochastic Manufacturing Systems
7. Queuing Theory
Final Project:
Student will work on a project. Students will select a topic, or propose a project themselves or work on a real problem in an industrial setting (this will require integration/adaptation skills and creativity since many algorithms/models presented in the literature cannot be directly adapted to industrial setting).

Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>20%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>20%</td>
</tr>
<tr>
<td>Exam 3</td>
<td>20%</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Paper presentation</td>
<td>10%</td>
</tr>
<tr>
<td>Final Project</td>
<td>20%</td>
</tr>
</tbody>
</table>

Late Work Policy:
Late homework or reports will not be accepted, unless certified medical proof is given. If you are unable to attend the class at which the homework is due, it is your responsibility to submit it earlier.

Students with disabilities:
Students with disabilities or who suspect they have a disability may wish to self-identify for purposes of modifications. You can do so by providing documentation to the Office of Disabled Student Services located in the UTEP Union. If you have a condition which may affect your ability to exit safely from the premises in an emergency or which may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or director of the Disabled Student Services. For general information about the American with Disabilities Act (ADA), please call 747-5184.

Academic Honesty
During exams and quizzes, you are not allowed to use any form of wi-fi enabled electronic device, including cell phones or other electronic communication devices or methods (calculators, wrist watches, earbuds, etc.). No wrist watch or other electronic device may be worn. During exams and quizzes, you are allowed to use only instructor approved calculators. Check your syllabus for the list of approved calculators. No electronic version of the book, loose paper print-outs of the book or extra sheets of paper of any kind are allowed unless explicitly mentioned in writing by the instructor. As a part of the zero-tolerance policy, if you have a cellphone or other electronic device capable of communication on your person; or if any proctor sees or hears any electronic device during the exam or if you share your work with someone else, you will be reported to the proper authorities and you may receive a zero on the exam and an F in the class. Other actions including suspension may also be perused. If you have a disability that requires the use of an electronic device during exams you must have a letter of accommodation from the Center for Accommodations and Support Services (CASS). This accommodation must be coordinated in advance with the instructor. During exams, you will not be allowed to leave the examination room until you complete the exam. This includes restroom breaks. Students with disabilities must have a letter of accommodation and coordinate this in advance with the instructor. Instructors and/or proctors may record and/or use their personal cell phones to document activity during the exam. Recording devices may also be located at various locations in the room and may be out of sight of the
students. These recordings will be managed according to the UTEP approved regulations for such media. If you are suspected of scholastic dishonesty you may not be directly confronted about your conduct by the instructor or proctor. You will however, be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) and your exam will not be admissible. Your grade in the class may not be available until OSCCR makes a final ruling, this may adversely impact your ability to enroll in other classes or graduation.

If you arrive more than 15 minutes late to an exam, you will not be allowed to enter the examination room. There will be no makeup exams administered. If you have a university approved excuse, your instructor will have a process for determining how to handle the missing grade outlined in the syllabus. However, no makeup exams will be given.

If you miss more than one exam, the instructor may choose to administratively drop you from the class. This may adversely impact a visa and financial aid.

No food or drinks will be allowed in the examination room.

Departmental policy allows for the use of assigned seats. All students must present their UTEP issued ID prior to and during every exam and may be required to sign in. Not having a UTEP issued ID when asked will result in forfeiture of the exam.

Scholastic dishonesty on homework, lab assignments and all other class assignments will be held to the same standards and requirements of academic honesty as quizzes and exams.

**Class Attendance Policy**

Attendance is mandatory. Anyone with 5 or more absences will be dropped from the class. A drop for not attending will count toward the State Allowed Six Drop Limit. If you are failing the class at the time of the drop you may also be given a WF designation. Be advised that a drop could adversely impact visa status, financial aid and other programs.

As per UTEP rules, you may be asked to show a UTEP ID at any time during class.

**Harassment Policy**

The department has a zero-tolerance policy for harassment. Engagement in any behavior considered harassment will be reported to the proper authorities. In addition to generally understood forms of harassment, the department also treats the following behavior as harassment:

- Repeated emails and/or calls regarding subjects that have already been addressed. Once a decision has been made or a question answered, a student who continues to ask the same question will be given a warning by the recipient of the email/call. If the student continues, the behavior will be reported. Questions that seek understanding of course material are not harassment; but repeated questions about a grade or an administrative decision are.

- Grades are NOT negotiable, ever. If you believe a grading mistake has been made, you must follow the process described in the UTEP catalog. Any request for a grade elevation that is NOT based on a mistake is considered harassment and will be reported immediately.

- Remaining in an office after the occupant requests you leave is considered harassment and potentially threatening. You will be reported immediately without warning and depending on the severity, may be reported to law enforcement.

- Similar behavior towards department staff, and student advisors will also be treated as harassment, including persistent phone calls, emails, and badgering. Department staff and student advisors are there to help students, and should be treated with due respect.