C O U R S E S Y L L A B U S

I n s t r u c t o r

• Name: Dr. Mohsen Hosseini
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• E-mail: Mohsen.Hosseini@usm.edu
• Phone Number: 228.214.3365

O f f i c e H o u r s

• Monday, Tuesday 11:00pm – 4:00pm; or by email appointment

D r o p D a t e

Last day to withdraw the course without a grade of W is Aug 23\textsuperscript{th}, 2017.

Important academic dates can be found from link below:
https://www.usm.edu/registrar/fall-2017-academic-calendars

P r e r e q u i s i t e s

• Statistical Method I/CSS-211 or similar statistic course

C r e d i t H o u r s

• 3 hours

C o u r s e D e s c r i p t i o n

• The IET 480 - Industrial Simulation and Modeling course is intended to cover analysis of systems like manufacturing and service operations encountered in industry using computer simulation techniques. As simulation is a vital tool for studying the impact of proposed system designs, this course uses a specific software package, FlexSim, Simtools and Vensim to demonstrate the fundamental concepts, theory, and practice in the use of simulation for designing and analyzing various systems.
Course Overview

- Industrial engineers typically take a broader "systems" outlook when involved in engineering design because they are usually involved in manufacturing systems design or service systems design. Simulation is a vital tool for studying the impact of proposed system designs. This course will use a specific software package, Flexsim, Simtools, Vensim for performing simulations. Upon finishing this course, the student should be able to build a computer model of any typical manufacturing or service facility and determine the impact of proposed design changes to that system.

Course Outcome

- At the end of the course, students are able to conduct, analyze and interpret experiments and apply experimental results to compare system designs. Apply creativity in the design of systems and identify, analyze and solve system bottlenecks. Show a commitment to quality, timeliness, and continuous improvement. Develop, implement and improve integrated systems that include people, materials, information, equipment and energy. Finally, integrate systems using simulation and statistical procedures.

Student Learning Outcome(s)

- Students learn how to use FlexSim and VenSim (software) and MS Excel for performing simulations. Upon finishing this course, the student should be able to:
  - Build a computer model of any typical manufacturing or service facility and determine the impact of proposed design changes to that system.
  - Involve in the identification, formulation while performing simulation assignments, and accomplish the ability to solve engineering problems, evaluation methods.
  - Use the techniques, skills, and modern engineering tools necessary for engineering practice.

Course Communication

- All class lecture notes and videos to the corresponding lectures will be uploaded in the course webpage via Canvas. Course communication will be via USM email, Canvas e-mail, and discussion board. Students can meet the instructor during office hour or by making appointment as needed.

Textbook (optional)

Applied Simulation: Modeling and Analysis Using FlexSim.
Authors: Eamonn Lavery, Malcolm Beaverstock, Allen Greenwood, William Nordgren

You can buy the book the from Flexsim website. See link below:
https://www.flexsim.com/store/
The FlexSim book is also available to buy at Amazon for both kindle and hard copy versions.

**Technology Requirements**
- Students will require Computer, internet connection, and headphones/speaker. Students also require software Microsoft Word, Excel, Power Point and scientific calculator to complete the assignments and course exams.

**Class Procedures and Requirements**
- Students should read all the lecture notes, (power point presentations), text chapters, and listen to recorded audio lectures post in the course website to accomplish the best performance. There will be assignments related to the class lectures in order to test the understanding the subject matters. Assignment will be post in the Assignment box. All submission should be via Assignment Drop Box within the assignment due date.

**Class Participation Policy**
- This is an online course, there is no in-class participation needed.

**Evaluation Criteria**

<table>
<thead>
<tr>
<th>3 Exams (each one 20%)</th>
<th>60%</th>
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<tbody>
<tr>
<td>10 Assignments (each one 4%)</td>
<td>40%</td>
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<tr>
<td>Total</td>
<td>100%</td>
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**Grading Scale**
- Total 100-point scale below:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100</td>
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<tr>
<td>B</td>
<td>80-89</td>
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<tr>
<td>C</td>
<td>70-79</td>
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<tr>
<td>D</td>
<td>60-69</td>
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<tr>
<td>F</td>
<td>0-60</td>
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**Late Submission Policy**
- Late submissions will not be accepted at all except medical or documented emergency.
Academic Honesty
The following is from the USM Undergraduate Bulletin:

“When cheating is discovered, the faculty member may give the student an F on the work involved or in the course. If further disciplinary action is deemed appropriate, the student should be reported to the Dean of Students. In addition to being a violation of academic honesty, cheating violates the Code of Student Conduct and may be grounds for probation, suspension, and/or expulsion. Students on disciplinary suspension may not enroll in any courses offered by The University of Southern Mississippi.”

This is optional: Students must send the instructor an e-mail using the course web site e-mail stating that they understand USM’s academic honesty policy and also understand that if they do not uphold the standards of academic honesty, the instructor will enforce all applicable punishment.

ADA Policy—Pick one of these.

ADA Syllabus Statement for the Hattiesburg Campus

If a student has a disability that qualifies under the American with Disabilities Act (ADA) and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies.

Address:
The University of Southern Mississippi
Office for Disability Accommodations  118 College Drive #
8586
Hattiesburg, MS  39406-0001
Voice Telephone:  (601) 266-5024 or (228) 214-3232   Fax:  (601) 266-6035
Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1-800-582-2233 (TTY) or email Suzy Hebert at Suzanne.Hebert@usm.edu.

ADA Syllabus Statement for the Gulf Coast Campus

If a student has a disability that qualifies under the American with Disabilities Act (ADA) and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies.
Address:
The University of Southern Mississippi on the Gulf Coast
Office for Disability
Accommodations 730 East Beach Blvd
Long Beach, MS 39560
Voice Telephone: (228) 214-3232 or (601) 266-5024   Fax: (601) 266-6035
Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1-800-582-2233 (TTY) or email Suzy Hebert at suzanne.hebert@usm.edu.

<table>
<thead>
<tr>
<th>Module</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to system simulation</td>
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<tr>
<td>2</td>
<td>Queuing Systems</td>
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<tr>
<td>3</td>
<td>Monte Carlo simulation in Excel</td>
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<tr>
<td>4</td>
<td>Building a simple processing model from scratch - FlexSim Model</td>
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<tr>
<td>5</td>
<td>Resource States, Schedules, and Failures; Saving Data: Exercise Model</td>
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<tr>
<td>6</td>
<td>Probability Review</td>
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<td>7</td>
<td>Random Number Generation</td>
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<tr>
<td>8</td>
<td>Dynamic Simulation Modeling</td>
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<tr>
<td>9</td>
<td>Warehouse Case study using FlexSim</td>
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<tr>
<td>10</td>
<td>Modeling Operation-I: Model</td>
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<tr>
<td>11</td>
<td>Modeling Operation-II: Model</td>
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<tr>
<td>13</td>
<td>Obtaining Confidence Intervals for Output</td>
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<tr>
<td>14</td>
<td>Output from Terminating Systems</td>
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*Schedule is tentative and may subject to change. Students will be notified should there be any changes.