



MENG 5399-Independent Study

Course Syllabus

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| Semester / Year | Fall / 2023 |
| Catalog Description | <p>Independent study in specific areas of Mechanical Engineering not covered by organized graduate courses. A maximum of six credit hours may be used for graduate credit on the MSME degree.</p> <p>This course prepares students to collect, synthesize, and analyze data, and use advanced statistical tools to make decisions on operations, risk management, engineering models, educational models, etc. In addition, this course investigates the use of various Machine Learning methods for data analytics to automate analytical model building.</p> |
| Prerequisites | Consent of the Department Chair. |
| Section Number | 001 |
| Instructor Name | Dr. Muath Salim |
| Contact Information | Email: msalim@uttyler.edu Office: RBN 3011 |
| Class Type / Instruction Mode / Location | Independent / In-Person / Tyler |
| Class Time | Weekly meeting with the instructor |
| Office Hours | Mon, Tue, & Wed. 1 pm – 2 pm |
| No. of Credits | 3 credits |
| Required Textbook | N/A |
| Optional References | <ul style="list-style-type: none"> • Data Mining and Business Analytics with R, by Johannes Ledolter; Publisher: Wiley (2013), ISBN-13: 978-1118447147; • Data Science and Machine Learning Mathematical and Statistical Methods, by Dirk P. Kroese, Zdravko I. Botev, Thomas Taimre, Radislav Vaisman |
| Additional Rules and Requirements | <ul style="list-style-type: none"> • R Statistical Software. R can be downloaded at the link below: http://www.cran.r-project.org/ • MATLAB • Microsoft Excel |
| Evaluation Method | <ul style="list-style-type: none"> • Assignments: 40% • Projects and Written Reports: 50% • Independent study meeting participation: 10% |
| Grading Policy / Scale | Letter Grades, Scale: A: 90 - 100, B: 80 – 89, C: 70-79, D: 60 – 69, F: <60 |
| Important Events / Dates | <ul style="list-style-type: none"> • Census date: Sep 1st, 2023 |



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| Attendance / Makeup policy / other rules | In case you have to miss a meeting with the instructor, it is your responsibility to keep up with the classwork and be informed of all announcements made in the class on homework, tests, etc. No makeup |
| Course Learning Objectives / ABET & PEOs Relation | By the end of this course, students will be able to: <ol style="list-style-type: none">1. Plan and collect data using appropriately selected methods that serve relevant research objectives.2. Conduct data analytics using scientific methods and provide logical explanations including potential relationships between quantitative data and real-world problems.3. Select a suitable data analytics method based on understanding the concepts, scope, limitations, and potential issues with the selected method.4. Apply different methods of data analytics and expand to machine learning then utilize outcomes to provide constructive guidance in decision making.5. Solve problems and make decisions informed by advanced data analytics and machine learning tools. |
| Tentative Topics / Course Plans | <ul style="list-style-type: none">• Processing the Information and Getting to Know Your Data• Data visualization• Standard Linear Regression• Local Polynomial Regression: a Nonparametric Regression Approach• Monte Carlo Methods• Data Science and Machine Learning• Artificial Neural Network• Building Educational model based on Fuzzy Logic |
| University Policies | https://www.uttyler.edu/academic-affairs/files/syllabus_information_2021.pdf |