Course Syllabus
MIS 7700 – Fundamentals of Data Analytics
Spring 2021
3.0 Credit Hours

Instructor Information:
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Phone: 901-678.3609
Office Location: FCBE#309
Office Hours: MT 1:00-3:00 PM

Course Information
Section meeting times:
Th 7:10-10:10 PM
Meeting location: Remote Only
Meeting dates: January 19th to May 6th

Course Overview:
This course introduces the basic mathematical foundations required for data analytics. We cover the foundations of analytical methods. Students will get exposure to a variety of mathematical techniques and manipulation tools. You will be using real world datasets from a variety of websites to perform analytics.

Pre-Requisites/Co-Requisites:
This is a graduate level foundational course for other courses advanced courses in Business Analytics. There are no pre-requisites for this one.

Course Objectives:
By the end of this course, you should be able to:

- Explain and describe the mathematical foundations behind analytics.
- Demonstrate the importance of calculus in mathematical analyses.
- Explain how to use probability as a basis for doing statistics.
- Demonstrate the ability to identify and execute appropriate statistical tests under different scenarios.

Basis for course objectives:
The objectives for this course were formulated by a team of faculty in the BIT department and are based upon a significant amount of input from business executives, industry experts, other FCBE faculty, and business school accreditation guidelines (AACSB). The specific topics covered in this course are based upon the current and projected demand for job skills that employers will need to achieve the strategic goals of their organizations.
Fogelman College: Learning Outcomes for Your Degree
The Fogelman College has established the following learning goals for all students successfully completing the MSIS/MSBA degree:

- Graduates will be effective communicators.
- Graduates will problem solvers.
- Graduates will be leaders.
- Graduates will be knowledgeable about the global business environment.

Required Texts (and Related Materials):

COMPUTER & SOFTWARE:
This course requires the use of a computer and specific software programs. To complete some of the assignments, you will need access to a computer that can access specific software programs. Tutorials for downloading, installing and using these programs will be posted at the appropriate time during the semester.

- **RStudio** is the interface for the opensource statistical software **R**. Throughout the semester, we will be using code samples from R. You will also need to use R for some of the class assignments. Students can access RStudio using umApps. Instructions on how to download and install the software are provided on eCourseware.

- **Microsoft Excel** (a spreadsheet program) is part of the Microsoft Office software suite – for both the PC or MAC. U of M students may install Microsoft Office on a PC or MAC by following the instructions here: [GetOffice](#)

READING ASSIGNMENTS:
All the outside reading material for this course is available online. The elearn [Content] page has links to all the weekly reading assignments. **There is no required textbook for this course.** We will use learning material and readings from a variety of sources.

Course Methodology
- This course is offered in an online asynchronous format this semester. All the lectures, lab-assignments and relevant course material will be released as per the schedule given below.
- There will be a virtual classroom session on eCourseware on Thursdays 7:10-10:10 PM. While attendance is optional, the instructor will be available for any questions. Students are suggested to go through the lectures during this time and avail this opportunity for any clarifications.
- **Students are suggested to visit this link for information related to ongoing COVID Situation.**

Suggestions for improving your success in your college studies:
- **Make a PLAN OF STUDY** for yourself. Decide upon a set time of day or week that you can devote to your schoolwork (such as “every Sunday evening” or “Fridays and Saturdays from 4pm to 6pm”)
- The weekly schedule (below) includes the recommended number of hours you should devote to *this* course each week.
- It may be beneficial to you to post specific appointment times in your personal calendar. Try to schedule your study appointments during the time of day when you are likely to be rested, alert, and not hungry.
- If you get distracted easily, you may need to set up frequent-but-shorter study sessions such as one to two-hour study sessions several times throughout the week as opposed to one long study session on the weekend. Review
the previous weeks’ lesson before starting to learn the next lesson; it’s a good way to review and to remind yourself where you left off.

- Ask friends and family members not to disturb you during your study time.
- Have a quiet place where you can go to study, where there won’t be a lot of distractions. You may want to set your phone on “do not disturb” during your study time.
- Sit at a desk in a well-lit area (and grab a cup of coffee!) so that you don’t get too sleepy!
- View reading content on a large screen device such as a desktop or laptop computer, not a cell phone. (Larger screens cause less eye strain)

**Grading and Evaluation Criteria:**

Over the semester, you will have a variety of opportunities to earn points towards your final (overall) letter grade in this course. This section of the syllabus describes the assessed work you will be doing and how overall (final) letter grades will be computed.

**Final Course Grades:**

Your final letter grade is based on your overall average. Your overall average is calculated as the sum of all the points you earned on graded assignments divided by the total number of points possible. The letter grade is based on the following schedule:

- Above 95%..........................................................A+
- Above 90% but below 95%.................................A-
- Above 85% but below 90%.................................B+
- Above 80% but below 85%.................................B
- Above 75% but below 80%.................................B-
- Above 70% but below 75%.................................C+
- Above 65% but below 70%.................................C
- Above 60% but below 65%.................................C-
- Below 60%..........................................................F

Your overall grade for the semester is based on how well you perform on a mixture of formal activities including homeworks, discussions and exams.

**Scoring Methodology Used to Determine Course Grade:**

Points earned on the assessed activities will be distributed as follows:

- 11 Homework Assignments (Least scoring one will be dropped.10*5) pts........50 points
- Mid Term.................................................................................................................................50 points
- Final Exam (1 * 50) pts........................................................................................................50 points
- **Total Possible for Semester............................................................................................150 points**

**Final Exam Schedule**

There will be one final exam for this class which will be scheduled according to the Registrar's academic calendar website (opens in new window).
### Tentative Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Readings</th>
<th>Key Deliverables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 January 21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>Syllabus Overview</td>
<td>Khan Academy – Summarizing Quantitative Data (Until Quiz 2)</td>
<td>Pretest</td>
</tr>
<tr>
<td>1 January 21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>Review of Basic Statistics – Measures of central tendency and dispersion</td>
<td>Khan Academy – Basic Set Operations</td>
<td></td>
</tr>
<tr>
<td>1 January 21&lt;sup&gt;st&lt;/sup&gt;</td>
<td>Basics of set theory</td>
<td>Khan Academy – Functions</td>
<td></td>
</tr>
<tr>
<td>2 January 28&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Basics of Functions</td>
<td>Khan Academy – Functions</td>
<td></td>
</tr>
<tr>
<td>2 January 28&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Basics of Matrix Algebra</td>
<td>Khan Academy - Matrices</td>
<td></td>
</tr>
<tr>
<td>3 February 4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Introduction to R</td>
<td>Khan Academy – Derivatives Introduction (Until Quiz 2)</td>
<td>Home Work 1 – Due 02/11/2021 7:10 PM</td>
</tr>
<tr>
<td>3 February 4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Differential and Integral Calculus</td>
<td>Khan Academy – Probability Basics</td>
<td></td>
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<tr>
<td>4 February 11&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Basics of Probability</td>
<td>Khan Academy – Probability Basics</td>
<td>Home Work 2 – Due 02/18/2021 7:10 PM</td>
</tr>
<tr>
<td>5 February 18&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Conditional Probability and Bayes Theorem</td>
<td>Khan Academy – Conditional Probability Bayes Theorem Explained</td>
<td>Home Work 3 – Due 02/25/2021 7:10 PM</td>
</tr>
<tr>
<td>6 February 25&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Basics of Permutations and Combinations</td>
<td>Khan Academy – Random Variables (Only Discrete and Continuous Random Variables)</td>
<td>Home Work 4 – Due 03/04/2021 7:10 PM</td>
</tr>
<tr>
<td>6 February 25&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Commonly used Probability Distributions</td>
<td></td>
<td></td>
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<tr>
<td>7 March 4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Normal Distribution</td>
<td>Why Normal Distribution is so Important?</td>
<td>Home Work 5 – Due 03/10/2021 7:10 PM</td>
</tr>
<tr>
<td>8 March 11&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Mid – Term exam 7:10 PM – 10:10 PM (Online)</td>
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<td></td>
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<tr>
<td>9 March 18&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Hypothesis Testing</td>
<td>Khan Academy – Significance Tests</td>
<td>Home Work 7 – Due 04/01/2021 7:10 PM</td>
</tr>
<tr>
<td>10 March 25&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Commonly used statistical tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 April 1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>Design of Experiments (ANOVA)</td>
<td>Khan Academy - ANOVA</td>
<td>Home Work 8 – Due 04/08/2021 7:10 PM</td>
</tr>
<tr>
<td>11 April 1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>Design of Experiments (ANOVA)</td>
<td>Khan Academy – Analyzing one categorical variable (Until Quiz I)</td>
<td></td>
</tr>
<tr>
<td>12 April 15&lt;sup&gt;th&lt;/sup&gt;</td>
<td>Categorical Data Analysis</td>
<td>Khan Academy – Two Way Tables for Categorical Data Khan Academy – Chi Square Tests</td>
<td>Home Work 9 – Due 04/22/2021 7:10 PM</td>
</tr>
<tr>
<td>13 April 22&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>Course Review</td>
<td></td>
<td>Home Work 10 – Due 05/05/2021 7:10 PM</td>
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Professor’s Expectations of Students:

- All homework assignments are individual assignments and each person is expected to create their own files and do their own work. **Collaboration** on homework assignments is **cheating**. If you turn in another student’s work as your own, you will receive a 0 on that assignment.
- You are expected to turn in your assignments on time. The due dates for assignments are provided on the weekly schedule (below). Late assignments must be turned in to the **late assignment drop box** on elearn.

Student’s Expectations of the Professor:

In my role as your instructor, there are certain things you can expect from me including: well-organized and engaging learning experience, response to emails within two (2) business days, and feedback on all work submitted within 7-10 calendar days.

Course Policies

E-mail:

All students are required to maintain and access their University of Memphis (@memphis.edu) email account. You will receive all official course correspondence at this email account. It is your responsibility to check your inbox frequently and read all email messages from the course instructor.

Academic Integrity:

The University of Memphis has clear codes regarding cheating and classroom misconduct. If interested, you may refer to the Student Handbook section on academic misconduct for a discussion of these codes. Note that using a “Solutions Manual” is considered cheating. Should your professor have evidence that using a “Solutions Manual” has occurred, he/she may take steps as described on the campus’ Office of Student Conduct website (opens in new window). If you have any questions about academic integrity or plagiarism, you are strongly encouraged to review the Fogelman College’s Website on Academic Integrity (opens in new window).

Classroom or Online Behavior:

All participants in the course should be considerate of the other course participants and treat them (as well as their opinions) with respect. The class will operate under the assumption that all feedback offered is positive in nature and that the intentions of the person(s) providing feedback are strictly honorable. Insensitivity in this area will not be tolerated. If you have any questions about online communication, you should review the Fogelman College’s Netiquette website (opens in new window).

Late Assignments:

Assignments that are submitted to the dropbox (activities and homework projects) should be uploaded to the dropbox by the due date. The dropbox will accept late submissions for one week beyond the due date, however, 5 percentage points may be deducted for each day that the assignment is late.

Syllabus Changes:

The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of such changes both by individual email communication and posting both notification and nature of change(s) on the course bulletin board.
Student Services
Please access the FCBE Student Services (opens in browser window) page for information about:

- Students with Disabilities
- Tutoring and other Academic Assistance
- Advising Services for Fogelman Students
- Technical Assistance