Online Course Syllabus

Course Information

Course Number/Section   MIS 6334. 0W1
Course Title   Advanced Business Intelligence
Term   Fall 2016 (Aug 22 – Dec 22)

Professor Contact Information

Professor   Syam Menon
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About the Instructor

Syam Menon has taught information systems and operations courses for over 15 years. He received his MBA and PhD from the University of Chicago, and has been at UTD since 2002. His research and teaching interests revolve around optimization, data mining and privacy.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

OPRE 6301, MIS 6324. Some knowledge of basic statistics and probability will be helpful.

Course Description

This course is intended to expose students to advanced techniques in business intelligence. In addition, it will introduce students to the basic concepts of SAS needed as part of the data mining certificate program. A variety of SAS topics will be covered, including different data manipulation techniques, methods to summarize data, macros, random number generation, matrix language (IML), statistical techniques (regression, logistic regression, etc.), and other aspects of SAS programming. The advanced business intelligence techniques will cover the following broad areas: data analytics (e.g., data pre-processing, cleaning, feature selection, data imputation), model analytics (e.g., advanced models, model selection, model enhancement and model combination), advanced customer analytics (e.g., consumer choice, counting & timing, survival) and other special topics. Some of the advanced models will be solved using Excel; various aspects of WEKA will also be covered during the course of the semester.

Student Learning Objectives/Outcomes

- To learn advanced business intelligence techniques and tools.
- To have working knowledge of SAS.

Required Textbooks and Software

Required Texts

- The Little SAS Book: A Primer, 5e, by Lora Delwiche and Susan Slaughter. SAS Press. ISBN-10: 1612903436, ISBN-13: 978-1612903439. A soft copy of this book can be borrowed from the UTD library. Go to http://www.utdallas.edu/library, enter "Little SAS Book: A Primer" into the search box and hit enter. Click on the correct edition of the book and choose "Read this eBook".

Required Software

- **SAS 9.4**. There will be many exercises using SAS Enterprise Miner in this class. Students are required to purchase and install SAS 9.4 on their computers. It can be purchased from UT Austin's online shop. Instructions on how to purchase and install SAS are provided as separate handouts. **The approval process for the academic license takes time, so do this ASAP**.
- **Excel Solver**
- **WEKA** (download the latest stable version from the WEKA download site: http://www.cs.waikato.ac.nz/ml/weka/downloading.html)

Textbooks and some other bookstore materials can be ordered online through Off-Campus Books http://www.offcampusbooks.com or the UT Dallas Bookstore http://www.bkstr.com/texasatdallasstore/home. They are also available in stock at both bookstores.

Technical Requirements
In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements http://www.utdallas.edu/elearning/students/getting-started.html#techreqs on the Getting Started with eLearning webpage http://www.utdallas.edu/elearning/students/getting-started.html.

Course Access and Navigation
The course can be accessed using the UT Dallas NetID account at: https://elearning.utdallas.edu. Please see the course access and navigation http://www.utdallas.edu/elearning/students/getting-started.html#courseaccessandnav section of the site for more information.

To become familiar with the eLearning tool, please see the Student eLearning Tutorials http://www.utdallas.edu/elearning/students/eLearningTutorialsStudents.html.
UT Dallas provides eLearning technical support 24 hours a day/7 days a week. The eLearning Support Center http://www.utdallas.edu/elearninghelp services include a toll free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

Communication
This course utilizes online tools for interaction and communication. Some external communication tools such as regular email and a web conferencing tool may also be used during the semester. For more details, please visit the eLearning Tutorials webpage http://www.utdallas.edu/elearning/students/eLearningTutorialsStudents.html for video demonstrations on eLearning tools.

Student emails and discussion board messages will be answered within 3 working days under normal circumstances.

Distance Learning Student Resources
Online students have access to resources including the McDermott Library, Academic Advising, The Office of Student AccessAbility, and many others. Please see the eLearning Current Students page http://www.utdallas.edu/elearning/students/cstudents.htm for details.

Server Unavailability or Other Technical Difficulties
The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and also contact the online eLearning Help Desk http://www.utdallas.edu/elearninghelp. The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

Assignments & Academic Calendar

DATES	TOPICS	LECTURES	ASSIGNMENTS
MODULE I : PREPROCESSING, INTRODUCTION TO SAS			
22Aug – 28Aug	Unit 1 - Preprocessing	Preprocessing (PPT)	1. Purchase & install SAS (see instructions) 2. Form groups by 05 Sep 2016 3. Get the Text book (eBook available from the library) 4. Go over the syllabus in detail
29Aug – 04Sep	Unit 2a - Principal Component Analysis Unit 2b - Introduction to SAS Unit 2c - PCA in SAS	A. PCA (PPT) B. Introduction to SAS C. PCA in SAS	
MODULE II : PROBABILITY-BASED AND OTHER CLASSIFIERS, BASIC SAS, WEKA			
05Sep – 11Sep	Unit 1a - Probability Review Unit 1b - Classifiers: Naïve Bayes Unit 1c - SAS Data Manipulation I	A. Probability Review (PPT) B. Naïve Bayes (PPT) C. SAS Data Manipulation I	
12Sep – 18Sep	Unit 2a - Classifiers: Bayesian Networks Unit 2b - SAS Data Manipulation II	A. Bayesian Networks (PPT) B. SAS Data Manipulation II	
19Sep – 25Sep	Unit 3a - Classifiers: Support Vector Machines Unit 3b - SAS Data Manipulation III	A. SVMs (PPT) B. SAS Data Manipulation III	**19Sep2016: 1.HW 1 assigned**

26Sep – 02Oct	Unit 4 - Model Enhancements	Ensembles (PPT)	**26Sep2016:** **1.HW 1 due**
03Oct – 09Oct	Unit 5a - Introduction to WEKA I Unit 5b - Introduction to WEKA II Unit 5c - Classification in WEKA	A. Introduction to WEKA I B. Introduction to WEKA II C. Classification in WEKA	
PROCTORED EXAMINATION 1			
10Oct – 13Oct	**Proctored Examination 1 via UTD Testing Center or Approved Testing Service** **All completed exams must be received by 12:00 NOON CT on 13Oct2016**		
MODULE III : CUSTOMER ANALYTICS: BUILDING YOUR OWN MODELS, ADVANCED SAS			
17Oct – 23Oct	Unit 1a - Probability Distributions Unit 1b - Introduction to MLE	A. Probability Distributions (PPT) B. Introduction to MLE	
24Oct – 30Oct	Unit 2a - Discrete Time Models Unit 2b – Discrete Time Models Unit 2c - Simulation in SAS	A. Discrete Time Models (PPT) B. Discrete Time Models (Excel) C. Simulation in SAS	
31Oct – 06Nov	Unit 3a - Continuous Time Models Unit 3b – Continuous Time Models Unit 3c - Macros in SAS	A. Continuous Time Models (PPT) B. Continuous Time Models (Excel) C. Macros in SAS	**31Oct2016:** **1.HW 2 assigned**
07Nov – 13Nov	Unit 4a - Count Models Unit 4b – Count Models Unit 4c - Clustering and Imputation in SAS	A. Count Models (PPT) B. Count Models (Excel) C. Clustering and Imputation in SAS	**07Nov2016:** **1.HW 2 due** **2.Project assigned**
14Nov – 20Nov	Unit 5a - Choice Models Unit 5b – Choice Models Unit 5c - PROC IML	A. Choice Models (PPT) B. Choice Models (Excel) C. PROC IML	**14Nov2016:** **1.HW 3 assigned**
22Nov2016 : FALL BREAK: UNIVERSITY CLOSED			
28Nov – 29Nov	Free for Self-Review		**28Nov2016:** **1.HW 3 due** **2.Project due**
02Dec (Friday)			**02Dec2016:** **1.Peer Evaluation Due**
PROCTORED EXAMINATION 2			
30Nov – 05Dec	**Proctored Examination 2 via UTD Testing Center or Approved Testing Service** **All completed exams must be received by 12:00 NOON CT on 05Dec2016**		

Proctored Final Exam Procedures
This course requires **two proctored examinations**, each worth 250 points (25% of the final grade). Both examinations will comprise a mix of true-false, multiple choice and problem-solving/descriptive questions. You are allowed a basic calculator when taking this exam – **no scantrons are needed**. You will have **two hours** to take the test.
The first proctored examination must be taken during the testing window: **October 10, 2016 – October 13, 2016**, while the second proctored examination must be taken during the testing window: **November 30, 2016 – December 05, 2016**. Please see the http://www.utdallas.edu/studentsuccess/testingcenter/proctored_exams/index.html to make arrangements.

Local students can take their exams on-campus at the **UTD Student Success Center**. Students who find UTD geographically inconvenient may use a testing service of their choice at a convenient location to have the exam proctored. Please go to the http://www.utdallas.edu/studentsuccess/testingcenter/proctored_exams/index.html page to find detailed information on arranging a proctored exam. Please note students are responsible for any fee charge of their testing services.
All completed exams must be received by

- **12:00 NOON Central Time on October 13, 2016** for Examination 01, and
- **12:00 NOON Central Time on December 05, 2016** for Examination 02,

to allow timely grade reporting to the UTD Registrar.

If any student needs special accommodations, please seek the instructor's approval in advance. If you have any questions about using either UTD or outside testing center service, please contact the UTD Student Success Center (972-883-6707; TestingCenter@utdallas.edu).

Grading Policy

Weights

Homework 1	100	10 %
Homework 2	100	10 %
Homework 3	50	5 %
Exam 1	250	25 %
Exam 2	250	25 %
Project	200	20 %
Class Participation/Contribution	25	2.5 %
Peer Evaluation	25	2.5 %
Total	**1,000**	**100%**

Grading Scale

Overall Course Total	Letter Grade
920 – 1000	A
890 – 919	A-
860 – 889	B+
820 – 859	B

790 – 819	B-
750 – 789	C+
680 – 749	C
0 – 679	F

Groups

All the homework assignments and projects in this course are to be done in **groups of up to 5 students**. You can sign up into groups using the online group sign-up tool. Once formed, altering the groups will not be possible except in very special circumstances. Groups should be formed as soon as possible, and **no later than September 05, 2016**. **Any student who fails to do so will be assigned to a group by themselves, and will have to do all the work needed for the course individually**.

The objective of a group assignment is for everyone to contribute and learn from each other. The suggested approach is for each member of a group to work through the entire assignment first, and then to meet and discuss each other's findings to improve the final product. If you split the assignment up and assign different parts to different group members, the amount you learn, and therefore your grade, will be affected.

A private discussion area may be set up on the discussion board for internal group communications. A group chat room can also be created for each group to use. A web conference system is available for use. Teams can schedule a live web conference for team work. Please see the Web Conferencing page for instructions and other web conference information.

Homework Assignments

There are three group homework assignments in this course. Homework 01 and homework 02 will each contribute 100 points (10%) towards the final grade, while homework 03 will contribute 50 points (5%) towards the final grade. All homework assignments will involve the use of SAS.

Project

There is a group project in this course. It will be assigned together during the week of **November 07, 2016**, and will be due on **November 28, 2016**. The project count towards 200 points (20%) of the final grade, and will entail your analyzing a dataset provided by me, using the models developed in this class. It is time consuming, and it is suggested that you get started on it as soon as they are assigned.

Assignment submission instructions

Locate the assignment in your eLearning course. You will submit your assignments in the required file format with a simple file name and a file extension. Click the assignment name link and follow the on-screen instructions to upload and submit your file(s). For additional information on how to submit assignments, view the Submitting An Assignment video tutorial.

Please Note: Each assignment link will be deactivated after the assignment due time. After your submission is graded, you may go to My Grades on the course menu and click the score link to check the results and feedback.

For any team project assignments, one group member will submit the assignment for the group and all group members will be able to view the results and feedback once it's been graded.

Participation/Discussions
Class participation is encouraged via the various tools described earlier. While direct answers are obviously not allowed, positive posts that help groups or the class in general will be noticed. There are 25 points for participation and discussion, and quality rather than quantity is the key grading criterion.

Peer Evaluation
Each student will evaluate himself/herself as well as other group members, on all group work, using a Peer Evaluation Form. The peer evaluation form should be submitted using the Assignment tool by **December 02, 2016**. **Students who do not submit a completed peer evaluation form will get an automatic grade of zero** (irrespective of evaluations from other group members).

Online Tests/Quizzes
There will be one online examination, worth 250 points (25% of the final grade). The exam will comprise true-false and multiple choice questions. You can access this exam clicking the exam link on the designated page. You are not allowed any books or notes, but a calculator is allowed. The exam is timed, and you are allowed only one attempt. You will have one hour to attempt the exam. This exam requires a secure browser called LockDown Browser. You will not be able to open it within Chrome, Firefox, IE or Safari. Please read the on-screen instructions carefully before you click "Begin". After the exam is graded and released, you may go to My Grades page and click the score link of the exam to view your graded submission.

Course Policies
Make-up exams
Make-ups (tests, quizzes or homework) will not be allowed without prior permission. In general, there will be no make-ups except for extenuating circumstances.

Extra Credit
There will be no work available for extra-credit.

Late Work
Late submissions will not be accepted without prior permission.

Class Participation
Students are required to login regularly to the online class site. The instructor will use the tracking feature in eLearning to monitor student activity. Students are also required to participate in all class activities such as discussion board, chat or conference sessions and group projects.

Classroom Citizenship
The same guidelines that apply to traditional classes should be observed in the virtual classroom environment. Please use proper netiquette when interacting with class members and the professor.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.