Course Syllabus

Course Prefix, Number, and Title:
CIS 368 D30 – Predictive Analytics

Credits:
3 credits

University Name:
Dakota State University

Academic Term/Year:
Spring 2019

Last date to Drop and receive 100% refund:
January 16

Last date to Withdraw and earn a grade of 'W':
April 2

Course Meeting Time and Location:

Instructor Information:

Name:
Ozlem COSGUN

Office:
East Hall, Room 317

Phone Number(s):
Office: 605-256-5074

Email Address:
Ozlem.Cosgun@dsu.edu

Virtual Office Hours:
Friday 1:00 pm – 2:00 pm via skype by appointment.
Other times by appointment.

Approved Course Description:

Catalog Description:
This course provides a broad understanding of the role of predictive analytics for decision-making in different application domains. Students will be exposed to a number of predictive analytics techniques such as regression, neural networks, support vector machines, clustering and association rules.
Prerequisite(s): CIS 372 and BADM 220 or MATH 281

Additional Course Information:
We will be using SAS JMP 14, R and RStudio editor.

Prerequisites:
Course Prerequisite(s):
CIS 372 Programming for Analytics and BADM 220 Business Statistics or MATH 281 Introduction to Statistics

Technology Skills:
SAS JMP, R, RStudio, Microsoft Excel

Course Materials:
Required Textbook(s):
1. Galit Shmueli, et.al. (2016), "Data Mining for Business Analytics: Concepts, Techniques, and Applications with JMP Pro", Wiley, ISBN: 978-1-118-87752-4

Optional Materials:
2. James R. Evans, (2016), "Business Analytics", 2nd edition, Pearson
3. Galit Shmueli, et.al. (2017), "Data Mining for Business Analytics: Concepts, Techniques, and Applications in R", Wiley, ISBN-13:978-1118879368
4. Paul Teetor, "R Cookbook", (*available in pdf online*)
5. Hadley Wickham and Garret Grolemund, "R for Data Science Import, Tidy, Transform, Visualize, and Model Data", (*available in pdf online*)

Required softwares:

We will use SAS JMP 14, R and RStudio editor.

1. Please download JMP software from http://www.onthehub.com/jmp/ . 6-month and 12-month licenses are available. 6-month license is enough for this course.
2. Please download R through the following link: www.r-project.org and install RStudio via https://www.rstudio.com/products/rstudio/ . (*free*)

Student Support:
DSU Knowledge Base:

The DSU Knowledge Base contains links and resources to help students by providing information about the following topics: User Accounts & Passwords, Academic Tools & Resources, Software & Apps Support, WiFi & Network Access, Campus Emergency Alert System, Campus Printing, IT Security & Safe Computing, and the Support Desk (which is there to help both on and off-campus students). The Knowledge Base can be accessed through the link below:

· DSU Knowledge Base

D2L Support for Students:

The D2L Support for Students site is designed to provide DSU students a D2L support resource center that contains user guides, tutorials, and tips for using the D2L learning environment. The D2L Support for Students site can be accessed through the link below:

·   [DSU D2L Support Resources for Students](#)

Course Delivery and Instructional Methods:

Instructional methods: Lectures, slide shows, electronic mails, quizzes and assignments.

Class Preparation: All class materials including lecture notes, slides, videos, announcements, questions (and answers), quizzes and exam can be found/posted on the course D2L site http://d2l.sdbor.edu . Students are expected to check their Email at least once a day.

Class Videos: Videos of each class will be posted at: https://videos.dsu.edu/Playlist/CIS368-SP2019
 Or you can reach videos under the Getting started widget at D2L website.

Classroom Policies:

Attendance and Make-up Policy:
Students are expected to follow the courses regularly through D2L.
There is no make-up for quizzes and exam. Late assignments are not accepted.

ADA Statement:
If you have a documented disability and/or anticipate needing accommodations (e.g., non-standard note taking, extended time on exams or a quiet space for taking exams) in this course, please contact the instructor. Also, please contact Dakota State University's Disabilities Office by calling 605-256-5121 or emailing Success.Center@dsu.edu as soon as possible. The DSU website contains additional information and the form to request accommodations found at https://portal.sdbor.edu/dsu-student/student-resources/disability-services/Pages/default.aspx/. (Students must log into the DSU portal to access this page.) You will need to provide documentation of your disability. The Disabilities Office must confirm the need for accommodations before officially authorizing them.

Academic Honesty Statement:
Cheating and other forms of academic dishonesty run contrary to the purpose of higher education and will not be tolerated in this course. Please be advised that, when the instructor suspects plagiarism, the Internet and other standard means of plagiarism detection will be used to resolve the instructor's concerns. The South Dakota Board of Regents Student Academic Misconduct Policy can be found here: [SDBOR Policy 2.33](#).
All forms of academic dishonesty will result in an F for that assignment or quiz (minimum) to an F for the course grade and possible notification of the Academic Integrity Committee.

Communication and Feedback:

Requirements for Course interaction:

Preferred contact method is through email. Email messages should be sent to me at Ozlem.Cosgun@dsu.edu rather than through D2L email. When emailing me, please place "CIS 368 – your name" at the beginning of the subject line. This will aid me in responding to your email quicker.

Students are expected to check their Email at least once a day.

Email Response Time:

I generally respond to email messages within 24 hours. Response time may be a little longer on weekends and holidays.

Feedback on Assignments:

Feedback for assignments is usually provided within 2 weeks of the assignment due date. I'll notify the class if delay is expected.

Student Learning Outcomes:

Upon completing the course, the student will be able to:

- Gain an overview of data mining techniques including clustering, factor analysis, regression and the classification techniques

- Analyze data using a variety of predictive models and interpret the results.

- Identify the appropriate predictive analytics technique for different analysis problems.

- Apply analytics tools in SAS JMP and R.

- Interpret analytic models and results for making better business decision.

Evaluation Procedures:

Assessments:

The course grade will be calculated as follows and it is subject to change.

Work item	Weight
4 Assignments	40%
5 Quizzes	20%
Midterm	20%
Final Project	20%

Assignments: All assignments are individual assignments and will be delivered electronically via D2L submission. It is expected that you complete assignments on time. Any assigned work not submitted by due date will be graded a ZERO. Please plan accordingly. We have 4 assignments, which account for 40% of your final grade (10 points for each assignment).

Quizzes: There will be 5 quizzes, which account for 20% of your final grade (4 points for each quiz). There is no make-up for quizzes. I will post the quizzes on Fridays and you are expected to submit them on Sundays.

Midterm: You will have one midterm in 8th week, which accounts for 20% of your final grade. There is no make-up for midterm.

Final Project: You will work on one project, which accounts for 20% of your final grade. The project is an individual one. The project grade will be based on the quality of each component of your work. Evaluation of the reports is based on the following criteria: technical soundness, organization, and clarity. Details of the project will be given during the semester.

Final Examination:
There is no final exam.

Performance Standards and Grading Policy:
The final letter grade will be based on the following scale:
90% - 100%. . . . . "A"
80 - 89.99%. . . . . "B"
70 - 79.99%. . . . . "C"
60 - 69.99%. . . . . "D"
Less than 60% . . . . "F"

Student Verification Statement and Proctoring Policy:
Federal law requires that universities verify the identity of students when course materials and/or course assessment activities are conducted either partially or entirely online. A student's Desire2Learn (D2L) login and password are intended to provide the student with secure access to course materials and are also intended to help the university meet this federal mandate. Some DSU Faculty also require the use of a proctor for exams in distance-delivered (Internet) courses and this requirement provides a second level of student identity verification. Students are responsible for any proctoring fees, if applicable. Finally, an instructor who uses web conferencing technology may require students to use a webcam during exams, as another means of student identity verification through voice and visual recognition.

Tentative Course Outline and Schedule:
The following is a tentative course session schedule. I reserve the right to make adjustments throughout the semester as deemed necessary.

Week	Date	Topics	Details/Reading documents	Chapters	Quiz/Assignment/Project, Dues
1	Jan 7-9-11	Course overview, Introduction	Syllabus, Introduction to data analytics, overview of data mining	Evans – CH1 Shmueli-CH1	
2	Jan 14-16-18	Data exploration	Data visualization	Evans – CH3 Shmueli-CH3	

Week	Date	Topics	Details/Reading documents	Chapters	Quiz/Assignment/Project, Dues
3	Jan 23-25 **Jan 21 – no class**	Data exploration	Data visualization, Data cleaning, data preparation	Shmueli-CH4 Wickham – CH9	Assignment 1 out Quiz 1
4	Jan 28-30-Feb1	Descriptive DM - Clustering	K-means clustering, Hierarchical clustering	Shmueli-CH 5-14 Evans – CH10 Teetor – CH13	
5	Feb 4-6-8	Descriptive DM – PCA	Principal component analysis, Factor Analysis	Shmueli – CH4 Teetor – CH13	Assignment 1 due Quiz 2
6	Feb 11-13-15	Association Rule mining	Market basket analysis	Evans-CH10	Assignment 2 out
7	Feb 20-22 **Feb 18 – no class**	Prediction methods - Regression	Simple and Multiple Linear Regression	Shmueli-CH6 EVANS-CH8 Teetor – CH11	Quiz 3
8	Feb 25-27-Mar 1	Prediction methods – Regression and ANOVA	Multiple Linear Regression, ANOVA	Shmueli-CH6 Teetor – CH11	Assignment 2 due Project out **Midterm**
9	Mar 2-10	Spring break			
10	Mar 11-13-15	Performance evaluation	Training and validating, Accuracy measures, ROC, Lift chart, k-fold validation	Shmueli – CH5	Assignment 3 out Quiz 4
11	Mar 18-20-22	Classification methods	KNN, Support vector machines	Shmueli-CH 7 Evans-CH10	
12	Mar 25-27-29	Classification methods	Logistics Regression	Shmueli-CH10 Evans-CH10	Assignment 3 due
13	Apr 1-3-5	Classification methods	Classification and Regression trees	Shmueli-CH9	Assignment 4 out Quiz 5
14	Apr 8-10-12	Classification methods	Neural networks	Shmueli-CH11	
15	Apr 15-17 **Apr 19 – no class**	Review – Case study			Assignment 4 due
16	Apr 22-24-26	Project Presentations			Final Project due