



MSIS 5633

Predictive Analytics Technologies

All Sections

Spring 2022 Syllabus (Version 1.0)

Instructor

Dr. Dursun Delen

Regents Professor of Management Science and Information Systems
Spears and Patterson Endowed Chairs in Business Analytics
Research Director for the Center for Health Systems Innovation

Office: Tulsa-NCB 302, Phone: (918) 594-8283; Stillwater BU 408.

Email: dursun.delen@okstate.edu; **Web:** <http://spears.okstate.edu/delen>

Class Web Site

<http://canvas.okstate.edu/> (OSU's new Learning Management System)

Canvas tutorials for students: osuonline.okstate.edu/Canvas.vbhtml

Administrative support for online students: Greenwood Center for Online Excellence; **Email:** spearsonline@okstate.edu; **Phone:** 405-744-4048.

Class Time/Place

Wednesdays, 5:30-8:15pm in BUS 070. And, online for online students.

Office Hours

By appointment.

Course Overview

The main objective of this course is for the student to develop an in-depth understanding/appreciation of the role of business analytics and computer-based information systems in direct support of managerial decision making (nowadays commonly called as business analytics, business intelligence, and data science). Specifically, at the end of this course students should develop knowledge and hands-on skills about:

- ✓ Business intelligence, business analytics (descriptive, predictive and prescriptive), data science, Big Data, and decision support systems
- ✓ Real-world data, data integrations, and data preprocessing
- ✓ Descriptive statistics, data warehousing, and visual analytics
- ✓ Data, text and Web mining methodologies and enabling technologies
- ✓ Big Data tools and technologies

Pre-requisites

There is not any pre-requisites for this course. However, having the basic understanding of the following concepts would greatly improve the students' learning experiences:

1. Familiarity with one or more programming languages (such as Python, R, C#, Visual Basic, Java, C/C++, Smalltalk, etc.) for object-oriented and structural thinking and reasoning purposes. Note however that there will not be any required programming in this class.
2. Artificial intelligence and machine learning, relational databases, web-based information systems, and general business functions.



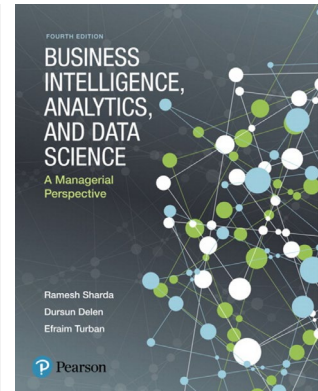
**Required
Text**

The course will use the following book:
**Business Intelligence, Analytics, and Data
Science: A Managerial Perspective** (4th Edition)

Publisher: Pearson, ©2018

Authors: Ramesh Sharda, Dursun Delen and
Efraim Turban

ISBN-13: 9780134635316 (US Edition)



Other Material

Because the field of Business Analytics is changing and redefining itself continuously, there will be additional handouts (technical and academic journal papers and other written materials) for you to read and discuss. These material will be posted on the class web site or will be distributed in class.

**Additional Texts
(for Reference)**

- ❑ Berthold, M.R., Borgelt, C., Höppner, F., Klawonn, F. & Silipo, R. (2020). "Guide to Intelligent Data Science: How to Intelligently Make Use of Real Data." (Texts in Computer Science) (2nd Edition).
- ❑ Sharda, R., Delen D. & Turban, E. (2019). "Business Intelligence and Analytics: Systems for Decision Support" (10th Ed.). Prentice Hall.
- ❑ Vidgen, R., Kirshner, S., & Tan F. (2019). "Business Analytics: A Management Approach." Springer Publishing.
- ❑ Shmueli, G., Bruce, P. C., Yahav, I., Patel, N. R., & Lichtendahl Jr, K. C. (2017). "Data mining for business analytics: concepts, techniques, and applications in R." John Wiley & Sons.
- ❑ Knafllic, C. N. (2015). "Storytelling with data: A data visualization guide for business professionals." John Wiley & Sons.
- ❑ Delen, D. (2015). "Real-World Data Mining: Applied Business Analytics and Decision Making" (1st Ed.). Financial Times (FT Press).
- ❑ Abbott, D. (2014). Applied predictive analytics: Principles and techniques for the professional data analyst. John Wiley & Sons. 978-111872796.
- ❑ Dursun Delen, John Elder, Bob Nisbet, Tom Hill & Gary Miner. (2012). "Practical text mining and statistical analysis for non-structured text data applications. Academic Press (an Elsevier Publishing Co).
- ❑ David L. Olson & Dursun Delen. (2008). "Advanced Data Mining Techniques" (1st Ed.). Springer Publishing.

Software

1. **Primary - KNIME** (a free open source analytics platform – knime.org)
2. **Primary - SAS Visual Analytics** through SAS Viya for Learners.
3. **Tableau** – For Visual Analytics.
4. RapidMiner (a "free" open source analytics tool – rapidminer.com)
5. IBM SPSS Modeler with Text Analytics
6. R & Rattle (open-source analytics platforms/languages)
7. Simio, Weka, JMP, Excel/Solver.



Computer Requirements

Online Students: Here are computer requirements for you:

- A broadband internet connection
- Windows 7 or Mac OS Mavericks or newer OS are preferred
- Google Chrome or Mozilla Firefox web browser needed
- Note: lecture videos are not compatible with Internet Explorer or Edge
- VLC Viewer video player (click on link to download)

Examination

There will be one mid-term exam. The exam will be administered online on Canvas. The exam will include a mix of multiple-choice, fill-in-the-blanks, short answer essay questions and numerical problems.

Missed Examinations

Only in extenuating circumstances such as death in the family, illness, births, etc. will makeup provisions apply. You have to substantiate the extenuating circumstance by a verifiable/official report. You are to advise your instructor in advance, or right after the fact, of your absence due to such matters.

Term Project (Team-based)

There will be a team project involving development of a complete business intelligence solution using one or more of the analytics tools and techniques. Specifics about the acceptable business problems, which you will be identifying, analyzing and solving, will be given later in the semester. Depending on the class size, each team will be made up of three or four people. You will be responsible for identifying, conceptualizing, designing and developing a valuable solution to a real-world business problem. Each team will submit a progress report and a final report (documenting each and every step of their development effort). For specifics about any written report or assignment, please look at General Guidelines for Any Written Report. Teams will also present their project (as a team) at the end of the semester. For online students, the presentation will be a video recording, the link of which will be posted on the specific discussion board. Generally, (unless a compelling argument is given to suggest otherwise) the term project will be involved in analyzing and solving a data mining and predictive modeling related business problem.

Homework

Several homework assignments will be given over the course of the semester. Unless otherwise specified by the instructor, you will have one week to work on each. You have to turn in your typed, well-organized write-up **electronically** (using Canvas assignment submission procedure at canvas.okstate.edu) by the stated due date and time. For specifics about any written report or assignment, please look at General Guidelines for Any Written Report. The homework assignments are to be solved **individually**. This means that you are not to solve problems together or compare answers prior to turning in the work. Cooperative efforts on individual work will result in an immediate score of zero for all parties involved. The purpose of the homework assignments is to provide you with the kind of practice and exposure opportunities you need master the underlying concepts and techniques.



**Late
Assignments**

Late assignments will **not** be accepted, unless a prior permission is granted by the instructor. That is, the submission procedure will automatically be disabled after the due date/time on the course Web site.

**Participation and
Professionalism**

10% of your final grade will be coming from your participation on the discussion boards on Canvas. A good participation constitutes posts that are informative to others. A simple agreement with the post of your friend (i.e., “that is a good point” or “I agree with you”) will not count. Every post must contain elaboration and information. At the end, relative quantity, quality of the posts, and proper distribution over the semester will determine your participation grades. The success of this course depends on each participant (instructor and students) to actively contribute to the community of learners.

Attendance

This class has both an in-person and an online section, both combined into one unified class website on Canvas. Attendance to the class meetings is expected and highly recommended for the students in the in-class section.

Grading Policy

Mid-Term Exam:	25%	
Homework Assignments:	20%	
Term Project:	25%	
Weekly Online Mini Quizzes:	20%	
<u>Participation & Professionalism:</u>	<u>10%</u>	
Total Points:	100%	<i>* Online Learning students' participation points will come from their productive and informative participation on the online discussion forums.</i>

The final grade will be determined using a standard scale based on the total percentage of points (i.e., >89%: A, 80-89%: B, 70-79%: C, 60-69%: D, <60%: F). A decision to redefine letter grade scale will be made only at the end of the semester based on the distribution of all final grades.

**Instructor
Response**

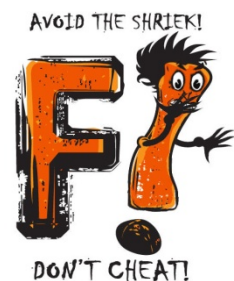
Either my teaching assistant or I will do our best to respond to student inquiries within 24 hours Monday-Friday and 48 hours over the weekend. Students can expect grades for assignments to be posted to the Gradebook in Canvas within one week of turning in the assignment.

**Special
Accommodations
for Students**

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact the Office of Student Disability Services at 315 Student Union before the end of the first week of the class. For more information about OSU Student Disability Services, please go to: <http://www.okstate.edu/ucs/stdis/>.

**Academic
Dishonesty**

Oklahoma State University is committed to maintaining the highest standards of integrity and ethics. This level of ethical behavior and integrity will be maintained in this course. Participating in a behavior that violates academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, fabricating information, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others,



fraudulently altering academic records, and similar behaviors) will result in a sanction. Sanctions include: receiving a failing grade on an assignment, examination or course, receiving a notation of a violation of academic integrity (F!) on your transcript, and being suspended from the University. Please familiarize yourself with the Oklahoma State University Academic Integrity Policies found at: <http://academicintegrity.okstate.edu/>.

**Internet
Netiquette
Guidelines**

A melding of the words "network" and "etiquette", netiquette refers to the manner in which communication is conveyed in an electronic environment. Here are some guidelines for communication within this course:

- REFRAIN FROM USING ALL CAPS. It is considered SHOUTING when communicating online.
- Do not post or forward offensive or racially insensitive jokes/comments.
- Be careful with humor and/or sarcasm.
- Don't respond to personal attacks: Contact the instructor for action.
- Always add in the subject line a concise statement describing the email or discussion post. Make sure your post has information value-add.
- Respect others' opinions. If you disagree with what another has said, post your thoughts in an objective, respectful manner. Do not make remarks that can be taken personally.
- Reflect upon the text you have entered before posting.
- Keep the discussion within the scope of the course material.
- Communication should be grammatically correct. Adhere to correct sentence structure, grammar, and spelling conventions. Proofread for errors before posting a message.
- Before you respond to a threaded message, read all the messages related to that message that have been previously posted.
- Send out an email to a group using the blind carbon copy field – BCC does not allow your recipients to view who was sent the email.

Tentative Course Outline

(Some alterations are possible)

Date	Topic	Reading Assignment
Week 1	Introduction to each other and to the course	Ch 1
Week 2	Descriptive Analytics I: Nature of Data and Statistics	Ch 2
Week 3	Descriptive Analytics II: DW & Visual Analytics	Ch 3 & HO
Week 4	Predictive Analytics I: Data Mining Process	Ch 4 & HO
Week 5	Predictive Analytics I: Data Mining Methods	Ch 4 & HO
Week 6	Predictive Analytics I: Data Mining Algorithms	HO (Ext. Ch 6)
Week 7	No In-class Meeting	Video
Week 8	Predictive Analytics II: Text Mining	Ch 5 & HO
Week 9	Predictive Analytics II: Text Mining with KNIME	Ch 5 & HO
Week 10	Spring Break – No Class	
Week 11	Predictive Analytics II: Web & Social Media Mining	HO
Week 12	Mid-term Exam (Chapters 1-5 & Ext. Ch 6)	
Week 13	Prescriptive Analytics: Optimization & Simulation	Ch 6 & HO
Week 14	Big Data Analytics & KNIME	Ch 7 & HO
Week 15	Analytics Feature Trends	Ch 8 & HO
Week 16	Project Presentations and Closing Comments	
Finals week	No final exam [submit project report and presentation].	

HO: Handout(s) posted on course Web site.

The instructor reserves the right, when and if necessary, to modify the syllabus—alter the grading policy, change examination dates, and modify the course content. If decided, such modifications will be announced and discussed in class and will be posted on the class website. Students are responsible for those changes.

Syllabus Attachment: For more student resources, go to:
<https://academicaffairs.okstate.edu/student-support/index.html>

