Marshall University

MTH 480/690 – SEC 201 – Special Topics: Data Mining
CRN 3972/3999 – Spring 2018

Class Time: MWF 9:00 – 9:50 AM
Location: Smith Hall 518
(Tentative Syllabus)

INSTRUCTOR: Dr. Raid Al-Aqtash
OFFICE: Smith Hall 721
OFFICE PHONE: 304-696-3044
E-mail: alaqtash@marshall.edu

OFFICE HOURS: M&W 10:00 AM – 12:50 PM, others by appointment.

UNIVERSITY POLICIES: By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to
http://www.marshall.edu/academic-affairs/policies/
Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment. The most recent revision of the 2015-2016 undergraduate catalog can be obtained at
http://www.marshall.edu/catalog/files/UG_15-16_final_published.pdf

Academic Integrity:
- The University Rules, including the Code of Conduct, and other documented policies of the department, college, and university related to academic integrity, will be enforced. **Any violation of these regulations will be dealt with on an individual basis according to the severity of the misconduct**.

- Please note that **any act** of *Plagiarism*, *Cheating*, or/and *Academic Dishonesty* will be **prosecuted to the maximum extent according to MU catalog**.

CLASS RULES:
1. **SILENT YOUR PHONES**.
2. If you need to leave the class early, inform your instructor before the class begins. Please **show your respect** to your classmates and your instructor.
3. **Good attendance is a major key to success in this (or any) class!** Students are expected to attend all scheduled classes.
4. **A person signing someone else's name is FORGERY.** This certainly includes anyone signing my name, such as on a drop slip in which the instructor's signature is required.

5. **When working on homework assignments, you are encouraged to collaborate with other students, but you need to submit your own work in your own words. Late submission is NOT accepted.**

TEXTBOOK: *An Introduction to Statistical Learning with Applications in R*
　　　Authors: Gareth James, Daniela Witten, Trevor Hastie, & Robert Tibshirani.
　　　　　ISBN 978-1-4614-7137-0　　　ISBN 978-1-4614-7138-7 (eBook)　　　Publisher: Springer
REFERENCES:
- Brett Lantz. (2015). *Machine Learning with R*, 2nd Edition. Packt Publishing
- Han, Kamber, & Pei. (2012). *Data Mining Concepts and Techniques*, 3rd Ed. Morgan Kaufmann.
- Sarma. (2013). *Predictive Modeling with SAS Enterprise Miner*, SAS Publishing.
- Berry & Linoff. (2004). *Data Mining Techniques*, 2nd Ed. New York: Wiley.
- Using *R for Introductory Statistics*, by John Verzani.
- http://cran.r-project.org/

Marshall University

PREREQUISITES: Either one of the following:
- ➢ Graduate student standing,
- ➢ MTH 230 and (STA 445, STA 345, or STA 326)
- ➢ Instructor/chairperson approval

COURSE DESCRIPTION AND OBJECTIVES:
Data mining techniques for analyzing large and high dimensional data. Topics include data mining strategy, exploratory analysis, predictive modeling techniques, model assessment and comparison.

The main objective of the course is to introduce graduate and advanced undergraduate students to the to the very powerful facilities that the programming language R provides for high dimensional data analysis.

You are advised to visit the R home page http://www.r-project.org/ or http://en.wikipedia.org/wiki/R and download the R programming language/software from your preferred CRAN mirror. These sites contain more information about R and instructions for downloading and installation. The R software will be utilized in classroom discussions. You are encouraged to bring your laptops to class. But please do not use it for any activities other than our discussions in the classroom.

STUDENT LEARNING OUTCOMES: The table below shows the following relationships: How each student learning outcomes will be practiced and assessed in the course:

Course Student Learning Outcomes	How students will practice each outcome in this Course	How student achievement of each outcome will be assessed in this Course
After successful completion of this course, the student will be able to: • describe and explain various supervised data mining techniques covered in the course for analyzing data mining projects, • explain the assumptions and basic theory behind each supervised mining technique, • select and apply appropriate modeling techniques for solving real world problems, • use the data mining related packages in the R software proficiently for conducting data mining modeling projects, • select and perform data process, variable selection and transformation needed for data mining projects, • present and communicate the results both verbally and in writing.	Classroom discussions, intensive readings (textbook), in-class activities, Homework, Sample Exam Problems	Course Project, Midterm & Final Exams

MATERIAL: We will cover most of the chapters of the text, with additional topics as time allows.

GRADED WORK: (500 points)
1. Exams:
There will be one midterm test and a final exam. **The final exam will be cumulative & comprehensive**. In case of extreme emergency, serious illness, or university related activity, when I have been notified with evidence or approval, or excused absences approved by the Dean of Student Affairs, the student will be allowed to make up the missed exam.

Midterm Test: *Friday, March 2nd, 2018*	(100 points)	~ 20%
Final Exam: *Friday, May 4th, 2018, 8:00 – 10:00 AM*	(150 points)	~ 30%
2. Final Project (TBD). Due on *Friday, April 20th, 2018*	(100 points)	~ 20%
3. Homework Assignments:	(150 points)	~ 30%

- ➢ There will be at least **6 assignments**, TBD. Each assignment weighs 25 points.

Marshall University

- ➢ Homework problems will be assigned about every two weeks on blackboard. When collected, homework is due at the beginning of class. Late homework will not be accepted.
- ➢ Some of the assignments might be online (blackboard). Further instructions on how to answer them will be given later.
- ➢ Your solution should be written neatly and it should follow logically from the learned topics. If I have to spend too much time to understand what is written, you may not get whole credit for the problem.
- ➢ **You are encouraged to collaborate with other students, however you are required to submit your own work in your own words.**

ATTENDANCE POLICY

Good attendance is a major key to success in this (or any) class!

- ✚ Students are expected to attend all scheduled classes. It is the student's responsibility to find out what was discussed in a missed class.
- ✚ **In case of an emergency, when I am notified ahead of time, or when the absence is excused by the office of the dean of affairs, a student will be allowed to makeup a missed work.**

Roughly speaking 90% is at least an A , 80% is at least a B, 70% is at least a C, 60% is at least a D. Final grades will be determined by the end of the semester.

DROP: The last day to drop class (no entry to academic record) is Friday, January 12th, 2018.

Martin Luther King, Jr. Holiday (Monday January 15th 2018) – University closed.

Withdrawals: Friday (March 16th, 2018) is the last day to withdraw "W" from the class.

Spring Break (Monday March 19th – Saturday March 24th) Classes dismissed.

Dead Week (Monday April 23 – Friday April 27).

The complete academic calendar is available at
http://www.marshall.edu/academic-calendar/academic/spring2018/

Blackboard / Electronic Communications:
MUonline <Blackboard> will be used to post pertinent class information and course documents. For technical problems with Blackboard contact IT Services Desk 304-696-3200.

Special Needs Policy:
Policy for Students with Disabilities: Marshall University is committed to equal opportunity education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disability Services (ODS) in Prichard Hall 117 (304.696.2467) to provide documentation of their disability. Following this, the ODS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure equality in classroom experience, outside assignment, testing, and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, access the website for the Office of Disabled Student Services:
http://www.marshall.edu/disabled