

**COURSE NUMBER: MGMT17300 –DATA MINING LAB**

**Semester Year:** Fall 2023 **Credit Hours:** 1

**Meeting Time:** Mondays 4:30-5:20pm  **Location:** WTHR 114

**Prerequisites**: None

**CONTACT INFORMATION & OFFICE HOURS**

**Instructor:** Zhiwei Zhu (Prof. Z)

**Office:** KRAN 426

**Office HR:** MW 2:30-4:00pm (face-to-face)

**Contact:** [zhu816@purdue.edu](mailto:zhu816@purdue.edu) or (765)-496-8271

**Note**: Assistance by appointment is available. Email responses are typically within 24 hours. If for some reason you do not have a response by the 24-hour mark, please email me again.

**COURSE DESCRIPTION**

**Course Objective:**

This course is tailored for students who are either new to the dynamic field of business analytics or possess a strong interest in establishing a foundational understanding of modern data-driven decision-making. In contrast to a sole focus on areas like data mining, machine learning, or information management systems, this course aims to furnish students with a holistic grasp of the multifaceted roles performed by diverse data and analytics disciplines within the intricate landscape of business decision-making. By reviewing numerous real world business cases and engaging in the exploration of two data mining case studies, the course facilitates an experiential learning process. This process emphasizes the interconnected nature of these disciplines, contributing to the cultivation of a thorough comprehension of data-driven decision-making. This heightened understanding empowers students to thoughtfully select their advanced analytics courses and strategically navigate their individual paths toward specialized or advanced training in fields aligned with data analytics.

**Course Outcomes:** (refer to Appendix A for comprehensive course coverage)

### By the conclusion of this course, students will have the ability to:

### Grasp a holistic view of the three technical pillars that support contemporary data-driven decision-making: data management, business analytics, and data science.

### Acknowledge the vital role of structured business data and enterprise data management/analytics infrastructure in facilitating efficient data-driven decision-making.

### Gain foundational knowledge in utilizing powerful analytics tools R and RStudio.

### Make informed decisions in navigating advanced business information management and analytics proficiency developments.

**Course Structure:** (refer to Appendix B for a detailed course/event schedule)

The course is designed to promote a comprehensive learning experience through a blend of reading materials and practical exercises. Weekly class sessions will be primarily dedicated to discussions and demonstrations, enriching your understanding of the subject matter.

**COURSE REQUIREMENTS**

* A laptop or desktop with internet access and the capability to install and run R.
* Purdue Brightspace account, which will serve as the platform for sharing, tracking, and archiving course-related info, including the syllabus, exams, projects, and earned scores.
* e-learning platform, *Thinkific*, and e-textbook: “Modern Data-Driven Decision Making: with practices in data mining and R”, by Zhiwei Zhu, © Copyright Digital and AI Literacies 2023. (You may purchase and register for a *Thinkific* account and the e-book at <https://dsai.thinkific.com/courses/modern-data-driven-decision-making>.

**ASSESSMENTS/ASSIGNMENTS**

**Course Assignments**: (refer to *Thinkific* for detailed assignments and due dates)

Beyond comprehension of textbook content, this course accentuates the refinement and assessment of students' proficiencies in analytical communication and team collaboration. These skills, integral to a prosperous career in today's business milieu, are coined as the "Successful Career 3Cs." To excel in the course, it is equally vital to provide accurate responses in assignments and exams, as well as actively engage in both class and team activities. Evaluation of students' overall achievements will be quantified using a performance score system, encompassing a maximum of 100 points, as delineated below:

### Timely completion of pre-class readings and post-class exercises on *Thinkific*, demonstrating your engagement with the course content. For instance, for Lesson 3, the pre-reading deadline is the day before the third week's class, and the post-exercise deadline is the day before the fourth week's class. (40%)

### A one and a half hours of online final exam hosted on Brightspace to assess your overall understanding of the course material. (30%)

### Submission of your team's project report on Brightspace, showcasing your practical application of the learned concepts. (20%)

### Active participation in class activities and attendance, contributing to a dynamic learning environment. (10%)

Please note that:

* The final exam will be conducted online and is open-book.
* It will take place on Sunday, December 10th. You must start your exam between 4:00 PM and 6:00 PM. At or after 6:00pm, the exam will not be available for starting.
* The duration of the exam is one hour. Once you begin the exam, it must be completed within 1.5 hours.
* The exam will conclude at the end of your 90 minutes by an automatic submission.
* It is your responsibility to ensure you have a functional computer, a reliable network connection, and follow exam schedule.
* During the exam time, should you have any questions unrelated to technical issues (computer-related), please direct them to me via email.

**Course Grading**: (refer to Appendices C and D for specific team and peer evaluation details)

Students' final grades will be determined based on the ordering of their total earned score points, aligning the school’s guidelines for undergraduate classes. Notably, the final grade will not hinge on a mere point count or percentage. Also, the final grades will be curved. Per the School of Business Undergraduate Grading Policy, the target grade distribution for elective courses culminates in an average GPA that is around or below 3.4. The following table illustrates the target distribution.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Grade* | *A/A-* | *B+/B* | *B-* | *C+* | *C or below* |
| *GPA* | *4/3.7* | *3.3/3* | *2.7* | *2.4* | *<2* |
| *% of Students* | *30-40%* | *30-40%* | *10-20%* | *10-15%* | *< 10%* |

**COURSE POLICIES**

* Abide by Purdue University's academic regulations, consulting your academic advisor for precise details.
* Promptly engage with the instructor for any inquiries, suggestions, or requests for assignment extensions in the event of necessary absence.
* Ensure the punctual submission of all assignments using the designated platform and adhering to the specified format. Late submissions will not be entertained without a pre-approved extension.
* Actively participate in all course-related activities, encompassing class sessions, discussions, and team projects. Stay informed by keeping an eye on emails and on announcements posted on Brightspace.

**APPENDIX A: TENTATIVE COURSE COVERAGE**

**Chapter I: Three Pillars of Modern Data-Driven Decision Making (MDDDM)**

Lesson 1: Technical Enablers of Modern Data-Driven Decision Making

Lesson 2: Data Organization for Using Data to Drive Decisions

**Chapter II: Getting Equipped with Tools**

Lesson 3: Tools for Using Data to Drive Decisions (no class)

Lesson 4: Introduction to R and RStudio

Lesson 5: Installing Packages and Importing Data in R

Lesson 6: Data Types and Viewing Data Types in R

**Chapter III: Embarking on a Data Mining Adventure**

Lesson 7: Key Steps of Performing Data Mining in R

Lesson 8: Most Applied Data Mining Techniques (no class)

Lesson 9: Exploratory Data Analysis in R: Summary Statistics

Lesson 10: Exploratory Data Analysis in R: Visualization and Dashboarding

Lesson 11: Mine Data through Predictive Modeling in R

Lesson 12: Identifying Significant Predictors

Lesson 14: Evaluating Predictive Model Performance

Lesson 15: Bringing It All Together: From Data to Insights to Decisions

**APPENDIX B: CLASS SCHEDULE AND KEY DATES**

* Aug 21 – First class
* Sep 4 – Labor Day no class
* Oct 9 – Break Day no class
* Dec 4 – Team presentation and report due
* Dec 10 – Final Exam

Please note that for the two classes missed due to holidays and breaks, there will be no make-up sessions. However, students are expected to independently complete the assigned readings and exercises during these periods. While class discussions won't take place, engaging with the materials and teammates will ensure you stay on track with the course content.