DA 701 - Data Research Methods and Tools

Course Description
Coverage of information management—research methods and tools: Students will learn the Cross-Industry Standard Process for Data Mining (CRISP-DM), how the methodology relates to the scientific method, as well as advanced statistical methodologies related to the contemporary analysis of organizational data. Taking an analytical approach, students will learn about the applicability of particular statistical approaches/packages for gaining business understanding in specific settings.

Learning Outcomes
By the end of this course, students will be able to understand processes associated the analysis of large organizational data sets. Specifically, students will learn the CRISP-DM, a widely accepted framework for organizing this process. In addition, students will learn about the exploration and integration of data sets prior to their inclusion in comprehensive models, as well as how to test and evaluate such models. To accomplish this, students will gain knowledge of statistical packages such as IBM SPSS Statistics and Modeler.

Course Materials
Required:
Discovering Statistics Using IBM SPSS Statistics, 4th Edition (2013), Andy Field SAGE, ISBN-13: 860-1200577914, ISBN-10: 1446249182

Data Mining with SPSS Modeler: Theory Exercises and Solutions, (2016), Tilo Wendler and Soren Grottrup Springer, ISBN – 978-3-319-28707-2

Library Resources:
Patrick Griffis Email: patrick.griffis@unlv.edu Phone: 895-2231

Assignments:

Deliverable	Points	Percentage
Big Data Fundamentals Assignment	8	2%
Field Chapters (4 points each)	32	9%
Modeler Application Chapters (3 point each)	27	8%
Wendler-Grottrup Chapters (8 points each)	32	9%
Case Studies	40	12%
Exam 1	75	21%
Exam 2	75	21%
Final Project	60	18%
Total	**349**	**100%**

Exercises: Chapter assignments will vary in structure. Some will be from the Fields textbook; some will be from the Wendler and Grottrup textbook, and others will be from the Modeler Application Guide.
Case Studies: Students will analyze cases related to data analytics in organizations
Exams: Exams will be essay format and cover topics related to the use of the CRISP-DM and scientific method to analyze big data related business problems.
Final Project: Student groups will be required to design, test, run and evaluate a predictive stream within IBM SPSS Modeler. Students will receive a license for Modeler as part of the IBM MAP program.

Tentative Course Calendar

Topic	Reading	Activity/Deliverable
Course Introduction		
Syllabus/Expectations		
Module 1: Scientific Methods—CRISP-DM—SPSS Statistics		
The Scientific Method	Big Data Ebook	Sign up for Big Data University
Crisp-DM	Crisp-DM Guide	Big Data Fundamentals Assignment
Importance of Statistics	Read Chapter 1 - Fields Review Smart Alex's Tasks	
Statistics Refresher	Read Chapter 2 – Fields Review Smart Alex's Tasks	
SPSS Environment	Read Chapter 3 – Fields Review Smart Alex's Tasks	*Complete Chapter Exercises*
Graphs	Read Chapter 4 – Fields Review Smart Alex's Tasks	*Complete Chapter Exercises*
Bias	Read Chapter 5 – Fields Review Smart Alex's Tasks	*Complete Chapter Exercises* Case Study 1
Non-Parametric Data	Read Chapter 6 – Fields Review Smart Alex's Tasks	**Discussion of Projects** *Complete Chapter Exercises*
Correlation	Read Chapter 7 – Fields Review Smart Alex's Tasks	*Complete Chapter Exercises*
Regression	Read Chapter 8 – Fields Review Smart Alex's Tasks	**Project Draft 1-RQ** *Complete Chapter Exercises*
Comparing Two means	Read Chapter 9 – Fields Review Smart Alex's Tasks	*Complete Chapter Exercises*
Comparing Several Means	Read Chapter 11 – Fields Review Smart Alex's Tasks	*Complete Chapter Exercises*
Exam 1		
Module 2 – Big Data Tools – SPSS Modeler		
Modeler Overview	Read Modeler Application 1 Read Chapters 1-2 – Wendler	*Work on W. Chapter Examples Ch_2*
Basic Functions *Guest Speaker:* Nicole Alioto IBM	Read Modeler Application 2 Read Chapters 1-2 – Wendler	*Work on W. Chapter Examples Ch_2* *Complete Modeler Applications Ch_1-2*
Basic Functions Cont'd	Read Chapter 2 – Wendler Read Modeler Application 3	**Project Draft 2-HYP** *Complete W. Chapter Examples Ch_2* *Complete Modeler Applications Ch_3*
Univariate Data Preparation	Read Chapter 3 – Wendler Read Modeler App 6-7	*Work on W. Chapter Examples Ch_3* *Complete Modeler Applications Ch_6-7*
Univariate Automated Modeling	Read Chapter 3 – Wendler Read Modeler App 4-5	*Complete W. Chapter Examples Ch_3* *Complete Modeler Applications Ch_4-5*
Multivariate Graphs	Read Chapter 4 – Wendler Read Modeler Application 8	Tech Update 24-25 **Project Draft 3-Method** *Work on W. Chapter Examples Ch_4* *Complete Modeler Applications Ch_8*
Multivariate Screening Data	Read Chapter 4– Wendler Read Modeler Application	*Complete W. Chapter Examples Ch_4* *Complete Modeler Applications Ch_9* Case Study 2
Regression Advanced Modeler	Read Chapter 5 – Wendler Read Modeler Applications	*Work on Chapter Examples Ch_5*
Regression Advanced Modeler Cont'd	Read Chapter 5 – Wendler Read Modeler Applications	*Complete Chapter Examples Ch_5*
Exam 2		
Work in Teams on Projects		
Final Project Due		

Class Conduct and Related Policies:

Grading of Individual versus Group Work: Team members will receive a collective grade for their team deliverables (i.e., if the team earns an A on one of the components of the business plan then each of the team members receives that grade on this deliverable in the grading spread sheet). Team members found shirking their responsibilities receive a separate grade for the team deliverables. Students will complete a team assessment at semesters end and grades adjusted accordingly.

Late Assignments: Late assignments are permissible only in cases of unavoidable personal or family emergencies and the student must notify me as soon as possible. In all other cases, there will be a significant reduction in points for late assignments.

Late or Absent from Class: Though I will not literally take "roll" each day, I will generally monitor attendance and timeliness for class and this will be factored into the participation score.

Grade Appeals: If you believe there was a mistake made in the grading of one of your assignments please notify me promptly and I will determine whether a review of the assignment is warranted.

University Policies

Academic Misconduct—Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution.
An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the *Student Academic Misconduct Policy* (approved December 9, 2005) located at: https://www.unlv.edu/studentconduct/student-conduct.

Copyright—The University requires all members of the University Community to familiarize themselves **with** and to follow copyright and fair use requirements. **You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws.** Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: http://www.unlv.edu/provost/copyright.

Disability Resource Center (DRC)—The UNLV Disability Resource Center (SSC-A 143, http://drc.unlv.edu/, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Religious Holidays Policy—Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of

the student to notify the instructor **within the first 14 calendar days of the course for fall and spring courses (excepting modular courses), or within the first 7 calendar days of the course for summer and modular courses,** of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: http://catalog.unlv.edu/content.php?catoid=6&navoid=531 .

Transparency in Learning and Teaching—The University encourages application of the transparency method of constructing assignments for student success. Please see these two links for further information:

https://www.unlv.edu/provost/teachingandlearning
https://www.unlv.edu/provost/transparency

Incomplete Grades—The grade of I—Incomplete—can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

Tutoring and Coaching—The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit http://www.unlv.edu/asc or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of the SSC (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TEB second floor.

UNLV Writing Center—One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student's Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: http://writingcenter.unlv.edu/.

Rebelmail—By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. **Emailing within WebCampus is acceptable.**

Final Examinations—The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: http://www.unlv.edu/registrar/calendars.