WPC 300: Problem Solving and Actionable Analytics

W. P. Carey School of Business
Arizona State University

Spring B, 2022

[7.5 weeks accelerated online course]

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Office Hours: Tuesdays and Thursdays 6:00 – 7:00 PM AZ (via – Zoom Conference)

Tue: https://asu.zoom.us/j/86224252942

Thu: https://asu.zoom.us/j/86224252942

Note: The information contained in this syllabus (except grading policies) is subject to change if I consider it necessary for the betterment of the course. Any substantive changes will be posted on the Announcement Board on Canvas

Course Description

This course provides foundational skills for exploring unstructured business problems. The course will cover techniques to approach decision-making in a systematic manner, enabling students to become more comfortable in handling tasks or projects that are not initially well defined. Methods will include exercises in brainstorming and iterating as well as the use of more traditional analytical tools (such as spreadsheets and visualization software).

The course will offer applications across different functional areas and disciplines. After the course, a student should be able to better understand the types of problems businesses confront and solve, the information available to bring to bear on decisions, and modeling techniques and constructs used to solve them. Throughout, communication of results is emphasized.

W. P. Carey School of Business Learning Goals

The Undergraduate Program of the W.P. Carey School of Business has established the following learning goals for its graduates:

- **Critical Thinking**
- **Communication**
- **Discipline Specific Knowledge**
- **Ethical Awareness and Reasoning**
- Global Awareness

Items in bold have significant coverage in this course.

Teaching Philosophy, Course Objectives, and Course Learning Outcomes

This course will utilize readings, in-class exercises, and software tools to develop student competency in collecting and organizing information to deliver insight and inform decisions.

After the course, the student should have the ability to:

- What can analytics do for business?
- How do organizations generate, store, and organize data?
- How do organization undergo the process of the data creation for analytics?
- How do organizations actually analyze data and find insights?

Textbook and Other Materials

This course does not require a textbook.

Grading and Course Requirements

This course will require advance preparation and active participation. The course will consist of hands-on assignments, quizzes, a midterm, a final and a final team project. Quizzes will be given approximately weekly to ensure adequate preparation for and participation in class.

Course grades will be based on the following weights:

Grading Criteria	Weight	Points
Hand on Assignments: HOA (6) 30 pt. X6	18%	180
Weekly Concept Test: Quiz (7) 20 pt. X 6 (lowest score is dropped)	12%	120
Weekly Lab Test: Lab Test (6) 20 pt. X 6	12%	120
Practical Exam	20%	200
Final Exam (via Honorlock)	20%	200
Team Project Presentation Preview [30 points] Presentation [150 points]	18%	180

Final course grades will be based on the following guidelines: A+: 97.00+; A: 93.00+; A-: 90.00+; B+: 87.00+; B: 83.00+; B-: 80.00+; C+: 77.00+; C: 70.00+; D: 60.00+; E: Below 60.00. Any request for grade rounding and grade bump will not be entertained at the end of the semester.

Please note that this course does not offer Y-Grade. Difficult situations may arise, and appropriate accommodations will be considered on a case-by-case basis.

Assignments and Examinations:

Readings: Students will complete the assigned readings to build the background for learning according to the recommended reading plan.

Weekly Test: Every week, you will get two tests, designed to test your knowledge based on the assigned readings and weekly video modules and lab from the same week.

Hands-on Assignments: Hands-on Activities (HOAs) are assignments that enable you to gain firsthand experience and knowledge to analytics tools used in industries. These assignments are designed to develop your ability to apply your knowledge of analytics in the real world.

Practical Exam: Once the main analysis tools and techniques have been illustrated and practiced through the labs and assignments (approximately the midpoint of the course), a practical exam will be held that will test that accumulated knowledge skills in the use and application of the various tools and techniques. This represents a culmination of the individual; hands on efforts done in the labs and assignments. You will have 100 minutes from the time you first click open the exam to complete and submit them. During this test, you will be required to use JMP Pro and Excel software to perform analyses based on an assigned dataset and answer multiple choice questions.

Final Exam: Final exams are timed and closed book, designed to test competency in course material at a deeper level than the weekly quizzes. All times are Arizona time (if you are in a different time zone, please make arrangements to take exams on the Arizona time schedule). You will have 100 minutes from the time you first click open the exam to complete and submit them. **One page (both front and back) handwritten cheat sheet will be allowed during the exam.** You will be taking the final exam using Online Proctoring Tool (Honorlock).

You are advised to complete your weekly tests, assignments, and exams early in case of technical glitches on your end (e.g., loss of internet, computer issues, etc.). **Inability to submit a quiz, assignment, or exam due to technical glitches on your end is not a sufficient reason to extend the deadline.**

Team Project: Each team will complete one project presentation from assigned data sets. The project will deliver a presentation file on VoiceThread. At the end of the term, each team will submit one such presentation videos (along with the corresponding power point files) for the evaluation.

Makeup Exams and Late Assignments

Makeup exams are NOT given in this class except under very limited conditions and must be approved by the instructor before the date of the exam. Make-up exams will be administered at the end of the semester or sooner at the discretion of the instructor.

Assignments that are not turned in before the due date will NOT BE ACCEPTED, resulting in a score of 0 points. All assignments must be submitted to Canvas by the time specified. Canvas occasionally schedules maintenance, which is posted days in advance on this website: http://syshealth.asu.edu/. It is your responsibility to schedule your assignment submissions around scheduled maintenance shutdowns. This site also allows you to see the status of Canvas.

Technology Requirement

- Windows 7 or Mac OS Mavericks or newer operating system are required. A Chromebook will NOT serve you well for this course.
- Google Chrome or Mozilla Firefox web browser (click on links to download).
- We will be using some Excel & mostly JMP Pro throughout the course, which is available for download from the university link below.
    - https://myapps.asu.edu/ (enter JMP in the search field)
- Tableau software links will be available for download on the canvas by the instructor.

Honorlock for Final Exam

You will be taking the final exam using a remote proctoring tool (Honorlock). This system allows you to take your exams at a convenient time as allowed by your school or organization, while proctoring your exam by recording the visual, audio, and desktop aspects of the exam and exam environment.

Requirements You will need a laptop or desktop, camera, microphone, and a sufficient Internet connection. Honorlock is not available for mobile devices.

Guides and Walkthroughs

Please go to https://sites.google.com/asu.edu/wpcusinghonorlockincanvas/home

and download and install Honorlock.

Authenticating with DUO with your cell phone you should be able to authenticate with DUO while logging in with Honorlock with little to no disruption. Once you are logged in to Canvas, please put your cell phone away.

Practice Exam You must complete the W. P. Carey Honor Code Acknowledgement using Honorlock in order to view content in this course. This ensures that you have acknowledged reading and will abide by the W. P. Carey Honor Code, and that the computer you are using will function properly with Honorlock.

Notifications You may be contacted regarding any activities flagged during the exams you take as follows:

- Your school or organization may contact you directly
- They may request that Remote Proctor contact you, in which case you will receive an email from Remote Proctor

After your exam, be on the lookout for notifications. Your school or organization will determine final disposition of any violations. Please contact them with any questions or concerns you may have.

Important Information Regarding Honorlock:

- Students are required to establish their identity by showing official identification before they begin their test
- Students are responsible for self-testing the functionality of the system well in advance of all Remote Proctored exams in their courses, so that any required troubleshooting could be accomplished. You can retake the W. P. Carey Honor Code Acknowledgement to confirm Honorlock is working on your computer.

Test Environment Requirements The online testing environment should mimic the 'in class' testing environment, and must conform to the following:

Testing Area

- Sit at a clean desk or clean table (not on a bed or couch)
- Lighting in the room must be bright enough to be considered "daylight" quality. Overhead lighting is preferred; however, if overhead is not possible, the source of light should not be behind the student
- Be sure the desk or table is cleared of all other materials (except an optional cheat sheet). This means the removal of all books, notebooks, calculators, etc. unless specifically permitted in posted guidelines for that particular examination
- No writing visible on desk or on walls
- The following should not be on your desk or used during your exam unless specifically allowed for that examination:
    - Excel / JMP Pro / Tableau
    - Word
    - PowerPoint
    - Textbooks
    - Websites
    - Calculators
    - Pen or Pencil
- Close all other programs and/or windows on the testing computer prior to logging into the proctored test environment
- Do not have a radio or the television playing in the background
- Do not talk to anyone else. There can be no communicating with others by any means
- No other persons except the test-taker should be permitted to enter the room during testing

Behavior

- Dress as if in a public setting
- You must not leave the room during the testing period at any time, unless specifically permitted in posted guidelines for that particular examination
- You must not take the computer into another room to finish testing. The exam must be completed in the same room where you completed the "Exam Environment View".
- No use of headsets, earplugs, or similar audio devices are permitted
- Do not use a phone for any reason. The only exception is to contact support or your instructor in the event of a technical issue

Technical Support

If you experience technical difficulties with Canvas, My ASU, or your ASU email contact the ASU Help Center not your instructor. The Help Center is open 24x7, 395 days. You can call 1-855-278- 5080 or go to http://my.asu.edu. Click on the Service Center tab; click the red Live Chat button. PC and Mac computers are available for student use at the computing sites on the Tempe, Downtown, and Polytechnic campuses. The ASU libraries on all four campuses (Tempe, Downtown, Polytechnic, West) also have computers available. The Hayden Library on the Tempe campus is open during the semester 24 hours from Sunday at 10 am-Friday at midnight and Saturday 9 am Friday at midnight. Students can

get in-person technical help for their personal computer at the Tech Studio. They are located at each of the four campuses and are open during the semester weekdays, business hours.

Online Etiquette

When taking a course online, it is important to remember several points of etiquette.

- Avoid language that may come across as strong or offensive. Language can be easily misinterpreted in written communication. Humor and sarcasm may easily be misinterpreted, so try to be as matter of fact and professional as possible.
- Keep writing to the point and stay on topic. Keep sentences brief so that readers do not get lost. Do not introduce new topics, as it may confuse the readers.
- Read first, write later. It is important to read all posts or comments within the course discussion before personally commenting to prevent repeating commentary or asking questions that have already been answered.
- An online classroom is still a classroom. Though the course may be online, appropriate classroom behavior is still required. Respect for fellow classmates and the instructors is as important as ever

Academic Integrity and Ethical Behavior

The W. P. Carey School takes academic integrity very seriously. Any suspected violations of academic integrity will be taken seriously and result in the following sanctions:

- A minimum of zero on the assignment AND
- A reduced grade in the course OR
- A failure in the course OR
- An XE which denotes failure due to academic dishonesty on the transcript OR
- Removal from the W. P. Carey School of Business

Additional information on ASU's academic integrity policy may be found at http://provost.asu.edu/academicintegrity.

Honor Code and Professionalism Policy

The honor code is available via the following link:
https://gradstudents.wpcarey.asu.edu/sites/default/files/professionalism-policy-final-june-2016.pdf

Prohibition Against Discrimination, Harassment, and Retaliation
Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling, is available if you wish to discuss any concerns confidentially and privately.

Religious Accommodations

Accommodations will be made for students with religious holidays. Below is the calendar of official religious holidays. Each holiday noted with two asterisks denotes an observance for which work is not allowed. For these holidays, students will not be penalized in any way for missing class or assignment. This means that this will not count as an absence in class and they will be granted a makeup assignment or exam, etc.

https://provost.asu.edu/index.php?q=religious-holiday-calendar All requests for accommodation must be submitted by the end of the second week of class.

University-Sanctioned Activities

Accommodations will be made for students who miss class related to university-sanctioned activities according to ACD 304-02.

If you are participating in a university-sanctioned activity, please let your instructor know as early in the course as possible so that accommodations can be made.

Threatening Behavior Policy

The university takes threatening behavior very seriously and these situations will be handled in accordance with the Student *Services Manual*, SSM 102-02 http://www.asu.edu/aad/manuals/ssm/ssm104-02.html.

Disability Accommodations

If you need an accommodation for a disability, you must register with the Student Accessibility and Inclusive Learning Services (SAILS). Please let your instructor know as early as possible so that appropriate accommodations can be made.

Copyright Material

All the materials presented to you online including exams, quizzes, assessments, chapter reviews, etc. contain the intellectual property of the authors of the textbook and/or the publishers. The contents are intended solely for distribution to students enrolled in this course section. Unauthorized use or distribution of this content without express permission will be considered a violation of the W. P. Carey Code of Academic Integrity. All rights to the course materials are reserved.

Course Schedule

(Professor reserves the right to change the course schedule during the semester when necessary)

Week	Tasks
Week #1 **03/14– 03/20**	**Topic: Science of Analytics** **Learn:** • What is s analytics? • The different types of models in business analytics. • Decision making biases • Advanced excel **Read/Watch:** • Lecture notes • All video lectures and lab video tutorials **Assignments [due on Sunday (03/20) at 11.59 PM Arizona Time]** • Take the W. P. Carey Honor Code Acknowledgement in order to view content • HOA 1 (Analysis using Pivot Table) • Quiz 1 • Lab Test 1
Week #2 **03/21 – 03/27**	**Topic: Descriptive Statistics and Experimental Design** **Learn:** • Descriptive statistics • Observational vs experimental study • A/B Testing • Experimental Design • Fundamentals of Data analysis using JMP Pro **Read/Watch:** • Lecture notes • JMP descriptive analysis tutorial • All video lectures and lab video tutorials **Assignments [due on Sunday (03/27) at 11.59 PM Arizona Time]** • HOA 2 (Medical Malpractice - Case study) • Quiz 2 • Lab Test 2

Week #3 **03/28 – 04/03**	**Topic: Introduction to Inferential Statistics** **Learn:** • Key concepts in inferential statistics • Principle of randomization and central limit theorem • Hypothesis testing (t-test, z-test), two mean tests, ANOVA using JMP Pro **Read/Watch:** • Lecture notes • JMP analysis tutorial • All video lectures and lab video tutorials **Assignments [due on Sunday (04/03) at 11.59 PM Arizona Time]** • HOA 3 (Pizza Perk– Case study) • Quiz 3 • Lab Test 3
Week #4 **04/04 – 04/10**	**Topic: Data Preparation and Data Mining (I)** **Learn:** • Key concepts of ETL • Basic concepts of data mining (supervised vs. unsupervised) • Principles of Clustering (k-means and hierarchical) • Clustering (k-means and hierarchical) analysis using JMP Pro **Read/Watch:** • Lecture notes • JMP analysis tutorial • All video lectures and lab video tutorials **Assignments [due on Sunday 04/10) at 11.59 PM Arizona Time]** • HOA 4 (Wellness campaign – Case study) • Quiz 4 • Lab Test 4

Week #5 **04/11 – 04/17**	**Topic: Data Mining (II): Linear Regression Analysis** **Learn:** • Key concepts of Regression Analysis (Linear, Multiple Linear and Logistic) • Regression analysis using JMP Pro • Interpretation and application of analysis results **Read/Watch:** • Lecture notes • JMP analysis tutorial • All video lectures and lab video tutorials **Assignments [due on Sunday (04/17) at 11.59 PM Arizona Time]** • HOA 5 (Car Manufacturer – Case study) • Quiz 5 • Lab Test 5 • Presentation Preview
Week #6 **04/18– 04/24**	**Topic: Data visualization and reporting** **Learn:** • Theory and principles of data visualization • Data visualization & interpretation using Tableau **Read/Watch:** • Lecture notes • *Tableau* tutorial • All video lectures and lab video tutorial **Assignments [due on Sunday (04/24) at 11.59 PM Arizona Time]** • HOA 6 (ERPSim Game data visualization) • Quiz 6 • Lab Test 6 • **Individual Practical Exam**

Week #7 **04/25 – 05/01**	**Topic: Information architecture** **Learn:** • Information architecture in modern firm • Relational database and SQL programing • Big Data and Cloud Computing • Simple database query using WebSQL **Read/Watch:** • Lecture notes • All video lectures and lab video tutorials **Assignments [due on Saturday (04/30) at 11.59 PM Arizona Time]** • Quiz 7 • Group Presentation (Based on analysis performed on provided data sets) • Peer review • Course Evaluation
05/01 **Final Exam**	**Topic: Course wrap up** **Learn:** • Course summary **Read/Watch:** • Study guide / course review • Course summary **Assignments [due on Sunday (05/01) at 11.59 PM Arizona Time]** • Final Exam (Via Honorlock)