



WPC 300: Problem Solving and Actionable Analytics
2022 Fall C SLN: 85090
Canvas URL: <https://canvas.asu.edu/courses/128768>
Lecture Time: Tuesday 3:00 PM – 4:15 PM
Room: **AGBC 115**

Instructor: Dr. Alan Xu
Office: SANTN 230J
E-mail: yilanxu@asu.edu

Office Hours: Every Tuesday 12:45 PM - 2:45 PM Arizona Time (via – Zoom Conference call)
<https://asu.zoom.us/j/82767683244> (Sign in Zoom with your asu.edu email)
Please email to make an appointment to meet outside this office hour.

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

- Ask the right questions to identify problems across functional areas
- Critique available organizational data (both qualitative and quantitative) and its applicability to deliver insights for a given business situation
- Create problem statements to establish objectives, scope, relevant data sources, and strategies for data collection, including ethical considerations
- Develop basic models to predict and prescribe decisions and actions
- Explore data to visualize and communicate insights and recommendations

Textbook and Other Materials

Book #1

Online Book/Software: Data Analysis with Microsoft Excel

Author: Allen, Gove, Ball, Nicholas, Anderson, John, Jackson, Robert

Publisher: MyEducator

Version: 2022, online

Cost: \$39.99

ISBN: 978-1-952023-19-4

We will be using MyEducator to access the above interactive smarttextbook. ***Information on how to purchase access to MyEducator can be found in the Start Here section on Canvas.*** Here are some tips for accessing MyEducator via Canvas in order to begin:

- Please do not use a tablet or a phone to purchase the book - use a computer.
- Please use Chrome or Firefox as your Internet browser.
- Please make sure that your Canvas has an email that is identical to MyEducator account if you already have an account on MyEducator. If not, please still make sure that there is your email address on Canvas.
- If you have MyEducator account, please log out from it by going to myeducator.com (<https://myeducator.com/>)
- If you are still unable to access the book in Canvas, please clear cache, close all the Internet browsers (if you are a Mac user, please "quit" them all), and then try it again.

Do you have an access code? [Click here for step-by-step instructions on how to redeem your pre-purchased access code](https://myeducator.freshdesk.com/support/solutions/articles/14000071756-how-do-i-use-an-access-code-to-access-a-myeducator-smart-textbook-)
(<https://myeducator.freshdesk.com/support/solutions/articles/14000071756-how-do-i-use-an-access-code-to-access-a-myeducator-smart-textbook->

If you are retaking a course, you do not need to purchase the content again. Sign up like normal and the system should recognize your prior purchase. If you have any problems, please contact us at support@myeducator.com.

Book #2

Book: Bulletproof Problem Solving: The One Skill That Changes Everything

Author: Charles Conn, Robert McLean

Publisher: Wiley

Version: March 2019

Cost: \$17.50 online

ISBN: 978-1-119-55303-8

This book will be part of the Inclusive Access program. All enrolled students receive access to the digital materials approximately 5 days prior to the start of each semester. After the drop/add period ends, any student who hasn't opted out of the program pays for the material at the discounted price, which posts automatically to their student account. Students who opt-out lose access and will need to purchase on their own through the bookstore or online.

This required material for this course will be provisioned as an e-book and made available at a discounted price cheaper than if purchased directly from the publisher. If you wish to take advantage of this discounted group price, no additional action is needed. Following the drop/add period, a charge of \$17.50, plus tax, will post to your student account under the header "Bkstr Publisher Negotiated Rate" and your access will continue uninterrupted. If you'd rather purchase the material from an alternate source, you may choose to opt-out of the program by using this link: <https://includedcp.follett.com/1230> . Enter your ASU e-mail address AS IT APPEARS IN THE ASU DIRECTORY (<http://asu.edu/directory>), then follow the instructions provided. Be aware that if you do opt-out, your access to the e-book will be discontinued. If you need assistance accessing the book or the opt-out portal, please email asuinclusiveaccess@gmail.com To access the e-book, follow these instructions (books will be available approximately 5-days prior to the start of class):

1) Go to <https://brytewave.redshelf.com>

2) Click "Login" then "Forgot Password" and enter your ASU email address EXACTLY as it appears in the directory.

[please note: all students have two configurations of their email address (asurite@asu.edu and firstname.lastname@asu.edu); both are tied to the same email account but the system will only recognize the email address that appears in the directory. If you don't receive the password reset, please turn any forwarding rules off in your ASU email box and try again (the Gmail servers sometimes block ASU emails).

4) Return to <https://brytewave.redshelf.com>. Your username will be your ASU email address (again, EXACTLY as it appears in the directory) and your password will be whatever you changed it to.

It is considered a violation of academic integrity to utilize course materials which are illegally sourced. Please ensure that you are ordering and paying for your own materials as outlined in the ordering instructions.

Grading and Course Requirements

This course will require advance preparation and active participation. The course will consist of hands-on assignments, quizzes, mini cases and a take home final. Quizzes will be given periodically to ensure adequate preparation for and participation in class.

Course grades will be based on the following weights:

Grading Criteria	Weight
Practice Problem: X 6	12%
Test your skills X 6	18%
Concept Quiz X 5	20%
Play Posit / Clicker X 50	5%
Mini Cases X 3 [5 + 10 + 10]	25%
Take Home Final Exam	20%
Total	100%

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.

Individual Assignments and Exam:

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

Practice Problems: These are assigned practice tests from MyEducator, designed to provide general insights on how to use excel to solve a given problem. You will get unlimited attempts to complete them before the due date. Your highest score will be saved.

Test your skills: These assignments from MyEducator enable you to gain firsthand experience and knowledge to use Excel. They are designed to develop the ability to apply your knowledge of analytics in the real world. You will have three attempts on this exercise before the due date. Your highest score will be saved.

Concept Quiz: These quizzes are designed to test your understanding of the assigned reading from “Bulletproof problem solving”. You will have two attempts on these quizzes. Your highest score will be saved.

Mini Cases: These assignments are designed to test your knowledge to apply problem-solving skills to solve important business problems and interpret the results from the analysis.

Final Take-home Exam: The final exam is a comprehensive test of your overall understanding of the materials converted in the course. This take-home exam (open-book exam) will test your critical thinking, analytics skills, and overall problem-solving skills.

Grade Weights

	Grading Criteria	Source	Weight
Unlimited attempts	Practice Problem: X 6	MyEducator	12%
Max three attempts	Test your skills X 6	MyEducator	18%
Max two attempts	Concept Quiz X 5	Bulletproof	20%
In-class one attempt	Clicker X 50	Lecture	5%
One attempt	Mini Cases X 3 [5 + 10 + 10]	ME & BP	25%
One attempt	Take Home Final Exam	ME & BP	20%
	Total		100%

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 10, Mac OS Mavericks, or newer operating systems 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** throughout the course

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, 365 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 at 9 am, Friday at midnight. Students can get in-person technical help for their personal computers at the Tech Studio. They are located at each of the four campuses and are open during the semester on weekdays, during 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

Course Schedule

See the Course schedule document for reading assignments, graded assignments, due dates and times.

School and University Policies

Don't take your knowledge of these policies for granted, as they will be observed and enforced in this class. I'm sure you've seen them in many syllabi: you are probably now a junior or senior, so I would argue that it's a great time to look through them and refresh your memory. Please humor me and spend a few minutes reviewing them and clicking a link or two.

See this [page for details on](#)

- W. P. Carey Honor Code
- Professionalism Policy
- Prohibition Against Discrimination, Harassment, and Retaliation
- Instructor Absence Policy
- Religious Accommodations
- University Sanctioned Events
- Tutoring Support
- Threatening Behavior
- Student Accessibility and Inclusive Learning Services (SAILS)
- Offensive Material
- Copyright Material

Course Schedule

All assignments due times are Arizona Time

Week 0	
Welcome and start here	
Topics Covered:	Introduction to the Course
Reading:	• Welcome and start here • Syllabus • Schedule
Lecture Topics:	• Course Introduction • Faculty Introduction
Deliverables	
All assignments are due before class begins	
Individual Assignments:	• W. P. Carey Honor Code Acknowledgment • MyEducator Getting Started assignment

Week 1 & 2 (Aug 18, Aug 25)	
Module 1 - Introduction to Problem Solving and Problem-Solving Approach	
Module Objectives:	● Define Problem Solving ● Describe the business drivers that catapulted problem solving capability to become one of the top desired skills in business ● Explain the seven-step process of Bulletproof problem-solving ● Apply the bulletproof problem-solving approach to business problems ● Demonstrate the use of Excel functions such as VLookup, HLookup, Match, Index, Choose, Today, DateIf, Workday, Networkdays
Reading:	● Introduction (from Introduction, textbook) ● Learning Bulletproof problem-solving approach (from chapter 1, textbook) ● Introduction- Device and Environment Setup (MyEducator) ● Referencing functions and Date Functions in Excel (Lesson 1 of MyEducator)
Lecture Topics:	● 1.1 Introduction to problem-solving. ● 1.2 Examples of Problem Solving. ● 1.3 “Bulletproof” Framework of Problem Solving. ● 1.4 Application of Framework in real world ● 1.5 Aligning Excel functions to problem solving approach (1) ● 1.6 Aligning Excel functions to problem solving approach (2)
Deliverables	
Dates to be determined - See Course Site	
Individual Assignments:	● Test your skills – getting started with MyEducator ● Clicker ● Concept Quiz 1 ● Practice Problem ● Test Your Skills
Week 3 & 4 (Sept 1, Sept 8)	
Module 2 – Define the problem	
Module Objectives:	● Implement refinement of problem statement using the characteristics of good problem statements ● Describe other problem-solving approaches and frameworks ● Explain multi-dimensional analysis ● Examine data, within the context of problem-solving, with multi-dimensional analysis by using Excel Pivot tables
Reading:	● Define the Problem (Chapter 2 Textbook) ● Multi-Dimensional Analysis using Pivot Tables (Lesson 2 of MyEducator)

Lecture Topics:	• 2.1 Defining and Refining Problem Statement • 2.2 Example to refine a problem statement • 2.3 Other Frameworks of problem Solving: Design Thinking • 2.4 Multi-Dimensional Analysis Overview [Excel] • 2.5 Pivot Tables in Excel • 2.6 Preview of Mini case Assignment # 1 in the context of problem-solving framework
Deliverables	
Dates to be determined - See Course Site	
Individual Assignments:	• Practice Problem 2 • Test Your Skills 2 • Clicker - 2
Week 5 & 6 (Sept 15, Sept 22)	
Module 3 – Problem Disaggregation and Prioritization	
Module Objectives	• Describe the types of logic trees and their uses • Implement logic trees for a problem • Apply cleaving frames to take problems apart • Explain probability distributions, specifically, bell shaped and non-bell-shaped distributions and the central tendency, variability of data. • Demonstrate the use of exploratory analysis in disaggregation and prioritization
Reading:	• Problem Disaggregation and Prioritization (Chapter 3 of Textbook) • Exploratory Data Analysis and Basic Probability Distributions (Lesson 3 of MyEducator)
Lecture Topics:	• 3.1 Logic Trees and Uses • 3.2 Application of Logic Trees • 3.3 Cleaving Framework. • 3.4 Exploratory data analysis in disaggregation and Prioritization • 3.5 Data Types • 3.6 Probability Distribution Functions
Deliverables	
Dates to be determined - See Course Site	
Individual Assignments:	• Concept Quiz-2 • Practice Problem 3 • Test Your Skills 3

	- Clicker - 3 - Mini Case Assignment # 1: Which Product to Discontinue at Carey's Extreme Sports
Week 7 & 8 (Sept 29, Oct 6)	
Module 4 – Conduct Analysis	
Module Objectives:	- Explain Heuristics and Rules of Thumb techniques used in problem solving - Apply question-based problem technique to get to “rough cut” solutions to problems - Solve a problem by using Root Cause Analysis - Describe Hypothesis Testing - Design and interpret T- Test and Anova Tests to solve problems
Reading:	- Conduct Analyses (Chapter 5 of the textbook) - Inferential Statistics: A/B A/B/C Tests (lesson 4 of MyEducator)
Lecture Topics:	4.1 Heuristics 4.2 Question-Based Problem Solving and Root Cause Analysis. 4.3 Hypothesis Testing 4.4 Testing Means with T-Test 4.5 ANOVA Test 4.6 Preview of Mini case # 2 [Carey's Extreme Sports – Understanding customers]
Deliverables	
Dates to be determined - See Course Site	
Individual Assignments:	- Concept Quiz - Practice Problem - Test your skills - Clicker

Week 9 & 10 (Oct 13, Oct 20)	
Module 5 – Big Guns of Analysis	
Module Objectives:	- Explain “big guns of analytics” and their application in problem solving - Examine the options to select the right analytical approach for a given problem - Perform correlation analysis and linear regression
Reading:	- Big Guns of Analysis (Chapter 6 of the textbook) - Predicting using Linear and Multiple Regression (Lesson 5 of MyEducator)

Lecture Topics:	• 5.1 Overview of “Big guns of analysis” • 5.2 Observations, Experiments and A/B Testing • 5.3 Correlation & Simple Linear Regression • 5.4 Multiple Linear Regression • 5.5 Employing the “Big Guns” • 5.6 Preview of mini case #3 [Carey’s Extreme Sports - Model for Company’s Profit]
Deliverables	
Dates to be determined - See Course Site	
Individual Assignments:	• Concept Quiz • Practice Problem • Test Your Skills • Clicker • Mini case # 2 [Store manager’s dilemma on Monthly Revenue for product X]

Week 11, 12 (Oct 27, Nov 3)	
Module 6 – Synthesize Results and Tell a Great Story	
Module Objectives:	• Describe data visualization • Differentiate between good and bad visualization • Synthesize results • Construct a great story
Reading:	• Synthesize Results and Tell a great story (Chapter 7 of textbook) • Advanced Visualization (Lesson 6 of MyEducator)
Lecture Topics:	• 6.1 Data Visualization Principles • 6.2 Example of good and bad visualization • 6.3 Story Telling with Visualization • 6.4 Basic visualization with Excel • 6.5 Advanced visualization with Excel • 6.6 Dashboard
Deliverables	
Dates to be determined - See Course Site	
Individual Assignments:	• Concept Quiz • Practice Problem • Test Your Skills

	• Clicker • Mini Case Assignment # 3
--	---

Week 13, 14 (Nov 10, Nov 17)	
Module 7 – Build a great workplan and team process	
Module Objectives:	• Organize and design a great workplan • Describe bias and ethics • Identify different types of bias
Reading:	• Build a great workplan and team process (Chapter 4 of textbook)
Lecture Topics:	• 7.1 Special topics (Faculty's choice) • 7.2 Build a great workplan and team process [Clicker] 3 • 7.3 Bias and Ethics in Problem Solving • 7.4 Course Takeaways • 7.5 What is beyond this course? • 7.6 Final thoughts
Deliverables	
Dates to be determined - See Course Site	
Individual Assignments:	• Clicker • Do the course review for the final take home exam.

Week 15 (Dec 1)
Final Take Home Exam Review

Take-home final exam Dec 5 & 6 - good luck.