DATA VISUALIZATION (BDAN 430)
Syllabus

Associate Professor	Email	Office Location & Hours
Dr. Lily Popova Zhuhadar	Lily.popova.zhuhadar@wku.edu	GH226, 11:30am – 2:00pm, M/W

DESCRIPTION:

This course provides a comprehensive introduction and hands-on experience in basic data visualization, visual analytics, and visual data storytelling. It introduces students to design principles for creating meaningful displays of quantitative and qualitative data to facilitate managerial decision-making in the field of business analytics. Many organizations are using analytics and visualization to make better decisions and improve customer and shareholder value. This is deemed a critical skill in business today.

In this course we will learn about how to leverage the power of data visualization to communicate business-relevant implications of analyses and the difference between using visualization for analytics vs.data storytelling. Modules are organized around concepts, tools, and applications, and cover the visual analytics process from beginning to end--from collecting, preparing, and analyzing data to creating data visualizations, dashboards, and stories that share critical business insights. We will leverage the analytical capabilities of Tableau, the industry leading visualization tool, and prepare students to be competent users of this technology.

*NOTE: This class is hands-on and requires use of appropriate software to practice and apply concepts learned. Students should be prepared to spend time outside utilizing provided resources and independent learning to complement software instruction provided in Blackboard.

COURSE LEARNING GOALS:

- Understand how to use data to summarize, visualize and develop insights.
- Effectively use optimization to support decision-making in the presence of number of alternatives and business constraints.
- Identify, evaluate, and capture business analytic opportunities that create value.
- Explain data visualization principles and guidelines for effective analysis and presentation
- Develop and interpret a wide range of visualizations in Excel and Tableau
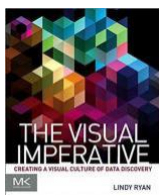- Verbally communicate persuasive, data-driven business insights.

TEXTBOOKS AND TECHNICAL REQUIREMENTS:

1) *Visual Data Storytelling with Tableau* by Lindy Ryan, Pearson (2018)

Visual Data Storytelling with Tableau
1st edition
Lindy Ryan

ISBN-13: 9780134712833

2) *The Visual Imperative by* Lindy Ryan, Morgan Kaufmann (2016)

SUGGESTED READING: (NOT REQUIRED)

1) *Communicating Data with Tableau: Designing, Developing and Delivering Data Visualizations Ben Jones, O'Reilly (2014)*
2) *The Big Book Dashboards: Visualizing Your Data Using Real-World Business Scenarios* Steve Wexler, Jeffrey Shaffer, Andy Cotgreave, Wiley (2017)
3) *The Functional Art,* Alberto Cairo, New Riders (2012)
4) *Information Dashboard Design: Displaying Data for At-a-Glance Monitoring,* Stephen Few, O'Reilly Media (2013)
5) *Storytelling with Data,* Cole Nussbaumer, Wiley (2015)
6) *Visualize This: The Flowing Data Guide to Design, Visualization, and Statistics,* Nathan Yau, Wiley (2011)
7) *The Visual Display of Quantitative Information*, Edward Tufte, Graphics Press, 2nd Edition (2001)

TECHNICAL   REQUIREMENTS:

A significant amount of time that students spend completing their assignments will involve the use of visualization software. Instruction will be focused and directed based on the capabilities/features of:

- Tableau Desktop Professional (TFT License), Student License
- Microsoft Excel

Students will be able to learn the basic features of one or more of these software programs through training videos that are posted in Blackboard, self-directed studies or by using available resources online. The instructor is also willing to help with specific questions or techniques as needed.

Students are responsible for downloading a FREE version of Tableau Desktop. You are free to use either the PC or Mac version of the software. You can apply for a free license of Tableau and download the software here: http://www.tableau.com/academic/students

PROCEDURES, TECHNIQUES, AND METHODS:

This course will employ a variety of techniques directed at different styles of learning. In addition to lecture, we will use small group discussions, brainstorming, case studies, hands-on activities, and group presentations. The class will rely heavily on computer use. In addition, Blackboard is the main site to access lecture notes, handouts, assignments, video instructions, and links to other learning resources. Most lectures will focus on real-world situations and cases to explain, illustrate, and demonstrate the concepts and techniques of contemporary business.

STUDENT OUTCOMES:

After taking this course, students should be able to collect and process data, create an interactive visualization, and use it to demonstrate or provide insight into a problem, situation, or phenomenon. Moreover, students should have the basic knowledge needed to critique various visualizations (good and bad), and to identify design principles that make good visualizations effective. Students should also have a basic understanding of some of the challenges present in making data understandable across a wide range of potential audiences.

Finally, students will have the opportunity to demonstrate their own skills in identifying a visualization that can be improved, completing their own design and/or analysis on the underlying data, and working to publish or promote acceptance of their presentation.

METHODS OF EVALUATION AND GRADING:

Students are expected to prepare and participate by:
1. Reading course content and producing scheduled assignments each week
2. Participating in discussions posted on Blackboard, projects, and quizzes
3. Completing the assigned homework projects by the due date
4. Participation in Group Projects

Students are expected to complete each test, exam, homework, and all other assignments independently. The student's submissions must represent his or her individual work, and citations must be provided where content from other sources is referenced. Also, you may not re-use a data set from one project to another; you must start with a completely new data set each time.

Course grades will be determined as follows:

1) Participation	100%
2) Quizzes	200%
3) Homework	100%
4) Midterm Exam	200%
5) Group Case Study Project	100%
6) Final Project	300%
Total:	100%

Students will be assigned to groups for the purpose of completing specific assignments. It is important that you participate as necessary in the groups to complete assignments. Low participation in your group may affect your final grade for any group assignments.

By the end of this course, student should be able to take Tableau Data Analyst Certificate

Prepare for Your Exam

One of the best preparations is role experience and time with the product. To be prepared, candidates are strongly encouraged to have at least 6 months of experience. We also encourage you to explore some of our expert training options:

Tableau Certified Data Analyst Exam Readiness

This course is a ready-made bundle designed to help you build the skills and confidence you need to become a Tableau Certified Data Analyst. And you get two exam vouchers, just in case.

CHECK IT OUT →

Analyst Learning Path

A combination of eLearning and badges built for the Analyst skill set.

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Unlimited access to our most popular virtual classroom courses. Here is our two-step process to get the most out of the pass as you prepare for your exam.

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Exam

The midterm exam will cover concepts and material covered in lectures, hands-on practice, and readings. Students will be expected to apply class readings and lectures in answering the test questions.

The test will be taken through DELO Testing Center. Without **prior** approval, prior to the exam time, make-up opportunities are limited to documented emergencies. Instructor discretion is used in determining whether a situation constitutes an emergency.

Projects

Through a variety of projects, we will analyze best practices and compare and contrast with not-so-best practices. Students will learn to critique good and bad data visualizations and will be required to create and recreate various data visualizations using various sets of data.

Homework

Homework assignments will be given and are due by the date and time indicated by the instructor.

Late Assignments

Late assignments are not accepted. Assignments not submitted on time will receive a zero.

Adjustments to Assignments, Schedule, and Syllabus

The scope, timing, and due date/time of any assignments, projects, homework, exams, or any other required work may be adjusted by the instructor as needed to maximize learning opportunities for students and/or better serve the goals of the course. The syllabus may likewise be modified at the discretion of the instructor. Any adjustments will be communicated to students on Blackboard. Resubmissions of assignments are not permitted.

COURSE PREREQUISITE:

- Before attending this course, you should have a Personal Computer to install some software packages, in order to do your assignments, during the semester.

- **Note**: In case you don't have a personal computer, WKU TRC Center (located in MMTH) offers laptops to WKU student (free of charge). You can check out a laptop for two weeks long, afterward, on a bi-weekly basis, you can request a renewal. Here is a link to this recourse: https://apps.wku.edu/trc/index.php?fuseaction=auth.notLoggedin

IMPORTANT DATES:

Refer to *https://www.wku.edu/registrar/academic_calendars/ for more details.*

EXPEXTATIONS of STUDENTS:

Students are expected to read the scheduled assignments each week. Also, to complete the assigned homework, and quizzes posted on Blackboard, by the due dates. Most importantly, they must complete each test, exam, homework, and all other assignments independently.

POLICIES:

- The professor reserves the right to make changes to the syllabus or schedule as necessary; it is the student responsibility to be aware of these changes by periodically checking the syllabus on Blackboard Course Site.
- Mid-Term Exam is proctored via DELO Testing Center: https://www.wku.edu/testing.
- Problems with Blackboard should immediately be reported to the Information Technology Services at (270) 745-7000.
- Don't email your assignment to me unless I instruct you to.
- Assignments are due and must be uploaded to the appropriate location by the announced due date. Your assignments must be uploaded to the correct place to receive a grade.
- A malfunction of your personal computer is not a reason for not completing a test or assignment on time.
- It is the student's responsibility to check the site to make sure the assignment upload was successful.
- Students experience personal illnesses, a family crisis, work schedule problems, automobile trouble, and similar "life" situations every semester. These are not typically unusual circumstances and do not warrant exceptions to course policies. Good planning and proactive efforts on the part of the student can avoid many of the problems that arise from these situations.

ACADEMIC DISHONESTY:

- Students who commit any act of academic dishonesty will receive from the instructor a failing grade F in this course. This rule applies to any act that involves cheating and plagiarism.

- Cheating will not be tolerated. Note that cheating might involve but <u>not limited to</u> the following actions: *"To represent written work taken from another source as one's own is plagiarism. Plagiarism is a serious offense. The academic work of a student must be his/her own. One must give any author credit for source material borrowed from him/her. To lift content directly from a source without giving credit is a flagrant act. To present a borrowed passage without reference to the source after having changed a*

few words is also plagiarism," for more details, refer to
https://www.wku.edu/undergraduatecatalog.

E-MAIL ETIQUETTE:

- Each student must have a WKU email address and Blackboard account for participation. Email and Blackboard are considered official communication tools for this course. Thus, announcements and reminders are posted/sent frequently and will be sent only to official WKU email addresses. If you use a different email address, please ensure that your WKU email is forwarded correctly. It is your responsibility to check WKU email and Blackboard regularly and to be aware of all reminders and announcements.

- E-mail will generally be the best way to contact me. During normal business hours, I usually respond to e-mail fairly quickly (unless I am in a meeting/class/etc.).

- Please keep in mind that I am not as quick to respond to e-mail in the evenings or during the weekends, and. holidays. Please consider e-mail as a method of *professional* correspondence. Thus, you should do your best to use correct grammar, punctuation, and capitalization.

- Also, when you contact me via e-mail, make sure that you include BDAN-430 as well as your last name in the subject line of the e-mail.

ADA ACCOMMODATIONS:

In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, Room 1074. The SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at sarc.connect@wku.edu. Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

TITLE IX/ DISCRIMINATION & HARASSMENT

WKU is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) and Discrimination and Harassment Policy (#0.2040). Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121.Please note that while you may report an incident of sex/gender based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and MUST report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

WKU COUNSELING & TESTING CENTER

The university experience should be challenging, but not overwhelming. To this end, the WKU Counseling Center provides a variety of services to help strengthen students' capacity to tolerate distress, form healthy relationships, and seek healthy expressions of their ideals and values. If you would like to speak with someone, you may contact WKU's Counseling and Testing Center at 270-745-3159 or use their Here To Help service at https://www.wku.edu/heretohelp/heretohelpemail.php. If you need immediate help, please visit

the Counseling Center in 409 Potter Hall or call the 24-hour emergency help line at 270-843-4357.

TUTORING

1. **STUDENT SUCCESS TUTORING CENTER**

   If you need to refresh your knowledge on topics (closely related to this course) pertaining to some courses you have taken previously, such as Excel. All you need to do is to schedule an appointment for a free tutoring at the GFCB Student Success Tutoring by visiting this Website: https://www.wku.edu/business/tutoring.

2. **LEARNING CENTER**

   The Learning Center (DSU A330) provides **free** supplemental education programs for all currently enrolled WKU students. For more information, or to schedule a tutoring appointment, please call TLC at (270) 745- 6254 or log on to their website at www.wku.edu/tlc.