Meeting days: Monday except Friday Jan 19th (1/8 (light online) 1/15 and 3/25)	Instructor title and name: Matt Boyne
Meeting times: 9:30-12:15	Phone: 760.715-8071
Meeting location: Mission Valley	E-mail: mboyne@pointloma.edu
Final Exam: April 29th Please adhere to University policy for the Final as listed below.	Office location and hours Fermanian 130 10:00-5:0o Friday
Additional info: MV Office Hours 3:00-5:15 Tuesdays and Wednesdays; and all day Fridays at Lomaland	Additional info: Call anytime

To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Fermanian School of Business Mission

Character – Professionalism – Excellence – Relationships – Commitment - Innovation

As members of a vital Christian community, we strive to provide high quality business programs that equip students to make a positive impact in their workplace and community by connecting purpose to practice.

COURSE DESCRIPTION

This course explores methods of applied data analysis, including capturing, identifying and analyzing data to inform decision making. Topics include an overview of statistical concepts, guidelines for effective data analysis, data visualization principles, and presenting and evaluating alternative solutions. Emphasis will be placed on designing and creating data visualizations to communicate with various stakeholders.

COURSE LEARNING OUTCOMES

Upon completion of this course, students will be able to:

1. Identify the processes and issues associated with research problem definition, research design, question, scale and survey design, sample design, data collection, data analysis, and writing and presenting research methodology (PLO 1 & 6).

2. Determine an appropriate research methodology to achieve specific research objectives that includes quantitative and qualitative data collection/analysis techniques (PLO 3).
3. Analyze research projects to determine the appropriateness of methods (PLO 2).
4. Interpret the appropriate use of emerging business research methods (PLO 3).
5. Collaborate with a team to present current topics (PLO 6 & 7).

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES (Have access to the books and your laptop for every class please)
1. Business Intelligence, Analytics, Data Science and AI at https://www.pearson.com/en-us/subject-catalog/p/business-intelligence-analytics-and-data-science-a-managerial-perspective/P200000001822/9780137305711
2. As the primary source on Tableau we will use Visual Analytics with Tableau by Alexander Loth. This book is available digitally for free from our Library at this link
3. Get a Tableau download for Students (free). Follow the instructions for the Desktop version. It is important that you get this loaded before week 2 begins.

Supplemental and free: From our Library both these books can be used to understand Managerial Analytics and Visualizing Data with Excel:

https://pointloma.on.worldcat.org/oclc/857068245

https://ebookcentral-proquest-com.pointloma.idm.oclc.org/lib/pointloma-ebooks/detail.action?docID=5993965

ASSESSMENT AND GRADING-Specific Details at the end of the Syllabus

- Exams and assessments are open book and notes
- All assessments and exams are to be an individual effort though group study is encouraged. If an assignment is Team Based Learning or EduScrum the team's work will be submitted in the team assignment and the previous request does not apply.

Prof Note-Professional Standards: We have to live by our values in our class performance:

- Punctuality. Is the student on time for every class showing the Fermanian Value of Commitment?
- Attendance. Are the University's policies of absences and attendance adhered to?
- Professionalism per Fermanian Values. Is the student engaged in the material, using electronic resources properly, fully present in the class, and contributing to the body of knowledge we are developing as a class?
- Excellence per Fermanian Values. Are questions, comments, positions and effort in line with standards of Excellence as stated in the Fermanian Values?

	Sample grade scale:

1. Pretest for Quantitative Research Techniques and Statistics 5% 50 Pts 2. Post-test for same 5% 50 Points 3. 9 Team Based Learning Exercises 45% 450 Points 4. 3 end of Module Assessments 15% each for 450 points 1000 Points and 100%	A=93-100 A-=92-90 B+=87-89 B=83-86 B-=80-82 C+=77-79	C=73-76 C-=70-72 D+=67-69 D=63-66 D-=60-62 F=0-59

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. Late work will only be accepted in the case of an emergency.

ARTIFICIAL INTELLIGENCE (AI) POLICY

You are allowed to use Artificial Intelligence (AI) tools (e.g, ChatGPT, iA Writer, Marmot, Botowski, etc.) in this course. Any work that utilizes AI-based tools must be clearly identified as such, including the specific tool(s) used. For example, if you use ChatGPT, you must cite ChatGPT including the version number, year, month and day of the query and the statement "Generated using OpenAI. https://chat.openai.com/". Please think this through before doing so in order to be sure you know how inaccurate the systems can be.

CONTENT WARNING

I acknowledge that each of you comes to PLNU with your own unique life experiences. This contributes to the way you perceive various types of information. In [class name], all of the class content, including that which may be intellectually or emotionally challenging, has been intentionally curated to achieve the learning goals for this course. The decision to include such material is not taken lightly. These topics include [list topics]. If you encounter a topic that is intellectually challenging for you, it can manifest in feelings of discomfort and upset. In response, I encourage you to come talk to me or your friends or family about it. Class topics are discussed for the sole purpose of expanding your intellectual engagement in the area of [subject/major], and I will support you throughout your learning in this course.

TRIGGER WARNING

I acknowledge that each of you comes to PLNU with your own unique life experiences. This contributes to the way you perceive several types of information. In [class name], we will cover a variety of topics, some of which you may find triggering. These topics include [list topics]. Each time this topic appears in a reading or unit, it is marked on the syllabus. The experience of being triggered versus intellectually challenged are different. The main difference is that an individual must have experienced trauma to experience being triggered, whereas an intellectual challenge has nothing to do with trauma. If you are a trauma survivor and encounter a topic in this class that is triggering for you, you may feel overwhelmed or panicked and find it difficult to concentrate. In

response, I encourage you to take the necessary steps for your emotional safety. This may include leaving class while the topic is discussed or talking to a therapist at the Counseling Center. Should you choose to sit out on discussion of a certain topic, know that you are still responsible for the material; but we can discuss if there are other methods for accessing that material, and for assessing your learning on that material. Class topics are discussed for the sole purpose of expanding your intellectual engagement in the area of [subject/major], and I will support you throughout your learning in this course.

SPIRITUAL CARE

PLNU strives to be a place where you grow as a whole person. To this end, we provide resources for our graduate students to encounter God and grow in their Christian faith. At the Mission Valley (MV) campus we have an onsite chaplain who is available during class break times across the week. If you have questions for, desire to meet or share a prayer request please email mvchaplain@pointloma.edu.

In addition, on the MV campus there is a prayer chapel on the third floor which is open for use as a space set apart for quiet reflection and prayer.

LANGUAGE AND BELONGING

Point Loma Nazarene University faculty are committed to helping create a safe and hospitable learning environment for all students. As Christian scholars we are keenly aware of the power of language and believe in treating others with dignity. As such, it is important that our language be equitable, inclusive, and prejudice free. Inclusive/Bias-free language is the standard outlined by all major academic style guides, including MLA, APA, and Chicago, and it is the expected norm in university-level work. Good writing and speaking do not use unsubstantiated or irrelevant generalizations about personal qualities such as age, disability, economic class, ethnicity, marital status, parentage, political or religious beliefs, race, gender, sex, or sexual orientation. Inclusive language also avoids using stereotypes or terminology that demeans persons or groups based on age, disability, class, ethnicity, gender, race, language, or national origin. Respectful use of language is particularly important when referring to those outside of the religious and lifestyle commitments of those in the PLNU community. By working toward precision and clarity of language, we mark ourselves as serious and respectful scholars, and we model the Christ-like quality of hospitality.

You may report an incident(s) using the Bias Incident Reporting Form.

SEXUAL MISCONDUCT AND DISCRIMINATION

In support of a safe learning environment, if you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that accommodations and resources are available through the Title IX Office at pointloma.edu/Title-IX. Please be aware that under Title IX of the Education Amendments of 1972, faculty and staff are required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at counselingservices@pointloma.edu or find a list of campus pastors at pointloma.edu/title-ix.

GPS ACADEMIC RESOURCES

PLNU offers the following free academic resources virtually for Graduate Professional Studies (GPS) Students. Visit myPLNU through the links below for more information.

- **The GPS Writing Center** offers:
  - **Zoom Writers Workshops** offered each quad on a variety of helpful topics
  - **One-to-one appointments** with the Writing Coach
  - **Microlearning YouTube Video Library** for helpful tips anytime
  - **Research Help Guide** to help you start your research
  - The physical office is located on the third floor of the **Mission Valley Regional Center** off the student lounge
- **Academic Writing Resources Course:** Found on your Canvas Dashboard, this course is non-credit with 24/7 access, no time limits, and self-paced content. **Watch a quick video run-through** and take time now to explore!
- **Tutoring**: Students have access to 24/7 live or scheduled subject tutoring through Tutor.com, including a Paper Drop-Off Service with feedback within 12 hours.

We are here to support you! Contact us anytime: **GPSWritingCenter@pointloma.edu**

PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See the Academic Honesty Policy in the Graduate and Professional Studies Catalog for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

COURSE MODALITY DEFINITIONS

1. In-Person: Course meetings are face-to-face with no more than 25% online delivery.

2. Online: Coursework is completed 100% online and asynchronously.

3. Online Synchronous: Coursework is completed 100% online with required weekly online class meetings.

4. Hybrid: Courses that meet face-to-face with required online components.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See Academic Policies in the Graduate and Professional Studies Catalog for additional detail.

The second absence, other than University excused, may result in a 50 point, penalty, the third 100 points and the fourth 250 points. Please do not be late for class as a professional standard. Late arrivals can be considered absences.

FINAL EXAMINATION POLICY

Successful completion of this class requires taking the final examination on its scheduled day. No requests for early examinations or alternative days will be approved.

COURSE SCHEDULE AND ASSIGNMENTS

Week 1: 1/8 - There is no face-to-face class or Zoom session. Please work at your own pace but have the assignment completed by 1/15. Follow the directions for the Quantitative Research Techniques and Statistics Module Pre-Test. Get a notebook and pen so you are ready to take notes during the Pre-Test.

As you take the Pre-Test and come across terms that you do not know, need further explanation about, or require additional information stop and write out the term before you answer the question. Try to create a study plan of information as if you need to get a 100% on the test.

Then complete the Module…BUT don't take the Post-Test yet. See if you can answer your questions, if not start by going through the PPT slides provided. If still unable, go a general web search and note the source.

The first week's assignment is worth 50 points, or 5% of your grade. For each question or term you do not know research that term using the Module (without taking the post test) or a general web search, write out what the term or concept means. The submission will be a Word document with your name on it listing the term, the research's results and the source. Even if you got a 100 on the pretest please list anything that requires greater explanation.

HW#1 – Pre-Test Write Up 5% or 50 Points Due Monday 1/15/24

Note Class is held on Friday for Week 2: 1/19 – Introduction and Basic Statistics for Analytics

Please read Foundations of Statistics for Analytics

Statistical inference focuses on generalizing information from a sample to a population. Confidence intervals and hypothesis tests allow for using data to inform our understanding about the underlying process or population. The central limit theorem (CLT) forms the foundation of classical statistical methods when drawing inferences about both population means and population proportions. The goal of confidence intervals is estimating a range of reasonable values for the parameter, while hypothesis testing allows us to use data to examine the likelihood of a preconceived parameter value.

Introduce Analytics, our class syllabus and Class Guided readings on both Chapters 1 in Sharda and Visual Analytics with Tableau (VAT). After class please read Chapters 1 from both Sharda and VAT.

HW #2 – Post-Test Module for Statistics 5% or 50 Points Due 1/22

The first module introduces key probability concepts that underpin most statistical and analytical methods. Without a strong foundation in the ideas of probability, randomness, and uncertainty, it is very difficult to truly understand and correctly apply most statistical inference methods. The normal distribution is the foundation to most of statistics through the central limit theorem, which underlies much of classical statistical methodology. When making decisions in an inherently uncertain world, the rules and laws of probability help provide support for addressing issues that arise from uncertainty.

Quantitative Research Techniques and Statistics Course Assignment Leveling Module

You are required to take the Quantitative Research Techniques and Statistics course assignment leveling module. The time to complete the module is estimated at 6 to 9 hours, depending on your previous exposure to the subject.

To access the Quantitative Research Techniques and Statistics module, follow the on-screen instructions found at the following URL: https://micro.peregrineacademics.com/pointloma \

The password for the module is: PLNU-1001

If you have any problems with the registration process, please visit Peregrine's technical support page at: http://www.peregrineacademics.com/support

To successfully complete the module, you must earn a minimum score of 80% on the module post-test. You are allowed to attempt the post-test twice. If you have not achieved a passing score (80%) after two attempts, you will be required to purchase a new module for $39.00 and continue attempts until a passing score is achieved at the same URL:

https://micro.peregrineacademics.com/pointloma

The password for the retake module is: PLNUPAY-1001

If you take any modules that are not assigned to you for this course, you will be billed for each module at $39. Modules should only be taken when assigned by the course and NOT earlier.

This module is worth 5% of your total course grade. The deadline for completing the module is May 22, 2022. The percentage earned on the leveling module post-test will be translated into points earned in this course as follows:

Post-test Percentage	Points Earned in Course
95.00-100	50
90-94.99	45
85.00-89.99	40
80.00-84.99	35
<80.00	0

Module 2 Defining Analytics and Introducing Tableau (Week 3)

Week 3 Introduction to Analytics and Tableau

Business analytics is "the methodology of extracting information and knowledge from data that improves a company's bottom line and enhances the consumer experience." The focus is on how the leader derives information from the data that can help the organization. The focus of the

leader has shifted (somewhat) from 'how can I get more, rich data?' to 'how can I use the myriad of data I have to improve the business?' To answer this question, a clear understanding of the data is key, as that will drive the methods applied.

Before Class Please Listen to Guided Readings – Chapters 2 of Visual Analytics with Tableau (VAT); and Chapter 2 of Sharda; Please also read [Data Visualization with Tableau](#)

Learning Objectives:

- What does Data Literacy mean?
- What is Data Visualization?
- Define data and Data Analytics
- Data Driven Decision Making
- Homework Projects and Data Sources

After Class to Do-"Connect to and Customize Data" at https://elearning.tableau.com/tableau-fundamentals

Module 3 – Data Visualization Methods Using Excel and Tableau with Data-Driven Decision Making (Weeks 4-6)

This module focuses on descriptive analytics and the summation of data both graphically and numerically. When discussing analytics in any context, communication is key and a "picture is worth a thousand words." Distilling large amounts of data into clear summary statistics and graphics is a key step in communicating the story of the data. Translating data from its raw form into digestible content is key for any manager. This summation via numerical and/or visual methods begins the journey of communicating numbers to the employee, follower, constituent, client, student, patient, etc. Visuals often make clear the various relationships among the variables, while the numerical summaries give objective information about the variables' shape, center, and spread.

<u>Week 4 (January 29th)</u> – Visualizing Categorical and Numeric Values

In Class-Use Team-Based Learning to apply basic analytics and visualization in a short case analysis. Guided readings Chapter 3 VAT; Chapter 3 of Sharda

Learning Objectives:

- Types of Measures
- Introduction to Data Structuring
- Communicating with Data
- Connecting to Data with Tableau
- Introducing Excel as an Analytic Tool

After class to do: Homework-"Organize Data and Create Filters"
https://elearning.tableau.com/tableau-fundamentals

<u>Week 5 (Feb 5th)</u> – Visualizing Summary Measures

Use team-based learning to practice types of measures and apply in short cases. Discuss previous week's work in the application. Guided readings of Chapters 4 in Sharda and VAT

Learning Objectives:

- Summary Measures with Excel and Tableau
- Keeping up with the Quants
- Analytics 3.0

Team Based Learning in Class 5%

After class to do: "Build Common Views" https://elearning.tableau.com/tableau-fundamentals

Week 6 - Module Review. First in Class Test Descriptive Analytics and Visualizations 15%

Module 4 Predictive Analytics (Weeks 7-10)

Predictive Analytics relies on regression analysis. Regression is arguably the most common analytic technique used today. The goal has shifted from learning about a single variable to how multiple variables work together. Inferential goals remain (Does variable x impact or relate to variable y?), but goals of prediction (predictive analytics) are now introduced. The response variable is numerical, but the independent variables can be of any type. This module focuses on finding the line (plane) of best fit, evaluating the goodness-of-fit, testing significance, and ensuring the assumptions of the model are maintained. Regression analysis is the first 'model building' technique within the predictive analytics framework.

<u>Week 7 </u> – Chapter 5 of Sharda; and Chapter 5 of Visual Analytics with Tableau.

Assignment # 6 Team Based Learning in Class (5%)

After class to do-"Apply Analytics" https://elearning.tableau.com/tableau-fundamentals

This point of study for our class is intended to explore "the right questions and meaningful data" using the 4D Framework

1. Problem: A key challenge or issue your audience wants to solve. They may want to make an aspect of the business more efficient or effective than it currently is. For example, a problem may be that your marketing team is struggling to generate an adequate number of new business leads. The better you understand the problem and its consequences, the better prepared you are to find potential causes and solutions. When the problem is clear, you're less likely to meander aimlessly through the data.

2. Outcome: A strategic goal or desired end result your audience wants to achieve. If the problem represents the current state, the outcome represents the future or desired state. When the desired outcome is explicitly stated (a specific target), you know how much of a gap there is and what needs to be accomplished. For example, your marketing team may have established a goal of increasing the number of leads by 60% in the next quarter. If an outcome hasn't been established by your audience, you may need to set a reasonable one on their behalf.

3. Actions: The key activities and strategic initiatives your audience has implemented (or will be) to fix a problem or achieve an outcome. They represent investments of money, time and resources that will be relevant and top-of-mind for your audience. For example, your marketing team may be focused on expanding its virtual marketing events or enhancing its digital marketing efforts to drive more leads. Any insights you uncover on these activities or initiatives will be of strong interest to your audience.

4. Measures: The key metrics and other data used to highlight the problem, monitor the performance of the initiatives and define the achievement of the desired outcome. Not all of the data will be relevant or useful to answering key questions. Understanding which metrics and dimensions matter as well as how to interpret what they mean will be essential to making sense of the numbers. For example, if you know the marketing team is looking at total inquiries, total qualified leads and cost per lead, you'll want to keep your analysis centered on these key metrics so you don't go too far astray from what your audience is focused on.

Week 8 – Chapter 6 of Sharda, and Chapters 6 of Visual Analytics with Tableau.

Assignment # 7 Team-Based Learning in Class (5%)

After class to do-"Work with Multiple Data Sources" https://elearning.tableau.com/tableau-fundamentals

Week 9 – Chapters 7 of Sharda and VAT; and watch
https://www.youtube.com/watch?v=mT4OuzpVPDk

Assignment #8 Team-Based Learning in Class (5%)

After class to do-"Create Dashboards and Stories" https://elearning.tableau.com/tableau-fundamental

Week 10 - In Class Module Review and Assignment #9 Assessment (15%)

Week 11 Easter

Module 5 Prescriptive Analytics, Software and Trends (Weeks 12-16)

The final piece of the analytics 'puzzle' is prescriptive analytics. Some people regard prescriptive analytics as a very broad term that encompasses all analytics techniques with an overall goal of improving business decision-making. However, most people prefer making a distinction between descriptive, predictive, and prescriptive analytics, where prescriptive analytics uses simulation and optimization algorithms to quantify the effect of different possible actions by a decision-maker to help make a more informed decision. Prescriptive analytics focuses on decision-making based on analytical models. Once the models have been built, tools like simulation allow for understanding the distribution of outcomes given the decision made by the company to allow for more goal-oriented decisions. Linear programming (as well as integer programming) is a constrained optimization technique in which the allocation of limited resources can be distributed to optimize output. Prescriptive techniques are truly focused on understanding the implications of decisions and how to optimize decision-making.

Week 12 – Prescriptive Analytics Chapter 8 in Sharda and VAT

- Team Based Learning in Class 5%

Week 13 – Software and Trends Chapter 9 in Sharda and VAT

- Team Based Learning in Class 5%

Additional resources about making and presenting story points in Tableau:

- http://onlinehelp.tableau.com/current/pro/online/windows/en-us/stories.html
- https://public.tableau.com/s/blog/2014/07/story-points-sizing-tips
- https://www.youtube.com/watch?v=u8aOJizBGtY

Week 14 - AI Trends in Analytics Chapter 10 in Shards and VAT

- Team Based Learning in Class 5%

Week 15-Ethics in Data Analytics

- Team Based Learning in Class 5%

Week 16 - Module 5 In Class Assessment 15%