University of New Hampshire
Peter T. Paul College of Business and Economics

ARTIFEX - DS XYZ

Course Name: DS XYZ	Term: Fall	Year: 2019

Course ID: PAUL 598.01 - Artifex
Faculty Adviser: Christopher Glynn
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Office Hours: Tuesday and Thursday 4:30 – 5:30

Course Overview

The primary purpose of this course is to deliver an experiential learning opportunity in business analytics to students at Paul College, building skills required of analytics professionals.
The course delivery is a mix of lectures and project-based learning. In one course period per week, lectures on modern statistical tools and practice will be given. In the second course period per week, students will bring those tools to address challenges in real data provided by industrial partners. In addition, Industrial partners may deliver guest lectures either in-person or via Zoom.

The students enrolled in the course are members of Artifex; a cross-disciplinary analytics organization at Paul College that provides undergraduate students an opportunity to learn about industrial practice of analytics and data science**.** Students will work in groups to build analytics products. Examples of potential projects include: Forecasting revenues and expenses in different business scenarios for the Seacoast Science Center; Constructing house-price indices with Zillow data; Measuring customer satisfaction from Yelp and TripAdvisor data; Predicting an employee's healthcare plan choice with MyHealthMath; and Building a dashboard to help present metrics on student and teacher success in the Dover School District.

Learning Objectives

Upon completion of this course students will be able to:

1. Design and build analytics products, dashboards, decision support tools, and interactive data visualizations using statistical software packages;
2. Utilize modern and computational statistical methods to learn from complex and noisy data sets;
3. Integrate statistical software with information systems and SQL databases;
4. Utilize modern analytics tools such as GitHub, R, TidyVerse, …
5. Understand the practical functions and challenges of analytics organizations by interacting with industry partners.

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Learning Outcomes (program-level)

This course addresses the following Paul College BSBA learning objectives:

- 1.1 Students will demonstrate proficiency in the core content areas of business.
- 1.2 Students will think critically to address business situations.

Prerequisites.

- ADMN 420
- MATH 420

Textbook (required)

Data Science: A Gentle Introduction
James G. Scott
https://jgscott.github.io/STA371H_Spring2018/files/DataScience.pdf

A First Course in Bayesian Statistical Methods
Peter D. Hoff
Springer Texts in Statistics

Confidentiality

During the course, students may receive confidential information, including datasets, code, and other proprietary materials. Improperly disclosing such information could cause competitive harm, damage the reputation of PCBE and our industrial partners. By enrolling in this course, students agree to safeguard the confidentiality of proprietary information and not to disclose or distribute any materials outside of the course, including to classmates not taking the course, without explicit prior permission.

Officers & Executive Committee

The class is led by Professor Chris Glynn with assistance from five appointed officers that serve on the Executive Committee. Below is a brief description of the positions and roles of each appointed officer.

Chief Executive Officer

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- Preside over project-based course meetings and develop weekly agendas for executive tasks and academic programming.
- Manage class activities and overall daily operations including but not limited to:
  - Development of policies and procedures
  - Industrial partner meetings
  - Providing feedback to technical teams
- Monitor technical teams
- Give final approval to analytics products

Chief Operating Officer

- Responsible for strategic and technical initiatives and project management
- Manage technical team leaders
- Develop templates for shared software, technical reports, and other work products
- Responsible for planning events and course logistics beyond the classroom

Chief Analytics Officer

- Share technical knowledge through mini-lectures on project days
- Serve as a mentor to technical team leaders
- Manage GitHub repository for all R code
- Manage code reviews for quality control

Chief Marketing Officer

- Responsible for the overall branding and public image of Artifex
- Manage public facing social media accounts to promote analytics at Paul College
- Update website www.unhdata.com to reflect the present the overall portfolio of projects
- Plan Analytics Symposium to host industry partners for a half-day conference

Chief Product Officer

- Responsible for all data products

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- Test and validate products
- Create repository of product documentation
- Integrate products into workflow of industry partners

Current Executive Committee: Students are appointed to the executive committee by the faculty adviser based previous experience in Artifex, demonstrated excellence in analytics, and leadership potential. Appointments are made annually prior to the beginning of the academic year.

Currently the executive team consists of the following individuals.
Chief Executive Officer: Cassidy Bartlett (clb1029@wildcats.unh.edu)
Chief Operating Officer: Riley Gardner (rtg1001@wildcats.unh.edu)
Chief Analytics Officer: Carter Mercer (ctm1015@wildcats.unh.edu)
Chief Marketing Officer: Cortlynn Danby, cnd1008@wildcats.unh.edu
Chief Product Officer: Nicholas Rocchio, nrr1004@wildcats.unh.edu

Assessments & Grading

Grade components

Students will complete a variety of assessments including quizzes, a written report, a presentation and individual and peer evaluations. The table below summarizes the assessments as well as their respective grade weightings.

Assessment	Responsibility	Evaluated by*	Weight
DataCamp Modules	Individual	Faculty Adviser	20%
Client Deliverables / Work Product	Group	Industry Partner/Adviser	30%
Written Project Report	Group	Adviser	20%
Final Presentation On-Campus	Group	Adviser/Industry Partner	15%
Individual Written Performance Assessment	Individual	Adviser	10%
Individual 360 Performance Evaluation	Individual	Adviser /Peers	5%

Assignment Details

DataCamp Modules (20%): Each week, a DataCamp Module will be assigned that closely corresponds to the topics discussed in lecture. These modules are essential for building practical experience and solving hands-on problems with statistical software. Student

completion of DataCamp Modules will be tracked online by the instructor. Students are responsible for completing each module independently and on time.

Deliverables / Work Product (30%): Each team will be responsible for delivering Work Product defined in conjunction with the Industry Partner and documented in the statement of work. The Industry Partner (along with the faculty adviser) will evaluate the team's Deliverables & Work Product and assign a score based on how well the team met the requirements documented in the statement of work.

Written Project Report (20%): In addition to any specific deliverables to the Industry Partner, each team is required to provide a written Project Report which will be printed and presented to the partner as documentation of the project engagement. The report shall include (at a minimum):

- Executive Summary
- Company Overview
- Problem Statement / Scope of Work
- Summary Project Plan / Approach
- Solution Summary / Description of Deliverables
- Recommendations / Next Steps
- Budget / Financial Summary (if applicable)

The faculty adviser will score the report based on completeness, level of detail, organization, accuracy, use and citation of relevant sources, professionalism etc. See appendix for more information on preparing your Project Report.

Final Presentation On-Campus (15%): Each team will deliver a brief PowerPoint presentation during the last week of the course. The presentation shall include (at a minimum):

- Introduction
- Presentation Topics / Agenda
- Brief Company Background
- Problem Statement / Challenge
- Related Industry Research (if applicable)
- Overview of Solution / Deliverables / Work Product
- Next Step Recommendations
- Closing / Q&A

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Note: In addition to this on-campus summary presentation, your Industry Partner may require a more in-depth, on-site presentation of deliverables. On-site presentations will be scored by the Industry Partner as part of the Client Deliverables / Work Product.

Individual Written Performance Assessment (10%): Each individual team member will write a personal reflection and assessment covering the following:

- Executive Summary
- Assessment of Project Outcome
- Assessment of Process
- Individual Contribution
- Lessons Learned
- Peer Evaluation

The faculty adviser will score the Individual Written Assessment based on completeness, organization, level of self-reflection, professionalism, etc. See appendix for more information on preparing your Individual Performance Assessment.

Individual 360 Performance Evaluations (5%): After reviewing the team and individual scores on the above deliverables, faculty advisers will consider client and peer evaluations to determine the final individual letter grades assigned to each student in this course. Total scores may be adjusted (up or down) based on the performance evaluations.

Course letter grade definition

Your final course grade will be based on the following distribution.

Grades Scored Between	*Will Equal*
94% and Less than 100%	A
90% and Less Than 94%	A-
87% and Less Than 90%	B+
84% and Less Than 87%	B
80% and Less Than 84%	B-
77% and Less Than 80%	C+
74% and Less Than 77%	C
70% and Less Than 74%	C-
67% and Less Than 70%	D+

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64% and Less Than 67%	D
60% and Less Than 64%	D-
0% and Less Than 60%	F

Tentative Class Schedule*

Week #	Topic	DataCamp Assignment
1	Intro to Data Science	Introduction to R
2	Exploratory Data Analysis	Exploratory Data Analysis in R
3	Foundations of Probability	Foundations of Probability in R
4	Statistical Inference	Foundations of Inference in R
5	Intro to Bayesian Inference	Fundamentals of Bayesian Data Analysis
6	Modern data science tools	Introduction to the TidyVerse
7	Cleaning, Merging, and Subsetting data	Working with Data in the TidyVerse
8	Linear Regression	Modeling Data in the TidyVerse
9	Analytics Writing and Communication	Communicating with Data in the TidyVerse
10	Version Control	Introduction to Git for Data Science
11	Risk Modeling with Logistic Regression	Introduction to Credit Risk Modeling with R
12	Building Web Applications with Shiny	Building Web Applications in R with Shiny
13	Web applications cont.	Building Web Applications in R with Shiny: Case Studies
14	Dashboards with R	Building Dashboards in R with Shiny dashboard

*Please Note: the instructor reserves the right to modify this schedule

Policy on Late Submissions and Quizzes

Late homework, quizzes, and exams will not be accepted, and they will receive zero credit.

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Class Participation

You are expected to contribute to class discussions, respectfully ask questions, share your knowledge, and be a productive team member. Class attendance is required and you are responsible for all material covered in class in addition to assigned readings and exercises outside of class. In respect to your classmates and the instructor, it is expected that you refrain from talking to others, sleeping, playing videos games, browsing the internet, texting, posting to social media, and other disruptive activities. Such activities may result in you being asked to leave the lecture.

Technical Requirements and Technical Support

See website listings for current recommendations and requirements related to this course - https://online.unh.edu/technical-requirements. Technical assistance related to Canvas is available at https://itsupport.unh.edu/mycourses/.

University Disability Accommodations

The University is committed to providing students with documented disabilities equal access to all university programs and facilities. If you think you have a disability requiring accommodations, you must register with Disability Services for Students (DSS). Contact DSS at (603) 862-2607 or disability.office@unh.edu. If you have received Accommodation Letters for this course from DSS, please provide me with that information privately in my office so that we can review those accommodations.

Academic Honesty and Plagiarism

Students are required to abide by the UNH Academic Honesty policy located in the Student Rights, Rules, and Responsibilities Handbook.

As your instructor, I proactively monitor academic integrity through regular use of tools like SafeAssign and a diversified assessment approach. All work submitted to SafeAssign become a part of a UNH proprietary database. This is actively used to identify future intellectual property theft. Plagiarism of any type may be grounds for receiving an "F" in an assignment or an "F" in the overall course. Plagiarism is defined as "the unattributed use of the ideas, evidence, or words of another person, or the conveying the false impression that the arguments and writing in a paper are your own." (UNH Academic Honesty Policy, 09.3) Incidents are reported to the school dean and may be grounds for further action. If you have questions about proper citation

refer to your department's writing guidelines. You can contact me at any time on this issue. Additional resources are located below:
http://libraryguides.unh.edu/unhmcitingsources
http://www.library.unh.edu/reference/citation.shtml

Emotional Health and Wellness

Your academic success in this course is important. If, during the semester, you find emotional or mental health issues are affecting that success, please contact Psychological and Counseling Services (PACS) (3rd fl, Smith Hall; 603 862- 2090/TTY: 7-1-1) which provides counseling appointments and other mental health services.

Note: This syllabus is subject to change. Students will be promptly notified of any changes.