Provisional Battle Plan for the Practicum in Data Analytics

* Assignments may be individually-based (i), team-based (t), or a scaffolding assignment (s).

Dates	Topics	Assignments
Week 1 9/3-9/7	Syllabus, team formation, project introductions, review key team strategies Project planning and generating domain knowledge *Read HBR Chap 1, 3-6, More on Project Scope*	Team formation and initial assignment of the contract bid Teams should meet out of class to discuss project & draft team norms. **Due (Fri) Sep 7 by 5 pm** Completed "team norms" doc, electronically signed by all team members, and placed into your Google Team Drive.
Week 2 9/10-9/14	User-centered project design strategies, Writing it up Sep 10: Class in Red Frame Lab Sep 12: Professional writing workshop	**Due (Sun) Sep 9 by midnight** Project plan draft in google drive (s) **Due (Fri) Sep 14 by midnight** Professional Resume for feedback (s)
Week 3 9/17-9/21	Data management and Discussions on ethics (statistical, human, data, communication, etc.) Sep 17: Data Documentation Worksheet Sep 19: Ethics *Read HBR Chap 7-9* **Sep 21-22: Karthik Ram, ROpenSci**	**In class (Mon) Sep 17** Data documentation worksheet (s) **Due (Sun) Sep 23 by midnight** (1) IRB Certificate dropped into google drive (s) (2) Domain knowledge mini-review (i)
Week 4 9/24-9/28	Project management and team collaboration strategies Sep 24: Project management and teamwork Sep 26: Present in class *Read HBR Chap 12-13, 17* https://coast.noaa.gov/ddb/ https://datapractices.org/manifesto/	**Present in class Sep 26/27** Bid proposal presentation (t), *feedback from a local professional in data analytics* **Due (Fri) Sep 28 by 5 pm** Project bids (t), and emailed to clients
Week 5 10/1-10/5	Research Design and Methods (statistical choices, modeling, surveying, etc.) Oct 1: Research design workshop Oct 3: Project sprints	**In-person Project Bid presentations to clients should happen this week**
Week 6 10/8-10/12	Collaborating and version control Intro to Data Visualization and Storytelling Oct 8: git and GitHub Oct 10: Peer teaching from *Various readings on data visualization*	**In class (Weds) Oct 10** peer teaching data viz (s) **Due (Sun) Oct 7 by midnight** Public-facing GitHub account and contributions to the team GitHub (s)
Week 7 10/15-10/19	Advanced graphics week: Visual output that is useful and meaningful Oct 15: project updates and sprints	On **(Weds) Oct 17**, bring 2 visuals (per team) to workshop. One should be something more *finished* that you'd present in your progress report,

	Oct 17: Graphics Workshop with Josh Smith (Midwest Health Collaborative) and Kelsey Bieri (ICC Analytics). There may be an opportunity to join them for lunch! Read & explore: Tableau public gallery Data storytelling in dashboards Design for color blindness	and the other can be an *idea* of what you want, even if it's just sketched up on paper. (s) **FALL BREAK OCT 18-19**
Week 8 10/22-10/26	Project sprints, progress reports Oct 22: Project check-ins with visuals Oct 24: Project sprints	**Due (Fri) Oct 26 by 5 pm** Check-in reports (4-6 pages; t)
Week 9 10/29-11/2	High Stakes Communication Oct 29 - START Interview prep, *guest interviewers* Oct 31 - Check-ins, Project sprint time	**Out of class this week:** *Touch base with clients, ask if an in-person meeting is desired.*
Week 10 11/5-11/9	Public Communication and Editing Nov 5 - Giving and receiving critical feedback, revising written communication Nov 7 - Project sprints	public communication (i), due **Workshop blog posts during class time (Mon) Nov 5 (s),** **Due (Sun) Nov 11 by midnight,** **Final revised version**
Week 11 11/12-11/16	Project wrap-up, final countdown Nov 12 - Check-ins, presentation strategies Nov 14 - Project sprints *Read HBR Chap 15-16*	**Due (Fri) Nov 16 by 5 pm** Check-in reports (3-5 pages; t) informal presentation on next level project progress
11/19-11/23	THANKSGIVING BREAK	
Week 12 11/26-11/30	Confident Public Communication Nov 12 - Check-ins, presentation strategies Nov 14 - Project sprints	
Week 12 12/3-12/7	Dec 3 - Ignite presentations Dec 5 - Project sprints	**Present in class (Mon) Dec 3** Ignite presentations (i) peer review (s)
Week 13 12/10-12/14	Dec 10 - course evaluations, project sprints Dec 12 - Project sprints, **LAST DAY OF CLASS** *Read HBR 20-21; Project Closeout*	**Due (Fri) Dec 14 by 5 pm** Final project deliverables (t). *Please read the full instructions very carefully, and include all necessary parts in your "packet" to turn in.*
Week 14 12/17-12/21	Formal presentations to clients and debriefing **Scheduling will depend on clients & students from the other class. Do not schedule travel home early as your presentation may be as late as Dec 21.**	Client presentations and debriefing (t)
CONGRATS! YOU MADE IT TO THE END OF THE SEMESTER! ACHIEVEMENT UNLOCKED!		

Practicum in Data Analytics

DA 301
Fall 2018
Denison University
Olin 222 (Monday and Wednesday, 1:30-2:50p)

Instructor: Dr. Sarah Supp
   Office: Burton Morgan 411   Email: supps@denison.edu   Phone: 740-587-5048

Prerequisites: DA 101, CS 111/112, and MATH 242 or a disciplinary research methods
Office Hours: Mon 3:00-4:00p and Weds 9:30a-12:30p

Note: *Dr. Mike Brady also teaches a section of DA 301 this semester. He may prove a valuable resource and sounding board throughout the class. His office is in Burton Morgan 402 and he can be reached at bradym@denison.edu.*

Overview

Using Denison as a model of society, this practicum will analyze new and existing data sources at Denison to explore questions of collective importance. A problem-driven approach will lead students to acquire new data analytic skills, set in a realistic and ethical context that carefully considers the implications of data display and policy recommendations on end users, stakeholders, and community members. A significant component of the course is working with policy making and implementing professionals on campus, and developing presentation skills appropriate for professional communication with the public and/or a private audience. Though a significant learning opportunity itself, this course should also be seen as a prelude to a community internship in the post-Junior year summer and will provide ample opportunities to develop your skills and background for an intellectual and professional life after Denison. In this course, students will synthesize, hone, adapt, and translate their data analytics skills to a real problem, and be exposed to data analytics in a broad context (for profit, non-profit, government, academic research, and other disciplines).

Class will consist of a mixture of short lectures and hands-on computing exercises, group discussion, team reports, and project sprints. We may have the opportunity have guest speakers visit the class during the semester. It is critical that students come prepared and participate.

Course objectives

At the end of the course you should be able to:
1. Integrate knowledge and skills from prior courses in a deeper understanding of the complexity and iterative nature of the DA cycle.

2. Have an increased comfort with real world, ambiguous, organic problems, and use techniques or strategies for addressing them.
3. Communicate effectively to technical and nontechnical audiences, using oral, visual, and written formats.
4. Build an growth-mindset and attitude to become a lifelong learner. Recognize what knowledge gaps need to be filled for your to effectively address a question (e.g. technical skills or domain knowledge), and build confidence to fill in those gaps.
5. Build and practice professional skills and norms in anticipation of internships and eventual post-graduation plans.
6. Reflect and address ethical concerns with human (or other sensitive) data, fair reporting and inference, and/or problems with speaking truth to power.

Required Texts

- *HBR Guide to Project Management (available on Amazon ~$15)*
- Additional selected readings will be made available via NoteBowl/Google Drive
- Self-directed reading

Class Technology (Hardware, Software)

Projects in this course should use the tools that are the best suited to work through your team's data analysis and to produce the product(s) your client has requested. It is strongly suggested that you use a workflow and programming tools that will help you to document, manage, and keep track of your changes throughout the semester. We will learn and use GitHub as a central repository for team projects, and to help manage collaborative coding and documents. Google Team Drives are also encouraged to be used to share and store course and project files.

- **Version Control:** git and GitHub
- **Programming:** whatever tool is right for the job. Examples might include, but are not limited to - R, Python, SQL, Tableau, unix shell, Stata, SPSS, etc…
    - *Note: Your professor is proficient in some, but not all of these (e.g., R, SQL, etc).*
- **Computers:** Laptops should be sufficient, computer lab or server available if needed

Online Tools and Class Forum

We will use the newly adopted NoteBowl platform. I will update the syllabus as needed on NoteBowl, and you can use the main forum as a place to share relevant class information with your peers, or to share conceptual questions that may benefit others. Additional information from class time, assignments, and additional readings may be posted on NoteBowl, as links to a shared Google Drive.

Assignments and Grading

Graded Course Components

Component	assignments	%
Team Projects The largest portion of the class grade will be based on the ability of teams to work through the data analysis cycle, problem solve collaboratively, and produce a quality final product for their client to use.		**70%**
	Initial bid proposal	10%
	Bid proposal presentation	5%
	Technical progress report I	10%
	Technical progress report II	10%
	Project Final Packet	
	Executive Summary	5%
	Technical Report	15%
	Products	5%
	Presentation and debrief	10%
Individual Skill Building A portion of the class grade will be based on individuals practicing and demonstrating mastery of technical and non-technical professional skills.		**30%**
	Participation (3 parts)	
	In class participation	3%
	Community Scholar	3%
	Scaffolding assignments	9%
	Domain-knowledge	5%
	Blog post	5%
	Ignite presentation	5%

Course Grading

A+:	98%+	A:	92%	A-:	90%
B+:	88%	B:	82%	B-:	80%
C+:	78%	C:	72%	C-:	70%
D+:	68%	D:	62%	D-:	60%

F: below 60

Project Information

The client-based course projects are designed to give you the opportunity to collaborate with a team and with an end user on a set of deliverables within a constrained timeline. The goals of the semester-long project include learning how to work on bigger, more open-ended data sets or analysis products, and to give you the opportunity to gain practical experience and expertise in using data analysis tools that you will need in the real world while you still have access to experienced teachers to help you navigate the process. While some class time will be provided to work on projects, you will need to schedule time to work within your teams outside of class. Your instructor and client will provide feedback at several points throughout the semester.

Expectations

Participation

This class requires active and engaged participation. Simply listening and reflecting is not enough. I hope each of you will come prepared with insightful questions regarding concepts, skills, readings, and relevant connections to current events and professional settings. There are 3 areas of participation in this course:

1. In-class participation

"Step up, step back": I hope everyone plays a role in leading and driving the discussion with your questions and comments, as well as taking time "step back" to listen, and let others have the opportunity to contribute.

My role is to guide, clarify, and add detail where needed. The participation component of your grade will reflect a broad assessment of your fair, productive, and thoughtful contributions during class time, and feedback from your peers on your contributions and attitude as a collaborative team member. Your daily attendance is assumed. *If your circumstances require you to miss class, or to miss multiple classes in a row for any reason, please speak with me ASAP.* For top marks, be active in class on a regular basis, make comments and pose questions that contribute to discussion, remain respectful of others, and practice active listening. Consider the following scale:

- *(A) Were I not in the class, quality of class discussions would be significantly diminished.*
- *(B/B+) Were I not in the class, quality of class discussions would be diminished.*
- *(B-/B) Were i not in the class, quality of class discussions would be slightly diminished.*
- *(C) If I was not in the class, the quality of the course would not be changed.*
- *(D or lower) If I was not in the class, the quality of the course would be improved.*

2. Out of class "Community Scholar"

As upper class students and leaders in the Data Analytics major, it is important to take a personal interest in some of the events that are organized by the department. In doing so, you will have the opportunity to deepen your own learning, practice interacting with various practitioners of data analytics and tech career skills, and serve as a role model for up and coming data analytics students who are looking to you to see what the major involves and where it could take them. You will be required to **choose 3 approved Data Analytics or Professional Development events to attend and participate in** during the semester.

3. Scaffolding Assignments

Throughout the semester, there will be several in and out of class activities that are designed to help prepare for and make progress on your projects, and to further your professional development. These will receive a quick evaluation score on a plus/check/minus scale.

The Fine Print

Class Technology

Students are required to provide their own laptops and to install free and open source software on those laptops. Support will be provided by the instructor in the installation of any useful or required software. R can also be accessed via the browser at r.denison.edu. If at any time you don't have access to a laptop please contact the instructor and the Data Analytics Program can provide you with a loan from the laptop cart. In class, please use eduroam to connect to the internet instead of Denison Guest.

Please be respectful with your use of laptops and technology in class. I request that you only use them for class related purposes, as I and others may find them distracting (For example, no email or social media should be open in your browser tabs!). Cell phones should be kept silent and put away, and you can expect the same from me.

Team Work

In this class, you will work together in the same team of 3-4 people for the entire semester. Thus, clear communication, strong collaboration, and conflict resolution will be critical in achieving your end goals and in attaining a deep learning experience. I encourage you to approach team work with an open mind, and to be cognizant of how your actions and communication can either help everyone on the team learn, or create a negative environment that hinders learning and productivity. Team collaboration is an essential skill for data analytics, including the ability to work together with people you don't know, or don't get along with well. For you to get the most out of the experience and maximize your takeaways from the group experience, each team member should contribute to all (technical and non-technical) aspects of the project (for example, don't designate only one person as the "note-taker" or "editor").

For each team, assessments will be provided during the semester to reflect on the group's collaboration. Furthermore, evaluation of "deliverables" expected of each team will mimic the real world in that it is the product that is expected and assessed in terms of expectations. This means that stereotypical issues that can arise in group effort cannot change the evaluation of the product (i.e., a project or assignment cannot be evaluated more favorably because the group did not work well together). *In extreme cases of "free-riding" or acting unfairly or inappropriately, the individual grades of member(s) may be subject to a penalty, and they will meet with the instructor to determine an improvement plan.* Thus, it is important to work together, communicate clearly and often, voice issues and concerns, and seek out support to address potential issues early. Drs. Supp and Brady are happy to work with groups on these issues and the class will also cover and discuss effective team strategies.

Email and Notebowl

Read all emails carefully! Changes to the syllabus and schedule are likely to happen, but will be communicated in advance as possible in class and notebowl announcements. I will usually use the notebowl feed or email to communicate with the class, so please make sure you are set up to receive email notification from professor and classmate posts. For better or worse, I have to assume you have read all emails. I try to respond within 24hrs, during normal business hours, and expect the same. Emails sent at night (especially before a paper is due) are likely to receive response the next day. NoteBowl will have the reading/assignment schedule and reflect changes to the schedule, reading, and due dates.

Absences and emergencies

Attendance is expected (me too right?). That said, we are adults and life happens. If you have to miss (I hope you don't) I trust it is for a good reason. Given the team-based nature of the class, I am sure you will

try not not to miss when it will affect the team. That said, any more than two absences (the equivalent of a week of class) or a pattern of showing up late for class, for unexcused or non-emergency reasons could negatively affect your participation grade, and likely would have consequences in other areas. Of course, in the case where something unexpected does occur (illness, emergencies, etc..) reach out, let me know, and we will work on it. I care about you and all of our well-being. Let me help if I can.

Due dates, extensions, penalties

Given the team based nature of the class and the fact that it has to be in sync with the other section, deadlines for client assignments will generally be non-negotiable and late assignments may not be accepted. Occasionally we might move a deadline for everyone, but do not expect a deadline to shift individually except in the most extreme circumstances (all students are busy and have multiple deadlines). I may accept individual and scaffolding assignments late, but with a penalty. *Except in the case of a university wide issue, computer based excuses will be hard to defend -- save, backup, and communicate with teammates regularly.* The final deliverables and presentation are hard deadlines and late materials or presentations will not be accepted.

A short note on citations

Simply, cite your work. Unless otherwise noted, any assignment or presentation that relies on or references (either by paraphrase, direct quote, or data sourcing) the intellectual property of others, should be attributed to that source. In this class I am less concerned with the format but would ask that you choose a style and stay consistent. I would like citations to include the year of publication when cited. For example: (authors' last names, year). Citations/sourcing should appear in text (parentheticals, not footnotes) and should also have a references section at the end, with complete entries. If you are looking for a specific method consider the APA styles. Again the emphasis is less of the choice of a specific format, but rather transmissibility and transparency (https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_style_introduction.html).

Academic Honesty and Integrity

Academic honesty, the cornerstone of teaching and learning, lays the foundation for lifelong integrity. Academic dishonesty is intellectual theft. It includes, but is not limited to, providing or receiving assistance in a manner not authorized by the instructor in the creation of work to be submitted for evaluation. This standard applies to all work ranging from daily homework assignments to major projects or exams. Students must clearly cite any sources consulted—not only for quoted phrases but also for ideas and information that are not common knowledge. Neither ignorance nor carelessness is an acceptable defense in cases of plagiarism. It is the student's responsibility to follow the appropriate format for citations. Students should ask their instructors for assistance in determining what sorts of materials and assistance are appropriate for assignments and for guidance in citing such materials clearly. *For further information about the Code of Academic Integrity, see http://denison.edu/academics/curriculum/integrity.*

Disability Accommodation

Any student who feels they may need an accommodation based on the impact of a disability should contact me privately as soon as possible to discuss his or her specific needs. I rely on the Academic Resource Center (ARC) in 020 Higley to verify the need for reasonable accommodations based on the documentation on file in that office.

Writing Center

The Writing Center is a free resource available to all Denison students. Student writing consultants from many majors help writers one-on-one in all phases of the writing process, from deciphering the assignment, to

discussing ideas, to developing an argument, to finalizing a draft. Because proofreading is a last step in that process, you should leave plenty of time (like at least a week) for getting your ideas right before expecting proofreading help. Consultants also can help writers with personal documents, like job and internship applications. Consultants welcome diversity and are prepared to work with multilingual writers. If needed, Consultants can refer a multilingual writer to Denison's Coordinator of Multilingual Learning for additional support. The Center is located on the fourth floor of Barney-Davis Hall; a satellite location is in the Learning Commons on the entrance level of the Library.

Appointments between 4 pm and 9 pm, Sunday through Thursday, can be made for the Barney-Davis location on the online scheduler at the MyDenison Writing Center website; the library satellite location only is drop-in. Check the website on MyDenison for those hours.

Multilingual Support

In addition to the academic support services available to all Denison students, students who use English as a second (or third, etc.) language, can meet with Denison's Interim Coordinator of Multilingual Learning, Kalynda Thayer. She offers a variety of support for L2 students, from consulting with you about your written work to helping you devise strategies for developing and effectively using your listening, speaking, reading, and writing skills in English. You can email her at kalynda.thayer@denison.edu to schedule an appointment.

Reporting Sexual Assault

Essays, journals, and other coursework submitted for this class are generally considered confidential pursuant to the University's student record policies. However, students should be aware that University employees are required by University policy and Title IX guidance to report allegations of discrimination based on gender identity / expression, including sexual misconduct, sexual assault and suspected child abuse/neglect, occurring on campus and / or involving current students at Denison University when they become aware of possible incidents in the course of their employment, including via coursework or advising conversations. There are others on campus to whom you may speak in confidence, including counselors at the Whisler Center for Student Wellness, SHARE advocates, and clergy. More information on Title IX and University policy guidance on gender identity / expression bias and sexual misconduct / assault, including support resources, how to report, and prevention and education efforts, can be found at denison.edu/titleix; students may also contact Steve Gauger, Campus Title IX Coordinator, in Doane Administration 001, by email at gaugers@denison.edu, or by phone at 740-587-8660.

Cautions regarding copyright and licensing

All documents provided to you (i.e. syllabus, assignment prompts, etc.) are the property of the instructor, author, or client. It is a violation of intellectual property to post these online (especially to websites promoting copying/cheating) or to provide them to students not in our class or in future classes. For most of the datasets, sharing them, or the finished reports based on them, will also be a **serious ethical breach**. Your papers are your property, and while you can do with them as you wish, it may be a violation of academic integrity to make them available to others who might use them for plagiarism. Basically, keep course materials and your work to yourself except in the process of classroom editing and peer review.

Oral "R" General Education

Oral communication is a critical skill for data analysts, to acquire and hone. The DA 301 course has strong oral presentation components as part of its core curriculum and learning objectives will count as an "R" Oral competency towards your GE Requirements. Throughout the semester, you will gain instruction, practice, and feedback on oral communication through in-class participation and presentations, interacting with guest speakers and with your project clients,

class discussions, peer teaching, and peer review. Communication is the major way that data data analysis efforts become efficient, useful and relevant. While multiple methods of communication are practiced throughout the course, oral communication for both technical and non-technical audiences is frequently required and assessed.