Syllabus: DMC101 Data Analytics

Semester: Fall 2017
Instructor: Phong Le
Office: JR137
Course Website: Canvas

Office hours: MWF 10:40-11:40, Tu 1-2.
Appointments: Through Starfish
Email: phong.le@goucher.edu
Credit Hours: 4

Class time: (You should circle/highlight your section)

Section	Time	Room
DMC 100.002	9:20 - 10:30	Julia Rogers 128
DMC 100.003	8:00 - 9:20	Julia Rogers 128
DMC 100.004	2:40 - 3:50	Julia Rogers 121

Please attend the section you are enrolled in. You will be working closely with your class. This will impact your attendance and participation scores.

Who is your instructor?

My name is Phong Le. I am an assistant professor of mathematics. I received my Ph.D. in 2009 and from the University of California, Irvine. Before that I graduated from Goucher College with a degree in Mathematics and minor in Music. My research is in Number Theory and Algebraic Coding theory. I also am familiar with research in Statistics, computer science and math education. I prefer to be addressed as "Professor Phong," or "Dr. Phong." My pronouns are "he, his, him."

Who are you?

My hope is that I can answer this question much much more fully in the coming weeks. For now, it is enough to know that each and every one of you deserve my full attention, you deserve my support and you deserve a place in this classroom.

What will you learn in this course?

As will all courses, you will develop resilience, communication skills and in general grow as a human being. As will any mathematics course, you will also deepen your understanding of the language of mathematics and logic.

Learning Goals

- Collect and storing original data or retrieving existing data sets (most likely online)
- Clean or transforming data
- Analyze data numerically
- Analyze data visually/graphically

- Communicate conclusions from data analysis verbally
- Communicate conclusions from data analysis visually
- Critique data analysis
- Synthesize data analytics processes, including analysis and communication, to create a tangible product for a community partner

This course fulfills the foundational level data analytics general education requirement.

How do you use the book and online resources?

The books is Statistics: Concepts and Controversies 9th edition. This is a `**flipped'** class. In other words, **learning begins** outside of class. Often this will mean **reading** the book first. This may also include videos connected to the book. The book is very readable (as far as math books go). You will be expected to read it between each class period. Take notes, write in the margins (I use post-its). Look things up you do not understand online. Ask me for help.
We will be using a variety of software tools including Google and Microsoft products, JMP, Tableau and other software. You will need to create an account for Tableau Public. I will discuss this more via email and in class.

Graded Work

Reading Quizzes

Before most class periods you will be asked to complete a short quiz online based on the reading. These quizzes are meant to help you practice the basics, so that we may deepen our understanding in class. **Reading quizzes will not be allowed to be completed late. They are meant to be preparation for that day's work.** As with most online assignment systems, you may attempt the assignment as many times as you would like without penalty before the due date. That being said, the lowest 10% of reading quiz scores will be dropped.

Data Learning Projects (DLPs)

Data Learning Projects are projects meant to be **started and finished in one class period.** A few will extend to two. These projects build on and reinforce the reading assignments. For this reason, it is essential that you complete the reading quizzes before class.
Late DLPs due to absence will have a 10% per class period penalty. Penalty for school approved absences will be adjusted accordingly at the discretion of the instructor.
Some DLPs will be done as a group some are meant to be completed individually. In either case collaboration is encouraged but the work you turn in must be your own.

In Class Quizzes

Quizzes will be scheduled as needed. They may be used to prepare for exams or to highlight some particularly challenging issue that arises in class. They will typically be graded by completion. There are no makeups for missed quizzes. If you miss a quiz for a school approved conflict that score will be dropped. The lowest quiz score will also be dropped.

Homework

Every few chapters, we will have a homework assignment due. Often these will be assigned before we have actually covered all of the material. The assumption is that you work through this a little bit each week. This will be administered primarily through **Canvas**. Note that no

homework assignment scores will be dropped. As with other assignments, each class period it is submitted late will suffer a 10% penalty.

Exams

We have two exams and a final. Each of these exams may contain material from the past, however, they will focus on more recent material. The final will be comprehensive. Aspects of DLPs, reading quizzes and homework should all be used to prepare. **For the two exams, there will be no or minimal review**. You can come talk to me in office hours to prepare if you would like.

For exams 1 and 2, students will be assigned to groups to take the exam or a very similar one, again, this time as a group. Thought the individual exam will be weighted more heavily, the second pass will give students an opportunity to demonstrate mastery. This means that the exams will be tough!

Project

We have one large semester project. You will be acting as a data consultant with a local nonprofit.

Reflections

Roughly every week you will be asked to provide some kind of reflection for the course. This will be done primarily through Canvas. This will typically take the form of feedback on the in-class activities, projects and the assignments. Reflections are graded on satisfactory completion.

What should you be doing in class?

To illustrate the course's structure, consider the following typical day. Suppose on Monday there is an in-class project focusing on the sample mean. To prepare for the daily project, **there will be a reading assignment and an online reading quiz due at 7:30am the day of class.** During the first fifteen minutes of class, we will discuss the reading and the reading quiz. The remainder of the class period is devoted to you actively exploring the concepts and techniques of data and statistics. The project will assume that you have done the reading assignment. The in-class projects may involve computer programs such as Excel, JMP, R, Tableau and a variety of web tools. In general, DLPs are meant to be completed in one class period.
Every now and then I will call on a student randomly to answer questions. Be prepared. It is okay to say "I don't know" but know I'll ask you to explain WHY you don't know.
Be respectful, ask questions, get messy. You know this already. It will take a lifetime to do each of these things well. It is best to get started now.

What should you be doing outside of class?

I will send an email after every class. In that email, I will remind you of upcoming due dates. I will also tell you how to prepare for next class. Often it is just reading through the next section, watching a video and completing the reading quiz.
As if often the case, much of learning occurs outside of class as you work through the material at your own pace. Make sure to give yourself time and space for that. Students are expected to do

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2-3 hours of work outside the classroom for each credit hour, so a four-credit class would assume students have on average 8 hours per week of independent work doing research, completing homework, reading relevant material, etc. **This is the expectation for a C grade.** Remember, you need to put time into the course to excel and increase your knowledge base. If you are unable to make the time commitment, I suggest you consider a different course. That being said, if you are spending significantly more than 12 hours a week on average on this course, please come see me and we can discuss ways of improving study habits, using your time more effectively or finding a better fitting course at this time.

Grading

All grading is subjective. Ultimately, the grade you earn in the course will be based on your mastery of the material and your ability to communicate that ability to your peers and your instructor as demonstrated through the assigned work.

Category	**Weight**	**Notes**
Homework	15%	Homework due after several chapters. It should be started and worked on a little bit each week to keep up with the chapters and material.
Reading Quizzes	10%	The lowest 10% ish of reading quiz scores will be dropped.
Data Literacy Projects	15%	The lowest 10% ish of DLP scores will be dropped.
Participation	5%	Attendance, tardiness, answering questions, working in groups and everything you do in class will be part of your participation grade. In-class quizzes will be graded on participation.
Reflections	5%	Reflections will be taken approximately once a week.
Project	15%	Group Project!
Exam 1, Exam 1 Group	10%	9/25/17, 9/27/17
Exam 2, Exam 2 Group	10%	11/13/17, 11/15/17
Final Exam	15%	Date TBA

Your letter grade will to some degree adhere to the following breakdown:

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
97-100	93-96	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	0-59

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Attendance, Tardiness and being Present

Class is for your benefit. I notice when you are absent. I take attendance every day. This includes the number of times you come to class late. **An excessive number of absences or late arrivals will impact your participation grade.** It is difficult to participate if you do not come to class on time and prepared.

Students are permitted to miss class for religious observance. However, students are responsible for contacting faculty in writing at **least two weeks in advance** to make up assignments and activities as applicable. These absences should be considered independently of individual faculty or program attendance policies. Students cannot be penalized for missing classes.

Email Etiquette

I generally do not answer emails after 5:00pm or before 7:00am. Do not be rude. Politeness and restraint mean a great deal to me. PLEASE DO NOT SEND ME EMAILS IN ALL CAPS.

I have to turn in an assignment late! What happens now?

Stuff comes up. We underestimate our workload, or something unexpected happens. Late work is always accepted at my discretion. Please see above for more guidance. In most cases, the penalty for late work is 10% per class period past the original due date.
A larger concern I have with late work is that delaying one assignment has a way of delaying everything else in the process. Staying on top of your work provides a buffer from unexpected delays and surprises.

What happens if you are falling behind or totally lost?

My hope is that most of this material will be challenging but not terrifyingly so. For most of us, there will be some concept or section that for whatever reason is just not making sense. This is what happens when you continually take harder and harder courses. You reach a point where things are not so easy. The reasons may be internal (this math is very different from the math I've seen before) or external (I'm having trouble making time while balancing all of my other responsibilities and interests). Either way, when you feel lost, it is best to take a deep breath, take a break and regroup.
In almost every circumstance, the best thing to do is come seem me. This is also typically the most time efficient thing to do. I love talking to you and helping you learn math. Often all that needs to happen is I watch you work, talk with you and fix some small misconception, we practice it for a bit, then I send you on your way.
Office hours are great. Use them! I love talking with all of you about everything.

The Academic center of Excellence (ACE) also has resources related to organization and study skills. (url: http://www.goucher.edu/academics/academic-support/ace-academic-center-for-excellence).

Drop-in tutoring is available to you to support your math-based skills in this class through the Quantitative Reasoning (QR) Center! The schedule is available on the QR Center website and

occurs on the 3rd floor of the library. Please bring all of your materials so the tutors may best help you at the session. For questions, please contact the QR Center Director, Dr. Justine Chasmar Stauffer at Justine.chasmar@goucher.edu.

Prof. Phong Needs your help too!

Sometimes I make mistakes. **Actually, I make mistakes all the time.** Typos, poorly worded questions and all kind of things that make learning difficult. **I need your help to be my best.** I'm guessing you'll need my help to be your best too. If you see an error or you suspect something is off, please let me know right away. Catching errors will contribute to your participation grade. If it is bad enough, and you are the first to catch it, I may even offer extra credit.

Honor Code

Goucher College's Academic Honor Code is located here http://www.goucher.edu/documents/General/AcademicHonorCode.pdf and
General academic information, including Undergraduate Course Regulations, Academic Integrity, Class Attendance, Midterm Grades, Final Exams, and Posting of Grades can be found here http://catalog.goucher.edu/content.php?catoid=2&navoid=588

> *"At Goucher College, we honor freedom of expression, inquiry, and action. In return, we expect consideration of others, academic integrity, and a commitment to the value of truth. The tradition of freedom with responsibility at Goucher is fundamental to the ideals to which the life and work of the college are dedicated. The courage to challenge, the praise for honesty and effort, and the appreciation for commitment or involvement make our community open to truth and knowledge rather than to ignorance and misunderstanding. These same principles are relevant when we interact with the nonacademic world. It is important for each of us to be thoroughly familiar with the principles and procedures of the Academic Honor Code, which obliges each member of the Goucher community."*

Note that work from other past or current courses may not be used to meet the requirements for this course. Also note that giving access to an academic website that requires your password (for example GoucherLearn) violates the code of student conduct computer use policy.

Statement of Compliance with Title IX

Goucher College seeks to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of discrimination/ sexual harassment/misconduct/assault, we encourage you to report this. If you report this to a faculty member, she or he must notify our Title IX coordinator about the basic facts of the incident including your name. For more information about your options at Goucher, and confidential resources, please visit: http://www.goucher.edu/title-ix/ Victims of sexual assault also may contact a campus consultant to discuss their situation confidentially and/or receive assistance in the reporting and complaint process. Some of the confidential consultants include:
Shira Concool, LGPC, counselor 410-337-6054
Doug Girard, Psy.D., psychologist 410-337-6052

Josh Snyder, Hillel rabbi 410-337-6545
Cynthia Terry, college chaplain 410-337-6048
Non-Goucher sources of support are also available, including TurnAround, Inc., a nearby rape crisis center in Towson (410-377-8111 during regular business hours; 443-279-0379, 24-hour helpline).

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	Date	Day	Text
	8/25	F	Introductions, Syllabus Recon, Project intro, Chapter 1 Where Do Data Come From?
Week 1	8/28 - 9/1		2 Samples, Good and Bad
			3 What do Samples Tell Us
Week 2	9/4-9/8	M	Labor Day - No Class
		M	4 Sample Surveys in the Real World
		W	Project Partner Presentation
		F	Learn about Google Survey and Google Sheets
Week 3	9/11-9/15		5 Experiments Good and Bad
		W	Homework 1 due
		F	Project Proposals Due
Week 4	9/18-9/22		6 Experiments in the Real World
			7 Data Ethics
		F	Homework Discussion, HW 2 Assigned
Week 5	9/25	M	Exam 1
		W	Group Redo, Groups Assigned
		F	Buffer Day
Week 6	10/2-10/6		8 Measuring
		F	Benchmark Discussion, Project Workday
Week 7	10/9-10/13	M	9 Do the Numbers Make Sense?
	10/11-11/13		Fall Break - No Classes
Week 8	10/16-10/20		Complete 9
			Visualizations, JMP or Tableau or Excel?
			10 Graphs Good and Bad
Week 9	10/23-10/27		11 Displaying Distributions with Graphs
Week 10	10/30-11/3		12 Describing Distributions with Numbers
		F	**Project Due**
Week 11	11/6-11/10	M	13 Normal Distributions
		W	Homework 2 Due
		F	Homework 2 Returned, Homework 3 assigned
Week 12	11/13-11/17	M	Exam 2
		W	Group Redo
		F	14 Describing Relationships: Scatterplots and Correlations
Week 13	11/20-11/24	M	Mapmaking in Google
	11/22/17	W	Thanksgiving Break
	11/24/17	F	Thanksgiving Break
Week 14	11/27-12/1	M	14 Continued, 15 Describing Relationships, Regression, Prediction and Causation
		F	**Project Presentations**
Week 15	12/4-12/8		More regression and correlation
		F	Last Day of Class, HW 3 Due
	12/12 - 12/15		**Final Exam (See Below)**
101.002	**12/15**	**JR128**	**9-11am**
101.003	**12/14**	**JR 128**	**12-2pm**
101.004	**12/12**	**JR 128**	**12-2pm**