CI 411(950) Syllabus: Research after College

Instructor's Name: Christina Heady **Office**: 260 F **Instructor's email**: cheady@siu.edu **Instructor's phone:** 618-453-2779 **Office Hours:** Tuesday: 10:00-12:00 at the MLIB Information Desk and via Ask-a-Librarian chat. 12:00-1:00 in my office. Thursday: 10:00-1:00 in my office.	**Instructor's Name:** Joshua Vossler **Office**: 161 B **Instructor's email**: jvossler@lib.siu.edu **Instructor's phone:** 618-453-7539 **Office Hours:** Monday, 1:00-4:00 Tuesday, 11:00-2:00

REQUIRED TEXTBOOK(S):

n/a

GRADING SCALE:

1000-900=A, 899-800=B, 799-700=C, 699-600=D, 599-0=F

COURSE DELIVERABLES:

60% 6 Weekly Quizzes → 100 points each

15% 6 Weekly Assignments → 25 points each

25% Final Reflective Paper → 250 points

COURSE DESCRIPTION:

CI 411 is a **one credit course** that will acquaint students with theoretical concepts and professional resources relating to post-university research. This class will utilize professional and free resources that students will have access to after they graduate. Students will leave this class prepared to conduct research for professional or personal advancement as well as lifelong learning. Critical analysis of materials and resources will be **strongly emphasized** in the course.

ASSIGNMENTS:

Quizzes

These are worth a lot of points. Questions will require you to understand the readings. We recommend you take your time and carefully read before taking the quizzes. That said, there is no time limit. Take your time but turn it in before the due date (see course structure below).

Writing Assignments & Final Reflective Paper

Because this is an online class, your writing serves as the only ambassador for your ideas. This means attention to punctuation, capitalization, and style all matter. Think about this like applying for a job. You can write something exemplary but if you misspell a word, it can knock you out of the running. Details matter, especially when you're being evaluated on your writing. If you are concerned about the ability of your writing, you are welcome to send earlier drafts of your assignment to me beforehand.

A	B	C	D	F
Exemplary Work. Took the assignment to heights I did not anticipate. Grammar and mechanics are flawless.	Very good work. Went beyond the minimum requirements of the assignment. Grammar and mechanics are flawless.	College-level work. Met all the requirements for the assignment. Grammar and mechanics are acceptable and do not impede understanding.	Not college-level work. Did not meet all requirements for the assignment. Grammar and mechanics sometimes impede understanding.	Unacceptable work.

COURSE OBJECTIVES:

1. Students will develop an appreciation for the challenges cognitive biases pose to effective research.
2. Students will learn to apply research-oriented thinking in their personal and professional lives.
3. Students will develop an appreciation for the challenges of research in the context of lifelong learning.

COURSE STRUCTURE:

All course materials are organized into modules, organized by week. Use the course calendar and SIUOnline to keep track of due dates. Once an assignment is closed, it is closed. Finito.

You are expected to watch and read weekly materials in their entirety. There will be a weekly quiz AND writing assignment. Your response must be posted to the SIUOnline dropbox by 11:59 pm each Sunday. As an online course, most of the materials are self-paced, but budget your time wisely. I highly recommend that you DO NOT wait until Sunday to begin your assignments.

WEEKLY SCHEDULE

WEEK 1 (3/20): WE ARE ALL CONFIDENT IDIOTS.

DUE Sunday, March 26, by 11:59PM:
Quiz 1 & Assignment 1

Ignorance comes in multiple flavors. There's harmless ignorance, which is sometimes constructive. For example, many books could be (and are) filled with what I don't know about data science. I know that I am deeply, profoundly ignorant when it comes to data science, so when I encounter problems that seem to involve it, I seek expert assistance. I don't for a moment think I can handle it on my own, because I am a data science ignoramus. That kind of ignorance is almost like a safety net--because I know I'm ignorant, I will never undertake any project dealing with data science without a data scientist to help me. In the case of data science, I know what I don't know. That is, I know I know nothing about data science.

Then there's the other flavor of ignorance, the dangerous kind. This is the kind of ignorance that you're not aware of. Or even worse: the kind of ignorance in which you know just enough to believe you are actually quite knowledgeable, when really you're quite ignorant. It's ignorance paired with false confidence. A terrible combination. And because of the way our brains work, we are all vulnerable to this nasty flavor of ignorance. It's almost like a genetic disease: it doesn't affect you because you're lazy or bad, if affects you because you exist. There are things we can all do to minimize the damage this kind of ignorance inflicts, but we can't make ourselves immune from it. All we can do is try to fight the good fight. Let give you an example. I have a very smart friend. He has a Ph.D. He's got a fine, sharp mind. And toenails that don't always work quite right. He got an ingrown toenail a while back. He complained to me about how it hurt. I asked when he was planning to see a doctor. He said he wasn't going to, because the doctor was just going to tell him to stay off of it, and he wasn't willing to do that. He would take painkillers and suffer for the next few months, until summer came. Then he would stay off his foot for a week or two and heal up. I challenged him about this plan. It sounded kinda foolish. He insisted that he'd encountered this same problem ten or so years back, and that's what the doctor told him to do then, so that's what the doctor would tell him now. Furthermore, he'd had some training in a hospital, and had taken a first aid class as well. He told me he knew what he was talking about. A month later, the toe was infected; it hurt so much he couldn't sleep. He finally went to the doctor, who performed some minor surgery to fix the toenail and prescribed him antibiotics to quell the infection. My buddy was flabbergasted. Not only had the doctor fixed his problem--which he thought couldn't be done--the doctor informed him that without surgical intervention, that particular type of ingrown toenail only gets worse. No amount of rest in the world would have helped it.

Now, my friend's decisions were pretty obviously terrible, but I share that anecdote to illustrate how this kind of ignorance works. The person suffering from it DOES NOT know it is happening to them. Their friends might not notice, either. I only did because I'm excessively cautious when it comes to injuries. Their friends might never find out. In extreme cases, such as my buddy's toe, the person finds out the hard way. In this course, we will examine the many ways our minds work against us, in the hopes of better understanding our intrinsic strengths and weaknesses. Only by knowing where we are weak can we hope to become stronger.

Required Readings

1. We are all confident idiots. http://www.psmag.com/health-and-behavior/confident-idiots-92793
2. Fisher, M., Goddu, M. K., & Keil, F. C. (2015). Searching for explanations: How the Internet inflates estimates of internal knowledge. Journal of Experimental Psychology: General, 144(3), 674-687. doi:10.1037/xge0000070
   https://login.proxy.lib.siu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2015-13957-001&site=eds-live&scope=site

WEEK 2 (3/27): COGNITIVE BIASES

DUE Sunday, April 2, by 11:59PM:
Quiz 2 & Assignment 2

While the importance and challenge of evaluating information sources for credibility (e.g. identifying fake news) is ascendant in the media and popular consciousness, telling good information sources from bad is perhaps the least of our problems. Sure, there are those who will lie to you for their own ends, but the most pernicious lies are the ones we tell ourselves. Our brains are remarkable prediction engines, but they are far from perfect. Like our muscles, our brains strive for efficiency. We take mental shortcuts. Someone walks up to you and says his name is John and punches you in the nose. Ouch. A week later, someone else says his name is John and punches you in the nose AGAIN. Three weeks later, someone says his name is John and you flinch, because your brain has determined that people named John are dangerous. Reading this, you might say that's silly, but it's how we think. Scientists suggest that we take these mental shortcuts because they work *well enough* and save time. It's efficient, which is not to say it's perfect. The point of this unit is not to rain criticism down on our imperfect brains, or to demand that we all cease to use mental shortcuts. Our brains are what they are, and crying about it won't help anything. But we can seek to understand how our brains work, especially how they are weak. We can use that knowledge to make better decisions and, hopefully, to feel empathy for those who fall victim to the nastier aspects of our cognitive biases.

Required Readings

1. Brief introduction to cognitive biases: 3 lessons IBM's Watson can teach us about our brains' biases. http://www.engadget.com/2015/08/29/3-lessons-ibms-watson-can-teach-us-about-our-brains-biases/?utm_medium=feed&utm_source=Feed_Classic&utm_campaign=Engadget&ncid=rss_semi
2. The 12 cognitive biases that prevent you from being rational. http://io9.gizmodo.com/5974468/the-most-common-cognitive-biases-that-prevent-you-from-being-rational
3. List of cognitive biases: https://en.wikipedia.org/wiki/List_of_cognitive_biases

WEEK 3 (4/3): (MIS)INFORMATION OVERLOAD, PERFORMANCE, AND WELLBEING

DUE Sunday, April 9, by 11:59PM:
Quiz 3 & Assignment 3

This week is about dealing with information in our day to day lives and understanding how each of us reacts to a world filled with more information than we could read if we spent a lifetime doing nothing but. Not surprisingly, it's complicated. When it comes to information--and misinformation--we cannot trust our own sense of confidence. As we learned in week one, knowing just a little information can make us feel like we know much more than we actually do. In the last decade or two, the concept of information overload has been of concern to information scientists, librarians, and others who are concerned with the public's ability to locate and use information to live informed, productive lives. Yet, when asked, only the elderly seem to feel the effects of this phenomenon. It's interesting to see that the people who are most inundated with information--younger, wealthier folk in possession of multiple Internet-connected devices--feel the most confident about their ability to deal with large quantities of information. Why do you think that might be? Moving on, we examine the idea of maximizers and satisficers: two proposed personality types that are characterized by how they each interact with information. How might each personality type react to information overload? Complicating the matter are fake news and misinformation. It's hard enough managing to make informed decisions when we have access to accurate information, but accurate information is mixed in with inaccurate information, and it isn't always easy to tell the difference (even if you think it is). How might misinformation interact with maximizers and satisficers? How does it interact with the dangers of information overload?

Required Readings

1. Information Overload - Pew RC. http://www.pewinternet.org/2016/12/07/information-overload/
2. The real history of fake news. Columbia Journalism Review. http://www.cjr.org/special_report/fake_news_history.php
3. The misinformation effect: Planting misinformation in the human mind: A 30-year investigation of the malleability of memory. http://learnmem.cshlp.org.proxy.lib.siu.edu/content/12/4/361
4. "Maximizing versus satisficing" http://www.psych-it.com.au/Psychlopedia/article.asp?id=184

WEEK 4 (4/10): ASKING EFFECTIVE QUESTIONS

DUE Sunday, April 16, by 11:59PM:
Quiz 4 & Assignment 4

The finest hunter in the world will fail to locate a penguin at the North Pole. Because they don't live there. In the same way, the best researcher in the world won't be able to find good information if they are asking the wrong question. All research, all inquiry, begins with a question, and the eventual success of that research--whether it's personal or academic--depends almost entirely on the quality of that question. "What's the best flashlight" seems like an acceptable question one might ask if one were interested in purchasing a very good flashlight. One might imagine that such a question would perhaps yield a list of flashlights that could be sorted by cost or quality, and that would be that. One would be wrong and time would be wasted. Flashlights come in a ridiculously wide array of costs, shapes, and sizes. That first question fails to account for the reality of the flashlight market. It needs to be revised. A better question would be: "What are the best flashlights for carrying with me every day in my pocket that run on a single, non-rechargeable lithium battery and cost between $100 and $300?" That question would yield a list of six or eight popular small flashlights. A good question doesn't come out of nowhere. It must start with at least a little knowledge of the subject you plan to ask a question about. If you haven't been following the flashlight market, you might not know about the proliferation that has occurred as a result of improved LED technology. It is a truism in research that *we don't know what we don't know*. That is, when we are ignorant of something, we have tremendous difficulty determining just how ignorant we are, and in what ways. To surmount that problem, we need to begin any research project with curiosity, and ask not just the question we think we want the answer to--like that first flashlight question--but the question that will point us in the right direction. Like "What do I need to know about flashlights in order to choose a good one for me?" or perhaps the more basic "what is the problem I'm trying to solve?" Someone looking for a flashlight might want to vacuum up some darkness so they can see at night. But what if the problem is that they want to see what's making noise in their backyard at night without being seen themselves? In that case, a nightvision monocular would be a better solution, and would result in the question "what nightvision monoculars cost less than $1000 and can spot large animals or people at 200 feet or closer?" Knowing how to ask good questions isn't just useful for consumer research. It's also a rare and valuable skill in the workplace. No matter what you do for a living, asking good questions can help you learn valuable information, can help your colleagues solve problems, and can make you seem like a smart, useful person.

Required Readings

1. Wood, P. (2012). How to ask a good question. *The chronicle of higher education*. http://chronicle.com/blogs/innovations/how-to-ask-a-question/32095
2. Snyder, S. How to Ask a Smart Question. http://faculty.gvc.edu/ssnyder/121/Goodquestions.html

WEEK 5 (4/17): CONTINUING EDUCATION

DUE Sunday, April 23, by 11:59PM:
Quiz 5 & Assignment 5

The purpose of a college education--if you ask pretty much any university--is to make you into a better human being. One capable of critical thinking, abstract reasoning, creativity, and curiosity for the fascinating world we inhabit. Notably absent from that list of goals is "train you for a job". This makes a lot of people understandably crabby: why pay all of that money and spend four or more years at university if there's no pot of gold at the end of that rainbow? Their frustration has led to calls for higher education reform, curtailing of the humanities, and a variety of other ideas meant to promote job readiness in college graduates. And that is a noble goal, but as you'll see in this week's readings, it's misguided. The future is shrouded in mystery. If every university instantly converted all of their efforts to occupational training programs, employment readiness of college graduates might actually DECREASE. This is because the economy is constantly changing. Say it takes three years to develop a training program to prepare aspiring Web designers for the job market. Now say it takes two years for the first group of students to complete the program. By that time, the job the university is training them for might have changed. After all, that's a five year lag between the creation of the program and the first cohort of graduates. What if a major change affected the field of Web design during that time? Say, a move from one programming language to another, or a radical shift of visual design style? Or both, along with five other big changes? Sure, the new graduates might be able to acquire the new skills--probably on their own time and at additional cost--but doesn't that defeat the whole idea of an occupational training program? Absolutely. And even if the scenario I just described never comes to pass, similar ones will. Say the training program is perfectly up to date, and graduates instantly get jobs. What happens in a few years, when a big change happens? Same deal: they're stuck having to retrain. There's an important distinction hiding behind this debate, and it's the difference between education and training. Training prepares someone--usually as quickly as possible--to perform a specific job or complete a specific task. Training might impart some theoretical knowledge, if such knowledge is critical for performing that job or completing that task, but usually not much. There's nothing inherently wrong with training. It's just not education. Education develops critical thinking, abstract reasoning, creativity, and curiosity. It also hopefully leaves you knowing a moderate amount about a whole wide variety of things that have no particular function. You might leave a university with an education and zero concrete job skills, and that's not actually a problem because you might have to be trained and retrained for six or more jobs in your lifetime. What your education does is prepare you to handle those changes when they arrive; possibly foresee them before they blindside you; and perform your job at a higher level than many of your colleagues. Take Steve Jobs. He took a college class on typography, because he thought fonts were interesting. It was part of a typical college education. At that time, typography had nothing to do with computers. Jobs was inspired by this class, and years later he was responsible for the Macintosh computer having a wide array of typefaces for desktop publishing. Nobody had thought of doing that before. Jobs was successful at least in part because he made connections between things that seemed unrelated, but actually went together like chocolate and peanut butter. Education builds a robust mental foundation that you can apply to anything in your life, and prepares you to continue to add to it throughout your lifetime.

Required Readings

1. Keeping your professional development continuous. https://www.theguardian.com/careers/careers-blog/keeping-professional-development-continuous
2. Lifelong learning is becoming an economic imperative. http://www.economist.com/news/special-report/21714169-technological-change-demands-stronger-and-more-continuous-connections-between-education
3. Why Build Personal Learning Networks. https://elearningindustry.com/build-personal-learning-networks
4. What is open access? https://opensource.com/resources/what-open-access

WEEK 6 (4/24): USING RESEARCH TO CHANGE PEOPLE'S MINDS

DUE Sunday, April 30, by 11:59PM:
Quiz 6 & Assignment 6: Outline for final paper

Thinking clearly and having access to excellent information only gets you so far if you can't get other people to believe you, and shouting matches only make you hoarse. As we were reminded back in the first weeks of class, human beings aren't rational. We are instinctive, efficient thinkers. And one of the things we hate the most is change, especially change that makes us feel like we were wrong. We hate that feeling so much, many of us will persist in doing something the wrong way even when we have been shown a better way. Heck, we'll keep doing something wrong even when we have been shown that the wrong way will inconvenience or even kill us. We hate change that much. But clearly there are ways to sway people's opinions, because progress has occurred. We walked on the moon, we invented antibiotics. Just because implementing new ideas is possible, doesn't mean it's easy. The first reading of this week chronicles the sad story of origin of hand washing in hospitals, illustrating the dangers of trying to change people's minds in the face of new information. The second reading offers real, practical methods for winning people over with facts.

Required Readings

1. The Dirty History of Doctors' Hands: The challenge of using research to change people's minds
   http://www.methodquarterly.com/2014/11/handwashing/
2. The Debunking Handbook: How to refute bullshit & change people's minds
   https://www.skepticalscience.com/docs/Debunking_Handbook.pdf

(5/1) WEEK 7: WORKSHOP FINAL REFLECTION PAPER

FINAL REFLECTION PAPER DUE: Sunday, May 7 by 11:59PM