IDS 2935: Information Literacy: Medical and Ag Technology
Quest 2

I. General Information

Class Meetings

- Fall, 2023
- Tuesdays, Period 6, Thursday Period 6, 7
- Fifield Hall

Instructor

- Kevin Folta
- 2239 Fifield Hall
- Office hours: Thursdays 9:30-10:30; Tuesdays 10:30-11:30 and by appointment
- kfolta@ufl.edu

Course Description

New technologies in crops and medicine are emerging constantly. However, a powerful movement stands to arrest the application of new technologies before they can address the problems they were created to solve. Other interests profit from manufacturing risk around a scientific consensus supported by siloed factions within traditional and social media that fortify perceptions. This Quest 2 course considers cases of new technology and its implementation, and the movements that were created in response. Students will examine the psychology of information flow, our cognitive mistakes, logical fallacy, elements of argument and how the problems in communicating the science are hampered by the tribal echo chambers of social media. We will then apply these concepts in exploring case studies, from resistance to refrigeration to modern application of molecular medicine to COVID19, to changes in human genetics. The course will outline the scientific method, scholarly publication, and one-off publications that impacted food security and public health. Students will engage debate around several topics and learn communication strategies used in effective (and non-effective) argument. The main question asked is, "Just because we could, does it mean that we should?" as new technologies will be covered in detail, along with their risks and benefits—as well as how to communicate them. The course will allow students to connect with some of the authors of the relevant readings through visits via Zoom.

Quest and General Education Credit

- Quest 2
- Biological Sciences
- Writing Requirement (WR) 2000 words

This course accomplishes the [Quest](#) and [General Education](#) objectives of the subject areas listed above. A minimum grade of C is required for Quest and General Education credit. Courses intended to satisfy Quest and General Education requirements cannot be taken S-U.

Required Readings and Works

All readings and works are available in Canvas.
Required manual: Strunk and White, The Elements of Style
Materials and Supplies Fees: n/a

II. Graded Work

Description of Graded Work

(1000 points total)

10 Quizzes (50 points each) Assigned on Friday and due on Monday at NOON.

Written Assignment: Defend your personal position on the ethics of germline gene editing. Critique current standards and assess the balance against emotionally-based, evidence based, or ethics-based decisions (500 words, 50 points).

Written Assignment: Essay on resistance to a new technology (500-800 words) (100 points)

Written Assignment: (Counts toward Writing Requirement, 1000 words). (100 points)

Written Assignment: (Counts toward Writing Requirement, 1000 words) Did I change my mind and why? The writing assignment will be the conclusion of the course that will compare attitudes coming into the course against the feelings upon exit. What opinions on new technology changed? What created the change? How did the communications strategies described work to inform your change, if at all? (100 points)

Participation: Attendance, participation in group projects, and being prepared for class to discuss relevant readings and in-class materials. (100 points)

Grading Scale

For information on how UF assigns grade points, visit: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

A	94 – 100%		C	74 – 76%
A-	90 – 93%		C-	70 – 73%
B+	87 – 89%		D+	67 – 69%
B	84 – 86%		D	64 – 66%
B-	80 – 83%		D-	60 – 63%
C+	77 – 79%		E	<60

Grading Rubric(s)

Writing Assessment Rubric and Statements

	SATISFACTORY (Y)	UNSATISFACTORY (N)
CONTENT	Papers exhibit at least some evidence of ideas that respond to the topic with complexity, critically evaluating and synthesizing sources, and provide at least an adequate discussion with basic understanding of sources.	Papers either include a central idea(s) that is unclear or off-topic or provide only minimal or inadequate discussion of ideas. Papers may also lack sufficient or appropriate sources.
ORGANIZATION AND COHERENCE	Documents and paragraphs exhibit at least some identifiable structure for topics, including a clear thesis statement but may require readers to work to follow progression of ideas.	Documents and paragraphs lack clearly identifiable organization, may lack any coherent sense of logic in associating and organizing ideas, and may also lack transitions and coherence to guide the reader.
ARGUMENT AND SUPPORT	Documents use persuasive and confident presentation of ideas, strongly supported with evidence. At the weak end of the Satisfactory range, documents may provide only generalized discussion of ideas or may provide adequate discussion but rely on weak support for arguments.	Documents make only weak generalizations, providing little or no support, as in summaries or narratives that fail to provide critical analysis.
STYLE	Documents use a writing style with word choice appropriate to the context, genre, and discipline. Sentences should display complexity and logical sentence structure. At a minimum, documents will display a less precise use of vocabulary and an uneven use of sentence structure or a writing style that occasionally veers away from word choice or tone appropriate to the context, genre, and discipline.	Documents rely on word usage that is inappropriate for the context, genre, or discipline. Sentences may be overly long or short with awkward construction. Documents may also use words incorrectly.
MECHANICS	Papers will feature correct or error-free presentation of ideas. At the weak end of the Satisfactory range, papers may contain some spelling, punctuation, or grammatical errors that remain unobtrusive so they do not muddy the paper's argument or points.	Papers contain so many mechanical or grammatical errors that they impede the reader's understanding or severely undermine the writer's credibility.

- The Writing Requirement (WR) ensures students both maintain their fluency in writing and use writing as a tool to facilitate learning.
- The instructor will evaluate and provide feedback before the end of the course on all of the student's written assignments with respect to grammar, punctuation, clarity, coherence, and organization.
- WR course grades have two components. To receive writing requirement credit, a student must receive a grade of C or higher and a satisfactory completion of the writing component of the course.
- **Word counts are only suggestions** to help you define the scope and depth to approach a topic. The number of words in an essay will never be checked. However, a topic must be discussed at the appropriate depth and scope.

Participation Rubric

	High Quality	Average	Needs Improvement
Present	Complete attendance, engaged in discussion.	Missed classes, limited interaction with class	Multiple missed classes, not participating.
Informed: Shows evidence of having done the assigned work.	Can discuss details of assignments when called upon	Some knowledge of readings/work assigned	Does not come prepared for discussions
Thoughtful: Shows evidence of having understood and considered issues raised.	Enjoys debate with sensitivity to other positions, intellectually honest	Engages in conversations in class and is clear on issues	Fails to engage discussion

III. Annotated Weekly Schedule

Week	Topics, Homework, and Assignments
Week 1 8/24	**Topic:** Why are we here? Engaging – Your Role in Public Discourse and Advocacy **Summary:** What are the modern conduits to project your values and causes? What are some tactics to engaging dissent? Is there value in building audience and personal brand? **Required Readings/Works**: Does Debunking Work?, Timothy Caulfield, pg 183-200 - Deepfakes and Scientific Knowledge Dissemination **Assignment:** Entry Survey
Week 2 Tu 8/29 Th 8/31	**Topic:** The Mistakes We Make **Summary:** What do we do wrong when we encounter information on food, farming and medical technologies? What are the common strategies that are used to fool

Week	Topics, Homework, and Assignments
	us? What are common claims and practices and the evidence for their safety and efficacy? What are our predispositions to being fooled? Bias, motivated reasoning and self assessment are discussed. Decisions based on identity, echo chambers and silos. • **Required Readings/Works**: Understand the main message in Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. J Kruger, D Dunning. *Journal of personality and social psychology* 77 (6), 1121; Confirmation bias, motivated cognition and the backfire effect pp57-80 *in Cognitive Errors and Diagnostic Mistakes*
Week 3 Tu 9/5 Th 9/7	• **Topic:** Our Mistakes, What is Real Evidence? • **Summary:** Sociologists tell us that our biases lead us to believe some sources of information over others. Why do we trust information from specific sources, and how do we know it is valid? What is trust? Why do we not trust experts? • **Required Readings/Works**: A Life Preserver in a Sea of Misinformation; How we Killed Expertise, Tom Nichols (website, 1 page); **Special Guest:** Dr.Melanie Trecek-King
Week 4 9/12 9/14	• **Topic:** Modern Media, Fake News, Predatory Publishing and Radicalization • **Summary:** How do traditional media like television and news shape public perceptions, driving non-scientific movements? How does social media reinforce those perceptions? How has the scientific literature been co-opted by less rigorous interests, eroding trust in the scientific enterprise? How can we insulate ourselves from mistakes by challenging those perceptions? • **Required Readings/Works**: How to Fact-Check the Internet; How to Spot Fake News (1 page website), Don't be Fooled, Fact Check! (1 page, website); • **Special Guest:** John Guy, author "Think Straight"
Week 5 9/19 9/21	• **Topic:** Bad Science, Misleading Statistics, and the Historical Opposition to New Technology • **Summary:** What is the scientific method and what constitutes good evidence? How do traditional media like television and news shape public perceptions? How does social media reinforce those perceptions? How can we insulate ourselves from mistakes by challenging those perceptions? What are some historical examples of pushback against sound technology? • **Required Readings/Works**: chapter 1 on disruptive technology and social change, *Innovation and its Enemies* by Calestus Juma, pp 10-44; Video: Misleading Statistics • **Assignment:** Essay on surprising opposition to a specific new technology.
Week 6 9/26 9/28	• **Topic:** Critical Thinking in Medicine • **Summary:** Case studies are presented where physicians made errors based on logical fallacy and bias. • **Required Readings/Works**: Hasty decisions, survival bias, special pleadings and burden of proof. Chapter 14 "Cognitive Errors and Diagnostic Mistakes" by Dr. Jonathan Howard. Pp 211-234.

Week	Topics, Homework, and Assignments
	• **Special Guest:** Dr. Johnathan Howard
Week 7 10/3 10/5	• **Topic:** Alternative Medicine, Broken Promises, and the Allure of Natural Panaceas • **Summary:** A multi-billion dollar industry pushes unregulated and untested products that claim to prevent, treat or solve serious health problems. What are the common claims and what do the data actually say? How are experimental data misrepresented to suggest efficacy? Should the regulatory climate be different? • **Required Readings/Works**: *Three ways that pseudoscientific therapies can be harmful*, (website, 1 page) • **Assignment:** In Class QUIZ: Name the Logical Fallacy- In class, presented by Jay Novella, Skeptics Guide to the Universe
Week 8 10/10 10/12	• **Topic:** Retrospective Analysis of the COVID19 Pandemic • **Summary:** What can we learn from the COVID19 pandemic? When looking back at the watershed events that occurred, how could messaging been more effective, what strategies may have changed the course of the disease and associated public health issues? How effective were different country responses? Topics from early response, to vaccine development, to proposed therapeutics will be discussed. • **Required Readings/Works**: CompCore Project; Trust and the Coronavirus Pandemic Devine et al, 2020
Week 9 10/17 10/19	• **Topic:** Critical Analysis of "The Dirty Dozen"; Chemophobia • **Summary:** An annual report catastrophizes the residual chemistry detected on produce. What do the data really say, and what are the impacts on the food insecure? What are farmers using for crop protection strategies, what are the legitimate risks, and how can new methods be used going forward? • **Required Readings/Works**: *EWG's 2021 Shopper's Guide to Pesticides in Produce (website)*; The Truth About Pesticide Residues on Produce (1 page website), Dr. Steve Savage
Week 10 10/24 10/26	• **Topic:** Crop Genetic Engineering • **Summary:** It has been well demonstrated that genetic engineering can have positive effects for farmers and consumers, with specific environmental risks. What are the current technologies, are they safe, and should we use them? How do disinformation campaigns shape public perception? • **Required Readings/Works**: Genetic Engineering at the Heart of Agroecology, Lotz et al 2020; The Ethical Concerns of Transgenic Crops, Richroch et al., 2018
Week 11 10/31 11/2	• **Topic:** Gene Editing Crops for Health and Environment • **Summary:** Can new technologies be used to make crops that are actually more healthy, or even that could fight human disease? Some think so. What are the potential risks and benefits? How should they be regulated? • **Required Readings/Works**: https://blogh1.com/2021/10/25/anti-cancer-bread-and-super-tomatoes-the-gm-diet-that-could-transform-our-health/ • **Assignment:** Quiz 2. Potential risks and benefits of biotech crops. (50 points)
Week 12	• **Topic:** Animal Domestication and Genetic Improvement

Week	Topics, Homework, and Assignments
11/7 11/9	• **Summary:** Humans have domesticated wild animals and have radically altered their productivity for milk, meat, eggs, work, or companionship. New technologies have accelerated this process. Other techniques seek to limit disease-vectoring pests using genetic strategies. What are the risks and benefits, and should these approaches be used? • **Required Readings/Works**: Opportunity Cost of Regulatory Delay, Van Eenennaam et al, 2021; Lessons for the future of gene drive mosquito control, Schairer et al., 2021 • **Quiz 3:** Potential risks and benefits of animal cloning and engineering. (50 points)
Week 13 11/14 11/16	• **Topic:** Cancer and cancer disinformation • **Summary:** One in three people will experience cancer in their lifetimes. What is cancer, how is it treated, and how do we navigate the online misinformation? • **Required Readings/Works**: • **Special Guest**: Dr. Skyler Johnson, Radiation Oncologist, University of Utah
Week 14 11/21 11/23 (Txgiving)	• **Topic:** Germ Line Gene Editing • **Summary:** New technologies can reverse insidious human diseases, like Sickle Cell Disease. What are these technologies, and should we use them to alter DNA and make decisions for future generations? • **Required Readings/Works**: Schledgen et al., 2020, *BMC Medical Ethics* • **Assignment:** Personal position paper on Germ Line Gene Editing
Week 15 11/28 11/30	• **Topic:** Science Communication 1 – Ditching the Deficit Model • **Summary:** In publicly contentious topics, positions are taken that are dependent on social forces, and facts alone don't inspire change. What is the deficit model, why does it fail, and how can we improve our ability to educate others in issues where scientific consensus and public controversy? • **Required Readings/Works**: The Complexities of Communicating Science. NAS Report on Science Communication Chapter 2, pp23-50
Week 16 12/5 12/7	• **Topic:** Science Communication 2 – Building Empathy and Trust • **Summary:** What tactics can we learn from hostage negotiation that apply to scientific discussions? How can we change public discourse by focusing on values rather than direct evidence? • **Required Readings/Works**: video: "Start with Why" https://youtu.be/2Ss78LfY3nE Chapters 2 and 3 on tactical listening in *Never Split the Difference* Chris Voss (31 pp) • **Assignment:** Reflection paper on how the course changed or did not change their perceptions of biotechnology, public engagement strategies, and science communication. • **Assignment in Class-** Active Listening Drills • **Special Guest:** TBD.

IV. Student Learning Outcomes (SLOs)

At the end of this course, students will be expected to have achieved the Quest and General Education learning outcomes as follows:

- **Content***: Students demonstrate competence in the terminology, concepts, theories and methodologies used within the discipline(s)*. (Quest 2, Biological Sciences). The content will cover areas of biological science currently under ethical debate or issues of public concern in food, farming and medicine. Content will be presented that will be analyzed by students to identify the flaws and/or misrepresentation. The effects of scientific misrepresentation will be discussed. Weeks 6-14 will include extensive discussion of processes of biotechnology relevant to modern medicine and agriculture.

- **Critical Thinking**: *Students carefully and logically analyze information from multiple perspectives and develop reasoned solutions to problems within the discipline(s).* Students will be exposed to cognitive errors and breakdowns in logic, along with how data and statistics are willingly misrepresented or manipulated to shape perception*.* Guidelines for identifying credible information will be presented, as well as the influence of news media, social media and predatory publishing. This section satisfies the requirement for Critical Thinking in Quest courses and will apply to weeks 2-5 and associated assignments.

- **Communication**: *Students communicate knowledge, ideas and reasoning clearly and effectively in written and oral forms appropriate to the discipline(s).* Students will learn elements of persuasive rhetoric, public engagement, and scientific advocacy. The 'deficit model' will be discussed. There will be training of engagement in different media formats, along with associated caveats. Students will learn the elements of trust building, empathy and listening skills that are required for effective science communication. Students will be graded on in-class drills and written assignments, which include analysis of published scientific literature. This section will satisfy the Communication section of the Quest course and content will be presented in weeks 1, 15 and 16, and relevant assignments.

- **Connection**: *Students connect course content with meaningful critical reflection on their intellectual, personal, and professional development at UF and beyond.* Students will state positions on key areas of discussion at the beginning and end of the class, along with the evidence that best supports their positions. They will be assessed for potential biases using a questionnaire that identifies common populations segments based on political leanings, non-scientific beliefs, and media consumption. This section will combine areas of the course to reflect on the personal journey from beginning to end of this course material. It will be assessed as a final paper that considers attitudes coming in, attitudes upon exit, how change happened, what possibly prevented change, and how the student will communicate or perhaps advocate for change as an expert in these areas.

V. Quest Learning Experiences

1. Details of Experiential Learning Component

The experiential learning component will be in-class debates and drills in active listening and response. Students will also participate in improvisational comedy training that teaches focus on tactical listening.

2. Details of Self-Reflection Component

Students will complete a questionnaire at the start of the course that will gauge their opinions on several issues in food, farming and medicine. That foundation will be later assessed after exposure to the current information on the topic, inquiring how their mind was changed of if the information presented fortified a previously held position. The question, "What would change your mind?" will be presented. Finally, the critical data that shaped their belief will be discussed.

VI. Required Policies

Attendance Policy
Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Students Requiring Accommodation

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

UF Evaluations Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by

abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Counseling and Wellness Center

Contact information for the Counseling and Wellness Center: http://www.counseling.ufl.edu/ , 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

The Writing Studio

The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio online at http://writing.ufl.edu/writing-studio/ or in 2215 Turlington Hall for one-on-one consultations and workshops.

In-Class Recordings

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.