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Textbook: The workbook “Making Sense of Uncertainty: Activities for Teaching Statistical Reasoning in the Inverted Classroom” is required. It is available at both of the University bookstores and for purchase on-line in a direct-to-student fashion at: Store.van-griner.com/rayens-statistics.

This workbook is not a traditional textbook and does not present content. For content material you are expected to watch a series of content videos that will be posted on our Blackboard site, as well as read or view other supplementary material that your Team will supply. Stay alert to what is required.

Class Time and Location: Go to MyUK and log into Blackboard using your LINK BLUE username and password. You will find our course there. It is very important that you check Blackboard (Bb) 3-4 times a day minimum. This is not a correspondence course so you won’t be able to work way ahead or go for extended periods of time without working in the class. There will be assignments made and due on a daily basis. So you have to stay alert to what is going on. Expect that you will have work due the next day; that will be our pattern. You need to make sure that the email you read routinely is the email that Blackboard has associated with your name.

Minimum Technology Requirements: In order to participate in this course, you will need access to a computer with the minimum hardware, software and internet configuration described at this site: http://www.uky.edu/Blackboard/computer.php. In addition, you will need:

- Reliable access to a computer with video camera and microphone capabilities.
- The ability to make and successfully share videos of yourself discussing answers to assigned prompts.
- The ability to view pdf files (Adobe Reader is a powerful, free download)
- The ability to view the videos we have posted. These will be posted on Bb with a built-in player in the embedded code, so everyone should have efficient and error-free access.
- The ability to view videos that we have not posted but rather linked from other sites. This is typically not a problem since you probably already are adept at viewing web-based videos. Just make sure you can get to what we assign.
- An internet service provider (ISP) giving fast enough access to the University of Kentucky Blackboard website (elearning.uky.edu) so that you may view the videos and other materials that may be posted, and can participate in any required virtual group sessions.

The use of Internet Explorer is NOT recommended for use with Blackboard. Firefox is the recommended Internet browser for the course. Firefox is free. Google on the name and make sure you download from the actual Firefox site and not a third party site.

If you experience technical difficulties with accessing course materials, the Customer Service Center may be able to assist you. Their hours are 7am – 6pm Monday through Friday. You may reach them at 859-257-1300 or
by e-mail at helpdesk@uky.edu. Please also inform the Course Instructor when you are having technical difficulties. However, it is your responsibility to resolve access difficulties as they arise; it is not the responsibility of the Instructor or the Team.

How will we interact with each other?

- **The GGDB:** This is our General Group Discussion Board (GGDB). It is open to all students in our class. We encourage you to use that GGDB to post general questions! Your Instructional Team will check these Boards several times every day and reply in a timely manner. Other students are strongly encouraged to reply as well. The more help, the better we all do in the course. Participating in this Board is not graded. However, it is a good way to get help from the Team and from your peers.

- **Monitoring:** Please do not expect the GGDB to be monitored 24/7. That is not reasonable. While we may often have someone monitoring rather late into the evening and very early in the morning, don’t expect that. It is your responsibility to ask the necessary questions on a schedule that allows us reasonable time to answer prior to an assignment being due.

- **Email:** Certainly email is OK for questions that you don’t want posted, but lots of emails from a large class can be hard to keep up with. If you must use email, use the following guidelines:
  - All emails MUST have the subject “STA 210:LastName_FirstName” and should be emailed to both Amanda and Emily unless a special exception is warranted. This will help us serve you better and greatly reduce the risk of emails getting lost. If you don’t go by these rules the Team may just ignore your email.
  - The Team will check e-mail several times a day and, unless there are some special circumstances afoot, will follow the schedule below. The Instructional Team is not required to continue or initiate any email conversations after 5:00 p.m. or before 9:00 a.m.
    - E-mails received before 5 pm on a weekday will be responded to that day if there is time.
    - E-mails received after 5 pm may not be responded to until the following morning.
    - E-mails received after 5 pm on Friday will be responded to within 24 hours.

- **Other:** For face-to-face, telephone, Skype, or Adobe Connect appointments, please contact us to set up a meeting time.

What will a day look like for us?

- **Posting of Daily Message:** Each day will start with a “Daily Message” that your Instructor will post under the Announcements tab on Blackboard. It will be posted by 12:00 a.m. each day. It may be a video or it may be a simple text message. Regardless, it will introduce the Daily Assignment for that day and give you any special instructions that are warranted. You may be advised to watch a particular content video or visit an external source or website prior to starting your work.

- **Daily Assignments:** Essentially every day you will be working on a “Beyond the Numbers” exercise from your workbook, or doing a supplemental exercise, or taking a quiz, or maybe doing all three. Majority of the Daily Assignments will be graded by the Team and some will be graded on completion. It’s the only way the Team can keep up in a six-week time frame. However, all of the Daily Assignments that are assigned are explicit statements about issues and knowledge we value in the course, so you will want to be very sure you ultimately know how to do all of them. Always check Blackboard for any special instructions for your Daily Assignments.
• **These Daily Assignments exercises will be due by 6 p.m. the next day.** For example, if the Daily Message for Tuesday (posted by 12:00 a.m. that Tuesday) assigns WBN3 on page 23 of your workbook as the Daily Assignment, then that work is due by 6 p.m. on Wednesday, at which time the link disappears. To submit your answer, you simply have to type neatly formatted answers into the appropriate “answer box” associated with the WBN3 link on Blackboard. Your Instructor and/or Team will demonstrate for you how to do this, if a demonstration is needed. Your Team will clarify which ones are graded and which ones are not graded.

• **The Instructional Team will monitor the Discussion Board** periodically throughout each assignment cycle should issues arise. Each Daily Assignment exercise will explain what you need to do and how you need to submit the assignment. Be alert! When the deadline passes the link to the exercise will disappear. Post questions on the GGDB if you need help!

• **Working Beyond the Classroom (WBC):** Throughout our six-week term you will also have 3 longer “projects” required of you. We have called these “Beyond the Classroom” projects and they are designed to give you an opportunity to demonstrate an understanding of the primary learning outcomes for the three modules in this course. These will be assigned periodically and you will typically have a week to complete one. So on any given day you may have questions about these exercises as well. Post questions on your GGDB if you need help. We are watching!

How is my grade determined?

- **Daily Assignments** 30%
- **Working Beyond the Classroom** (total of 3) 35%
- **Exams** (total of 3) 35%
- **100% total**

What about the exams? Do I need to arrange for proctors?

No proctors. They are more trouble than they are worth. Each exam will be part open response and part multiple choice. You will take the multiple choice part on Bb. That part will be timed, but available over a 24 hour time frame. For instance, if your schedule dictates that you need to take the exam at 2:00 a.m. then that will be possible. But when you open it at 2:00 a.m. you will have one hour before the link closes. Each open response question MUST be answered by video. That is you will be required to organize your thoughts and then deliver your answer to us by way of a video recording that will be posted on YouTube. Each exam will have detailed instructions on how to post the YouTube link on Blackboard. Of course the recording of the open response answers will not be timed, but do have to be completed within the 24 hour examination window.

Online examinations are CLOSED BOOK examinations. You cannot use any other sources (human, on-line, whatever) when taking an examination. You are on your honor to take the examination on your own without the assistance of any other person or materials. Violation of this code of honor constitutes cheating. You will receive, at a minimum, a 0 on any assignment on which you are caught cheating.

If you encounter technical problems when taking an exam, you should first try contacting the help desk in the College of Arts and Sciences: ashelp@uky.edu. Make sure your email header communicates the urgency of your message, e.g. “HELP!! Bb froze during online exam!” The A&S team is usually very responsive. If you can’t get through to them, then contact the campus Customer Service Center mentioned on the first page of this syllabus. If all else fails, try calling or emailing your Instructor.
Who will do the grading?
Both Emily and I will be grading. If a Beyond the Numbers assignment is designated (after being turned in) as one that will be graded on completion then it is your responsibility to make sure you understand what the correct answers are. Using the content videos, Team email exchanges, and the GGDB, please realize that it still your responsibility to know the point of and solutions to all assignments in either category. Those ideas and exercises may well appear in some form on the exams. Your Lead Instructor will grade the Beyond the Classroom assignments. The multiple choice parts of the exams will be graded automatically on Bb. The team will share the open response (video) grading.

How much work should I expect to be doing?
All course materials are on-line and it is your responsibility to access material in a timely manner. The Daily Message will set the tone for the day and may announce a longer-term Beyond the Classroom project. In general you should expect to spend a MINIMUM of 2-3 hours per day either on-line interacting with the course materials and/or communicating with the instructional team.

Can you tell me what the overall schedule is?
Mostly, yes. We can’t forget to be flexible, however, when things don’t go quite as we plan.

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<th>Module</th>
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So what about late or missed assignments?
Late assignments will be accepted only in the event of documented excused absences as defined by University Senate Rules V, 2.4.2. Problems associated with inappropriate computer equipment, traffic, library services, over-sleeping, procrastination or forgetfulness, are just some of the unacceptable excuses for late submission of assignments. It is your responsibility to make sure that you access and submit assignments on time. Once the deadline for submission has passed, these assignments will no longer be accessible on BlackBoard.

What is this course really about?
This course is a course in the “statistical inferential reasoning” (SIR) category that is part of the University’s new general education program. Broadly speaking, the goal of this course is to help you develop your expertise at consuming the kinds of inferential arguments we either encounter, or construct, as part of our daily lives. Most of our daily encounters with statistical inference arise either formally from polls, surveys, social and medical experiments; or informally, from “human inferences” associated with simple statistical constructs like tables and graphs. Accordingly, this course is divided into three modules that reflect these sources:

I. Slippery Evidence
The primary intent of this module is to help students begin to absorb common statistical information appropriately and to form associated human inferences carefully. The focus will be on tables, charts and summaries in the media, but some time will be spent on the psychology of inference as well.

Learning Outcomes for Slippery Evidence
Students who successfully complete this module should be able to:
1. Identify categorically good or bad statistical summaries, charts and graphs and explain the reasons they are so categorized;
2. Identify categorically good or bad statistical arguments based on statistical summaries, charts, and graphs, and explain the reasons they are so categorized;
3. Distinguish the concepts of correlation and causation and explain how they offer different types of evidence;
4. Identify hidden or confounding variables in studies reported by the media or in the literature;
5. Explain if and how hidden or confounding variables can or did affect the associated common-sense inferences;
6. Define what is meant by Simpson’s Paradox;
7. Explain how a misinterpretation of randomness leads to poor human inferences;
8. Explain how not having enough or the right information leads to poor human inferences;
9. Present examples relevant to each of Outcomes 5., 6., 7, and 8;
10. Identify and present at least one argument from psychology or neuroscience that supports the contention that poor human inferences are common.

II. MOE’s Lineage
The primary intent of this module is to develop a deeper sense of what statistical confidence means and doesn’t mean by exploring sampling variability and encountering some of the important theory behind repeated sampling. The focus will be largely on polls and social surveys.

Learning Outcomes
Students who successfully complete this module should be able to:
1. Identify categorically good or bad surveys and explain the reasons they are so categorized;
2. Identify a push poll from the news and explain the reasons such a poll is likely not a source of useful information;
3. **Explain** the difference between sampling variability and non-sampling variability;
4. **Identify** strategies for understanding non-sampling variability;
5. **Identify** a margin of error that is in the news, but not discussed in class, form the associated confidence interval and use the language of the module to explain the sort confidence that is being offered, and the type of risk that is being quantified;
6. **Compare and contrast** the information contained in a Cosmopolitan on-line poll, a CBS Evening News call-in poll, a Gallup random-dialing poll, and a door-to-door political campaign poll.
7. **Define** sampling variability and explain the role it plays in the construction of a confidence interval;
8. **Define** sampling distribution and demonstrate the Central Limit Theorem by hands-on repeated sampling;
9. **Produce** a non-95% confidence interval for a proportion or mean, based on data from a simple random sample;
10. **Explain** what happens to a confidence interval as the confidence level changes and/or the sample size changes.

### III. No Ho Hum HO HA

The primary intent of this module is to encounter the concepts and language of hypothesis testing by way of the more common ideas of sensitivity and specificity. Discussion will revolve around field sobriety tests and home pregnancy tests.

#### Learning Outcomes

Students who successfully complete this module should be able to:

1. **Define** sensitivity and specificity;
2. Read about a dichotomous decision process that is in the news, not discussed in class, and **explain** the roles for sensitivity and specificity in assessing the integrity of that process;
3. **Identify** the structure of a test of hypothesis and **explain** the purpose of the null and the alternative, and the way in which the evidence that is gathered is used;
4. **Define** significance and power, and **explain** the roles each play in assessing the integrity of the dichotomous significance test;
5. Read about a test of significance associated with an experiment that is in the news, but not discussed in class, and use the language of the module to **explain** and **evaluate** the nature of the evidence that is presented;
6. **Explain** the role of modeled error in a simple test of hypothesis for a simple experimental design.
7. **Define** the Prosecutor’s Fallacy;
8. **Explain** the importance of the Prosecutor’s Fallacy to interpreting specificity and sensitivity;
9. **Explain** the importance of the Prosecutor’s Fallacy to describing the results of null hypothesis testing;
10. Read a news story and **identify** and **demonstrate** the difference between various conditional events and unconditional events discussed in that story.

### What else do I need to know?

#### Distance Learning Library Services

As a Distance Learning student you have access to the Distance Learning Library services at [http://www.uky.edu/Libraries/DLLS](http://www.uky.edu/Libraries/DLLS). This service can provide you access to UK’s circulating collections and can deliver to you manuscripts or books from UKs library or other libraries. The DL Librarian may be reached at 859-257-0500, ext 2171, or 800-828-0439 (option #6) or by mail at dlservice@email.uky.edu. For an interlibrary loan visit: [http://www.uky.edu/Libraries/linpage.php?lweb_id=253&llib_id=16](http://www.uky.edu/Libraries/linpage.php?lweb_id=253&llib_id=16).

#### Policy on academic accommodations due to disability
If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

**Academic Offenses:**
PLAGIARISM and CHEATING are serious academic offenses. The following is an excerpt taken from the "Students Rights and Responsibilities Handbook, University of Kentucky" regarding cheating:

"Cheating is defined by its general usage. It includes, but is not limited to, the wrongful giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade."

The following is an excerpt taken from the "Students Rights and Responsibilities Handbook, University of Kentucky" regarding plagiarism:

"All academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else’s work....... If the words of someone else are used, the student MUST put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic."

Charges of an academic offense will be made against any student that cheats or commits plagiarism. Penalties for such an offense will be assessed according to University Regulations regarding Academic Offenses. The most severe penalties include suspension or dismissal from the University.

**In addition** to the circumstances listed above, the following activities are considered evidence of cheating:

1) Any talking to another student during an examination.
2) Looking at another student’s work during an examination, or allowing another student to look at your work.
3) Collaborating with another student on an examination and/or submitting an assignment that is similar in wording or sentence construction to the work of another student in the class, even if you acknowledge the participation of the other student. ALL SUBMITTED WORK MUST BE DONE BY YOU ALONE.

**Student Conduct**
Students are expected to maintain decorum that includes respect for other students and the professor, to regularly log in to the course, and to display an attitude that seeks to take full advantage of the educational opportunity. All students are expected to be prepared to work and actively participate in class activities.

**Unresolved Academic Issues**
Consult the University of Kentucky *Student Rights and Responsibilities* regarding the steps for addressing unresolved academic issues.