Term Information

Effective Term	Spring 2021
Previous Value	*Summer 2012*

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Creating an official online offering

Adding 8 and 7 weeks as an option for summer/fall/spring

Remove old quarter references for prerequisites and exclusions

Updated topic list

Updated course goals to match the syllabus

Checked Freshman, Sophomore, Junior, and Senior, as some students might take this course out of the suggested 4 year plan timeline.

Updated the prerequisite list

Updated the exclusions list

What is the rationale for the proposed change(s)?

Creating an online offering of this course will reach more students and provide more opportunities for students to enroll, especially SPS majors which require 2260.

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the request contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area	Horticulture and Crop Science
Fiscal Unit/Academic Org	Horticulture & Crop Science - D1127
College/Academic Group	Food, Agric & Environ Science
Level/Career	Undergraduate
Course Number/Catalog	2260
Course Title	Data Analysis and Interpretation for Decision Making
Transcript Abbreviation	Data Analysis
Course Description	Basic concepts of probability and statistics applied to the interpretation of quantitative data.
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week
Previous Value	*14 Week, 12 Week*
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	Yes
Is any section of the course offered	100% at a distance

Previous Value	*No*
Grading Basis	Letter Grade
Repeatable	No
Course Components	Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites	Prereq: Math 1130, 1131, 1148, 1149, 1150, 1151.01, 1151.02, or 1156.
Previous Value	*Prereq: Math 1130 (130), 1148 (148), 1149, 1150 (150), 1151.01, 1151.02, or 1156.*
Exclusions	Not open to students with credit for AEDEcon 2005, AnimSc 2260, ComLdr 3537, ENR 2000, or STAT 1450.
Previous Value	Not open to students with credit for 260, AEDEcon 2005 (205), AnimSc 2260 (260), ComLdr 3537 (387), or ENR 2000 (222).
Electronically Enforced	No

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	26.1101
Subsidy Level	Baccalaureate Course
Intended Rank	Freshman, Sophomore, Junior, Senior
Previous Value	*Sophomore*

Requirement/Elective Designation

General Education course:
    Data Analysis

Course Details

Course goals or learning objectives/outcomes	• Differentiate a population from a sample and understand the parameters that describe a population or sample.
	• Apply statistics for informed decision-making and for specific areas of study, through understanding of probability, sample methodology and hypothesis testing.
	• Distinguish appropriate and inappropriate applications of statistics in daily life.
Previous Value	• *Understand basic concepts of statistics and probability.*
	• *Comprehend methods needed to analyze and critically evaluate statistical arguments.*
	• *Recognize the importance of statistical ideas.*
	• *Develop quantitative literacy and logical reasoning skills, including the ability to identify valid arguments, use mathematical models, and draw conclusions and critically evaluate results based on data*

Content Topic List

- Introduction to Statistics
- Methods of describing qualitative and quantitative data
- Summation notation
- Measures of central tendency and variability
- Standard Deviation
- Relative standing
- Detecting Outliers; Events, sample spaces, and probability
- Unions and Intersections
- Complimentary events
- Additive rule
- Conditional probability
- Multiplicative rule
- Random sampling
- Additional Counting Rules
- Random variables
- Probability distributions
- Expected values of random variables
- Binomial distribution
- Poisson Distribution
- Hypergeometric dist.
- Continuous probability
- Uniform distribution
- Normal distribution
- Assessing normality
- Approx. binomial w/normal
- Central limit theorem
- Large scale CI for a pop. mean
- Large and Small scale CI for a pop. Mean
- Large scale CI for a pop. proportion; Sample Size
- Large sample test of a population Mean
- p-values; Small sample tests about a pop. mean
- Large sample test of a proportion; Inferences based on 2 samples
- Comparing population means: Independent sampling
- Paired Difference Experiments
- Comparing proportions
- Analysis of Variance
- Mean Comparison
- Probability models
- Model assumptions
- Least squares

- Coefficient of correlation and Determination
- Estimating
- Categorical Data Analysis

Previous Value

- *Statistics, data, and statistical thinking*
- *Methods of describing data*
- *probability*
- *Discrete random variables*
- *Continuous random variables*
- *Sampling distributions*
- *Estimation with confidence intervals*
- *Tests of hypothesis*
- *Two sample confidence intervals and hypothesis tests*
- *Analysis of variance*
- *Simple linear regression*
- *Categorical data analysis*

Sought Concurrence   No

Attachments

- Data Analysis GE Assessment Plan.docx: GE Data Analysis Assessment Plan

  (GEC Course Assessment Plan. Owner: Luikart,Meredith Marie)

- GE Rationale - HCS 2260Data Analysis and Interpretation for Decision Making.docx: GE Data Analysis Rationale

  (Other Supporting Documentation. Owner: Luikart,Meredith Marie)

- Syllabus HCS 2260 Spring 2021 Live Section._8_7_20docx.docx: Revised Spring In-Person Syllabus version 4

  (Syllabus. Owner: Luikart,Meredith Marie)

- Syllabus HCS 2260 Spring 2021_v4_8_7_20.docx: Revised Spring Online Syllabus version 4

  (Syllabus. Owner: Luikart,Meredith Marie)

- HCS 2260.docx: ASCTech Form from Ian Anderson

  (Other Supporting Documentation. Owner: Luikart,Meredith Marie)

Comments

- Removed the 8-week online syllabus version that CFAES requested. Uploaded the requested ASCTech form from Ian Anderson. *(by Luikart,Meredith Marie on 08/25/2020 02:02 PM)*

- - I see you worked with Ian Anderson. Please upload the filled out ASCTech review checklist that he returned to you. I cannot tell from the email exchange whether he sent it back to you. If he did not, please ask that he do that for you. - The panel will only need to see one online syllabus. (There are 2 uploaded.) So I would suggest removing one so that the faculty reviewers not be confused. Please only keep the one reviewed and approved by Ian Anderson. (Do not remove the in-person syllabus, however. Thank you for providing that. The panel will wish to look at it for comparative purposes.) *(by Vankeerbergen,Bernadette Chantal on 08/25/2020 12:52 PM)*

- Additional minor edits as per email 7 August 2020

  Revise as per COAA via email 24 July 2020

  Return to department per their request 15 July 2020 *(by Osborne,Jeanne Marie on 08/07/2020 02:56 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Luikart,Meredith Marie	07/14/2020 03:51 PM	Submitted for Approval
Approved	Metzger,James David	07/14/2020 03:52 PM	Unit Approval
Revision Requested	Osborne,Jeanne Marie	07/15/2020 01:37 PM	College Approval
Submitted	Luikart,Meredith Marie	07/17/2020 09:27 AM	Submitted for Approval
Approved	Metzger,James David	07/17/2020 09:32 AM	Unit Approval
Revision Requested	Osborne,Jeanne Marie	07/24/2020 01:36 PM	College Approval
Submitted	Luikart,Meredith Marie	07/28/2020 02:26 PM	Submitted for Approval
Approved	Metzger,James David	07/28/2020 02:38 PM	Unit Approval
Revision Requested	Osborne,Jeanne Marie	08/07/2020 02:56 PM	College Approval
Submitted	Luikart,Meredith Marie	08/07/2020 04:45 PM	Submitted for Approval
Approved	Barker,David John	08/14/2020 02:31 PM	Unit Approval
Approved	Osborne,Jeanne Marie	08/21/2020 12:13 PM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	08/25/2020 12:52 PM	ASCCAO Approval
Submitted	Luikart,Meredith Marie	08/25/2020 02:02 PM	Submitted for Approval
Approved	Metzger,James David	08/25/2020 02:04 PM	Unit Approval
Approved	Osborne,Jeanne Marie	08/25/2020 02:18 PM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Oldroyd,Shelby Quinn Vankeerbergen,Bernadette Chantal	08/25/2020 02:18 PM	ASCCAO Approval

Horticulture and Crop Science 2260:

Data Analysis and Interpretation for Decision Making

Spring 2021

Meeting Dates and Location: Lectures will be MWF 12:40-1:35 in 118 Parker Hall.

Course Format:

In person or P designates courses completed 100% in person.

Instructor:

Dr David Gardner
gardner.254@osu.edu; 614-292-9002
email is preferred method of communication
240B Howlett Hall
Office hours Monday 1:35-2:35 or by appointment

Credit Hours: 3

Credit hours and work expectations: This is a **3-credit-hour 14-week course**. According to Ohio State policy, students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 5-6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

GE data analysis course.

Prerequisites: Math 1130, 1131, 1148, 1149, 1150, 1151.01, 1151.02, or 1156.

Exclusions: Not open to students with credit for AEDEcon 2005, AnimSci 2260, ComLdr 3537, ENR 2000 or STAT 1450.

Textbooks/Readings: McClave and Sincich. Statistics (10th or later edition). Prentice Hall

Optional Readings: None

Additional Required Materials: None

Other Fees or Requirements: None

Course Description:

Basic concepts of probability and statistics applied to the interpretation of quantitative data.

Goals:

- Differentiate a population from a sample and understand the parameters that describe a population or sample.

- Apply statistics for informed decision-making and for specific areas of study, through understanding of probability, sample methodology and hypothesis testing.
- Distinguish appropriate and inappropriate applications of statistics in daily life.

GE Data Analysis Goal:
- Students develop skills in drawing conclusions and critically evaluating results based on data

Learning Outcomes:

- Students understand basic concepts of statistics and probability.
- Students comprehend methods needed to analyze and critically evaluate statistical arguments.
- Students recognize the importance of statistical ideas.

Students meet the GE Data Analysis learning objectives through introductory study of statistical analysis and data interpretation.

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at OCIO Help Hours, and support for urgent issues is available 24x7.
- **Self-Service and Chat support:** (http://ocio.osu.edu/selfservice)
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Baseline technical skills for online courses

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide.

Required equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone

Required software

- Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation is found https://ocio.osu.edu/kb04733.

Carmen Access

You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:
- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions.

- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click "Enter a Passcode" and then click the "Text me new codes" button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the [Duo Mobile application](#) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

Course Schedule:

The schedule below is a general outline of course activities; changes can (and are) made to the specific topics covered in lecture based on the progress in covering the material.

Days followed by a parenthetical number denote when problem sets are issued and due. For example, on Friday, January 15 problem set #1 will be issued. On Wednesday, January 27 problem set #1 is due and problem set #2 will be issued.

Wk		Date	Chapter	Topic
1	M	Jan 11	1	Course Overview; Introduction to Statistics
	W	Jan 13	1	Introduction to Statistics
	F(1)	Jan 15	2.1-2.2	Methods of describing qualitative and quantitative data
2	M	Jan 18		No Class – Martin Luther King Day
	W	Jan 20	2.3 - 2.5	Summation notation; Measures of central tendency and variability
	F	Jan 22	2.6, 2.7	Standard Deviation; Relative standing
3	M	Jan 25	2.8 - 3.1	Detecting Outliers; Events, sample spaces, and probability
	W(2)	Jan 27	3.2 - 3.4	Unions and Intersections; Complimentary events; Additive rule
	F	Jan 29		Work on Excel exercises / **1st Excel Exercise Due**
4	M	Feb 1	3.5, 3.6	Conditional probability; Multiplicative rule
	W	Feb 3		Review for Exam 1
	F	***Feb 5***		***Exam #1: Chapters 1-3.6***
5	M	Feb 8	3.7, 3.8	Exam 1 review; Random sampling; Additional Counting Rules
	W(3)	Feb 10	3.8	Additional Counting Rules
	F	Feb 12		Work on Excel exercises
6	M	Feb 15	4.1, 4.2	Random variables; Probability distributions
	W	Feb 17	4.3, 4.4	Expected values of random variables; Binomial distribution
	F	Feb 19	4.4	Binomial distribution
7	M	Feb 22		Work on Excel exercises / **2nd Excel Exercise Due**
	W	Feb 24	4.5 - 5.1	Poisson Distribution, Hypergeometric dist., Continuous probability
	F(4)	Feb 26		Work on Excel exercises / **3rd Excel Exercise Due**
8	M	Mar 1	5.2, 5.3	Uniform distribution; Normal distribution
	W	Mar 3	5.3	The Normal Distribution
	F	Mar 5	5.4, 5.5	Assessing normality; Approx. binomial w/normal
9	M(5)	Mar 8		Review for Exam 2
	W	***Mar 10***		***Exam #2: Chapters 3.8-5***
	F	Mar 12	6.1, 6.2	Exam 2 review; Sampling distributions
	M	Mar 15		Spring Break
	W	Mar 17		Spring Break
	F	Mar 19		Spring Break
10	M	Mar 22	6.3, 7.1, 7.2	Central limit theorem; Large scale CI for a pop. mean
	W	Mar 24		Work on Excel exercises / **4th Excel Exercise Due**
	F(6)	Mar 26	7.2, 7.3	Large and Small scale CI for a pop. Mean
11	M	Mar 29	7.4, 7.5	Large scale CI for a pop. proportion; Sample Size
	W	Mar 31	8.1, 8.2	Large sample test of a population Mean
	F	Apr 2	8.3, 8.4	p-values; Small sample tests about a pop. mean

12	M(7)	Apr 5	8.5, 9.1	Large sample test of a proportion; Inferences based on 2 samples
	W	Apr 7	9.2	Comparing population means: Independent sampling
	F	Apr 9	9.3, 9.4	Paired Difference Experiments; Comparing proportions
13	M	Apr 12		Review for Exam 3
	W	**Apr 14**		**Exam #3: Chapters 6-9**
	F(8)	Apr 16	10.1-10.3	Exam 3 review; Analysis of Variance, Mean Comparison
14	M	Apr 19	11.1-11.3	Probability models; Least squares; Model assumptions
	W	Apr 21	11.4-11.9	Coefficient of correlation and Determination; Estimating
	F	Apr 23	13	Categorical Data Analysis
15	M	Apr 26		Review for Final / **Extra Credit Excel Exercise Due**
Final		**TBD**		***Comprehensive but w/ emphasis on Ch. 10-13***

Instructor's policy on late or make up work:

The only way a lecture exam or the final exam may be taken at an alternative time (either earlier or later) is under extenuating circumstances after permission has been secured from the instructor at least two calendar days in advance of the scheduled exam date. Make-up exams, if given at all in well-justified cases, will be considerably different from the regularly administered exam.

All assignments are due by 11:59 pm on the designated due date. You can find the actual due dates in Carmen website under the syllabus/assignment sections. There are no extensions of due dates without documented, extenuating circumstances subject to the approval of the instructor. All requests for extensions must be received by the instructor no less than 1 week prior to the due date; in the case of a documented emergency, you must contact the instructor within 24 hours to request an extension. Make-up exams are permitted with permission of instructor. Students must communicate with instructor to establish a day/time for make-up exam.

Evaluation

How your grade is calculated

ASSIGNMENT CATEGORY	PERCENTAGE
Lecture Exams (3 1-hour exams)	45
Final Exam	15
Problem sets (8 sets)	20
Excel exercises (4)	20
Extra credit excel exercise	(+5)
Total	**100 (+5)**

See course schedule above for due dates.

Description of Evaluation Activities:
Lecture exams – 45% of the total grade.
There will be three midterm exams (15% each). You must complete the midterm and final exams yourself, without any external help or communication. Each exam lasts for 1 hour. Collaboration with classmates or other individuals on the exams is strictly forbidden. Taking an exam with another

person, communicating with another person during an exam by any means, or receiving any form of assistance from others during an exam will be considered academic misconduct and will be dealt with according to the procedures established by The Ohio State University.

***Final Exam* – 15% of the total grade.** The final will be comprehensive, but emphasize material after the third midterm

***Problem Sets*- 20% of the total grade.**
There will be 8 **required** problem sets, starting the 1st week and continuing through the 13th week. The due date will be stated on the problem set. You will typically have 5-7 days to complete the problem set. The next problem set will be issued on the previous problem set's due date. See the calendar for more information.

***Excel Exercises* – 20% of the total grade required + up to 5% extra credit**
There are 5 exercises on Carmen that will help you to learn how to use the basic statistical analysis tools that are available in Microsoft Excel. This is the "lab" portion of the class. You are free to work on these at any time but on designated days I will set aside lecture time for you to work on them (see course schedule). The first 4 of these exercises are required for 20% of your grade. You may complete the other for an additional 5% extra credit. Below is a guide of exercise content:

Exercise	Chapter	Topic
1	1,2	Basic statistical analysis tools in Excel
2	2,3,4	Mean and Variance of a Random Variable
3	4	Probabilities and Sampling a Binomial Distribution
4	5,6	Central Limit Theorem, Probabilities of Normal Random Variables
5	11	Linear Correlation and Regression

Grading Scale: The standard grading scale is below.

Percentage	Grade		Percentage	Grade
93-100	A		73-76.9	C
90-92.9	A-		70-72.9	C-
87-89.9	B+		67-69.9	D+
83-86.9	B		60-66.9	D
80-82.9	B-		<60	E
77-79.9	C+			

COURSE POLICIES

Faculty feedback and response time
I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

- **Grading and feedback:** For large weekly assignments, you can generally expect feedback within **7 days**.

- **E-mail:** Email sent to gardner.254@osu.edu will receive a reply within 24 hours on school days.

- **Discussion board:** I will check and reply to messages in the discussion boards every **24 hours on school days**.

Attendance Policy:

Student participation requirements

Students are expected to attend all class sessions. The following is a summary of everyone's expected participation:

- **Office hours**: *FLEXIBLE*

My office hours are from 1:35 to 2:35 on Mondays (immediately following lecture). Please contact me at the beginning of the week if you need a time outside my scheduled office hours.

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

Writing style:

While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emoticon) is fine for non-academic topics.

Tone and civility:

Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online or in person.

Citing your sources:

When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)

Backing up your work:

Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

E-Mail Etiquette:

For example, Professional relationships should be maintained when using e-mail for a class. Below I have included guidelines from Bloomsbury's guide on email etiquette that you should follow when drafting your e-mail. I will not respond to e-mails that I consider inappropriate. I will respond to appropriate emails in a timely manner, do not expect an immediate reply. If you require an immediate response consider visiting with me in person.

DO

- Include a descriptive statement in the subject line.
- Use proper salutations when beginning an e-mail.
- Be concise in the body of the e-mail, use complete sentences and proper grammar.
- Use an appropriate closure at the end of each e-mail followed by your first and last name.
- If replying to an e-mail, reference the original e-mail and its content.
- Be selective of your choice of words. Emotions are difficult to convey in text and without the benefit of facial expressions your sentiment can be lost in the words you choose to write.

DON'T

- Use all capital letters; this conveys a tone of ANGER.
- Use e-mail as a format to criticize other individuals.

- Ask for your grade via e-mail. Grades will not be discussed by e-mail. If you need to discuss a graded item make an appointment to do so in my office.
- E-mail to inquire when grades will be posted. We will work toward submitting grades promptly, however, recognize that grading assignments and exams requires considerable time to ensure uniformity and fairness.
- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review at a later time when emotions are not directing the content.

Exams:

You must complete the midterm and final exams yourself, without any external help or communication. Each exam lasts for 1 hour. Collaboration with classmates or other individuals on the exams is strictly forbidden. Taking an exam with another person, communicating with another person during an exam by any means, or receiving any form of assistance from others during an exam will be considered academic misconduct and will be dealt with according to the procedures established by The Ohio State University.

Written assignments:

Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow **[MLA/APA]** style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.

Reusing past work:

In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.

Falsifying research or results:

All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.

Collaboration and informal peer-review:

The course includes many opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on an exam or assignment is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.

UNIVERSITY POLICIES see: https://ugeducation.osu.edu/faculty-and-staff-resources for current versions

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct at Student Life http://studentconduct.osu.edu.

Ohio State's academic integrity policy
Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students

have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity ([Ten Suggestions](#))*
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Intellectual Property (covered by copyright) includes Course materials (Text, Audio, Video, Multimedia, Sims, Apps, etc.), and Student Generated materials

Disability Services

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to Office of Student Life - Disability Services for more information.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Canvas) accessibility
- Streaming audio and video
- Synchronous course tools
- Definition OSU
- Overview of Accessibility at OSU
- If you require specific software for the course list or provide a link to the software's accessibility privacy statements
  - Adobe Connect (Carmen Connect) Accessibility Adobe Privacy Policy
  - MediaSite Accessibility Statement
  - Microsoft Office Accessibility Microsoft Office 365 Privacy

Diversity

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

UNIVERSITY RESOURCES - see: https://ugeducation.osu.edu/faculty-and-staff-resources
for current versions

Counseling and Consultation Services:

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on

campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Title IX:

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit equity.osu.edu or email equity@osu.edu.

Grievances

According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with the instructor or professor. Then, if necessary, take your case to the department chairperson, college dean or associate dean, and to the provost, in that order. Specific procedures are outlined in Faculty Rule 3335-7-23. Grievances against graduate, research, and teaching assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department.

Content Warning

Some contents of this course may involve media that may be triggering to some students due to descriptions of and/or scenes depicting acts of violence, acts of war, or sexual violence and its aftermath. If needed, please take care of yourself while watching/reading this material (leaving classroom to take a water/bathroom break, debriefing with a friend, contacting a Sexual Violence Support Coordinator at 614-292-1111, or Counseling and Consultation Services at 614-292-5766, and contacting the instructor if needed). Expectations are that we all will be respectful of our classmates while consuming this media and that we will create a safe space for each other. Failure to show respect to each other may result in dismissal from the class.

Horticulture and Crop Science 2260:

Data Analysis and Interpretation for Decision Making

Spring 2021

Meeting Dates and Location: Synchronous lectures via Zoom will be MWF 12:40-1:35. The Zoom login ID will be emailed to the class list prior to the start of class.

Course Format:

Distance Learning or DL designates courses completed 100% at distance. I will host most lectures live via Carmen zoom but you are not required to attend live. Most lectures will be available both as a recording of the zoom class period and as prerecorded sessions.

Instructor:

Dr David Gardner
gardner.254@osu.edu; 614-292-9002
240B Howlett Hall.

Credit Hours: 3

Pace of online activities: This course is divided into **modules**. Students are expected to keep pace with weekly deadlines for assignments and lectures but may schedule their efforts freely within the period stated in the calendar of activities in the syllabus.

Credit hours and work expectations: This is a **3-credit-hour 14-week course**. According to Ohio State policy, students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 5-6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

Prerequisites: Math 1130, 1148, 1149, 1150, 1151.01, 1151.02, or 1156.

Exclusions: Not open to students with credit for AEDEcon 2005, AnimSci 2260, ComLdr 3537, or ENR 2000.

GE data analytics course.

Textbooks/Readings: McClave and Sincich. Statistics (10th or later edition). Prentice Hall

Optional Readings: None

Additional Required Materials: None

Other Fees or Requirements: None

Course Description:

Basic concepts of probability and statistics applied to the interpretation of quantitative data.

Goals:

- Differentiate a population from a sample and understand the parameters that describe a population or sample.
- Apply statistics for informed decision-making and for specific areas of study, through understanding of probability, sample methodology and hypothesis testing.
- Distinguish appropriate and inappropriate applications of statistics in daily life.

GE Data Analysis Goal:

- Students develop skills in drawing conclusions and critically evaluating results based on data.

Learning Outcomes:

Students meet the GE Data Analysis learning objectives through introductory study of statistical analysis and data interpretation. By the end of this course:

- Students understand basic concepts of statistics and probability.
- Students comprehend methods needed to analyze and critically evaluate statistical arguments.
- Students recognize the importance of statistical ideas.

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at OCIO Help Hours, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** (http://ocio.osu.edu/selfservice)
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

Baseline technical skills for online courses

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide.

Technology skills necessary for this specific course

- Zoom text, audio, and video chat
- Recording a slide presentation with audio narration
- Recording, editing, and uploading video

Required equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone

Required software

- [Microsoft Office 365:](#) All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through [Microsoft's Student Advantage program](#). Full instructions for downloading and installation is found https://ocio.osu.edu/kb04733.
- [Approved browsers](#):

Carmen Access

You will need to use [BuckeyePass](#) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](#) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click "Enter a Passcode" and then click the "Text me new codes" button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the [Duo Mobile application](#) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

Course Schedule:

The schedule below is a general outline of course activities; changes can (and are) made to the specific topics covered in lecture based on the progress in covering the material.

Days followed by a parenthetical number denote when problem sets are issued and due. For example, on Friday, January 15 problem set #1 will be issued. On Wednesday, January 27 problem set #1 is due and problem set #2 will be issued.

Wk		Date	Chapter	Topic
1	M	Jan 11	1	Course Overview; Introduction to Statistics
	W	Jan 13	1	Introduction to Statistics
	F(1)	Jan 15	2.1-2.2	Methods of describing qualitative and quantitative data
2	M	Jan 18		No Class – Martin Luther King Day
	W	Jan 20	2.3 - 2.5	Summation notation; Measures of central tendency and variability
	F	Jan 22	2.6, 2.7	Standard Deviation; Relative standing
3	M	Jan 25	2.8 - 3.1	Detecting Outliers; Events, sample spaces, and probability
	W(2)	Jan 27	3.2 - 3.4	Unions and Intersections; Complimentary events; Additive rule
	F	Jan 29		Work on Excel exercises / **1st Excel Exercise Due**
4	M	Feb 1	3.5, 3.6	Conditional probability; Multiplicative rule
	W	Feb 3		Review for Exam 1
	F	***Feb 5***		***Exam #1: Chapters 1-3.6***
5	M	Feb 8	3.7, 3.8	Exam 1 review; Random sampling; Additional Counting Rules
	W(3)	Feb 10	3.8	Additional Counting Rules
	F	Feb 12		Work on Excel exercises
6	M	Feb 15	4.1, 4.2	Random variables; Probability distributions
	W	Feb 17	4.3, 4.4	Expected values of random variables; Binomial distribution
	F	Feb 19	4.4	Binomial distribution
7	M	Feb 22		Work on Excel exercises / **2nd Excel Exercise Due**
	W	Feb 24	4.5 - 5.1	Poisson Distribution, Hypergeometric dist., Continuous probability
	F(4)	Feb 26		Work on Excel exercises / **3rd Excel Exercise Due**

8	M	Mar 1	5.2, 5.3	Uniform distribution; Normal distribution
	W	Mar 3	5.3	The Normal Distribution
	F	Mar 5	5.4, 5.5	Assessing normality; Approx. binomial w/normal
9	M(5)	Mar 8		Review for Exam 2
	W	**Mar 10**		**Exam #2: Chapters 3.8-5**
	F	Mar 12	6.1, 6.2	Exam 2 review; Sampling distributions
	M	Mar 15		Spring Break
	W	Mar 17		Spring Break
	F	Mar 19		Spring Break
10	M	Mar 22	6.3, 7.1, 7.2	Central limit theorem; Large scale CI for a pop. mean
	W	Mar 24		Work on Excel exercises / **4th Excel Exercise Due**
	F(6)	Mar 26	7.2, 7.3	Large and Small scale CI for a pop. Mean
11	M	Mar 29	7.4, 7.5	Large scale CI for a pop. proportion; Sample Size
	W	Mar 31	8.1, 8.2	Large sample test of a population Mean
	F	Apr 2	8.3, 8.4	p-values; Small sample tests about a pop. mean
12	M(7)	Apr 5	8.5, 9.1	Large sample test of a proportion; Inferences based on 2 samples
	W	Apr 7	9.2	Comparing population means: Independent sampling
	F	Apr 9	9.3, 9.4	Paired Difference Experiments; Comparing proportions
13	M	Apr 12		Review for Exam 3
	W	**Apr 14**		**Exam #3: Chapters 6-9**
	F(8)	Apr 16	10.1-10.3	Exam 3 review; Analysis of Variance, Mean Comparison
14	M	Apr 19	11.1-11.3	Probability models; Least squares; Model assumptions
	W	Apr 21	11.4-11.9	Coefficient of correlation and Determination; Estimating
	F	Apr 23	13	Categorical Data Analysis
15	M	Apr 26		Review for Final / **Extra Credit Excel Exercise Due**
Final		**TBD**		***Comprehensive but w/ emphasis on Ch. 10-13***

Instructor's policy on late or make up work:

The only way a lecture exam or the final exam may be taken at an alternative time (either earlier or later) is under extenuating circumstances after permission has been secured from the instructor at least two calendar days in advance of the scheduled exam date. Make-up exams, if given at all in well-justified cases, will be considerably different from the regularly administered exam.

All assignments are due by 11:59 pm on the designated due date. You can find the actual due dates in Carmen website under the syllabus/assignment sections. There are no extensions of due dates without documented, extenuating circumstances subject to the approval of the instructor. All requests for extensions must be received by the instructor no less than 1 week prior to the due date; in the case of a documented emergency, you must contact the instructor within 24 hours to request an extension. Make-up exams are permitted with permission of instructor. Students must communicate with instructor to establish a day/time for make-up exam.

Evaluation

How your grade is calculated

ASSIGNMENT CATEGORY	PERCENTAGE
Lecture Exams (3 hour exams)	39
Final Exam	13

Discussion Forum participation	8
Problem sets (8 sets)	20
Excel exercises (4)	20
Extra credit excel exercise	(+5)
Total	**100 (+5)**

See course schedule below for due dates.

Description of Evaluation Activities:

Lecture exams – **39% of the total grade.**
There will be three midterm exams (13% each). The midterms will not be comprehensive.

Final Exam – **13% of the total grade.**
The final will be comprehensive, but emphasize material after the third midterm

Participating in discussion forums: **1+ TIMES PER WEEK – 8% of the total grade**
As part of your participation, each week you can expect to post at least once on the class discussion forum as part of our substantive class discussion on the week's topics.

Problem Sets- **20% of the total grade.**
There will be 8 **required** problem sets, starting the 1st week and continuing through the 13th week. The due date will be stated on the problem set. You will typically have 5-7 days to complete the problem set. The next problem set will be issued on the previous problem set's due date. See the calendar for more information.

Excel Exercises – **20% of the total grade required + up to 5% extra credit**
There are 5 exercises on Carmen that will help you to learn how to use the basic statistical analysis tools that are available in Microsoft Excel. This is the "lab" portion of the class. You are free to work on these at any time but on designated days I will set aside lecture time for you to work on them (see course schedule). The first 4 of these exercises are required for 20% of your grade. You may complete the other for an additional 5% extra credit. Below is a guide of exercise content:

Exercise	Chapter	Topic
1	1,2	Basic statistical analysis tools in Excel
2	2,3,4	Mean and Variance of a Random Variable
3	4	Probabilities and Sampling a Binomial Distribution
4	5,6	Central Limit Theorem, Probabilities of Normal Random Variables
5	11	Linear Correlation and Regression

Grading Scale: The standard grading scale is below.

Percentage	Grade	Percentage	Grade
93-100	A	73-76.9	C
90-92.9	A-	70-72.9	C-
87-89.9	B+	67-69.9	D+

83-86.9	B	60-66.9	D
80-82.9	B-	<60	E
77-79.9	C+		

COURSE POLICIES

Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

- **Grading and feedback:** For large weekly assignments, you can generally expect feedback within **7 days**.

- **E-mail:** Email sent to gardner.254@osu.edu will receive a reply within 24 hours on school days.

- **Discussion board:** I will check and reply to messages in the discussion boards every **24 hours on school days**.

Attendance Policy:

Student participation requirements

Because this is a distance-education course, your attendance is based on your online activity and participation. The following is a summary of everyone's expected participation:

- **Logging in***: AT LEAST ONCE PER WEEK*

  Be sure you are logging in to the course in Carmen each week, including weeks with holidays or weeks with minimal online course activity. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible.*

- **Office hours and live sessions**: *OPTIONAL OR FLEXIBLE*

  All live, scheduled events for the course, including my office hours, are optional. For live presentations, I will provide a recording that you can watch later. If you are required to discuss an assignment with me, please contact me at the beginning of the week if you need a time outside my scheduled office hours.

- **Participating in online activities for attendance**: *AT LEAST TWICE PER WEEK*

  You are expected to log in to the course in Carmen every week. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible.*

- **Participating in discussion forums:** *1+ TIMES PER WEEK*
  - **Class Discussion:** As participation, each week you can expect to post at least one time as part of our substantive class discussion on the week's topics.
  - **Posting to discussion board:** I will check and reply to your messages in the discussion boards every **24 hours on school days**.

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

Writing style:

While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. Informality (including an occasional emoticon) is fine for non-academic topics.

Tone and civility:

Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.

Citing your sources:

When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)

Backing up your work:

Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

E-Mail Etiquette:

For example, Professional relationships should be maintained when using e-mail for a class. Below I have included guidelines from Bloomsbury's guide on email etiquette that you should follow when drafting your e-mail. I will not respond to e-mails that I consider inappropriate. I will respond to appropriate emails in a timely manner, do not expect an immediate reply. If you require an immediate response consider visiting with me in person.

DO
- Include a descriptive statement in the subject line.
- Use proper salutations when beginning an e-mail.
- Be concise in the body of the e-mail, use complete sentences and proper grammar.
- Use an appropriate closure at the end of each e-mail followed by your first and last name.
- If replying to an e-mail, reference the original e-mail and its content.
- Be selective of your choice of words. Emotions are difficult to convey in text and without the benefit of facial expressions your sentiment can be lost in the words you choose to write.

DON'T
- Use all capital letters; this conveys a tone of ANGER.
- Use e-mail as a format to criticize other individuals.
- Ask for your grade via e-mail. Grades will not be discussed by e-mail. If you need to discuss a graded item make an appointment to do so in my office.
- E-mail to inquire when grades will be posted. We will work toward submitting grades promptly, however, recognize that grading assignments and exams requires considerable time to ensure uniformity and fairness.
- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review at a later time when emotions are not directing the content.

Quizzes and exams:

You must complete the midterm and final exams yourself, without any external help or communication. Weekly quizzes are included as self-checks without points attached.

Written assignments:

Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow **[MLA/APA]** style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.

Reusing past work:

In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.

Falsifying research or results:

All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.

Collaboration and informal peer-review*:*

The course includes many opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on a quiz or assignment is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.

Group projects

This course includes group projects, which can be stressful for students when it comes to dividing work, taking credit, and receiving grades and feedback. I have attempted to make the guidelines for group work as clear as possible for each activity and assignment, but please let me know if you have any questions.

UNIVERSITY POLICIES see: https://ugeducation.osu.edu/faculty-and-staff-resources for current versions

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct at Student Life http://studentconduct.osu.edu.

Ohio State's academic integrity policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- *Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)*
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Intellectual Property (covered by copyright) includes Course materials (Text, Audio, Video, Multimedia, Sims, Apps, etc.), and Student Generated materials

Disability Services

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential. In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to Office of Student Life - Disability Services for more information.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Canvas) accessibility
- Streaming audio and video
- Synchronous course tools
- Definition OSU

- [Overview of Accessibility at OSU](#)
- If you require specific software for the course list or provide a link to the software's accessibility privacy statements
  - [Adobe Connect (Carmen Connect) Accessibility](#) [Adobe Privacy Policy](#)
  - [MediaSite Accessibility Statement](#)
  - [Microsoft Office Accessibility](#) [Microsoft Office 365 Privacy](#)
  - [Proctorio Accessibility](#) [Proctorio Privacy](#)
  - [Top Hat Accessibility](#) [Top Hat Privacy](#)

Diversity

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

UNIVERSITY RESOURCES - see: https://ugeducation.osu.edu/faculty-and-staff-resources for current versions

Counseling and Consultation Services:

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Title IX:

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu.

Grievances

According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with the instructor or

professor. Then, if necessary, take your case to the department chairperson, college dean or associate dean, and to the provost, in that order. Specific procedures are outlined in Faculty Rule 3335-7-23. Grievances against graduate, research, and teaching assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department.

Trigger Warning

Some contents of this course may involve media that may be triggering to some students due to descriptions of and/or scenes depicting acts of violence, acts of war, or sexual violence and its aftermath. If needed, please take care of yourself while watching/reading this material (leaving classroom to take a water/bathroom break, debriefing with a friend, contacting a Sexual Violence Support Coordinator at 614-292-1111, or Counseling and Consultation Services at 614-292-5766, and contacting the instructor if needed). Expectations are that we all will be respectful of our classmates while consuming this media and that we will create a safe space for each other. Failure to show respect to each other may result in dismissal from the class.

GE Rationale – HCS 2260 Data Analysis and Interpretation for Decision Making

GE Learning Objective 1: Students understand basic concepts of statistics and probability.

Course Objectives:
- Differentiate a population from a sample and understand the parameters that describe a population or sample.

Topics: statistics as a language, types of data, sampling methods, methods of describing qualitative and quantitative data, interpreting data in the form or tables, figures and graphs, rules of probability, discrete probability, expected values, continuous probability

Readings/Lecture Material: Videos of lectures uploaded to Carmen. Readings from Statistics 10th Edition, McClave and Sincich

Written Assignments: Discussion forum posts, problem sets, computer exercises

GE Learning Objective 2: Students comprehend methods needed to analyze and critically evaluate statistical arguments.

Course Objectives:
- Differentiate a population from a sample and understand the parameters that describe a population or sample.
- Apply statistics for informed decision-making and for specific areas of study, through understanding of probability, sample methodology and hypothesis testing.

Topics: sampling and sample distributions, the central limit theorem, confidence intervals, hypothesis testing, inferences based on 2 samples, analysis of variance, and regression.

Readings/Lecture Material: Videos of lectures uploaded to Carmen. Readings from Statistics 10th Edition, McClave and Sincich

Written Assignments: Problem sets, computer exercises

GE Learning Objective 3: Students recognize the importance of statistical ideas.

Course Objectives:
- Differentiate a population from a sample and understand the parameters that describe a population or sample.
- Apply statistics for informed decision-making and for specific areas of study, through understanding of probability, sample methodology and hypothesis testing.

- Distinguish appropriate and inappropriate applications of statistics in daily life.

Topics: statistics as a language: words symbols and terms, methods of describing qualitative and quantitative data, interpreting data in the form or tables, figures and graphs, distorting the truth with deceptive statistics,

Readings/Lecture Material: Videos of lectures uploaded to Carmen. Readings from Statistics 10th Edition, McClave and Sincich

Written Assignments: Discussion forum posts, problem sets

VII.B.8. Data Analysis

Goals:
Students develop skills in drawing conclusions and critically evaluating results based on data.

Expected Learning Outcomes:
1. Students understand basic concepts of statistics and probability.
2. Students comprehend methods needed to analyze and critically evaluate statistical arguments.
3. Students recognize the importance of statistical ideas.

Courses proposed for this component of the General Education (GE) should be designed with these goals and expected learning outcomes (ELOs) in mind and considered in terms of their contribution to the requirement as a whole. Courses will be reviewed by the Arts and Sciences Curriculum Committee (ASCC) in light of these goals and expected learning outcomes. All GE courses should be made available to undergraduates with a minimum of prerequisites and not be restricted to majors.

Proposals must include the following:
1. The appropriate Course Request Form via curriculum.osu.edu

2. A course syllabus that follows the ASC syllabus template guidelines (see pp. 13-15).

3. A concurrence should be solicited from the Department of Statistics specifically addressing the requested GE Data Analysis status.

4. A GE rationale that addresses how the course will meet the required coursework outlined below (pp. 59-60).

5. A GE assessment plan which explains how the faculty teaching the course will assess the effectiveness of the course in achieving the GE expected learning outcomes over time, rather than how individual student grades will be assessed. As you develop your GE assessment plan, please bear in mind that the faculty will need to implement it from the very first offering of the course so keep it simple (a GE assessment plan should not be so complex that it cannot be implemented).

Complete the following table to show how the faculty will assess the three expected learning outcomes. Then, in an appendix, provide one or more specific example(s) for each assessment method you will use.

GE Expected Learning Outcomes	Methods of Assessment *Direct methods are required. Additional indirect methods are encouraged.*	Level of student achievement expected for the GE ELO. *(for example, define percentage of students achieving a specified level on a scoring rubric)*	What is the process that will be used to review the data and potentially change the course to improve student learning of GE ELOs?
ELO 1 Students understand basic concepts of statistics and probability.	**1.** Problem sets Problem sets will cover multiple topics and be spread evenly throughout the course. They are 20% of the overall grade. **2.** Excel Exercises The Excel exercises are worth 20% of the overall grade with an opportunity for 5% extra credit. There are 5 exercises that cover different chapters in the course. **3.** Lecture Exams Lecture exam account for 39% of the overall grade. There are three exams, each for a total of 13%. These exams are not comprehensive and cover certain portions of the course. **4.** Final Exam The final exam is comprehensive but will also have an emphasis on material after the third lecture exam. The final exam accounts for 13 % of the final grade.	1. 85% of students to achieve 80% or higher based on grading rubric. 2. 100% of students will evaluate their work in the course and achieve 90% or higher on grading rubric. 3. 85% of students will achieve a grade in the top ten percentile of grading rubric 4. 85% of students to achieve 80% or higher based on grading rubric	**1.** Problem set and Excel exercise grades and review questions **2.** SEIs information, especially if comments are negative on activities. **3.** Carmen analytics: Do students participate and view each page as required? **4.** In-class discussion and feedback

ELO 2		
ELO 2 Students comprehend methods needed to analyze and critically evaluate statistical arguments.	**1.** Problem sets Problem sets will cover multiple topics and be spread evenly throughout the course. They are 20% of the overall grade. **2.** Excel Exercises The Excel exercises are worth 20% of the overall grade with an opportunity for 5% extra credit. There are 5 exercises that cover different chapters in the course. **3.** Lecture Exams Lecture exam account for 39% of the overall grade. There are three exams, each for a total of 13%. These exams are not comprehensive and cover certain portions of the course. **4.** Final Exam The final exam is comprehensive but will also have an emphasis on material after the third lecture exam. The final exam accounts for 13 % of the final grade.	**1.** 85% of students to achieve 80% or higher based on grading rubric. **2.** 100% of students will evaluate their work in the course and achieve 90% or higher on grading rubric. **3.** 85% of students will achieve a grade in the top ten percentile of grading rubric **4.** 85% of students to achieve 80% or higher based on grading rubric
ELO 3 Students recognize the importance of statistical ideas.	**1.** Problem sets Problem sets will cover multiple topics and be spread evenly throughout the course. They are 20% of the overall grade. **2.** Excel Exercises The Excel exercises are worth 20% of the overall grade with an opportunity for 5% extra credit. There are 5 exercises that cover different chapters in the course. **3.** Discussion Forum Students are required to post once per week on	**1.** 85% of students to achieve 80% or higher based on grading rubric. **2.** 100% of students will evaluate their work in the course and achieve 90% or higher on grading rubric. **3.** 100% student participation (outlined in syllabus and rubric)

	that week's topic. Discussion forum posts count for 8% of the overall grade.		

*Direct Methods *assess student performance related to the expected learning outcomes. Examples of direct assessments are course-embedded questions; pre/post test; standardized exams; portfolio evaluation; videotape/audiotape of performance; rubric-based evaluation of student work.*

*Indirect Methods *assess opinions or thoughts about student knowledge, skills, attitudes, learning experiences, and perceptions. Examples of indirect measures are student surveys about instruction; focus groups; student self-evaluations.*

After the second offering of the course, please submit an initial report summarizing the GE assessment results following the format of the "Assessment Report Requirements" in Appendix 11.

7. *For ASC units only*: If the GE request applies to a new course and the new course can also count toward the major of the submitting unit (whether as a required course or as an elective), please include the <u>curriculum map</u> of that program to which you have added the newly proposed course, indicating the program goal(s) and levels it is designed to meet. If the course is not new but the request involves moving the course to a new level or place on the major's curriculum map, the updated map will need to be provided as well.

Required Coursework for Students:

The intent of this General Education category is to enable students to deal with the gathering, presentation, and interpretation of data. Students should develop an understanding of problems of measurement, be able to deal critically with numerical and graphical arguments, and recognize the uses and misuses of statistics and related quantitative arguments. Courses should include exposure to fundamental ideas of probability, involve the use of computational technology in problems of data analysis, and include opportunities to present data using summary measures and graphical techniques. Specialized courses within the B. S. major may also be proposed to satisfy this requirement.

The ASCC Natural and Mathematical Sciences Panel and the full ASCC will use these guidelines (approved by the ASCC on April 11, 2014) as the basis for evaluation of data analysis courses. The fulfillment of the following criteria would make the course eligible to be considered for GE Data Analysis status with the final decision based on the overall rigor and sophistication of the course. Prerequisite courses can count in the requirement (for example Statistics 4202 meets the requirement because Statistics 4201 is a prerequisite).

Core requirements (at least 4 instructional hours spent on each bullet):

- Notions of probability. The axioms of probability, and basic probability calculations. Random variables, and probability calculations using random variables. Expected values.
- Basics of statistical inference. Moving from a sample to a population. Bias and variance. Understanding the margin of error and confidence. The logic of statistical testing. The misuse of statistics.

Additional requirements (At least two out of four, with at least 3 instructional hours spent on each numbered item):

1. Understanding where data come from. Data sources. Discriminating between observational and experimental studies. (Random) sampling.
2. Summarizing data graphically and numerically. Discriminating between good and bad summaries. Understanding the advantages and disadvantages of a given summary.

3. Methods of statistical inference. Statistical testing. Constructing confidence intervals. Making quantitative statistical arguments using data. Understanding and verifying assumptions underlying a given inference.
4. Statistical modeling (e.g., regression models, analysis of variance). Interpreting the parameters underlying statistical models. Model assessment.

Thus, in a three-semester-hour course, for example, at least one third of the class should be spent teaching topics in probability and statistics.

Possible software: The R Project for Statistical Computing (www.r-project.org) is an open source statistical software package. Commercial packages for which the university has a license include MATLAB, Mathematica, Minitab, JMP, SAS, SPSS, and Stata.

Useful reference: "Statistics: Concepts and Controversies, 8th ed." by Moore and Notz (The Statistics 1350 text).

Arts and Sciences Distance Learning Course Component Technical Review Checklist

Course: HCS 2260
Instructor: David Gardner
Summary: Data Analysis and Interpretation for Decision Making

Standard - Course Technology	Yes	Yes with Revisions	No	Feedback/ Recomm.
6.1 The tools used in the course support the learning objectives and competencies.	X			• Carmen • Office 365 • CarmenZoom
6.2 Course tools promote learner engagement and active learning.	X			• CarmenZoom • Carmen Quizzes
6.3 Technologies required in the course are readily obtainable.	X			All are available for free via OSU site license
6.4 The course technologies are current.	X			All are updated regularly.
6.5 Links are provided to privacy policies for all external tools required in the course.	X			No external tools are used
Standard - Learner Support				
7.1 The course instructions articulate or link to a clear description of the technical support offered and how to access it.	X			Links to 8HELP are provided.
7.2 Course instructions articulate or link to the institution's accessibility policies and services.	X			a
7.3 Course instructions articulate or link to an explanation of how the institution's academic support services and resources can help learners succeed in the course and how learners can obtain them.	X			b
7.4 Course instructions articulate or link to an explanation of how the institution's student services and resources can help learners succeed and how learners can obtain them.	X			C
Standard – Accessibility and Usability				
8.1 Course navigation facilitates ease of use.	X			Recommend using the Carmen Distance Learning "Master Course" template developed by ODEE and available in the Canvas Commons to provide student-users with a consistent user experience in terms of navigation and access to course content.
8.2 Information is provided about the accessibility of all technologies required in the course.	X			Accessibility links are provided for all tools.
8.3 The course provides alternative means of access to course materials in formats that meet the needs of diverse learners.	X			
8.4 The course design facilitates readability	X			Comes across like a wall of text. This could be solved by using the distance learning syllabus template.
8.5 Course multimedia facilitate ease of use.	X			All assignments and activities that use the Carmen LMS with embedded multimedia facilitates ease of use. All other multimedia resources facilitate ease of use by being available through a standard web browser

Reviewer Information

- Date reviewed: 8/25/20
- Reviewed by: Ian Anderson

Notes: Good to go!

[a]The following statement about disability services (recommended 16 point font): Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614- 292-3307, slds@osu.edu; slds.osu.edu.

[b]Add to the syllabus this link with an overview and contact information for the student academic services offered on the OSU main campus.
http://advising.osu.edu/welcome.shtml

[c]Add to the syllabus this link with an overview and contact information for student services offered on the OSU main campus. http://ssc.osu.edu. Also, consider including this link in the "Other Course Policies" section of the syllabus.