

## Term Information

Effective Term Spring 2020  
*Previous Value* Spring 2015

## Course Change Information

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

This is a request for approval of an online version of the International Studies 3400 Analysis and Display of Data class (the in-class version was previously approved and the class is offered on a regular basis).

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

To provide students the option of taking an online version of the class.

### 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)?

No programmatic implications for existing International Studies majors and minors. Please note the INTSTDS 3400 class is not approved for use in the ECON major.

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	International Studies
Fiscal Unit/Academic Org	UG International Studies Prog - D0709
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	3400
Course Title	The Analysis and Display of Data
Transcript Abbreviation	Anlys&Display Data
Course Description	Introduction to the analysis of data. Topics include sampling, data collection, probability, inference, random variables, display of data, correlation, and analysis of variance. This course does not count toward a course elective for Econ majors.
Semester Credit Hours/Units	Fixed: 3

## Offering Information

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week, 6 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
<i>Previous Value</i>	<i>No</i>
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

Exclusions Not open to students with credit for Econ 4400 (444), 5410 (641), 5420 (642), 3400 (443), Stat 1430 (133), 1450 (145), 2450 (245) or AEDEcon 2005 (205).

Electronically Enforced No

## Cross-Listings

Cross-Listings Cross-listed in Econ.

## Subject/CIP Code

Subject/CIP Code 27.0501  
Subsidy Level Baccalaureate Course  
*Previous Value* *General Studies Course*  
Intended Rank Sophomore, Junior, Senior

## Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors

General Education course:

Data Analysis

The course is an elective (for this or other units) or is a service course for other units

## Course Details

### Course goals or learning objectives/outcomes

- This course is an introduction to the analysis of data, drawing on statistical principles and theory used to interpret data from a social science perspective. The course places some emphasis on the application of statistics to economic measurement.

### Content Topic List

- Types of data, levels of measurement and organizing data (frequency distributions, proportions, ratios, cumulative distributions, bar charts, stem, leaf plots, histograms, frequency polygons and pie charts)
- Summarizing data: Measures of Central Tendency and Variability (mode, median and mean, range, mean deviation, variance and standard deviation)
- Making the leap from description to inference (probability and the rules of probability, probability distributions and what they allow us to do)
- Making the leap from description to inference (the normal curve, standard normal curve sampling distribution, standard errors and what they allow us to do)
- Inferential Statistics: Hypothesis testing using the Normal Distribution. Hypothesis testing using the t-distribution. Difference between hypothesis testing. Correlation and Regression.
- Data collection
- Analysis of variance

Sought Concurrence No

**Attachments**

- INTSTDS 3400 Syllabus-2, Online Version.docx: Online Version  
*(Syllabus. Owner: Meltz,Richard Lee)*
- 3400\_MW\_220 Keshk.docx: In-Class Version  
*(Syllabus. Owner: Meltz,Richard Lee)*
- INTSTDS 3400 Online, ASC Technical Review Checklist.pdf: ASC Tech Checklist  
*(Other Supporting Documentation. Owner: Meltz,Richard Lee)*
- 3400 Gen Ed Expected Learning Outcomes.docx: Gen Ed ELOs Checklist  
*(GEC Course Assessment Plan. Owner: Meltz,Richard Lee)*
- INTSTDS 3400 Syllabus Online Version\_Revised.docx: Online Syllabus, Revised  
*(Syllabus. Owner: Meltz,Richard Lee)*

**Comments**

- Revised Syllabus attached 10/02/2019 per feedback dated 09/23/2019 *(by Meltz,Richard Lee on 10/02/2019 01:19 PM)*
- See 9-23-19 feedback email to unit. *(by Vankeerbergen,Bernadette Chantal on 09/23/2019 04:03 PM)*

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Meltz,Richard Lee	07/02/2019 03:07 PM	Submitted for Approval
Approved	Kurtz,Marcus Jurgen	07/03/2019 06:37 AM	Unit Approval
Approved	Haddad,Deborah Moore	07/03/2019 08:08 AM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	09/23/2019 04:03 PM	ASCCAO Approval
Submitted	Meltz,Richard Lee	10/02/2019 02:52 PM	Submitted for Approval
Approved	Kurtz,Marcus Jurgen	10/02/2019 02:53 PM	Unit Approval
Approved	Haddad,Deborah Moore	10/02/2019 03:13 PM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Oldroyd,Shelby Quinn Vankeerbergen,Bernadette Chantal	10/02/2019 03:13 PM	ASCCAO Approval



**THE OHIO STATE UNIVERSITY**

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COLLEGE OF ARTS AND SCIENCES

# **SYLLABUS: IS/3400**

## **THE ANALYSIS AND DISPLAY OF DATA**

### **SPRING 2020**

## **Course overview**

The analysis and display of data provides students with an introduction to the steps and methods involved in gathering, presenting, analyzing and interpreting data. Students will develop an understanding of how to critically evaluate the validity of statistical arguments, numerical and/or graphical.

## **Instructor**

Instructor: Omar Keshk

Email address: [keshk.1@osu.edu](mailto:keshk.1@osu.edu)

Phone number: 614-688-4563

Office hours: to be determined

Office Location: 33 Townshend Hall, 1885 Neil Avenue

## **Course description**

The course will introduce students to the use of descriptive and inferential statistical techniques to present and analyze data. Emphasis will be on why, how and when to perform different statistical techniques.

## **Course learning outcomes**

By the end of this course, students should successfully be able to:

- Properly collect, analyze and present data
- Understand the role of descriptive statistical techniques in summarizing and presenting data

- Understand the role of inferential statistical techniques in testing hypotheses about real world phenomena
- Be competent consumers and/or users of statistical methods, understanding their strengths and weaknesses.

## GE Course Information

- This course satisfies the General Education requirement in Data Analysis
- Goals: Students develop skills in drawing conclusions and critically evaluating results based on data
- Learning Outcomes: Students understand basic concepts of statistics and probability, comprehend methods needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas.

## Course materials

### Required

Text:

[http://onlinestatbook.com/Online\\_Statistics\\_Education.pdf](http://onlinestatbook.com/Online_Statistics_Education.pdf) (Electronic on line, can be downloaded)

R Reader Part 1 and 2 (Electronic on line on Carmen)

Software:

You will be using a free program called RStudio. All activities that involve the use of RStudio will include detailed instructions on how to download, install and use the free program.

For other help with RStudio, please visit: <https://support.rstudio.com/hc/en-us>

### Optional materials

Wheelan, Charles. 2013. *Naked Statistics: Stripping the Dread from the Data*. New York: W.W. Norton and Company (Do not purchase if book costs more than \$10.00)

## 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 <https://ocio.osu.edu/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](mailto:8help@osu.edu)

- TDD: 614-688-8743
- Help with student academic services: <http://advising.osu.edu/welcome.shtml>

### Baseline technical skills necessary for online courses

- Basic computer and web-browsing skills
- Navigating Carmen

### Technology skills necessary for this specific course

- CarmenConnect text, audio, and video chat

### Necessary equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- RStudio, a free downloadable application that is available for Mac and Windows.  
Available at the following: <https://www.rstudio.com/products/RStudio/#Desktop>

## Grading and faculty response

### Grades

Assignment or category	Points
Practice Lab 1	0.25% (Extra Credit),
Lab 1	5%
Assignment 1	5%
Practice Lab 2	0.25% (Extra Credit),
Lab 2	5%
Assignment 2	10%
Practice Lab 3	0.25% (Extra Credit),
Lab 3	5%
Assignment 3	15%
Practice Lab 4	0.25% (Extra Credit),
Lab 4	5%
Assignment 4	20%

<b>Final Exam</b>	<b>30%</b>
<b>Total</b>	<b>100</b>

*See course schedule, below, for due dates*

## Assignment information

All labs, assignments, and the exam will be done, submitted and graded on line. The assignments will consist of true/false, multiple choice, fill in the blanks questions, and questions dealing with statistical application, computation and interpretation. The labs will consist of statistical computations and interpretation, with the majority of the emphasis on using statistical software to perform the computations.

## Late assignments

All assignments are posted a minimum of one week before they are due and therefore there is no excuse for turning in assignments late, unless with a valid excuse. It is to the instructor's discretion whether to accept the excuse, unless the excuse is consistent with OSU policy and requirements. Unexcused assignments submitted after due date will be deducted 10% per day. No late assignments will be accepted 5 days after the due date.

## Final Exam

There is only one exam in this class, the final exam. It will be online; it will be timed (1 hour and 45 minutes). I will give students a 2 day window to choose when to do it (the two days will be consistent with OSU mandated final exam times and dates). Once started the exam has to be completed in a single session (1 hour 45 minutes). There is absolutely no excuse for missing the exam, except for a valid medical reason. Students have to inform the instructor before, not after, the exam deadline of any issues that arise that prevent them from completing the exam.

## Grading scale

93.5–100: A  
 89.5–93.49: A-  
 86.5–89.49: B+  
 82.5–86.49: B  
 79.5–82.49: B-  
 76.5–79.49: C+  
 72.5–76.49: C  
 69.5–72.49: C-  
 66.5–69.49: D+  
 59.5–66.49: D  
 Below 59.49: E

## 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 labs, assignments, you can generally expect assignments to be graded, and commented on within **7 days**.

### E-mail

I will reply to e-mails within **24 hours on school days**. If you do not get a reply, send another email after 24 hours. If again, no response, chances are there is something wrong with my email filter and your specific email and we will get it resolved.

## Attendance, participation, and discussions

### 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*.

## Other course policies

### Academic integrity policy

#### Policies for this online course

- **Labs, assignments and Exam:** You must complete the labs, assignments, and exam by yourself, without any external help or communication.
- **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.

## Student Services

For an overview and contact information for student services offered on OSU main campus, please visit: <http://ssc.osu.edu>.

Student academic services can be accessed via <http://advising.osu.edu> or through the International Studies department (call 614-292-9657 to arrange either an in-person, e-mail or telephone based appointment).

## Ohio State's academic integrity policy

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 <http://studentlife.osu.edu/csc/>.

## Copyright disclaimer

The materials used in connection with this course are 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. I consider this material my work (unless otherwise noted) and do not want it distributed outside of the class. Materials such as lecture notes, labs, assignments and their solutions represent the instructor's own original work (unless otherwise noted) and may not be commercialized in anyway by students or disseminated to anyone not enrolled in the class, currently or in the future.

## Statement on title IX (Recommended)

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 <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at [titleix@osu.edu](mailto:titleix@osu.edu)

## Accessibility accommodations for students with disabilities

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 on as possible of their needs. The Office of Student Life Disability Services is located at 098 Baker Hall, 113 W. 12th Avenue; telephone 614-292-3307; SLDS [slds@osu.edu](mailto:slds@osu.edu); [slds.osu.edu](http://slds.osu.edu).

### 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

## Your mental health!

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. *YOUR LIFE AND HEALTH IS MORE IMPORTANT THAN ANY GRADE YOU WILL EVER GET.* 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](http://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](http://suicidepreventionlifeline.org)

## Course schedule (tentative)

Module	Topics	Readings
1 Week 1	Introduction to Class, Why Data Analysis	<b>Wheelan: Introduction and Chapter 1</b>
2 Week 2 & 3	<i>Types of Data (Qualitative and Quantitative), Levels of Measurement (Nominal, Ordinal, and Interval)</i>	<b>Online stats book:</b> 10-28 & 34-57 & 61 <b>Wheelan:</b> Chapter 7.
3 Week 4	Organizing Data (Frequency Distributions, Cumulative Distributions, Bar Charts, , Histograms, , and Pie Charts)	<b>Online stats book:</b> 65-114 & 34-57 & 61 <b>Wheelan:</b> Chapter 2.
4 Week 4 & 5	Measures of Central Tendency) and Measures of Variability	<b>Online stats book:</b> pp. 123-158 <b>Wheelan:</b> Chapter 3.
5 Week 6	Probability , its rules of Probability, and Probability Distributions	<b>Online stats book:</b> pp. 185-197 <b>Wheelan:</b> Chapter 5 & 6
6 Week 7 & 8	The Normal Curve, Random Sampling, Sampling Distributions, Standard Error	<b>Online stats book:</b> pp. 249-263 & 300-311 <b>Wheelan:</b> Chapter 8.
7 Week 9	Hypothesis testing using the Normal Distribution	<b>Online stats book:</b> pp. 329-339 & 370-393 & 399-406 <b>Wheelan:</b> Chapter 9
8 Week 10	Hypothesis testing using the t-distribution	<b>Online stats book:</b> pp. 340-356
9 Week 11	Difference between Means hypothesis testing	<b>Online stats book:</b> pp. 312-316 & 407-412 <b>Wheelan:</b> Chapter 13
10 Week 12	<i>Correlation</i>	<b>Online stats book:</b> pp. 317-322 & 357-358 <b>Wheelan:</b> Chapter 4
11 Week 13 & 14	<i>Bivariate and Multiple Regression</i>	<b>Online stats book:</b> pp. 462-509 <b>Wheelan:</b> Chapter 11, 12 & conclusion

**THE ANALYSIS AND DISPLAY OF DATA**  
**IS 3400**  
**SPRING 2019**  
**DERBY HALL, 0125**  
**MONDAY AND WEDNESDAY 2:20-3:40pm**

**SYLLABUS**

**Lecturer:** Dr. Omar Keshk  
**Office:** 33 Townsend Hall  
**Office Hours:** M & W 9.45am-10:55am  
T & TH 9.45am-10.45am & 1.10 pm-2.00pm  
or anytime by appointment  
**Office phone:** 292-9657  
**Email:** keshk.1@osu.edu  
**Class Web site:** [Carmen](#)

**Course Description and Objectives**

The purpose of this course is to introduce students to the analysis and presentation of data. To this end, this class will first introduce students to the most common methods of summarizing or modeling data (*descriptive statistics*). An understanding of how data is and can be summarized is important for those wishing to analyze and present data. Second, the students will be introduced to how the analysis of data is used to *substantiate* opinions and/or judgments of phenomena of interest (*inferential statistics*). This is perhaps the most powerful and most important use of data. This class will hopefully lay the foundation for students to become capable consumers and users of data in the future.

Note to all students, the study of statistics is cumulative. That is, to understand the material in the second week of lectures, you must first understand the material in the first week of lectures. If you miss a class, you will fall behind. It is imperative that you attend every class session. It is a *statistical* fact that the more classes you miss, the lower your grade will be. So do not miss any classes. Furthermore, if you miss a class or more, do not ask the Professor to fill you in on what you missed. I cannot fill you in on material that took two hours to discuss and I will not spend two hours reviewing what you missed. Consider yourselves warned.

**Course Readings**

**Required Reading**

Online Statistics Book for this class: <http://onlinestatbook.com/> (Syllabus refers to pdf version).

**Optional Reading**

Wheelan, Charles. 2013. *Naked Statistics: Stripping the Dread from the Data*. New York: W.W. Norton and Company (Do not purchase if book costs more than \$10.00)

## Course Requirements and Students Responsibilities

**Exams:** One Final Exam (Cumulative) 35%.

**Tentative Homework/Assignments:** Four assignments: 1<sup>st</sup> = 5%, 2<sup>nd</sup> = 15%, 3<sup>rd</sup> = 20% 4<sup>th</sup> = 25%

**Extra Credit Assignment:** 2.5%

### Warnings

No make-ups for missed exams, papers or assignments will be allowed under any circumstances except for valid medical reasons. Students experiencing any medical problems necessitating that they miss an exam must contact me as soon as possible or else they will not be allowed to make up the missed work. Finally, all makeup structure is left to the instructor's discretion and may be nothing like the work that was assigned to the rest of the class. No make-ups for papers will be allowed. **INSTRUCTOR CANNOT GIVE EXAMS EARLY TO ANY STUDENT UNDER ANY CIRCUMSTANCE.**

Instructor cannot accept any emailed work. All work must be printed and turned in during class.

**NOTE: PROFESSOR RESERVES THE RIGHT TO CHANGE EXAMS DATES DEPENDING ON HOW THE CLASS IS PROGRESSING.**

### **GRADING:**

**All students are advised to read my grading philosophy which is posted in an pdf file on carmen.**

**All Students are strongly encouraged to keep all graded assignments in their possession until their final grade is posted and they are satisfied. Any disagreement between the grade the professor has in his records and what the student believes he/she should have will only be resolved in their favor if they have the graded assignment showing the appropriate grade. Thus, having the graded assignment is an essential first step in any grade correction attempt. Without such evidence, there is no hope whatsoever.**

### Legal Requirements

#### **Academic Honesty**

**NO CHEATING WILL BE TOLERATED.** All University rules regarding plagiarism and academic dishonesty will be enforced. All cases will be referred to the Committee on Academic Misconduct for adjudication and enforcement. Please note the above are very serious offense and by contract, I must report all instances to the Committee on Academic Misconduct. The University Rules on academic misconduct can be found at <http://acs.ohio-state.edu/officies/oa/procedures/1.0.html> . The safest thing is to remember that if you take someone else's ideas, thoughts, opinion, etc. than you must cite them, i.e., give them credit. Always remember better safe than sorry.

#### **Disability**

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](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu);  
098 Baker Hall, 113 W. 12<sup>th</sup> Avenue.

### Recording Lectures:

No student can record lectures without the consent of the professor. Furthermore, the recorded lectures cannot be distributed, sold, or exchanged without the written consent of the instructor. The student wishing to tape the lectures will be required to sign a form affirming that they understand these restrictions, abide by them and accept liability if they violate them.

### Miscellaneous

If students want their exams and their papers after the semester has ended they must notify the Instructor within two weeks of the beginning of the following semester. Otherwise, their exams, papers, etc. will be disposed off after the 1<sup>st</sup> week of the following semester.

### Class Schedule

#### WEEK 1-3

#### ***Introduction to Class, and Data Analysis***

**Topics:** *Introduction to Class, Why Data Analysis & Begin Discussion of levels of measurement.*

#### ***Readings***

**Wheelan:** Introduction and Chapter 1.

#### ***Levels of Measurement, Organizing and Describing Data***

**Topics:** *Types of Data (Qualitative and Quantitative), Levels of Measurement (Nominal, Ordinal, and Interval)*

#### ***Readings***

**Wheelan:** Chapter 7.

**Online stats book:** 10-28 & 34-57 & 61

**Topics:** *Organizing Data (Frequency Distributions, Proportions, Ratios, Cumulative Distributions, Bar Charts, , Histograms, , and Pie Charts)*

#### ***Readings***

**Wheelan:** Chapter 7 & 2.

**Online stats book:** 65-114 & 34-57 & 61

#### **Descriptive Statistics**

**Topics:** *Mode, Median and Mean, Range, Mean Deviation, Variance and Standard Deviation*

#### ***Readings***

**Wheelan:** Chapter 3.

**Online stats book:** pp. 123-158

#### WEEK 4-5

#### ***Probability***

**Topics:** *Probability and the rules of Probability, Probability*

*Distributions and what they allow us to do*

**Readings**

**Wheelan:** Chapter 5 & 6

**Online stats book:** pp. 185-197 &

**WEEK 6-7**

**Topics:** *The Normal Curve, Standard Normal Curve Sampling Distributions, Standard Errors and what they allow us to do*

**Readings**

**Wheelan:** Chapter 8.

**Online stats book:** pp. 249-263 & 300-311

**WEEK 8-9**

***Inferential Statistics***

**Topics:** *Hypothesis testing using the Normal Distribution*

**Readings**

**Wheelan:** Chapter 9

**Online stats book:** pp. 329-339 & 370-393 & 399-406

**WEEK 10**

**Topics:** *Hypothesis testing using the t-distribution*

**Online stats book:** pp. 340-356

**WEEK 11-12**

**Topics:** *Difference between Means hypothesis testing*

**Readings**

**Wheelan:** Chapter 13

**Online stats book:** pp. 312-316 & 407-412

**WEEK 13-14**

**Topics:** *Correlation: What is it and what does it tell us  
& Correlation: Testing the significance of the relationship*

**Readings**

**Wheelan:** Chapter 4

**Online stats book:** pp. 317-322 & 357-358

**WEEK 15-16**

**Topics:** *Bivariate and Multiple Regression: What is it, what does it tell us and how to do it  
& what are its limits*

**Readings**

**Wheelan:** Chapter 11 & 12 AND conclusion

**Online stats book:** pp. 462-509

**Final Exam April 30<sup>th</sup> 4.00-5.45pm**

## **GEC STATEMENT**

### **Data Analysis**

**Goals:**

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

**Expected Learning Outcomes:**

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



## Arts and Sciences Distance Learning Course Component Technical Review Checklist

**Course:** IS 3400

**Instructor:** Omar Keshk

**Summary:** The Analysis and Display of Data

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			<ul style="list-style-type: none"> <li>- Carmen</li> <li>- Online Stats Book</li> <li>- R Studio</li> </ul>
6.2 Course tools promote learner engagement and active learning.	X			Carmen is the main tool for interaction. If there is interaction (message board discussions for example) with other students, it should be stated.
6.3 Technologies required in the course are readily obtainable.	X			All tools are available for free or free (R Studio) as part of the OSU site license software package (Office 365).
6.4 The course technologies are current.	X			All are regularly updated or web based.
6.5 Links are provided to privacy policies for all external tools required in the course.	X			Since accounts are not required to download all studio and all other tools are 1 <sup>st</sup> party, this requirement is met.
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 are provided for all tools.
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.				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 policy for R Studio does not seem to exist on their website so this is approved.
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			
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
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**Reviewer Information**

- Date reviewed: 6/12/19
- Reviewed by: Ian Anderson

**Notes: Consider adding dates to the course schedule so there is no confusion about the start and end of the weeks.**

<sup>a</sup>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](mailto:slds@osu.edu); [slds.osu.edu](http://slds.osu.edu).

<sup>b</sup>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>

<sup>c</sup>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.

Scoring Rubric to Report GE INTSTDS 3400 Data Analysis  
Results

	Capstone (4)	Milestone (3)	Milestone (2)	Benchmark (1)
<b>(ELO1)</b>  <b>Students understand basic concepts of statistics and probability.</b>	Final Exam will combined all three learning outcomes and test the students in their ability to apply what they learned in and on a new novel problem.	Assignments (required) will require students to apply these concepts to novel applications and new situations. (Assignments 1,2,3 will test for this).	Labs (required) will require the student to demonstrate a basic understanding of these concepts and show that they can define and apply their rules in Labs. (Labs 1,2,3 will test for this).	Practice labs (optional, extra credit) will establish the students' basic understanding with respect to this learning outcome. (Practice labs 1, 2,3 will deal with this)
<b>(ELO2)</b>  <b>Students comprehend methods needed to analyze and critically evaluate statistical arguments.</b>	Final Exam will combined all three learning outcomes and test the students in their ability to apply what they learned in and on a new novel problem.	Assignments (required) will require students to apply these concepts to novel applications and new situations. (Assignments 3,4 will test for this).	Labs (required) will require the student to demonstrate a basic understanding of these concepts and show that they can define and apply their rules in Labs. (Labs 3,4 will test for this).	Practice labs (optional, extra credit) will establish the students basic understanding with respect to this learning outcome. (Practice labs 3,4 will deal with this)
<b>(ELO3)</b>  <b>Students recognize the importance of statistical ideas.</b>	Final Exam will combines all three learning outcomes and test the students in their ability to apply what they learned in and on a new novel problem and how statistics can help solve certain problems.	All Assignments will stress and show the importance of statistical ideas in real life settings.	All labs will stress and show the importance of statistical ideas in controlled settings.	All Practice labs should establish the students' awareness of the importance of statistical ideas.