COURSE SYLLABUS – MATH 3339  
Statistics for the Sciences

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YEAR COURSE OFFERED: 2020  

SEMESTER COURSE OFFERED: Spring 2020  

DEPARTMENT: MATH  

COURSE NUMBER: 3339 – 15951  

NAME OF COURSE: Statistics for the Sciences  

NAME OF INSTRUCTOR: Wendy “Wenshuang” Wang

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The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

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Email Policy

In order to make sure I see class related emails, I require that students include “MATH 3339 Section 15951” as well as a searchable description of the issue in the subject line for ALL course-related email correspondence. I repeat, I am not responsible for addressing any email which does not conform to this policy. This is especially important when you have a special or urgent issue or request. If you do not receive a timely response to an important email, it is your responsibility to send a follow-up email. If I not respond to your email within two working days, please resend the email. If you again do not hear from me within one more working day, it is likely that your email is not coming through and you should come to office hours or speak with me before or after class. It is your responsibility to ensure that I am aware of issues you may have with the course; failure to effectively initiate timely communication is not a valid basis for a grade grievance and cannot be used as such.

Course Description

- Graphical and descriptive methods in statistics, probability, random variables and distributions, sampling, estimation, hypothesis testing, regression, analysis of variance, exploratory and diagnostics, statistical computing.
- Credits: 3 hours
- Prerequisite: MATH 1432
Learning Objectives
The student will be able to:
- Demonstrate the ability to understand basic theory of probability and statistics.
- Understand fundamentals of probability, distribution theory and sampling models.
- Interpret statistical data.
- Understand statistical inference and interpretation.
- Apply statistical concepts to actual scientific data using some sort of computer software.

Instructor Information
- Instructor: Wendy “Wenshuang” Wang
- Office: Fleming 11F
- Office Hours: Tuesday 10 -11 AM, Friday 1-3 PM, and by appointment
- Instruction: M/W/F 10-11 AM in SEC105
- Email: wwang60@central.uh.edu

Major Assignments/Exams
ASSESSMENTS
Poppers 5%
Online Quizzes 10%
Homework 10%
Exams (2 exams) 45% (22.5% each)
Final Exam 30%

Note: The percentage grade on the final exam can be used to replace your lowest test score.

Grading Scale
90% and above - A
at least 80% and below 90% - B
at least 70% and below 80% - C
at least 60% and below 70% - D
below 60% - F

Instructions for Poppers
- For each lecture starting on the third week of you will be asked a series of problems that will have to do with the lecture.
- This requires a buying a poppers package from the bookstore. Make sure that the package is for section 3339 -15951.
- You are required to fill in your ID number, popper number and blacken the correct circles. Make sure that your ID number and popper number are correct before turning in the popper at the end of the lecture. If these are not filled out correctly or if the darken circles are too light you will not get credit for that day’s lecture even if you attended.
- The total number of questions for the course will be counted, 85% of the total number of questions will be used for full credit. For example, if there are 5 questions each class for 24 classes, which is 120 questions. Your grade will be calculated out of 120(.85) = 96 points, with 96 points as the maximum value.
INSTRUCTIONS FOR QUIZZES

- The quizzes are located in the CASA CourseWare course website under the “Online Assignments” tab.
- The quizzes will close on the due dates given at 11:59 pm. See schedule below.
- One of the lowest quizzes will be dropped.
- You have 20 times to take each quiz.
- There is a 90 minute time limit for each quiz.
- The following table shows what sections each quiz covers.

<table>
<thead>
<tr>
<th>Quiz</th>
<th>Topics Covered</th>
<th>Textbook Sections</th>
<th>Date Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz 1</td>
<td>Counting Techniques and Introduction to Probability</td>
<td>3.1 – 3.3</td>
<td>January 25</td>
</tr>
<tr>
<td>Quiz 2</td>
<td>Probability Rules, Independence and Bayes Rule</td>
<td>3.4 – 3.7</td>
<td>February 1</td>
</tr>
<tr>
<td>Quiz 3</td>
<td>Distributions and Descriptive Statistics</td>
<td>2.1 – 2.4</td>
<td>February 8</td>
</tr>
<tr>
<td>Quiz 4</td>
<td>Bivariate Descriptive Statistics</td>
<td>2.6 &amp; 9.1 – 9.2</td>
<td>February 15</td>
</tr>
<tr>
<td>Quiz 5</td>
<td>Discrete Distributions</td>
<td>4.1 – 4.6</td>
<td>February 22</td>
</tr>
<tr>
<td>Quiz 6</td>
<td>Binomial, Hypergeometric, Poisson and Joint Distributions</td>
<td>4.4 – 4.9</td>
<td>February 29</td>
</tr>
<tr>
<td>Quiz 7</td>
<td>Continuous Distributions</td>
<td>5.1 – 5.4</td>
<td>March 7</td>
</tr>
<tr>
<td>Quiz 8</td>
<td>Uniform, Exponential, Normal &amp; Sampling Distributions</td>
<td>5.3 – 6.9</td>
<td>March 21</td>
</tr>
<tr>
<td>Quiz 9</td>
<td>Confidence Intervals</td>
<td>7.1 – 7.6</td>
<td>March 28</td>
</tr>
<tr>
<td>Quiz 10</td>
<td>Hypothesis Tests</td>
<td>8.1 – 8.5</td>
<td>April 4</td>
</tr>
<tr>
<td>Quiz 11</td>
<td>Inferences on Two Groups or Populations</td>
<td>10.1 – 10.5</td>
<td>April 11</td>
</tr>
<tr>
<td>Quiz 12</td>
<td>Inference on Regression Parameters</td>
<td>9.1 – 9.5</td>
<td>April 18</td>
</tr>
<tr>
<td>Quiz 13</td>
<td>ANOVA and Chi-square Tests</td>
<td>11.1 – 12.3</td>
<td>April 27</td>
</tr>
</tbody>
</table>
INSTRUCTIONS FOR HOMEWORK

- See the schedule below.
- Each homework assignment is worth 15 points.
- You will submit the homework in the CASA CourseWare website. See Instructions to upload homework in CASA for how to upload the homework.
- Working with other students on the assignments is highly recommended. However, each student’s homework must present their original work. Otherwise this will affect your grade.
- Two of the lowest homework scores will be dropped.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Topics Covered</th>
<th>Textbook Sections</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework 1</td>
<td>Probability</td>
<td>3.1 – 3.6</td>
<td>February 1</td>
</tr>
<tr>
<td>Homework 2</td>
<td>Distributions and Descriptive Statistics</td>
<td>2.1 – 2.6 &amp; 9.1 – 9.2</td>
<td>February 15</td>
</tr>
<tr>
<td>Homework 3</td>
<td>Discrete Distributions</td>
<td>4.1 – 4.9</td>
<td>February 25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Wednesday)</td>
</tr>
<tr>
<td>Homework 4</td>
<td>Continuous Distribution</td>
<td>5.1 – 6.7</td>
<td>March 21</td>
</tr>
<tr>
<td>Homework 5</td>
<td>Introduction to Confidence Intervals and Hypothesis</td>
<td>7.1 – 8.5</td>
<td>April 4</td>
</tr>
<tr>
<td>Homework 6</td>
<td>Inferences on Two Groups and Proportions, Inference</td>
<td>9.1 – 10 .5</td>
<td>April 18</td>
</tr>
<tr>
<td></td>
<td>for Regression Parameters and Correlation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homework 7</td>
<td>ANOVA and Chi-square Tests</td>
<td>11. 1 – 12.3</td>
<td>April 27</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Monday)</td>
</tr>
</tbody>
</table>

LATE ASSIGNMENT, MAKE-UP AND INCOMPLETE POLICIES

- This course is a cumulative course. You as a student need to keep up with the reading, homework assignments and exams.
- The following is calculated for the final grade:
  - Two of the lowest homework assignments are dropped.
  - One of the lowest online quizzes are dropped.
  - 85% of the total number of popper questions will be the 100%.
  - The final exam score can replace the lowest exam score out of three.
- Incomplete policy: A notation of "incomplete" may be given in lieu of a final grade to a student who has carried a subject successfully until the end of a semester but who, because of illness or other unusual and substantiated cause beyond the student’s control, has been unable to take or complete the final examination or to complete some limited amount of term work.
Exam Information

MIDTERM EXAMS
Test 1: Textbook Sections Covered: 1.1 - 4.9, & 9.1 – 9.2; February 27 – 29
Test 2: Textbook Sections Covered: 5.1 – 10.5; April 16 – 18

- The test will be given in CASA located on the second floor of Garrison, Agnes Hall or CBB, see the exam scheduler for details.
- You can access the scheduler for these exams by logging into Courseware.
- The exams given in CASA will consist of both multiple choice and written questions.
- The multiple choice questions will be machine graded.
- The written questions (free response) will be graded by the instructors and teaching assistants.
- The scheduler will be available approximately 2 weeks prior to the start of the exam cycle. Exam dates are listed above.

FINAL EXAM
- A comprehensive final exam will be given in CASA.
- You can access the scheduler for this exam by logging into Courseware.
- Dates: April 28 – 30

Required Reading
- The textbook, online quizzes, and additional help materials will be made available by logging into CourseWare at http://www.casa.uh.edu .
- The first portion of these materials are freely available for the first two weeks of class.
- All students must purchase a Course Access Code through the link on CASA by the beginning of the third week of class to continue accessing the course learning materials.
List of discussion/lecture topics

This table is tentative and may need to be updated during the semester. Updates will be announced in lecture and posted on the course website.

<table>
<thead>
<tr>
<th>Week</th>
<th>Textbook Sections</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Chapter 1, 3.1 &amp; 3.2</td>
<td>Sample, Population, Types of Variables, Types of Experiments, Introduction to Probability, Sample Spaces, Counting Rules</td>
</tr>
<tr>
<td>Week 2</td>
<td>3.4 – 3.6</td>
<td>Probability Rules, Independence, Bayes’ Theorem</td>
</tr>
<tr>
<td>Week 3</td>
<td>2.1 – 2.4</td>
<td>Univariate Descriptive Statistics (Central Tendency, Spread, Percentiles and Quantiles, Histograms, Boxplots, Stem-and-Leaf)</td>
</tr>
<tr>
<td>Week 4</td>
<td>2.5 – 2.6 &amp; 9.1 – 9.2</td>
<td>Bivariate Descriptive Statistics (Scatterplot, Covariance, Correlation, Least Squares Regression)</td>
</tr>
<tr>
<td>Week 5</td>
<td>4.1 – 4.6</td>
<td>Discrete Probabilities, Expected Values, Binomial Distribution</td>
</tr>
<tr>
<td>Week 6</td>
<td>4.7 – 4.9</td>
<td>Discrete Probabilities; Hypergeometric, Poisson, Joint</td>
</tr>
<tr>
<td>Test 1</td>
<td>1.1 – 4.9 &amp; 9.1 – 9.2</td>
<td></td>
</tr>
<tr>
<td>Week 7</td>
<td>5.1 – 5.5</td>
<td>Continuous Distributions, Uniform, Exponential, Gamma, Normal</td>
</tr>
<tr>
<td>Week 8</td>
<td>6.4 – 6.6</td>
<td>Sampling Distributions</td>
</tr>
<tr>
<td>Week 9</td>
<td>7.1 – 7.6</td>
<td>Introduction to Confidence Intervals</td>
</tr>
<tr>
<td>Week 10</td>
<td>8.1 – 8.5</td>
<td>Introduction to Hypothesis Tests</td>
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<td>Inference for Two Groups or Populations</td>
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<td>Week 12</td>
<td>9.3 – 9.5</td>
<td>Inference for Regression Parameters and Correlation</td>
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<tr>
<td>Test 2</td>
<td>5.1 – 10.5</td>
<td></td>
</tr>
<tr>
<td>Week 13</td>
<td>11.1 – 12.2</td>
<td>Analysis of Variance &amp; Chi-square Test for Goodness of Fit</td>
</tr>
<tr>
<td>Week 14</td>
<td>12.3</td>
<td>Chis-square Test of Independence</td>
</tr>
<tr>
<td>Final</td>
<td>Cumulative</td>
<td></td>
</tr>
</tbody>
</table>

Computer Requirement

- Knowledge of a statistical package is an indispensable part of the modern statistics. The class presentations, some homework assignments, and the exams are computer based.
- The statistical package R-studio is used in this class for exploring statistical concepts and demonstrating statistical analysis of actual data useful for business decisions. No previous knowledge of this software is assumed.
- This software is a free package that you can download on to your personal computer. This will be available to you for your exams in CASA.
- You first need to download R: [https://cran.cnr.berkeley.edu/](https://cran.cnr.berkeley.edu/)
- Then you can download Rstudio: [https://www.rstudio.com/](https://www.rstudio.com/)
COURSE SYLLABUS – MATH 3339
Statistics for the Sciences

CSD/Academic Accommodation

- **Academic Adjustments/Auxiliary Aids**: The University of Houston System complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for students who have a disability. In accordance with Section 504 and ADA guidelines, University of Houston strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please visit The Center for Students with DisABILITIES (CSD) website at http://www.uh.edu/csd/ for more information.

- **Accommodation Forms**: Students seeking academic adjustments/auxiliary aids must, in a timely manner (usually at the beginning of the semester), provide their instructor with a current Student Accommodation Form (SAF) from the CSD office before an approved accommodation can be implemented.

Details of this policy, and the corresponding responsibilities of the student are outlined in The Student Academic Adjustments/Auxiliary Aids Policy (01.D.09) document under [STEP 4: Student Submission (5.4.1 & 5.4.2), Page 6]. For more information please visit the Center for Students with Disabilities FAQs page.

Additionally, if a student is requesting a (CSD approved) testing accommodation, then the student will also complete a Request for Individualized Testing Accommodations (RITA) paper form to arrange for tests to be administered at the CSD office. CSD suggests that the student meet with their instructor during office hours and/or make an appointment to complete the RITA form to ensure confidentiality.

- **Note**: RITA forms must be completed at least 48 hours in advance of the original test date. Please consult your counselor ahead of time to ensure that your tests are scheduled in a timely manner. Please keep in mind that if you run over the agreed upon time limit for your exam, you will be penalized in proportion to the amount of extra time taken.

**UH CAPS Statement**

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the "Let's Talk" program, a drop-in consultation service at convenient locations and hours around campus. http://www.uh.edu/caps/outreach/lets_talk.html

**UH Academic Honesty Policy**

University of Houston students are expected to adhere to the Academic Honesty Policy as described in the UH Undergraduate Catalog. “Academic dishonesty” means employing a method or technique or engaging in conduct in an academic endeavor that contravenes the standards of ethical integrity expected at the University of Houston or by a course instructor to fulfill any and all academic requirements. Academic dishonesty includes, but is not limited to, the following: Plagiarism; Cheating and Unauthorized Group Work; Fabrication, Falsification, and Misrepresentation; Stealing and Abuse of Academic Materials; Complicity in Academic
Dishonesty; Academic Misconduct.

Refer to UH Academic Honesty website (http://www.uh.edu/provost/policies/honesty/) and the UH Student Catalog for the definition of these terms and university’s policy on Academic Dishonesty. Anyone caught cheating will be reported to the department for further disciplinary actions, receive sanctions as explained on these documents, and will have an academic dishonesty record at the Provosts office. The sanctions for confirmed violations of this policy shall be commensurate with the nature of the offense and with the record of the student regarding any previous infractions. Sanctions may include, but are not limited to: a lowered grade, failure on the examination or assignment in question, failure in the course, probation, suspension, or expulsion from the University of Houston, or a combination of these. Students may not receive a W for courses in which they have been found in violation of the Academic Honesty Policy. If a W is received prior to a finding of policy violation, the student will become liable for the Academic Honesty penalty, including F grades.

Other information

Besides asking your instructor, tutoring is available for this course at two places on campus
- LAUNCH – Cougar Village 1 N109 see: [http://ussc.uh.edu/lss/tutoring.aspx](http://ussc.uh.edu/lss/tutoring.aspx)
MODIFICATIONS ON THE COURSE SYLLABUS

In response to the City of Houston and Harris County emergency health declarations, and to mitigate the spread of COVID-19, the University of Houston paused face-to-face instructional activities and will start to deliver all classes remotely using online and/or virtual learning platforms, at least until April 4. The following policies will be in place until further notice.

Please read the following carefully, regarding the precise details of the switch to online instruction. Many other details remain precisely as on the course syllabus. Your instructor reserves the right to make changes to the syllabus/grades/policies of the course and to announce such information as needed. Indeed, a few such changes are to be expected given the emerging guidance coming from the department and university, questions and issues that arise, etc. You are responsible for knowing the content of any announcements concerning changes.

General Changes:

1) Lectures

Lecture videos will be posted on CASA as mp4 files. Students should be able to watch mp4 files. Live meetings will be held during lecture time at your instructor’s online Blackboards classroom. The link for your instructor’s online classroom is on CASA. Click on the classroom link and make sure you can attend live meetings. Log in with your real name. We expect that students will behave professionally during live meetings. Video recordings of live meetings will be posted for those who can’t attend. It is important to watch lecture videos in a timely manner so that we can follow the teaching schedule and you don’t fall behind.

2) Attendance/Poppers:

Poppers can be taken under EMCF tab at CASA website before the due date. Popper due dates can be seen under EMCF tab at CASA.

3) Testing

Math Department and CASA Testing Center are working on plans for our future tests. More information will be provided as soon as these plans are finalized. Testing dates are subject to change and the means of testing will be announced soon.
4) Grade distribution

Grade distribution is subject to change and changes will be announced in a timely manner.

5) OFFICE HOURS

See our CASA website for detailed information.

6) Academic Honesty

Academic Honesty Policy: In online assignments and tests you will sometimes be asked to make an Academic Honesty statement ("I received no help ...", etc.) University of Houston students are expected to adhere to the Academic Honesty Policy as described in the UH Undergraduate Catalog. “Academic dishonesty” means employing a method or technique or engaging in conduct in an academic endeavor that contravenes the standards of ethical integrity expected at the University of Houston or by a course instructor to fulfill any and all academic requirements. Academic dishonesty includes, but is not limited to, the following: Plagiarism; Cheating and Unauthorized Group Work; Fabrication, Falsification, and Misrepresentation; Stealing and Abuse of Academic Materials; Complicity in Academic Dishonesty; Academic Misconduct.

Posting answers for Poppers or Homework questions online (at group chats or other online tools) is considered an academic honesty violation. Students are expected to know the difference between “getting/giving HELP on a problem” and “getting/giving answers to a problem”. If a student is caught sharing answers (in person or online), he/she might be reported to the departmental hearing officer for an academic honesty violation. If a student becomes aware of cheating or any other violations; that student is responsible for informing the instructor.

Refer to UH Academic Honesty website (http://www.uh.edu/provost/policies/honesty/) and the UH Student Catalog for the definition of these terms and university’s policy on Academic Dishonesty. Anyone caught cheating will be reported to the department for further disciplinary actions, receive sanctions as explained on these documents, and will have an academic dishonesty record at the Provosts office. The sanctions for confirmed violations of this policy shall be commensurate with the nature of the offense and with the record of the student regarding any previous infractions. Sanctions may include, but are not limited to: a lowered grade, failure on the examination or assignment in question, failure in the course, probation, suspension, or expulsion from the University of Houston, or a combination of these. Students may not receive a W for courses in which they have been found in violation of the Academic Honesty Policy. If a W is received prior to a finding of policy violation, the student will become liable for the Academic Honesty penalty, including F grades.