

MATH 411C MATHEMATICAL STATISTICS II
SPRING 2021 (Mar 30 – Jun 4)

Instructor: Sahadeb Uprettee, PhD
E-mail: upretees@cwu.edu
Class Time: MWF 12 - 12:50 PM

Office Hours: MT 9-10:00 am, WR 3 – 4:00 pm or appointment
Classroom: Online Web

TEXTBOOK: Hogg R.V, Tanis E. A., and Zimmerman D. L. (2015): *Probability and Statistical Inference*, 9th Ed. Pearson.

PRE-REQUISITES: MATH 411 B with a grade of C or higher.

COURSE CONTENT: Derived distributions, point and interval estimation, hypothesis testing. Correlation and regression theory. Distribution free methods. Bayesian inference.

Learner Outcomes:

Upon successful completion of this course, the student will be able to:

- Find maximum likelihood and method of moments estimators.
- Use interval estimation to answer questions about populations.
- Test hypotheses about a statistical population.

Chapter 1: Interval Estimation

Confidence Intervals for Means, Confidence Intervals for the Difference of Two Means, Confidence Intervals for Proportions, Sample Size, Distribution-Free Confidence Intervals for Percentiles, More Regression, Resampling Methods.

Learning Outcomes

The students will be able to:

- Calculate the confidence intervals for means.
- Calculate the confidence intervals for the difference of two means.
- Calculate the confidence intervals for the proportions.
- Estimate required sample size.
- Estimate confidence band and prediction band.

Chapter 2: Tests of Statical Hypothesis

Tests About One Mean, Tests of the Equality of Two Means, Tests About Proportions, The Wilcoxon Tests, Power of a Statistical Test, Best Critical Regions, Likelihood Ratio Tests.

Learning Outcomes

The students will be able to:

- Perform hypothesis test for single mean.
- Perform likelihood ratio test.
- Perform Wilcoxon tests.
- Explain difference between type I error and type II error.

Chapter 3: More Tests

Chi-Square Goodness-of-Fit Tests, Contingency Tables, One-Factor Analysis of Variance, Two-Way Analysis of Variance.

Learning Outcomes

The students will be able to:

- Perform Chi-square goodness of fit tests.
- Perform one way ANOVA
- Perform two way ANOVA

REQUIRED CALCULATOR: A scientific calculator is required. If you are planning to take Exam P, some recommended calculators are TI-30XS MultiView, TI-30Xa, TI-30X II (IIS solar or IIB battery).

IMPORTANT DATES:

Tuesday, Mar 30 – First day of classes.

Class End: June 4

Study day: June 7

Midterm Exam One: May 3

Midterm Exam Two: May 28

Comprehensive Final Exam: Update later

EVALUATIONS:

Class Participation:	5%
Weekly Assignments:	30%
Midterm Exam One:	20%
Midterm Exam Two:	20%
Comprehensive Final Exam:	25%

Note: In the Class Participation, I expect your active involvement while discussing in the online class and complet reading assignments.

GRADING SCALE (MINIMUM CUTOFFS):

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
93	90	87	83	80	77	73	70	67	63	60	below 60

ZOOM CLASS & OFFICE HOURS: Use this zoom link to meet with instructor:

Class Link: <https://cwu.zoom.us/j/89994104661?pwd=V1ZVOWJKczlGeU5EaFE3T1g4WFd3dz09>

Office hours: <https://cwu.zoom.us/j/2549910586>

EMAIL CORRESPONDENCE: I will respond to student communications during business hours (M-F, 8 am-5 pm). You can typically expect a reply within approximately 24 hours, not including weekends. If you email me with questions about specific problems, I can be more helpful if you send pictures of what you've tried so far.

HOMEWORK: Each week homework will be assigned, and due dates will be announced in the Canvas. I will select homework problems from the textbook. Students are encouraged to discuss among the friends but do not copy other's work directly. If I find identical solutions, then both parties will get zero points. Your work should be clear, in a logical order, and provide sufficient explanation. You must upload a single pdf file of the homework into Canvas.

EXAM POLICY: There will be two midterm exams and one comprehensive final exam. All exams are cumulative. They will be taken in Canvas, will be timed, and you will be allowed to use your book and notes. You must upload your written exam as a single pdf file in Canvas.

TIME INVESTMENT REQUIREMENT:

The information listed below illustrates the total investment of time by an average student to achieve the learning goals of the course. (30 hours/credit x 3 = 90 hours)

The amount of time that an average student should expect to spend on this class is as follows:

- 30 hours - Time spent in the classroom, online instruction, taking exams and doing worksheets, etc.
- 60 hours - Time for preparation and study for in-class worksheets, homework, monthly and final exams, discussion during office hours.

COURSE POLICIES

COVID-19 STATEMENT:

“Due to COVID-19, and under the directive and mandate of public health officials and the president of Central Washington University, students must adopt face-covering protocol before entering any classroom or building at CWU until further notice. Students must also follow the social distancing placement marks in buildings and classrooms. If you do not have a face-covering Central Washington University can provide one for you. If you have not yet received your CWU-supplied facial covering, please go the SURC Information Desk. Please do so prior to the start of your first class.”

MENTAL HEALTH STATEMENT:

“Stress and other life circumstances that may be out of your control can make learning and focusing difficult. If you find stress or other mental health concerns make academics difficult, Central has resources to support you. I encourage you to reach out as soon as you notice you're struggling.”

RESOURCES FOR STUDENTS:

CWU Counseling Center: <https://www.cwu.edu/medical-counseling/counseling-clinic>

Mental Health Crisis Support outside normal business hours: 1-800 – 273 - 8255, Text HOME to 741741 or call 911.

Wellness Center: <https://www.cwu.edu/wellness/> 509-963 -3213

Student Rights and Responsibilities: <https://www.cwu.edu/student-rights/office-student-rights-responsibilities>

CENTRAL WASHINGTON UNIVERSITY COVID-19 REPORTING FORM: available on
<http://cwu.edu/student-success/covid-form>

POLICY ON ACADEMIC DISHONESTY:

Students are on their honor to follow the student conduct code as outlined in the Washington Administrative Code. Violations of this section will result in a failing grade in the course in addition to further possible university sanctions. (See <http://apps.leg.wa.gov/WAC/default.aspx?cite=106-125>)

POLICY ON DIVERSITY:

University-level education is about broadening horizons and looking at academic issues from a variety of perspectives. With this in mind, the participants in this class are encouraged to bring their own life experiences and viewpoints to bear on classroom discussions and assignments. Along with the freedom to express one's views comes the responsibility to respect the views of others. No student will be discriminated against based on race, ethnicity, age, creed, religion, gender, sexual orientation, marital status, or political ideology.

DISABILITY SERVICES:

Central Washington University is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any obstacles to learning, contact Disability Services to discuss a range of available options. Student Disability Services is located in Hogue 126. Call (509) 963-2214 or email ds@cwu.edu for more information. (see <https://www.cwu.edu/disability-services/>)

SUBMITTING ELECTRONIC FILES:

All electronic files must be submitted in .doc, .docx or .pdf format. If you don't have Microsoft Office, you can download it for free, using your CWU email and password from the MS Office website. Here is the guide on (<https://cwu.teamdynamix.com/TDClient/2015/Portal/KB/ArticleDet?ID=9080>), how to download MS Office. Mac users make sure to save documents with visible extension (.docx or .rtf).

RELIGIOUS HOLIDAY ABSENCES: In compliance with RCW 28B.137.010, CWU makes every effort to deal reasonably and fairly with students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required attendance. Students must present written notice to their instructor within the first two weeks of the class listing the specific dates on which accommodations are required. Contact the Dean of Student Success at (509) 963-1515 for further information or questions.

