



MATH 412: MATHEMATICAL STATISTICS
Summer 2022 Syllabus
July 11 – August 5
3 Credits

Place: Online	Instructor: TBA
Office: TBA	Office Hours: TBA
Phone: TBA	E-mail: TBA

COURSE DESCRIPTION: Methods of estimation, limiting distributions, interval estimation, point estimation, sufficient statistics, and tests of hypotheses.

Prerequisites: Students of Math 412 are expected to complete Math 403 with a minimum grade of “C-”.

Textbook:

Introduction to Mathematical Statistics, 8th Edition, by V. Hogg, Joseph W. McKean, Allen Thornton Craig.

Book Recommended:

Probability and Statistical Inference, ninth ed by Hogg, Tanis and Zimmerman.
Statistical Inference, 2nd ed by George, and Roger

Outline of the Course:

No.	Sections Covered (Tentative)	Week
1	Review of Probability (Chapter 1 - Chapter 2, Selected Sections)	0.5
2	Chapter 3, Some Special Distributions (3.1 - 3.4, 3.6)	0.5
3	Chapter 4, Some Elementary Statistical Inferences (4.1 - 4.2, 4.4 - 4.6)	1
4	Chapter 5, Consistency and Limiting Distributions (5.1 - 5.3) & Midterm Exam Review	0.5
5	Chapter 6, Maximum Likelihood Methods (6.1 - 6.3)	1
6	Chapter 7, Sufficiency (7.1 - 7.5)	0.5
7	Chapter 8, Optimal Tests of Hypotheses (8.1 - 8.3)	0.5

8	Chapter 11, Bayesian Statistics (11.1 - 11.2) & Final Exam Review	0.5
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Learning outcomes

Upon successful completion of this course, students will be conversant with

- Maximum likelihood estimation, likelihood ratio test;
- Confidence intervals and hypothesis tests;
- Principle of Bayesian analysis and use it for parameter estimation and model selection;
- Theories of limiting distributions;
- Sufficient statistics;
- Software R for computing multiple statistical estimation and methods.

Software: R

R is a free, open-source software for statistical analysis and programming. Download R through <http://cran.r-project.org>.

The downloaded software is sufficient for use; yet R-Studio is recommended as a convenient editor for R, especially for beginners. Download R-Studio from <http://www.rstudio.com/products/rstudio/download/>. R-Studio does not run by itself. To use R-Studio you need to also install R.

Attendance

Attendance will be taken on a regular basis as studies have shown that students that attend class regularly are more likely to complete their courses successfully.

Homework

Students are expected to read relevant sections of the textbook prior to attending class. Written homework will be graded. Students may work together on homework, but each individual student is required to submit their own work. Homework will be collected in class at the beginning of the class period, due dates will be given in class, and are on posted on Blackboard. **Late assignments will not be accepted.**

Blackboard

Homework, grades and additional course content will be uploaded to [Blackboard](#). Make sure to check it regularly for updates.

Midterm Exam

You will take one midterm exam during the semester. The best possible preparation for them is regular **attendance** and completion of assigned **homework**. The exam is taken in class during class time. The midterm exam will be tentative on **TBA**.

Final Exam

The final exam will be according to the BSU final exam schedule.

Grading Criteria:

Final Exam	30%
Midterm Exam	25%
Homework	35%
Attendance	10%

Grading Scale:

Letter grades will be assigned as follows:

A	93-100	C	73-76
A-	90-92	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	F	below 60

THE ACADEMIC ACHIEVEMENT CENTER (AAC) provides students with academic services and resources that propel them toward successful and timely degree completion. With all services available online for the fall, the AAC is the largest hub of student academic services on campus. The AAC is comprised of four major support areas: [Academic Advising](#) (first-semester freshmen), [Disability Resources and Student Accessibility Services](#), [Learning Assistance](#) (Academic Coaching and Tutoring), and [Testing Services](#). [Learning Assistance \(LA\)](#) consists of both [Academic Coaching](#) and Tutoring. Tutoring areas include: [Math Services](#), [the Accounting & Finance Lab](#), [Writing Studio](#), [Tutoring Central](#) (100/200 introductory and Core Curriculum courses), and [Second Language Services](#). All LA services for the fall 2020 semester are being offered online. To use the virtual drop-in tutoring or to make an appointment for Tutoring or Academic Coaching, please sign into our platform, [Accudemia](#), using your BSU credentials, or bookmark the link: <https://bridgew.accudemia.net>.

Academic Conduct

The academic integrity policy of Bridgewater State University will be strictly enforced. This policy can be found in the BSU Student Handbook. Specifically, the policy requires that students do not cheat, fabricate, plagiarize, or facilitate academic dishonesty. Students who passively engage in cheating (i.e. allowing others to cheat off them) may receive the same consequences as the person copying. Violations will be handled in accordance with BSU's [academic integrity policy](#).

Student Accessibility Services

Bridgewater State University is committed to providing equal access to students with documented disabilities. If you have a disability that may impact your experience in this class and for which you may require accommodations, please see the [Student Accessibility Services](#) (SAS) office so that such accommodations can be considered. The SAS can be reached at SAS@bridgew.edu or 508.531.2194. If you are granted accommodations, please meet with

me confidentially to review how they will be applied in this course.

* This syllabus may be amended during the semester.