MATH 424 Statistical Decision Theory Spring 2022

Math 424 Section 01, Spring 2022
Credit hours: 3
Class dates: Jan 18 - May 5
Class meeting time and location:
MWF 9:10 -10:00 pm, Roop 0105
Student/Faculty assessment Day: 2/8, No class between 8 am to 4 pm
Last day to withdraw from the university with cancellation of tuition charges and refund.
Break Days (no class): March 14-18.

Instructor: Lihua Chen

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Office:  Roop Hall 338   Office phone: 540-568-6533
Office hours (Virtual) MWF 3:30 - 5:10 and by appointment
zoom link posted in Announcements in Canvas
Email: chen3lx@jmu.edu
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Text: *Elementary Decision Theory*, Herman Chernoff and Lincoln E. Moses, 2011, Dover publications, Inc.
Course Website: All course materiabl will be posted in Canvas.
Goals of the Course
To understand statistical methods for making decisions under uncertainty including principles in decision theory, utility and loss functions, minimax strategy, Bayes strategy, randomized strategy, estimation and hypothesis testing in decision-theoretic framework and game theory.
Prerequisite: Math 318 or Math 329.

Evaluations:

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quizzes 30 percent
Midterm Test   30 percent  2/25 Friday
Final Exam 40 percent 5/9 Monday 8:00-10:00
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Grading scale:
Your letter grade depends on your overall weighted grade on quizzes, the midterm test and the final exam. It may also depend upon the performance of the class and the difficulty of the material.
No extra credit assigments will be given upon individual request.
Homework: Homework will be assigned but will not be graded. Homework solutions will be posted in Canvas. Some of the quiz problems will be selected from the homework problems.
Quizzes: Multiple Quizzes will be given and quizzes may NOT be made up. The quiz time will be announced at least one day in advance so please check your jmu email at least once a day so you won't miss the notice for the quiz.

Up to TWO quizzes with lowest scores may be dropped. Note one purpose of this policy is to take care of missed work due to excused absences. If you miss more than you are allowed to drop due to excused absences, please let me know and I will deal with this on an individual basis. The quizzes will be open book and open notes.

Exams: The final exam is open notes and open book. The formula sheets will NOT be supplied by the instructor.

The final exam is cumulative.

Attendance:

No attdendance will be taken for in-person classes.

Adding/Dropping Classes

Students are responsible for registering for classes and for verifying their class schedules on e-campus. Please refer to

`https://www.jmu.edu/registrar/_files/deadlines-spring.pdf`

for deadlines for adding or dropping a class.

Disability Accommodations

If you need an accommodation based on the impact of a disability, you should contact the Office of Disability Services (Wilson Hall, Room 107, www.jmu.edu/ods, 540-568-6705) if you have not previously done so. Disability Services will provide you with an Access Plan Letter that will verify your need for services and make recommendations for accommodations to be used in the classroom. Once you have presented me with this letter, you and I will sit down and review the course requirements, your disability characteristics, and your requested accommodations to develop an individualized plan, appropriate for Math 424.

Religious Observation Accommodations

All faculty are required to give reasonable and appropriate accommodations to students requesting them on grounds of religious observation. The faculty member determines what accommodations are appropriate for his/her course. Students should notify the faculty by no later than the end of the Drop-Add period the first week of the semester of potential scheduled absences and determine with the instructor if mutually acceptable alternative methods exist for completing the missed classroom time, lab or activity.

Academic Honesty

You are expected to finish all the quizzes and tests of this course on your own. Getting help from others on a quiz or test will be considered academically dishonest. The consequence of such behavior ranges from failure on the quiz or test to dismissal from university. The honor code of the university will be strictly enforced. The JMU Honor Code is available from the Honor Council Web site http:// www.jmu.edu/honor/code.shtml.

Inclement Weather Policies Please find JMU's cancellation policy at http://www.jmu.edu/JMUpolicy/1309.shtml.

Others: No WP or WF grade will be issued for this course. No Honors option will be offered in this course.

Disruptive behavior in the classrom will result in the reduction of the student's final grade.

Course outline:

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Framework of decision making
Bayesness and admissibility
Bayes estimator
Method of moment estimator
Maximum likelihood estimator
Unbiased estimator,  efficient estimator
Most powerful test, Neyman Pearson Lemma, Bayes test
Game: solutions of a game
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This is a tentative outline. The actual contents may be modified depending on the pace of the class and the needs of the students.