MTH107 Finite Mathematics

Winter 2023 (Online)

Instructor: Juhyung Lee

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Email Policy: Only URI email account should be used for communication

Office Hours: M-F from 8:00 am to 9:00 am or by appointment on Zoom. At this time, there will be no in person meetings in the instructor's office. You can find a link to join a zoom meeting on Brightspace → START HERE → Instructor Information

Website: Brightspace is the online learning platform used for URI

Text: Johnson / Mowry, Mathematics: A Practical Odyssey, URI custom edition (Not required)

Calculator: You may use a basic calculator on quizzes, homework, or exams. But, a graphing or scientific calculator (e.g. TI-84) is not permitted on exams

Technology requirements: To successfully complete this course, you will need access to a computer with reliable, high-speed Internet access and appropriate system and software to support the Brightspace learning platform. You should have the ability to upload your handwritten work as a single pdf document. (See Appendix A)

Grade Categories and Scale: Grades will be determined through a weighted average with categories and weights:

Categories	Weights	Categories	Weights
Worksheet	40 %	Exam I	20 %
Exam II	20 %	Exam III	20 %

Letter grades for the course will be determined by considering your overall weighted percentage according to the following scale:

Scale (%)	Grade	87-89.99	B+	77-79.99	C+	67-69.99	D+
93-100	A	83-86.99	B	73-76.99	C	60-66.99	D
90-92.99	A-	80-82.99	B-	70-72.99	C-	0-59.99	F

e-Campus Course Description: Concepts and processes of modern mathematics concerned with sets, the theory of probability, and statistics. Role of these concepts in today's social and physical sciences. (Prerequisites: Passing a placement test. Not open to mathematics majors)

Description: MTH 107 is a special topics course that satisfies the general education requirement for math at the University of Rhode Island. This course is designed for students who do NOT have precalculus or calculus requirements in their program of study. MTH 107 covers the following concepts of modern mathematics: Logic, Sets and Operations on Sets, Elements of Combinatorics, Probability and Statistics.

Lecture: The lecture videos will be uploaded to Brightspace. You are required to watch the lecture videos according to the course calendar.

Virtual Meeting: Zoom will be used for a virtual meeting on M-F from 8:00 am to 9:00 am. You are encouraged to prepare some questions and actively participate in the meeting.

Worksheet: A worksheet homework will be assigned every M-Th, with some exceptions. Scan your handwritten solutions and answers as single pdf document and upload it to Brightspace before it closes. The **two** worksheets with the lowest score will be dropped in calculating your course grade. Make up homework will not be given for any reason. If you miss a worksheet (even with a valid reason) it will count towards those two dropped homework.

Exams: Exam I, II, and III will be held as scheduled. Please, see the course calendar for details.

You may use a basic calculator $(+, -, \times, /,$ and square root) on exams. Also, you will be expected to use **your own lecture note** from the lecture videos and complete the exams without the aid of books, science/graphing calculators, internet connection, or any other aid or device of any kind including any input from any other person. Your experience on these exams should be similar to that of an in-person proctored exam.

Once the third exam is administered, your grade is final and no makeups or extra credit will be offered. An incomplete grade will not be given to students who are dissatisfied with their grades at the end of the semester and grades of NW will not be given to students who have completed even a single assignment.

Academic Integrity: Students are expected to be honest in all academic work. A student's name on any written work, quiz or exam shall be regarded as assurance that the work is the result of the student's own independent thought and study. Work should be stated in the student's own words, properly attributed to its source. Students have an obligation to know how to quote, paraphrase, summarize, cite and reference the work of others with integrity. The following are examples of academic dishonesty.
• Using material, directly or paraphrasing, from published sources (print or electronic) without appropriate citation
• Claiming disproportionate credit for work not done independently
• Unauthorized possession or access to exams
• Unauthorized communication during exams
• Unauthorized use of another's work or preparing work for another student
• Taking an exam for another student
• Altering or attempting to alter grades
• The use of electronic devices to gain an unauthorized advantage during exams
• Fabricating or falsifying facts, data or references
• Facilitating or aiding another's academic dishonesty
• Submitting the same paper for more than one course without prior approval from the instructors

Makeup Policy: Makeup exams may be scheduled in the event you are unable to attend exams under the following conditions. See University Manual sections 8.51.10 to 8.51.14 for guidelines.
• If your reason for missing the exam as scheduled is (i) a University sanctioned event for which verifiable documentation can be provided, (ii) a responsibility to an employer that cannot be rescheduled (with documentation from your employer), or (iii) Religious holidays, then you must inform your instructor 48 hours in advance of the exam and provide documentation if requested. Makeup exams

will be scheduled after the actual exam, and preferably before the class period when exams are to be handed back, but no later than one week after the original date.

• If the reason for missing the exam as scheduled is due to (i) illness (with verifiable documentation from a medical provider if requested), or (ii) an emergency (with appropriate documentation if requested), then you must contact your instructor within 24 hours of the exam. Makeup exams may be scheduled no later than a week after the original date, unless the illness or emergency precludes this, in which case we will follow the University Manual sections 8.51.10 to 8.51.14.

• Failure to notify your instructor within 7 calendar days of your absence will result in a 0 for the exam, see section 8.51.14 University Manual.

Anti-Bias Syllabus Statement: We respect the rights and dignity of each individual and group. We reject prejudice and intolerance, and we work to understand differences. We believe that equity and inclusion are critical components for campus community members to thrive. If you are a target or a witness of a bias incident, you are encouraged to submit a report to the URI Bias Response Team at www.uri.edu/brt. There you will also find people and resources to help.

Disability Services for Students Statement: Your access in this course is important. Please send me your Disability Services for Students (DSS) accommodation letter early in the semester so that we have adequate time to discuss and arrange your approved academic accommodations. If you have not yet established services through DSS, please contact them to engage in a confidential conversation about the process for requesting reasonable accommodations in the classroom. DSS can be reached by calling: 401-874-2098, visiting: web.uri.edu/disability, or emailing: dss@etal.uri.edu.

No Work Submitted and Incomplete Grades: University of Rhode Island regulations concerning no work submitted and incomplete grades will be followed. See the University Manual section 8.53.12 regarding no work submitted and sections 8.53.20 and 8.53.21 regarding incomplete grades for details.

Religious Holidays: It is the policy of the University of Rhode Island to accord students, on an individual basis, the opportunity to observe their traditional religious holidays. Students who plan to be absent from classes or examinations for religious holy days that traditionally preclude secular activity shall discuss this with the appropriate instructor(s) in advance of the holy day. See the University Manual section 8.51.11 for details.

Standards of Behavior: Students are responsible for being familiar with and adhering to the published "Community Standards of Behavior: University Policies and Regulations" which can be accessed in the University Student Handbook

web.uri.edu/studentconduct/university-student-handbook/

In particular, students are expected to support and promote the creation of a positive and productive learning environment. Examples of disruptive behaviors include inappropriate use of electronic devices, failure to set cell phones/pagers to silent, texting, carrying on unnecessary conversations, rudeness, etc. These behaviors and any behavior that interferes with the instructor's ability to conduct the class or other students' ability to have a quality learning experience will not be tolerated.

Learning Outcomes

MSC Rubric Elements:	STEM Rubric Elements:
A.1. Finds The Necessary Information	1. Identifies facts, Vocabulary, definitions, terms, concepts, people
A.2. Make a Plan For How To Solve The Problem	2. Recognizes concepts or tools relevant for application to a task
B.1. Performs the Calculation Or Analysis	5. Analyzes: Applies concepts to address the task
B.2. Checks the Answer For Accuracy	
C.1. Explains The Steps Taken	6. Analyzes: Deconstructs and contextualizes
C.2. Articulates The Solution	7. Analyzes: Evaluates and justifies
C.3. Presents The Problem And Solution In An Organized, Clear, and Concise Manner	

MTH 107 satisfies the MSC and STEM rubrics (full coverage) for general education.
At the end of the course the student should be able to:

1. Distinguish an argument from other forms of verbal expression recognizing their premises and conclusions.

   RUBRIC ELEMEMTS: Stem 1, Stem 6, Stem 7, A1, C1, C2, C3

2. Recognize valid and invalid, sound and unsound, syllogistic argument forms.
   RUBRIC ELEMEMTS: Stem 1, Stem 6, Stem 7, A1, C1, C2, C3

3. Detect contradictions and lack of consistency among the premises of an argument.
   RUBRIC ELEMEMTS: Stem 5, Stem 6, Stem7, C1, C2, C3

4. Represent propositions symbolically using variables and logic connectives.
   RUBRIC ELEMEMTS: Stem 1, Stem 2, A2, C2, C3

5. Give precise logical meanings of the logical connectives: not, and, or, if, only if, equivalent
   RUBRIC ELEMEMTS: Stem 2, Stem 6, A2, C1, C2, C3

6. Parse a statement to detect the linguistic equivalent of parentheses.
   RUBRIC ELEMEMTS: Stem 5, A2

7. Build a Truth Table to evaluate a statement.
   RUBRIC ELEMEMTS: Stem 2, Stem 6, A2, B1, B2, C1, C2, C3

8. Use the concept of "set" and "member" to represent relationships between objects and ideas.
   RUBRIC ELEMEMTS: Stem 1, Stem 2, A1

9. Reproduce key definitions used in set theory: negation, intersection, union, and subset.

RUBRIC ELEMEMTS: Stem 1, Stem 2, Stem 5, Stem 6, Stem 7, A1, A2, B1, B2, C1, C2, C3

10. Determine the number of items in a set by counting in new and different ways using factorials, combinations, and permutations.
RUBRIC ELEMEMTS: Stem 1, Stem 2, Stem 5, Stem 6, Stem 7, B1, B2, C1, C2, C3

11. Use a Venn diagram to visually represent sets and facilitate counting.
RUBRIC ELEMEMTS: Stem 1, Stem 2, Stem 5, Stem 6, Stem 7, A2, B1, B2, C1, C2, C3

12. Calculate any probability given the cardinality of the appropriate sets involved.
RUBRIC ELEMEMTS: Stem 1, Stem 2, Stem 5, Stem 6, Stem 7, B1, B2, C1, C2, C3

13. Calculate simple, conditional, and joint probabilities by counting the members in the appropriate sets.
RUBRIC ELEMEMTS: Stem 1, Stem 2, Stem 5, Stem 6, Stem 7, A2, B1, B2, C1, C2, C3

14. Apply rules of probability to real world situations like medical tests and casino games.
RUBRIC ELEMEMTS: Stem 5, Stem 6, B1, B2, C1, C2, C3

15. Recognize simple random processes (like dice rolling etc...) and calculate their expected value.
RUBRIC ELEMEMTS: Stem 1, Stem 2, Stem 5, Stem 6, A1, B1, B2, C1, C2, C3

16. Draw a histogram to represent a set of data.
RUBRIC ELEMEMTS: Stem 1, Stem 2, Stem 5, Stem 6, A2, C1, C2, C3

17. Calculate the mean, median, mode, standard deviation, and variance of a data set which is either grouped or ungrouped.
RUBRIC ELEMEMTS: Stem 1, Stem 2, Stem 5, Stem 6, Stem 7, B1, B2, C1, C2, C3

18. Determine z-scores and use a normal distribution table to solve problems involving data that is normally distributed.
RUBRIC ELEMEMTS: Stem 1, Stem 2, Stem 5, Stem 6, Stem 7, B1, B2, C1, C2, C3

Course Calendar for MTH 107 Fall 2022

This is a tentative course outline. It is subject to change.

Date (January)	Sections/Topics/Exams	Events
Monday, 2	§1.1 Deduction/Induction §1.2 Symbolic Logic	First Day of All Classes: Monday, Jan. 2
Tuesday, 3	§1.3 Truth Tables §1.4 Conditionals	
Wednesday, 4	§1.5 Analyzing Arguments §2.1 Sets and Set Operations	
Thursday, 5	§2.2 Applications §2.3 Intro to Combinatorics	
Friday, 6	**Exam I**	
Monday, 9	§2.4 Permutations and Combinations	
Tuesday, 10	§3.2 Introduction to Probability §3.3 Rules of Probability	
Wednesday, 11	§3.4 Combinatorics and Probability §3.5 Expected Value	
Thursday, 12	§3.6 Conditional Probability §3.7 Independence	
Friday, 13	**Exam II**	
Monday, 16	No class	Martin Luther King Day
Tuesday, 17	§4.1 Data Distributions §4.2 Mean, Median, and Mode	
Wednesday, 18	§4.3 Standard Deviation	
Thursday, 19	§4.4 Normal Distribution	
Friday, 20	**Exam III**	Last Day of All Classes: Friday, Jan. 20

Appendix : PDF Files

You will need to submit written work as a **single pdf** file. If you already know how to do this, feel free to skip the text below.

There are several ways one can convert handwritten notes into a pdf file. Here are some freely available ways of going about this:

1. Using a scanner if available.

2. Using a smart device, e.g., phone or a tablet. Here is a couple apps FREE applications:

   (a) Apple iOS – Scannable or Office Lens (later syncs with One Drive)

   (b) Android - ScannerApp or Office Lens (later syncs with One Drive)

   Whichever application you choose, you should not have to purchase it!

3. If none of the above options work, then you can do the following:

   (a) Take photos of individual handwritten pages.

   (b) Import each photo in a single Word document (one photo per page, enlarged as much as possible).

   (c) Export/save the Word document as pdf.

4. Finally, if you need to merge multiple pdf files into a single pdf file, you can use tools freely available on internet, e.g., https://www.pdf2go.com/merge-pdf