

MTH 107—Finite Mathematics (Spring 2019)

□ **Course 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.

□ **Instructor and contact information**

- Instructor: Juhyung Lee
- Email: juhyung@uri.edu
- Office: Lippitt Hall Room 202 A
- Office Hours: 10am-12pm and 12:30pm-2pm on Monday, Wednesday, and Friday

□ **Text Book and Calculators**

The textbook for the class is: *Mathematics: A Practical Odyssey (URI custom edition)*, by Johnson & Mowry.

You may use **a basic function calculator (+, -, x, ÷, and square root)**. However, a graphing or scientific calculator (e.g. TI-89 or TI-34) is **not** permitted on exams.

□ **Grade Categories and Scale**

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

Categories	Weights
In class quizzes	10 %
Worksheet Homework	15 %
Exam I	15 %
Exam II	15 %
Exam III	15 %
Cumulative Final	30 %

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

Scale (%)	Grade	Scale (%)	Grade
93-100	A	77-80	C+
90-93	A-	73-77	C
87-90	B+	70-73	C-
83-87	B	67-70	D+
80-83	B-	60-67	D

☐ **Worksheet Homework**

The worksheet homework will be posted in Sakai and collected every week, with some exceptions; specific deadlines will be announced with each assignment. Late submission will not be accepted (exceptions allowed for medical reasons). The two assignments with the lowest score will be dropped in calculating your course grade.

It is the student's responsibility to complete all the assigned problems and to go to office hours or ask in class if there are questions. You may also email me your questions. Your solution must be written in a correct and well-organized fashion.

☐ **Quizzes**

A short quiz will be administered every day of class, with some exceptions. The five quizzes with the lowest score will be dropped in calculating your course grade.

Make up quizzes will not be given for any reason. If you miss a quiz (even with a valid reason) it will count towards those five dropped quizzes. A re-weighting of quizzes may be considered only if you have missed more than five quizzes, all with valid reasons.

☐ **Exams and Make up policy**

There are three midterms and one final exam.

The following policies apply to all exams, and no exceptions will be made.

- You must have a URI Photo ID with you to take an exam, and show it to the proctor as you hand in your exam
- No books, bags, papers, extra scrap paper, or anything else may be taken with you to your seat. If you bring any of these items with you, you must leave them at the front of the room.
- Sharing calculators is not permitted.
- No cellphones, MP3 players, or any electronic devices of any kind may be used or even accessible to you at any time during the exam. Any student found with any cell phone or electronic device for ANY REASON during an exam is cheating.
- You may not ask any questions during the exam; understanding the questions is a part of the exam. If you think there is a typo or error, do the best that you can with the given information.
- You may not leave the room then return during the exam. Remember to use the bathroom before the exam. If you leave the room for any reason, your exam will be collected.
- Once finished, you must hand your exam to a proctor (your instructor, if in the room) and show your URI Photo ID.
- You are advised to bring multiple pencils to the exams, just in case. Do NOT use a pen.

The following policies apply to all Make-up exams, and no exceptions will be made.

- Makeup exams may be scheduled in the event you are unable to attend the evening exams under the following conditions. Note in particular that if you must miss the exam because of a scheduling conflict, you must notify your instructor before, not after, the exam, and emergencies require you to contact your instructor within 24 hours.
- If your reason for missing the exam as scheduled is:

- (i) a University sanctioned event for which verifiable documentation can be provided (including another scheduled class), or
- (ii) a responsibility to an employer that cannot be rescheduled (with documentation from your employer), then you **MUST INFORM YOUR INSTRUCTOR 48 HOURS IN ADVANCE OF THE EXAM AND PROVIDE DOCUMENTATION.**

Such events are scheduled in advance, so you must provide advanced notice to your instructor in order to have a makeup exam. Failure to provide this advanced notice will result in a grade of 0 for the exam. No exceptions. Makeup exams must be scheduled after the actual exam, and preferably before the class period when exams are to be handed back, but no later than two class days (excluding weekends and holidays) after the actual exam.

- If the reason for missing the exam as scheduled is due to:
 - (i) illness (with verifiable documentation from a medical provider), or
 - (ii) an emergency (with appropriate documentation), then you **MUST INFORM YOUR INSTRUCTOR WITHIN 24 HOURS OF THE EXAM** and provide documentation upon your return.

Failure to notify your instructor within 24 hours will result in a 0 for the exam. No exceptions. Makeup exams may be scheduled no later than two class days (excluding weekends and holidays) after the actual exam, unless the illness or emergency precludes this, in which case the makeup exam will be given on a common date during the last few weeks of the semester.

- If your circumstances do not meet either of the above (no documentation, non-emergency excuse without sufficient notice, etc.), then you will receive a 0 for the missed exam. No exceptions.

Academic Honesty

Students are expected to be honest in all academic work. Cheating is defined in the University Manual section 8.27.10 as the claiming of credit for work not done independently without giving credit for aid received, or any unauthorized communication during examinations (of course, this includes use of the “internet”). The resolution of any charge of cheating or plagiarism will follow the guidelines set forth in the University Manual 8.27.10 - 8.27.20.

Accommodations

Any student with a documented disability should contact your instructor early in the semester so that he or she may work out reasonable accommodations with you to support your success in this course. Students should also contact Disability Services for Students: Office of Student Life, 330 Memorial Union, 874-2098. They will determine with you what accommodations are necessary and appropriate. All information and documentation are confidential.

Sakai

Your instructor will maintain your up to date grades on Sakai. Your instructor might place important course material in the Sakai course shell. You can access Sakai at the following web address: <https://sakai.uri.edu/portal>.

Religious Holidays

Per policy of the URI, on an individual basis, the student has the opportunity to observe their traditional religious holidays. However, a written notification to each instructor is required.

Incomplete Grade

I follow to the letter the URI regulations concerning incomplete grades, namely the following paragraphs taken from the university manual:

8.53.20. A student shall receive a report of "Incomplete" in any course in which the course work has been passing up until the time of a documented precipitating incident or condition but has not been completed because of illness or another reason which in the opinion of the instructor justifies the report. An instructor who issues a grade of "Incomplete" shall forward a written explanation to the student's academic dean.

8.53.21. The student receiving "Incomplete" shall make necessary arrangement with the instructor or, in the instructor's absence, with the instructor's chairperson to remove the deficiency. This arrangement shall be made prior to the following mid-semester for the undergraduate student and within one calendar year for the graduate student.

□ **Schedule**

This is a tentative calendar for MTH 107, Spring 2019. It is subject to change.

Date	Sections/Events/Exams	Review Problems for Exams
Jan. 23 Jan. 25	First Day of Classes W. Jan. 23 (1.1)Deduction/Induction	(1.1)1,3,5,7,21,22
Jan. 28 Feb. 1	(1.2)Symbolic Logic (1.3)Truth Tables	(1.2)1,3,5,7,11,13,35,37 (1.3)9,21,41,51,57
Feb. 4 Feb. 8	(1.4)Conditionals (1.5)Analyzing Arguments	(1.4)1,7,11,18,21,33,37 (1.5)1,5,11,23
Feb. 11 Feb. 15	Exam I(Ch. 1): M. Feb. 11 (2.1)Sets & Set Operations	(2.1)1,2,7,11-21(odd),29,31
Feb. 18 Feb. 22	(2.2) Venn Diagrams (2.3)Introduction to Combinatorics	(2.2)5,7,14 (2.3)1-37(odd)
Feb.25 Mar. 1	(2.4)Permutations, Combinations	(2.4)1-11(odd),13,14,20,22,25,27-31
Mar. 4 Mar. 8	Exam II(Ch. 2): M. Mar. 4 (3.2)Intro to Probability Last day to drop: W. Mar. 6	(3.2)3,5,7,17,19,66,69
Mar. 11 Mar. 15	No Classes (Spring Break)	
Mar. 18 Mar. 22	(3.3)Rules of Probability (3.4)Combinatorics & Prob.	(3.3)1,3,9,11,39,41,57,61 (3.4)1,3,23-29(odd),31
Mar. 25 Mar. 29	(3.5)Expected Value (3.6)Conditional Prob.	(3.5)13,14,17,19,35 (3.6)1,5,7,15,17,21,23,29,30,41,43,45
Apr. 1 Apr. 5	(3.7)Independence Exam III(Ch. 3): F. Apr. 5	(3.7)1,3,9,13,15,17,23
Apr. 8 Apr. 12	(4.1)Data Distributions, Histograms, Frequency	(4.1)1,5,6,9,15
Apr. 15 Apr. 19	(4.2)Mean, Median, Mode (4.3)Standard Deviation	(4.2)1,3,5,11,15,17 (4.3)1,3,7,9,17,19
Apr. 22 Apr. 26	(4.4)Normal Distribution	(4.4)5-19(odd),25
Apr. 29	Review Last Day of Classes: Tu. Apr. 30	

□ **Learning Outcomes**

MSC Rubric Element: A.1. Finds The Necessary Information A.2. Make a Plan For How To Solve The Problem B.1. Performs the Calculation Or Analysis B.2. Checks the Answer For Accuracy C.1. Explains The Steps Taken C.2. Articulates The Solution C.3. Presents The Problem And Solution In An Organized, Clear, and Concise Manner	STEM Rubric Elements: 1. Identifies facts, Vocabulary, definitions, terms, concepts, people 2. Recognizes concepts or tools relevant for application to a task 5. Analyzes: Applies concepts to address the task 6. Analyzes: Deconstructs and contextualizes 7. Analyzes: Evaluates and justifies
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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 ELEMENTS: Stem 1, Stem 6, Stem 7, A1, C1, C2, C3

2. Recognize valid and invalid, sound and unsound, syllogistic argument forms.

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

3. Detect contradictions and lack of consistency among the premises of an argument.

RUBRIC ELEMENTS: Stem 5, Stem 6, Stem7, C1, C2, C3

4. Represent propositions symbolically using variables and logic connectives.

RUBRIC ELEMENTS: Stem 1, Stem 2, A2, C2, C3

5. Give precise logical meanings of the logical connectives: NOT, AND, OR, ONLY IF, IF AND ONLY IF.

RUBRIC ELEMENTS: Stem 2, Stem 6, A2, C1, C2, C3

6. Parse a statement to detect the linguistic equivalent of parentheses.

RUBRIC ELEMENTS: Stem 5, A2

7. Build a Truth Table to evaluate a statement.

RUBRIC ELEMENTS: 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 ELEMENTS: Stem 1, Stem 2, A1

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

RUBRIC ELEMENTS: 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 ELEMENTS: 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 ELEMENTS: 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 ELEMENTS: 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 ELEMENTS: 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 ELEMENTS: Stem 5, Stem 6, B1, B2, C1, C2, C3

15. Recognize simple random processes (like dice rolling etc...) and calculate their expected value.

RUBRIC ELEMENTS: 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 ELEMENTS: 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 ELEMENTS: 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 ELEMENTS: Stem 1, Stem 2, Stem 5, Stem 6, Stem 7, B1, B2, C1, C2, C3