
MTH 299 Course Syllabus

Spring 2020 Section 002 (Ruiter)

Last updated on: January 1, 2020

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Who/What/Where/When

Instructor information

ITEM	INSTRUCTOR	TEACHING ASSISTANT
Name	Joshua Ruiter	Paula Mercurio
Office Location	Wells C542	Well C112
Email	ruiterj2@msu.edu	mercuri6@msu.edu
Office Hours	TBD and by request	TBD and by request

Places and times

WEEKDAYS	LOCATION	TIME	ITEM
Monday	108 Berkey Hall	12:40-2:00 PM	Class
Tuesday, Thursday	219 Berkey Hall	12:40-2:00 PM	Class
TBD	Math Learning Center	TBA	299 MLC hours

Supplies and course materials

CATEGORY	ITEM	DESCRIPTION
Packet	Class examples PDF	Contains the examples we will cover.
Electronics	Printer	To print anything you need.
Electronics	Computer	To check email and access materials on D2L.

In Class Materials:

It is mandatory that you bring the example document/packet (non-solutions version) packet to class meetings.

Expectations

I expect you to be an active, hardworking, diligent, and competent learner. I expect you to attend lectures regularly. I expect you to spend approximately 12 hours per week outside of lecture combined between the tasks of reading, going over examples from class and working on homework problems. I expect you to ask lots of questions. I expect you to frequently visit office hours or the MLC. Above all, I expect you to be an engaged learner. By this I mean that you will engage your peers in and out of class, and ask plenty of questions of your instructor and of your TA.

Course Objectives

This course acts as a bridge from your training in calculus– which typically focuses on formulas and calculations– to that of higher mathematics– which focuses on abstraction, problem solving, and proof. You will be taught to think independently, to digest abstract concepts and tools from higher mathematics, and to express yourself clearly in a mathematical proof. You will be expected to become proficient with the structure of mathematical logic, including truth tables, and you will be expected to become proficient in some basic styles of proof, such as: direct proof, proof by contradiction, proof by induction, proof by contrapositive, equivalences, and more.

Grades

Overall

Your course grade will be based on:

PARTICIPATION	HOMEWORK	MINI EXAM	EXAM 1	EXAM 2	FINAL	TOTAL
10%	20%	5%	15%	15%	35%	100%

In addition, you must take the final examination in order to pass the course.

All assessment items (e.g. exams, semester-long cumulative homework score, etc...) will be scaled at the discretion of the instructor, and they will be recorded and communicated as a rational (decimal) number between 0 and 4.50– to keep stylistically as close to the MSU points scale. That way, the student can know on each particular assessment, how their performance was rated overall. The course grade will simply be calculated according to the weighted average indicated by the table above, given by the formula

$$\text{Course grade} = 0.1 * P + 0.20 * HW + 0.05 * Mini + 0.15 * E1 + 0.15 * E2 + 0.35 * FE,$$

where P , HW , $Mini$, $E1$, $E2$, and FE are respectively your point values for the items of participation, homework, mini exam, exam 1, exam 2, and the final exam. This calculation will produce a course grade given as a number between 0 and 5. Following this calculation, we will scale grades down from a 4.5 point scale to a 4 point scale, using the following table.

Final grades will be determined by:

4.0 GRADE	0.0	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Course grade	[0,1)	[1,1.5)	[1.5,2)	[2,2.5)	[2.5,3)	[3,3.5)	[3.5,4)	[4,4.5]

Please note that there will be no rounding up at the end of the semester. That is, if your calculated grade at the end of the semester is 3.46, then your course grade will be 3.00 and not 3.50.

Assessment - Participation

In our class there will be a participation grade. This participation grade is split into two parts: classroom participation, and 299 MLC/Office hours.

Classroom participation: Come to class, do the work, interact with your classmates, get some points. Easy as that. **To this end, attendance will be taken every class session.** You will be routinely encouraged to ask questions of the instructor and the TA, and of your fellow students. You will be expected share your thoughts and arguments with the rest of the class. **Remember that this classroom is a safe space for you and your peers to share their thinking and to learn. The instructors and TAs will not tolerate any bullying or demeaning behaviors. If you ever feel like your voice is not valued or heard in class, please come and talk with your instructor or to the Course coordinator.**

You will regularly work in groups with your peers. In this class, mathematics is a social activity. Your instructor/TA will assign you to various groups with your peers throughout the semester. You are expected to be an active member of these groups. You, along with your fellow group members, will collectively work on problems, and work to build collective understanding of various proving techniques. You will have access to common resources (board space, your notes, example document, instructor/TA help, etc.). You and your groupmates will present your solutions to your classmates. You are encouraged to ask as many questions as needed (to both your classmates and the instructor/TA), and to talk with everyone else as needed.

299 MLC/Office hours: You will be required to accumulate at least **5 hours** between the 299 MLC hours and your instructor's office hours. The 299 TAs will have sign-in and sign-out sheets at every 299 MLC office hour, and so will your instructor. This requirement may seem harsh, but it only amounts to 1 hour for every 3 weeks of class. Also, there is plenty of historical evidence that the students that routinely go to 299 MLC hours and/or office hours perform better. Also, 299 MLC hours are great places to go and do your homework on a weekly basis, even if you do not have any explicit questions. Please make this a habit early on in the semester, and do not wait till the last few weeks to try and accumulate the hours. Note that these hours can only be accumulated at your instructors' office hours and/or the 299 MLC office hours and NOT at the regular MLC hours. We have tried to space out the hours of the 299 MLC to accomodate your schedule, but please talk to your instructor if these hours do not work for you.

Assessment - Mini Exam

The Mini Exam is another way for you to get practice performing problems under pressure. This is like a long quiz (and is worth more points). The Mini Exam is tentatively scheduled for **Tuesday, January 28, 2020, in class**, and will cover material presented in class up until that point. Note, the last day to drop with a refund is Friday, January 31, at 8pm. The mini-exam is scheduled so that you can get some information about possibly dropping the class before the deadline.

Assessment - (during semester) Exams

Two exams that are 80 minutes long and are tentatively scheduled for **Thursday, February 20, 2020** and **Thursday, March 26, 2020**, both in class.

Assessment - Homework

Homework is easily the most important activity for learning in this course (and any mathematics course, really). As an adviser said to us at the beginning of graduate school, “mathematics is not a spectator sport!”, so stop watching people solve math problems, and go do it yourself. Homeworks will be available on D2L on Monday of each week and will be due the following Monday. This will begin on Week 2. **Your homework will be due at the START of class on the days they are due.** Each homework will contain at least 2-4 problems. Your solutions will be graded by your instructor/TA and you will be provided with feedback. For most homeworks, you will have the opportunity to choose **one problem** and submit a revised solution to that problem based on the feedback you received. These revisions will usually be due on the Tuesday of the week after you receive feedback for your homework. The score you receive on your revision will replace the score you originally received for that problem on the homework. Note that the opportunity to revise these homework problems is optional. You do not have to submit revisions if you choose to do so. However, we highly encourage you to use this opportunity to build on your understandings.

In the words of my favorite undergraduate teacher, “a proof is your attempt to convince someone that a certain statement is true”, and therefore I need to be convinced that you know what you are talking about and that your assertions are indeed true. Also, it is important that your homeworks and the arguments within are easily readable by your instructors and TAs. To facilitate this, you are required to turn in **REWRITTEN** final drafts of your homeworks. These final drafts must be generated after you have already worked out the problems on the homework. These final drafts must be written on **regular Letter sized (8.5x11 inches or A4 sized) paper and must be stapled.** The paper can be ruled or unruled. A copy of the HW assignment from D2L should be the cover sheet of your homework.

A special note on homework grading: There are many of you, and only two of us! So we will be unable to grade every homework problem which you hand in. We will make a selection of homework problems to grade each week at our discretion. We will do our best to provide solutions to the homework so that all of your hard work can be put to good use in learning/practicing the material in this course. Also, the homeworks with the lowest 2 grades will be automatically dropped at the end of the semester.

Assessment - Final Exam

By registering for this class, you understand that the final exam is a mandatory part of the course. The final exam is scheduled for **Monday, April 27, 2020, 5:45pm - 7:45pm** in a common location for all sections, to be announced in class at a later date. The final is cumulative.

Calculating your Final Grade

To calculate your final grade you will take your MSU point grade from each Assessment Topic and multiply it by the Assessment weight. Sum the results to get your current course grade.

EXAMPLE:

Assessment	PARTIC.	HW	MINI EXAM	EXAM 1	EXAM 2	FINAL	SUM
Weight	10%	20%	5%	15%	15%	35%	
Student Scores	3.1	2.6	1.25	4.1	3.71	3.68	
Mult. Result	.310	.520	.06	.615	.5565	1.288	3.3495

*Since this is less than 3.5 but greater than a 3.0 this student would receive **get a 3.0 in the course.***

Late/Missing...

Late/Missing Homework Policy

Late homework will not be accepted without a serious and valid excuse, verified by a note from an appropriate professional. To justify this strict policy, I will DROP the 2 lowest homework scores from each student during the semester. Therefore, you get 2 free occasions to “turn in your homework late” by exercising your free drop on that particular homework.

Late/Missing Exam Policies

Typically a missed exam is given a 0. There are no make up exams. Please make sure to arrive on time and prepared. You know all the (tentative) exam dates! Please minimize your risk around exam dates and email your instructor and collect crazy amounts of documentation (ideally from professionals) if anything unforeseen occurs on the exam day.

Administrative Drop for Non-Attendance

Students will be dropped from this course for non-attendance by a departmental administrative drop after the fourth class period, or the fifth class day of the term of instruction, whichever occurs first.

How to Succeed in Math 299

Additional Help

In addition to class and instructor office hours there are also times in which the MTH 299 TAs tutor in the Math Learning Center (MLC). These hours are available at <https://math.msu.edu/mlc/>.

There is also a class forum, operated by Piazza, in which you can ask questions of your fellow classmates, the TA, and the instructor. Here are the sign-up and home links, respectively:

Sign-up: piazza.com/msu/spring2020/mth299

Class home page: piazza.com/msu/spring2020/mth299/home

It is recommended that when you have a homework question that you use this forum so that way everyone can see the response!

Hints for Success

A Suggestion From Dan: Dan was one of our most seasoned assistants for 299, and he has seen a lot of you struggle and succeed. Here are some suggestions from him.:

“Welcome to math 299. This course is going to be different than most math courses that you have previously taken and for this reason we are giving you a suggested weekly schedule for staying on top of work and concepts. The week “begins” on Monday when homework is assigned and new topics are introduced. It would be useful to go back through the material that is introduced on Monday while looking over the homework problems that have been assigned. This gives you the whole week to get through homework as well as you can on your own with help from the book and possibly office hours. Another useful thing to do during the week is look over solutions to previous examples that you did not fully understand. It is expected that you understand the examples. Without doing this you risk falling behind in the course. The rest of the course days will be work days in which you will be working through the example sheet and doing mathematics together and gaining understanding from each other and the process. After these two days you should be fully able to do any homework problem assigned and due Monday. After looking through and understanding the weekly examples, you should finish your homework assignment and have it ready for Monday. Be sure to ask lots of questions of your instructors and classmates so that you can more fully understand the proof techniques and concepts in this course!”

The 299 Study Cycle

Often when the instructor or TA presents problems in class they are the polished solutions but in this class we need to realize that it takes a good amount of work to get to that point. It is a process! Here is a typical study cycle that can help you master the material.

1. Learn about a new topic in class. See some examples of problems and solutions presented in lecture format.
2. Ask questions of the instructor.
3. Work on examples in class with peers.
4. Ask questions - peers first, instructors second.
5. After class, continue working on examples discussed in class.
6. Ask questions (email instructor, D2L, MLC, or office hours).
7. Look at solutions of examples from class.
8. Ask questions.
9. Work on homework, starting each question, not necessarily completing any.
10. Probably another day of class on the same topic, possibly extending concepts.
11. Ask questions.
12. Finish the homework questions, turn in homework.
13. Look at homework solutions.
14. Ask questions.
15. Read and digest the graded homework. Try to figure out what went wrong.
16. Ask questions (there will be time in class to ask instructors about graded homework).
17. Revisit examples and homework to make sure you can successfully complete them now.
18. Ask questions.
19. Repeat!

Schedules and Dates

Important Dates

WEEKDAY	DATE	EVENT
Monday	1/6/20	Classes Begin.
Monday	1/20/20	NO CLASS – University closed.
Friday	1/31/20	End of 100% Tuition Refund
Wednesday	2/26/20	Middle of Semester. Last day to drop a course without a grade being reported.
Monday-Friday	3/2/20- 3/6/20	Spring Break (NO CLASS)
Thursday	4/23/20	Last day of classes.
Monday	4/27/20	5:45-7:45 PM FINAL EXAM

Tentative Weekly Schedule

See D2L for updates to the schedule. Updates will be announced in class or posted on D2L.

Date	Day	Wk #	Day #	Topics	Homework
1/6	M	1	1	Syllabus, begin working in groups	
1/7	T		2	Keep working in groups	
1/9	Th		3	Keep working in groups	
1/13	M	2	4	Sets, set operations	HW1 assigned
1/14	T		5	Statements and quantifiers	
1/16	Th		6	Easy implication questions	
1/20	M	3		<i>No class, holiday</i>	HW2 assigned
1/21	T		7	Negations	HW1 due
1/23	Th		8	Contradiction	
1/27	M	4	9	Practice	HW2 due, HW3 assigned
1/28	T		10	Mini exam	HW1 revision due
1/30	Th		11	Contrapositive	
1/31	F			<i>Last day to drop with 100% tuition refund</i>	
2/3	M	5	12	Contrapositive, induction	HW3 due, HW4 assigned
2/4	T		13	Induction	HW2 revision due
2/6	Th		14	Functions, domain, codomain	
2/10	M	6	15	Injective functions	HW4 due, HW5 assigned
2/11	T		16	Surjective functions	HW3 revision due
2/13	Th		17	Bijective functions, inverses	

Schedule continued on next page.

Date	Day	Wk #	Day #	Topics	Homework
2/17	M	7	18	Practice and review	HW5 due, HW 6 assigned
2/18	T		19	Practice and review	HW4 revision due
2/20	Th		20	Exam 1	
2/24	M	8	21	Indexed unions and intersections	HW6 due, HW7 assigned
2/25	T		22	Bounded sets	HW5 revision due
2/26	W			<i>Last day to drop with no grade reported</i>	
2/27	Th		23	Bounded sets	
3/2	M			<i>Spring break all week</i>	
3/9	M	9	24	Unbounded sets	HW7 due, HW8 assigned
3/10	T		25	Unbounded sets, convergent sequences	
3/12	Th		26	Convergent sequences	
3/16	M	10	27	Practice, catch up day	HW8 due, HW9 assigned
3/17	T		28	Modular arithmetic	HW7 revision due
3/19	Th		29	Division lemma	
3/23	M	11	30	Practice and review	HW9 due, HW10 assigned
3/24	T		31	Practice and review	HW8 revision due
3/26	Th		32	Exam 2	
3/30	M	12	33	Greatest common denominator	HW10 due, HW11 assigned
3/31	T		34	Equivalence relations	HW9 revision due
4/2	Th		35	Practice, catch up day	
4/6	M	13	36	Partitions	HW11 due, HW12 assigned
4/7	T		37	Equivalence classes	
4/9	Th		38	Equivalence classes	
4/13	M	14	39	Review	HW12 due
4/14	T		40	Review	HW11 revision due
4/16	Th		41	Review	
4/20	M	15	42	Timed practice, exam type problems	
4/21	T		43	Timed practice, exam type problems	
4/23	Th		44	Review, last day of class	
4/27	M			Final exam, 5:45-7:45pm	

Other Policies

The Spartan Code of Honor Academic Pledge:

<http://splife.studentlife.msu.edu/spartan-code-of-honor-academic-pledge>

“As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor in ownership is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do.”

Academic Honesty

Article 2.3.3 of the Academic Freedom Report states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, the Mathematics Department adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades; the all University Policy on Integrity of Scholarship and Grades; and Ordinance 17.00, Examinations. (See Spartan Life: Student Handbook and Resource Guide and/or the MSU Web site: www.msu.edu.) Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, lab work, quizzes, tests and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Also, you are not authorized to use the www.allmsu.com Web site to complete any course work in this course. Students who violate MSU academic integrity rules may receive a penalty grade, including a failing grade on the assignment or in the course. Contact your instructor if you are unsure about the appropriateness of your course work. (See also the Academic Integrity webpage.)

Limits to confidentiality

Essays, journals, and other materials submitted for this class are generally considered confidential pursuant to the University's student record policies. However, students should be aware that University employees, including instructors, may not be able to maintain confidentiality when it conflicts with their responsibility to report certain issues to protect the health and safety of MSU community members and others. As the instructor, I must report the following information to the Department of Police and Public Safety if you share it with me: • Suspected child abuse/neglect, even if this maltreatment happened when you were a child, • Allegations of sexual assault or sexual harassment when they involve MSU students, faculty, or staff, and • Credible threats of harm to oneself or to others. These reports will trigger contact from the Department of Police and Public Safety who will want to talk with you about the incident that you have shared. In almost all cases, it will be your decision whether you wish to speak with that individual. If you would like to talk about these events in a more confidential setting you are encouraged to make an appointment with the MSU Counseling Center.

Accommodations for Students with Disabilities (from RCPD)

Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a Verified Individual Services Accommodation ("VISA") form. Please present this form to me at the start of the term and/or two weeks prior to the accommodation date (test, project, etc.). Requests received after this date may not be honored.

Disruptive Behavior

Article 2.III.B.4 of the Academic Freedom Report (AFR) for students at Michigan State University states: "The student's behavior in the classroom shall be conducive to the teaching and learning process for all concerned." Article 2.III.B.10 of the AFR states that "The student has a right to scholarly relationships with faculty based on mutual trust and civility." General Student Regulation 5.02 states: "No student shall . . . interfere with the functions and services of the University (for example, but not limited to, classes . . .) such that the function or service is obstructed or disrupted. Students whose conduct adversely affects the learning environment in this classroom may be subject to disciplinary action through the Student Judicial Affairs office.