MTH 299.002 Course Syllabus [Spring 2016]

Last updated on: January 10, 2016

Who, when, and where

Name	Tianran Chen	Elizabeth Drueke
Role	Instructor	Recitation instructor
Office	C237 Wells Hall	N/A
Email	chentia1@msu.edu	druekeel@msu.edu
Office Hours	MF 11:15–12:15am, W 3:30–4:10pm	N/A

MWF	A301 Wells Hall	10:20 – 11:10am	Class meeting
Th	306 Ernst Bessey Hall	10:20 – 11:40am	Recitation

Expectations

I expect you to be an active, hardworking, diligent, and competent learner. I expect you to spend between 9 and 12 hours per week outside of lecture reviewing your notes and working on homework problems (standard expectations of 3-4 hours outside of class, per credit hour of enrollment).

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 exposed to and learn some basic concepts from real analysis (rigorous calculus), linear algebra (things similar to vectors and matrices from vector calculus), number theory, and group theory. 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

Your course grade will be based on:

Attendence	D2L quizzes	Quizzes	Homework	Mini exam	Exam 1	Exam 2	Final
2%	3%	3%	18%	4%	17.5%	17.5%	35%

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

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
% Grade	[0,55)	[55,60)	[60,65)	[65,73)	[73,80)	[80,85)	[85,90)	[90,100]

This scale may be rescaled throughout the semester to be more lenient. Such a rescaling is at the discretion of the supervisor and instructor.

D2L quizzes This is a form of online reading checks that encourage you to read the book before coming to class. Reading the book to gain multiple exposures to the material is key to retaining it for quizzes, exams, and life. Due dates are posted on D2L.

Quizzes These quizzes are closed notes and closed book (just like an exam). Quizzes are typically 10-20 minutes long. See the schedule for in-class quiz dates.

Mini exam This is like a long quiz (and is worth more points). The Mini Exam is tentatively scheduled for Feb. 4th, 2016 and will cover material presented in class up until that point.

Exams They are 80 minutes long and are given during recitation. They are tentatively scheduled for Feb. 25th, 2016 and Apr. 21st, 2016.

Homework Homework is easily the most important activity for learning in this course **A paper print out of the Homework** will be **due at the beginning of class** (typically each Wednesday), and will involve both short answer and proof type questions. **Your solutions must be typed in LaTeX and printed out to be counted.** Each homework will be worth 60 points and it is very important that claims and statements in your answers are justified. In addition, a copy of your homework .TEX document and .PDF must be submitted to D2L (due date/time for each assignment is on D2L). Forgetting to do this on an assignment will lose you 10 points. 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 the instructor's 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.

Final 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 May 2nd from 5:45–7:45PM** in a location to be announced in class at a later date. The final is cumulative.

Course resource

Textbook *How to Think Like a Mathematician* (by Kevin Houston).
It is mandatory that you bring it to all class and recitation meetings.

D2L Our course site on the MSU D2L system (`https://d2l.msu.edu`) is an important component in this course. You will be taking reading check quizzes on this site. Electronic version of your homework will also be submitted through this site. Schedule updates and supplement material (if any) will be posted on D2L.

Piazza forum There is also a class forum: `https://piazza.com/class/iihmrxrmz9w3v` in which you can ask questions to your fellow classmates, the TA, and the instructor. It is recommended that when you have a homework question that you use this forum so that way everyone can see the response!

Policies

Late/Missing homework

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 3 lowest homework scores from each student during the semester. Therefore, you get 3 free occasions to "turn in your homework late" by exercising your free drop on that particular homework.

Late/Missing Participation Policies

Like the homework, no special considerations will be made without a serious and valid excuse, verified by a note from an appropriate professional.

Missing exam

A missed exam is given a 0. There are no make up exams. Please email your instructor and collect appropriate of documentation 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.

Additional Help

In addition to class, recitation, and instructor office hours there are also times in which the MTH 299 TAs tutor int the Math Learning Center (MLC). These hours are available at:

`http://math.msu.edu/mlc/default.aspx?courseid=299`

Tentative schedule & important dates

(updates can be found on D2L)

Date	Wkday	Wk#	L/R #	Topics	Assessment
1/11/2016	M	1	L1	Hello. What is this class about? Syllabus. Some basic defs about sets and N, Z (note the typo in the def on p.5), R. Time permitting, discuss some operations on sets.	HW1 Avail
1/13/2016	W	1	L2	Finish operations on sets.	RC1.1 Due
1/14/2016	R	1	R1	Mostly TA present material. Sets. Set operations. Defining sets via "all x such that". Demonstrate what careful solutions look like to familiar calculus questions.	
1/15/2016	F	1	L3	sets and functions.	
1/18/2016	M	2	**No Class**		
1/20/2016	W	2	L4	Functions. Injective, surjective, and bijective.	HW1 Due, HW2 Avail, RC2.1 Due
1/21/2016	R	2	R2	Examples related to hw2. Venn diagrams. Functions. Go over HW1, with possibly some incorrect solutions.	Quiz 1
1/22/2016	F	2	L5	Functions.	RC2.2 Due
1/25/2016	M	3	L6	More on functions. Injectivity and surjectivity and bijectivity. Inverse.	RC3.1 Due
1/27/2016	W	3	L7	Introduce statements.	HW2 Due, HW3 Avail, RC3.2 Due
1/28/2016	R	3	R3	Examples related to hw3. Go over the student examples from 9/14. Induction problems. Function problems. Go over HW2, present some incorrect solutions from HW1.	Quiz 2
1/29/2016	F	3	L8	Induction. Statements (Negation, And, Or).	RC3.3 Due
2/1/2016	M	4	L9	Induction. Statements (Negation, And, Or).	
2/3/2016	W	4	L10	Implications and contradiction	HW3 Due, HW4 Avail, RC4.1 Due
2/4/2016	R	4	R4	MINI EXAM (final 35 minutes of class). Go over HW3 and or incorrect solutions to HW2.	
2/5/2016	F	4	L11	Implications and contradiction	RC4.2 Due
2/8/2016	M	5	L12	Implications and contradiction	
2/10/2016	W	5	L13	Implications, continued. Equivalent, converse, contrapositive.	HW4 Due, HW5 Avail, RC5.1 Due
2/11/2016	R	5	R5	More on implications. Go over HW4. Present incorrect solutions to HW3 and others.	Quiz 3
2/12/2016	F	5	L14	More on implications and other problem solving from previous topics.	RC5.2 Due
2/15/2016	M	6	L15	More on implications and other problem solving from previous topics.	
2/17/2016	W	6	L16	Quantifiers.	HW5 Due, HW6 Avail, RC6.1 Due
2/18/2016	R	6	R6	More quantifier examples. Go over HW5. Present incorrect solutions to HW4 and others.	Quiz 4
2/19/2016	F	6	L17	Quantifiers.	RC6.2 Due
2/22/2016	M	7	L18	Quantifiers and tie up random loose ends before Exam1.	
2/24/2016	W	7	L19	Review for Exam1	HW6 Due, HW7 Avail
2/25/2016	R	7	R7	EXAM 1	
2/26/2016	F	7	L20	First real analysis day. Bounded sets, indexed union, intro to sequences.	
2/29/2016	M	8	L21	More on first set of real analysis topics. EXTRA SESSION in the evening to return and go over Exam1	RC8.1
3/2/2016	W	8	L22	Second real analysis day. Open / closed sets, partitions, more sequences.	HW7 Due, HW8 Avail, RC8.2 Due

Date	Wkday	Wk#	L/R #	Topics	Assessment
3/3/2016	R	8	R8	Examples for real analysis, all. Go over HW7. Present incorrect solutions to HW5, HW6 and others.	Quiz 5
3/4/2016	F	8	L23	Real analysis examples.	RC8.3 Due
SPRING BREAK NO CLASS					
3/14/2016	M	9	L24	Real analysis examples.	
3/16/2016	W	9	L25	First lilnear algebra day. Vector spaces and linear functions.	HW8 Due, HW9 Avail, RC9.1 Due
3/17/2016	R	9	R9	Linear algebra examples. Go over HW8. Present incorrect solutions to HW7 and others.	Quiz 6
3/18/2016	F	9	L26	Linear algebra examples.	RC9.2 Due
3/21/2016	M	10	L27	Linear algebra examples.	
3/23/2016	W	10	L28	Second linear algebra day. More on vector spaces and linear functions.	HW9 Due, HW10 Avail, RC10.1 Due
3/24/2016	R	10	R10	More on linear algebra. Go over HW9. Present incorrect solutions to HW8 and others.	Quiz 7
3/25/2016	F	10	L29	More on linear algebra.	RC10.2 Due
3/28/2016	M	11	L30	More on linear algebra and other problem solving / previous topics	
3/30/2016	W	11	L31	First number theory day. Primes, divisibility, gcd, modular congruence.	HW10 Due, HW11 Avail, RC11.1 Due
3/31/2016	R	11	R11	Number theory examples. Go over HW10. Present incorrect solutions to HW9 and others.	Quiz 8
4/1/2016	F	11	L32	More on number theory.	RC11.2 Due
4/4/2016	M	12	L33	More on number theory.	
4/6/2016	W	12	L34	Second number theory day. Relations / equivalence relations.	HW11 Due, HW12 Avail, RC12.1 Due
4/7/2016	R	12	R12	More on number theory, especially equivalence relations. Go over HW11, present incorrect solutions to HW10 and others.	Quiz 9
4/8/2016	F	12	L35	More on number theory.	RC12.2 Due
4/11/2016	M	13	L36	More on number theory.	RC13.1 Due
4/13/2016	W	13	L37	Generic examples work session	HW12 Due, HW13 Avail
4/14/2016	R	13	R13	Review for final exam.	Quiz 10
4/15/2016	F	13	L38	More on number theory.	
4/18/2016	M	14	L39	Catch-all for topics in HW7-HW13.	
4/20/2016	W	14	L40	Review for Exam2.	HW13 Due
4/21/2016	R	14	R14	EXAM 2	
4/22/2016	F	14	L41	Go over exam 2.	
4/25/2016	M	15	L42	Review for final exam.	
4/27/2016	W	15	L43	Review for final exam.	
4/28/2016	R	15	R15	Review for final exam.	Quiz 11
4/29/2016	F	15	L44	Review for final exam.	

1/15/16	Online open add period for spring semester ends at 8pm.
1/18/16	Martin Luther King Day. University open, classes canceled.
01/19/16-01/22/16	Students go to Undergraduate office, C212 Wells Hall for Mathematics enrollment changes. (Late adds, drop to lower course, section changes)
2/05/16	End of 100% Tuition Refund
3/02/16	Middle of Semester. Last day to drop a course without a grade being reported.
3/7/16-3/11/16	Spring Break
4/29/16	Last day of classes.

Other policies

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 Universitys 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 students 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.