

MATH 149S (Capstone Mathematics for Teachers) Syllabus

Spring 2025

Instructor Information

Name: Maria Nogin

Department: Mathematics

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Office: PB 340

Student Support Hours (aka Office Hours): Mon & Tue 2-3 pm,
Wed, Thur, & Fri 10-11 am, and by appointment

Course Information

Course Modality: In-person

Course ID: 36670

Units: 4

Class Meeting Time & Location: TTh 12:30-1:45 pm, S 145

Canvas: fresnostate.instructure.com

Prerequisite: MATH 151

Pre- or corequisites: MATH 145, MATH 161

Course Description: Secondary school mathematics from an advanced viewpoint. This course builds on students' work in upper division mathematics to deepen their understanding of the mathematics taught in secondary schools. In collaboration with local in-service teachers and university faculty, students will actively explore topics in number theory, algebra, analysis, geometry, and apply their content knowledge in a service-learning context.

It is expected that students will spend approximately 2 hours of study time outside of class for every hour in class. Since this is a 4 unit class, you should expect to study an average of 8 hours outside of class each week. This includes some individual preparation for Service Learning.

Required Course Materials

This class does not use any textbook. All necessary materials are available on Canvas.

Course Specifics

Course goals:

Upon completion of this course, students should know/understand:

- Mathematical ideas and processes (such as integer, rational, real, and complex numbers; functions; solving equations; proportional reasoning; length, area, and volume) taught in grades 7-12.
- Relevance of mathematics learned in college to the teaching of mathematics in middle and high school curriculum.
- The role of problem solving in the secondary school mathematics curriculum.

Student Learning Outcomes:

Upon completion of this course, students will be able to do:

- Describe mathematical ideas and processes taught in the grades 7-12 curriculum (such as integer, rational, real, and complex numbers; functions; solving equations; proportional reasoning; length, area, and volume), both with rigor and in a way accessible to students.
- Describe connections among the various branches of mathematics studied in college: abstract algebra, geometry, mathematical analysis, number theory.
- Use mathematical reasoning to analyze student thinking.
- Find rich extensions to the standard secondary mathematics curriculum.
- Design, observe, and analyze lessons for grades 7-12 mathematics curriculum.

GE ePortfolio Assignment:

N/A (This class is not a GE class.)

Course Assignments:

There will be weekly homework, consisting of reading summaries/reflections, Service Learning reports, and problem sets. Homework is due at the beginning of the class period (12:30 pm). No late papers will be accepted unless you have a serious and documented reason.

Three of the homework assignments focus on documents related to Service Learning, containing the Service Learning Plan and two progress reports. These documents must be completed individually and will count toward your homework grade.

All other homework assignments should be done in groups of 2-4 people. You may choose your group. If you have difficulty finding one, reach out to your instructor. The groups do not have to be the same for all homework; you may do one homework with one person/group and another homework with another. However, in case you want to change your group, you should notify both your instructor and your group members well in advance (at least two weeks notice is recommended.) Write full names of all group members on the first page. Please make sure that everyone in the group participates, understands, and agrees with all solutions. The primary goal of homework is to learn, so if someone else does a part of the homework and you do not participate, you don't learn that material. You need to actively participate to make sure you learn well. The whole group will receive the same grade. If you have any questions or need someone to listen to and possibly comment on your ideas, please do not hesitate to ask your instructor (this is one thing her office hours are for!) Also, you are encouraged to work with any of your classmates even if they are not in your group. However, your group has to write all

explanations/solutions, in your own words. Any copying will be considered cheating and will not be tolerated. Finally, any use of AI is not allowed.

Homework is to be done using Overleaf (online collaborative LaTeX editor), and I will type my feedback in the file. I will create your Overleaf project. Please send me the list of your group members (names and Fresno State emails) as soon as you have your group. You must type all text directly in Overleaf (no copying). If you would like to have draft/test files, you may do so in the same project, but then indicate clearly which file is a draft and which is the final version to be graded. Even though I have access to your project, I will not check or grade your homework before the deadline. Continue working on your homework at any time before the deadline, however, you may not make any changes after the deadline (12:30 pm). If any edits are made after the deadline, this will be considered cheating, and your homework will not be accepted. No late submissions will be accepted unless you are sick or have another documented serious and compelling reason to delay homework (notify your group and instructor in advance if possible; provide a doctor's note or other documentation). Keep in mind that in case of a delay, you will most likely have to do the homework by yourself as your group members will have to submit their homework on time.

Exams:

There will be three tests (50 minutes long each). If for any reason you are unable to take a test at the scheduled time, please let your instructor know as soon as possible, and certainly before the test. In most cases, you will be expected to take the test before it is given in class. No late tests are given unless you have a serious and documented reason to miss class.

Attendance:

It is important to attend every class because group/class discussions are an important part of the course. Attendance may be taken but will not be directly a part of your grade. Participation, however, will be a part of your grade. There are several ways to participate: present your solutions to homework problems and class problems, work on other activities done in class, and contribute to the class discussions. Some class discussions will be based on reading assignments and service learning, others on the material studied in class.

If you miss a class, you should contact one of your classmates or the instructor to find out what was done in class and whether important announcements were made or homework was assigned.

Grading policy:

Your grade for the course will be based on your participation and performance on exams, homework, and Service Learning. The number of points awarded for these is as follows. A grade of C or better is required to pass this class.

Assignment	Weight
Class Participation	8%

Assignment	Weight
Homework	20%
Test 1	10%
Test 2	10%
Test 3	10%
Service Learning	24%
Presentation	3%
Final Project	15%
Total	100%

Letter Grade	Score
A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

Extra help:

It is essential not to fall behind because most classes will use the material studied previously. If you have trouble with some material, seek help in the following ways:

- If you are having any difficulties, seek help immediately - don't wait until it is too late to recover from falling behind!
- Ask me, either in class or privately. Don't be shy to ask questions. If you don't understand something, chances are very high that somebody else doesn't understand that either. So your classmates will be thankful to you for asking questions in class!
- Attend office hours. These are drop-in hours when I am in my office for sure, with my door open. If my posted office hours do not work for your schedule, make appointments. My contact info is listed on the first page of this syllabus.
- Questions about homework are welcome at any time. However, after you get help from me, you should put aside all the notes you made while talking to me, and write a complete solution from scratch, in your own words. I rarely write complete sentences during my office hours, I may only help you to find an approach or an idea. You are responsible for writing a complete solution/explanation.
- Work with your classmates. Note: working on your homework together is encouraged, however, every group should write down their solutions on their own. If somebody is helping you with your homework then the same rules as for my helping you apply, i.e. you should put aside all the notes and write a complete solution from scratch, in your own words. That way you will learn the best.

If you are having any difficulties, seek help immediately - don't wait until it is too late to recover from falling behind, or failing to understand a concept!

Service Learning

Service learning is a key component of this course. In short, Service Learning is defined as a meaningful service with the community that is tied to the curriculum and includes civic learning. Read more and watch short videos on Service Learning at the following sites:

[Service Learning and Students](#)

[What is Service Learning?](#)

[A Student's Guide to Successful Service Learning](#)

[Safety Guidelines for Service](#)

Below is the information on SL specifically in this class. Get familiar with the list of activities, read the rules and expectations, and then complete and sign the Service Learning Plan (see the first homework). Also, indicate your general preferences in [SL preference form \(optional\)](#) and availability for specific activities on [SL sign-up sheet](#). Make sure to sign up for some activities that are held soon, don't wait until later to start SL!

In this class, SL will involve at least 24 hours of observation of, participation in, assistance with, and instruction of extra-curricular activities (for advanced/interested students; not tutoring; this last task will be your main focus).

Below are a few types of pre-approved activities.

- Observe a Math Circle session for grades 3-8. No preparation is necessary. You earn 1.5 hours (the session is 1.5 hours long).
- Participate in a Math Circle session for grades 9-12. No preparation is necessary. You earn 2 hours (the session is 2 hours long).
- Proctor/assist with Math Competitions (AMC 8, Math Kangaroo, and/or Math Field Day). No preparation is necessary. You earn as many hours as the time spent proctoring the activity.
- Lead/teach. This will be the majority of your hours. You will team up with other people in our class, and work in small groups (usually 2-3 people). We will need to meet (sometimes once or twice, sometimes more than that) before each problem solving session to go over the concepts, problems, solutions, and/or prepare our materials. A limited number of pre-approved group meetings outside of class count toward your service learning hours. However, you will also need to do some work on your own between those group meetings.

Rules and expectations:

- Check your schedule carefully before signing up for an activity. We want to minimize cancellations as it is hard to find substitutes on a short notice.

- If you sign up to lead/help with an activity, make sure you work on it and attend all scheduled prep meetings. If you do not prepare, you will not be allowed to lead the session. Also, make sure you show up to the session. A no show will receive 0 points.
- If you sign up to observe an activity, no preparation is required. Make sure you show up to the session. A no show will receive 0 points.
- If you sign up for an activity and soon realize that you have a conflict, notify your group members and your instructor as soon as possible.
- If you prepared for an activity, remember that you have a certain role. So if you are late or do not show up, your team members will have a harder time leading the session. If you truly have an emergency on the day of the activity, notify your group members and your instructor (cell phone: 559-960-9420, email: mnogin@csufresno.edu) as soon as possible.
- Whenever you schedule a meeting with your group members, please copy to your instructor. Also, make sure that the whole group is aware of the meeting and everyone in the group is welcome to join. Meetings should be held in person on the Fresno State campus during reasonable hours (unless approved otherwise). Whenever you email your group members regarding meetings/preparation, make sure to reply to all. You will not receive credit for your prep meetings if the above conditions are not met.
- In your group meetings, you will decide on what to include, how to distribute the work, discuss solutions, finalize the materials, and practice your presentations. You may often be required to do some "homework" between meetings. This homework does not count toward your hours, only your group meetings do.
- Whenever original materials are developed for a session (e.g. a Math Field Day practice session), have all your materials ready at least one week in advance. This will give you and the instructor/teacher in charge time to proofread them.
- Make sure you are properly prepared. Proofread all your materials really carefully. The goal is to have error-free problems/solutions/answers for all sessions. Make sure you understand all solutions very well and are ready to lead the class discussion. If you have any difficulty, work with your group members and your instructor until you are confident. Remember that your prep meetings count towards your service learning hours. It is better to lead fewer activities and spend more time preparing for each one so that you are most ready and confident.
- Be professional, inclusive, considerate, and prompt. Check your email regularly and reply in a timely manner.
- When observing or participating in an activity led by other people, please be respectful. Be there on time and stay until the very end of the session. No talking, eating, making noises, or other distractions.
- When participating in an activity, you are expected to be there for the entire session and actively participate. Work on the assigned problems, share your ideas, ask questions, etc.

Failure to comply with the above rules and expectations will result in a lower grade.

List of pre-approved activities:

- **Math Circle**, grades 3-4, 5-6, 7-8, PB 011, 012, 013
 1. Saturday, January 18, 10:00-11:30 AM
 2. Saturday, February 1, 10:00-11:30 AM
 3. Saturday, February 15, 10:00-11:30 AM
 4. Saturday, April 26, 10:00-11:30 AM

Observers are welcome in all groups: grades 3-4, 5-6, and 7-8 on all dates, but the number of observers for each meeting is limited. No preparation necessary.

Sign up [here](#). [Fresno Math Circle website](#)

- **Math Circle**, grades 9-12, S 145
 1. Wednesday, January 29, 5:30-7:30 PM
 2. Wednesday, February 26, 5:30-7:30 PM
 3. Wednesday, March 26, 5:30-7:30 PM
 4. Wednesday, April 23, 5:30-7:30 PM

No preparation necessary. Participate in the activities along with the high school students. Dr. Khang Tran is teaching this group.

Sign up [here](#).

- **AMC 8 Competition**, grades 5-8
 1. Thursday, January 23, 5:00-7:00 PM, S2 208

One helper is needed. No preparation is necessary.

Sign up [here](#).

- **AMC 8 Solutions**, grades 5-8
 1. Thursday, February 6, 5:30-7:30 PM, S2 208

Observers are welcome. Preparation (40 minutes) is encouraged but not required. Your instructor is in charge of this session.

Sign up [here](#). [AMC Problems](#)

- **Math Kangaroo Practice Sessions**, PB 011, 012
 1. Saturday, February 8
 2. Saturday, February 22
 3. Saturday, March 8

- 10:00 AM-12:00 PM - grades 5-6 (and 1-2 on March 8)
- 1:30-3:30 PM - grades 3-4 and 7-8

Leaders are needed for grades 3-4, 5-6, and 7-8. About 3-5 hours of group preparation meetings will be needed for each session depending on the grade level. One helper is needed in grades 1-2 on March 8 only. Your instructor is in charge of all these.

Sign up [here](#). [Math Kangaroo web page](#)

- **Math Kangaroo Competition**, grades 1-12
 1. Thursday, March 20, 4:45-8:15 PM - Location TBD

Helpers are needed. No preparation necessary. Your instructor is in charge of this competition. Dr. Agnes Tuska will help as well.

Sign up [here](#).

- **Math Kangaroo Solutions and Awards**, grades 1-12
 1. Saturday, April 5, 10:00 AM-12:00 PM - PB 012, 013, 101

Leaders are needed for grades 3-4, 5-6, and 7-8. About 3-5 hours of group preparation meetings will be needed for each session depending on the grade level. Your instructor is in charge of this activity.

Sign up [here](#).

- **Math Field Day Practice Sessions at Fresno State**
 1. Tuesday, March 11, 5:30-7:30 PM, location TBD, grades 6-8, coordinated by Dr. Agnes Tuska, leaders needed
 2. Monday, March 24, 5:30-7:30 PM, location TBD, grades 6-8, coordinated by Dr. Agnes Tuska, leaders needed
 3. A session for grades 9-12 is run on both of the above days as well, coordinated by your instructor, participants welcome
- Leaders are needed for grades 6-8. You will work with Dr. Agnes Tuska (agnest@csufresno.edu). About 10-11 hours total of preparation will be needed. Participants are welcome in grades 9-12. No preparation is necessary.

Sign up [here](#).

[Math Field Day website](#)

- **Math Field Day Event**, grades 6-12

Saturday, April 12, the event is usually in the morning and early afternoon, the exact time is TBD for this year. The exact time of your assignment will be determined by you and the Math Field Day coordinator. Typically assignments are approx. 3-4 hours long. No preparation is necessary. As many volunteers as possible are welcome. [Sign up to volunteer at the Math Field Day](#). Dr. Kay Kelm

(kbyler@csufresno.edu) is the Math Field Day coordinator this year.

Upon completion, you must turn in:

- **time sheet.**
- **notes** taken if you were observing.
- **materials developed** if you developed your own materials for the activity (e.g. Math Field Day practice session).
- **reflections** are required for all SL activities. Describe the concepts taught, including, if any, definitions given, theorems stated and/or proved, and procedures/algorithms described; were the definitions and statements and/or proofs rigorous? Could they be given more rigorously? If so, how? If not, why not (i.e. what additional knowledge would be needed that is not covered in elementary/middle/high school)? Were the procedures/algorithms explained (i.e. explained why they would work, under which conditions they would work, etc.)? Which questions did the students ask? In particular, did they ask to clarify any concepts/theorems/procedures? Which of the teacher's answers or examples were most helpful to the students? What problems were given/discussed? Which problems allow interesting extensions? Which problems lead to learning more advanced mathematics? Did the participants have interesting approaches/solutions, insightful questions, or observations? What mathematics or a problem solving technique did you learn while working on these problems or observing or leading the activity? Also, reflect on the pedagogical side of your experience. Did you observe any new teaching styles or techniques? What did you notice about the students? How were students with different learning styles helped? Were there any gender/ethnicity/social background differences, concerns, or issues that you were not aware of before? How were any concerns or issues handled? What did you learn as a future teacher? How can you become a better teacher, educator, and role model for your students? Finally, reflect on how your work benefits the students and the community.
Reflections must be typed. Please use a 12pt font. A satisfactory paper will usually be 1-2 full pages for each hour observed or led.
- **evaluation** filled out by you (top part) and the teacher (bottom part) - if your instructor was not the faculty in charge of this activity.
- **peer evaluation** filled out by you for each group member - if you ever worked with peers without your instructor present.
- peer evaluations filled out by your group members will be submitted by your group members directly to the instructor.

Timeline for turning in papers: All papers (time sheets, materials developed, notes, reflections, peer evaluations, teacher's evaluations) related to meetings/activities held during dates 1-15 should be turned in by the end of the same month. Papers related to meetings/activities held during dates 16-31 should be turned in by the 15th of the

following month. Exception: all papers related to meetings/activities held in May, if any, should be turned in by May 15. Upload all your papers to Canvas.

To clarify, for example, if there is a session with K-12 students on February 8, and the group prep meetings for that session started on January 27, report any group prep meetings held before or on Jan 31 in the "SL Jan 16-31" assignment (due Feb 15). No materials, reflections, or evaluations are needed yet, just your time log. Any group prep meetings held on or after Feb 1 as well as the session itself on Feb 8 will be reported in "SL Feb 1-15" assignment (due Feb 28), together with materials, reflections, and evaluations.

Grading: Your reflections will be evaluated by your instructor and account for 25% of your SL grade. Your performance will be evaluated by the teacher (if applicable), group members, and instructor.

Finally, you should prepare a short **presentation** about your field experience. You may choose the topic you want to present on: a class activity you liked (whether the class was taught by you or the teacher you observed), your lesson plan, problem solving strategies you learned or taught, teaching strategies you learned, anything you have learned about the students and how to be a better educator and role model, and other topics you may have discussed in your written reflections. This presentation is your chance to share your experience and what you have learned with the whole class (rather than just the instructor). Since you will be often working in groups, presentations may be, but do not have to be, prepared by groups as well. However, in this case, make sure that all of the group members are involved in preparing the presentation as well as presenting.

For extra credit:

Complete additional hours (i.e. above 24 hours) leading/helping with extracurricular activities. To be eligible for extra credit, you must earn at least 70% for the required 24 hours. You will get 0.5 points (0.5% of your grade) for each additional hour.

Course Policies & Safety Issues

In class, you are expected to pay attention (taking notes is strongly encouraged) and work solely on the in-class assignments. No talking on unrelated topics, reading of outside materials, use of electronic devices (with very rare exceptions when the class works on LaTeX) is allowed. No audio or video recording in class is allowed.

If you are absent from class, it is your responsibility to check on the material covered and announcements made while you were away.

Please see the Course Assignments section above for more information on homework rules and expectations. All tests will be individual; no collaboration or communication will be allowed.

The following sections regarding COVID are subject to change given the changing circumstances on-campus and in the community. Please check the [COVID website](#) for the most up-to-date information.

Vaccination:

The California State University system strongly recommends the COVID-19 vaccination and booster for all students, faculty, and staff. As a reminder, you are eligible for a booster five (5) months after receiving a final dose of the Pfizer or Moderna vaccine; or two (2) months after receiving a Johnson & Johnson vaccine.

Face Coverings:

Fresno State no longer requires masks to be worn indoors, but based on updated guidance from public health experts, the University highly recommends that all students, faculty, and staff, regardless of vaccination status, wear a surgical grade or KN95 mask indoors. Faculty will continue to have the discretion to require face coverings for their in-person classes as they evaluate the health and safety needs of their individual classroom environments.

Testing:

The campus was fortunate to receive the Higher Education Emergency Relief (HEERF) Funds during the pandemic and through June 2023 but funds are no longer available. Students will still be able to obtain free kits from the Student Health and Counseling Center. Additionally, free [COVID-19 test](#) options are offered by the Fresno County Department of Public Health.

Please remember that the same student conduct rules that are used for in-person classroom instruction also apply to virtual/online classrooms. Students are prohibited from any unauthorized recording, dissemination, or publication of any academic presentation, including any online classroom instruction, for any commercial purpose. In addition, students may not record or use virtual/online instruction in any manner that would violate copyright law. Students are to use all online/virtual instruction exclusively for the educational purpose of the online class in which the instruction is being provided. Students may not re-record any online recordings or post any online recordings in any other format (e.g., electronic, video, social media, audio recording, web page, internet, hard paper copy, etc.) for any purpose without the explicit written permission of the faculty member providing the instruction. Exceptions for disability-related accommodations will be addressed by Student Disability Services working in conjunction with the student and faculty member.

Dispute Resolution:

If there are questions or concerns that you have about this course that you and I are not able to resolve, please feel free to contact the Chair of the department to discuss the matter.

Chair's name: Dr. Carmen Caprau
Department name: Mathematics
Chair's email: ccaprau@csufresno.edu
Department phone number: 559.278.2992

Intellectual Property:

All course materials, including but not limited to the syllabus, readings, quiz questions, exam questions, and assignments prepared by the instructor are the property of the instructor and University. Students are prohibited from posting course materials online (e.g., Course Hero) and from selling course materials to or being paid for providing materials to any person or commercial firm without the express written permission of the professor teaching this course. Doing so will constitute both an academic integrity violation and a copyright violation. Audio and video recordings of class lectures as well as images of chat or messages shared during course sessions are prohibited unless I give you explicit permission in advance. Students with an official letter from the Services for Students with Disabilities office may record the class if SSD has approved that service. Otherwise, recordings of lectures are included in the intellectual property notice described above. These provisions exist regardless of the modality of the course. That is they apply to in-person, hybrid, and online courses.

Student Ratings of Instruction:

In the final weeks of the semester, you will be asked to complete a short survey to provide feedback about this class. The primary goal of student ratings is to help your instructor improve the class. Feedback will also be reviewed by the department chair and the college dean. Please offer feedback honestly and thoughtfully. Your participation is appreciated. You can access your student rating surveys and get more information at [Fresno State Student Ratings for Instruction \(SRI\)](#)

University Policies

Students with Disabilities:

Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in the University Library, Room 1202 (278-2811).

Financial Aid Satisfactory Academic Progress Standards and Appeals Process:

<https://studentaffairs.fresnostate.edu/financialaid/policies/sap/index.html>

The following University policies can be found on the web at:

- [Adding and Dropping Classes](#)
- [Cheating and Plagiarism](#)
- [Computers](#)
- [Copyright Policy](#)
- [Disruptive Classroom Behavior](#)
- [Honor Code](#)
- [Title IX](#)

Fresno State is committed to fostering a safe, productive learning environment for all students. Title IX and CSU policy prohibit discrimination on the basis of sex, which includes sexual harassment, domestic and dating violence, sexual assault, sexual exploitation, and stalking. We understand that sexual violence can impact a student's

ability to be successful in the learning environment. We encourage students who have experienced sexual misconduct to seek information on where to report from any member of our faculty or staff in order to ensure that the university can provide students with the necessary resources and supportive measures.

As an instructor, I have a mandatory reporting responsibility as a part of my role. It is my goal that you feel comfortable sharing information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep the information you share private to the extent possible. However, I am required to report any information I receive regarding sexual misconduct or information about a crime that may have occurred during your time at Fresno State.

Students can report incidents of alleged sexual misconduct to either or both of the following resources:

Office of Compliance and Civil Rights | occr.fresnostate.edu | 559.278.5003
Fresno State Police Department | fresnostate.edu/police | 559.278.8400

Students can also report other incidents of discrimination or harassment to:

Office of Compliance and Civil Rights | occr.fresnostate.edu | 559.278.5003

Students can access confidential support from two separate resources on campus:

Counseling Services | studentaffairs.fresnostate.edu/health/counseling | 559.278.2734
Survivor Advocacy Services | fresnostate.edu/survivoradvocate | 559.278.6796

Pregnancy or Related Conditions:

[Pregnant Students](#) or those with related conditions should contact the Title IX Coordinator in the Office of Compliance and Civil Rights for assistance. The Title IX Coordinator can coordinate specific actions to prevent sex discrimination and ensure the student's equal access to educational programs or activities.

Office of Compliance and Civil Rights | occr.fresnostate.edu | 559.278.5003

[Parent scholars](#) provides information on priority registration and other support for parenting students.

[Services for Students with Disabilities](#) can also provide assistance with [accommodations](#).

If you have concerns and you are unsure who to contact, please visit the [Concern & Action Guide](#).

Emergency Information:

In the event of an emergency, everyone in the campus community becomes a partner in the response. To ensure you are prepared and remain calm you must make yourself familiar with campus protocols. To contact the Fresno State Police Department call 559.278.8400 from your cell phone or 911 from a campus phone. Prior to an emergency, assess your environment for options depending on the emergency. Identify all possible exit routes, in an emergency always use the closest safest exit. Once you exit the building go to the predetermined evacuation assembly point, if that is unavailable then go to an open safe space away from the emergency. Identify where and how you can secure yourself inside if you need to shelter in place or hide from a threat. Be prepared to help guide those around you and assist individuals who may be in need. Additional information can be found at www.fresnostate.edu/emergency.

University Services

The following University services can be found on the web at:

- [Associated Students, Inc.](#)
- [Students with Disabilities](#)
- [Dream Success Center](#)
- [Library](#)
- [Learning Center Information](#)
- [Student Health and Counseling Center](#)
- [Academic Success Coaching](#)
- [Survivor Advocacy](#)
- [Writing Center](#)

Subject to Change Statement

This syllabus and schedule are subject to change in the event of extenuating circumstances.

Tentative Course Schedule

Date	Reading assignment	Written homework due	Topic and class activities
Thu, Jan 16			Introduction. Syllabus and Schedule. Overview of service learning. Math Circle, AMC, Math Kangaroo, Math Field Day, practice sessions. Sign-up sheet .
Sat, Jan 18	10:00-11:30 AM, PB 011, 012, 013. Math Circle , grades 4-9 - observers welcome.		
Tue, Jan 21	Service Learning and Students What is Service Learning? A Student's Guide to Successful Service Learning Safety Guidelines for Service SL preference form (optional) SL sign-up sheet		More on service learning. Technology. LaTeX: On-line collaborative LaTeX compiler (Overleaf) , On-line LaTeX manual , Sample slides . TikZ package: Sample file , Manual . Practice: Group 1 , Group 2 , Group 3 , Group 4 , Group 5 , Group 6 , Group 7 .
Thu, Jan 23		Service Learning Plan (complete and sign) and Syllabus Quiz	TikZ package continued
	5:00-7:00 PM, S2 208. AMC 8 competition , grades 5-8 - one helper needed.		
Tue, Jan 28			Natural numbers, Integers. Divisibility. Divisibility tests for 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 25, 100. Decimal (base 10) representation.
Wed, Jan 29	5:30-7:30 PM, S 145. Math Circle , grades 9-12 - participants welcome.		
Thu, Jan 30	Bases other than 10	Homework 1	Homework 1 discussion. Bases other than 10, definition, examples, applications, problems. Bases problems.
Sat, Feb 1	10:00-11:30 AM, PB 011, 012, 013. Math Circle , grades 3-8 - observers welcome.		
Tue, Feb 4			Other bases cont. Fractions in other bases. Place value problems. Discussion on Service Learning: math competitions and competition practices.
Thu, Feb 6		Homework 2	Homework 2 discussion. Counting (combinatorics). Fresno Math Circle 7-8 problems, MFD Prep problems, Math club problems.
	5:30-7:30 PM, S2 208. AMC 8 solutions , grades 5-8 - observers welcome.		

Date	Reading assignment	Written homework due	Topic and class activities
Sat, Feb 8	10:00 AM-12:00 PM grades 5-6, 1:30-3:30 PM grades 3-4 and 7-8. PB 011, 012. Math Kangaroo Practice - leaders needed		
Tue, Feb 11			Combinatorics cont. Binomial coefficients (n choose k). Binomial Theorem. Fresno Math Circle 11-12 problems.
Thu, Feb 13		Homework 3	Homework 3 discussion. Probability. Fresno Math Circle 11-12 problems: discrete probability, continuous probability.
Sat, Feb 15	10:00-11:30 AM, PB 011, 012, 013. Math Circle , grades 3-8 - observers welcome.		
Tue, Feb 18			Natural numbers revisited. Axiomatic construction of natural numbers (Peano postulates for N) Integers revisited. Construction: integers as equivalence classes of pairs (differences) of natural numbers.
Thu, Feb 20		Homework 4	Homework 4 discussion. Review.
Sat, Feb 22	10:00 AM-12:00 PM grades 5-6, 1:30-3:30 PM grades 3-4 and 7-8. PB 011, 012. Math Kangaroo Practice - leaders needed		
Tue, Feb 25			Test 1 (on topics from Divisibility to Probability).
Wed, Feb 26	5:30-7:30 PM, Location TBD. Math Circle , grades 9-12 - participants welcome.		
Thu, Feb 27	Construction of the Number Systems (Beachy and Blair, Abstract Algebra, 3rd ed., A2-A3)	Service Learning: progress report 1	Rational numbers. Definition used in high school. Formal construction of rational numbers (as equivalence classes of pairs of integers). Rational numbers as terminating/repeating decimals.
Tue, Mar 4			Real numbers. Construction of real numbers as equivalence classes of Cauchy sequences of rational numbers.
Thu, Mar 6		Homework 5	Homework 5 discussion. Complex numbers. Definition and representation in \mathbb{R}^2 using rectangular and polar coordinates. Geometric interpretation of complex numbers multiplication.
Sat, Mar 8	10:00 AM-12:00 PM grades 1-2 and 5-6, 1:30-3:30 PM grades 3-4 and 7-8. PB 011, 012.		

Date	Reading assignment	Written homework due	Topic and class activities
	Math Kangaroo Practice. Grades 3-4, 5-6, and 7-8 - leaders needed, 1-2 one helper needed.		
Tue, Mar 11			Functions. Definitions of important terms (function, domain, codomain, range, graph, intercept, root). Discussion on Service Learning: teaching diverse students.
	5:30-7:30PM, Location TBD. Math Field Day practice , grades 6-8 - leaders needed		
Thu, Mar 13		Homework 6	Homework 6 discussion. Equations. The concept of equation.
Tue, Mar 18			Polynomials. Polynomial equations. Roots and graphs of polynomials. Solving polynomial equations and inequalities. Overleaf file with this discussion.
Thu, Mar 20		Homework 7	Homework 7 discussion. Review.
	4:45-8:15 PM, Location TBD. Math Kangaroo Competition , grades 1-12 - helpers needed.		
Mon, Mar 24	5:30-7:30PM, Location TBD. Math Field Day practice , grades 6-8 - leaders needed		
Tue, Mar 25			Test 2 (on topics from Natural Numbers to Equations).
Wed, Mar 26	5:30-7:30 PM, Location TBD. Math Circle , grades 9-12 - participants welcome.		
Thu, Mar 27		Service Learning: progress report 2	Quadratic Polynomials. More on graphs of quadratic polynomials and solving quadratic equations and inequalities. Overleaf file with this discussion. Quadratic formula. Factoring quadratic polynomials. Vieta's formulas. Problems, Math Circle materials.
Tue, Apr 1			Algebraic structures. Definitions: group, abelian group, ring, commutative ring, field. Chart of groups through fields.
Thu, Apr 3		Homework 8	Homework 8 questions/answers. Geometry. Proofs of the Pythagorean theorem. Coordinate Geometry. Distance formula. Equations of circle and ellipse. Coordinate geometry problems.
Sat, Apr 5	10:00 AM-12:00 PM, PB 012, 013, 101. Math Kangaroo Solutions and Awards , grades 3-4, 5-6, 7-8 - leaders needed		
Tue, Apr 8			Similarity. Areas and volumes of similar figures/solids. Math club problems. More problems on similarity.

Date	Reading assignment	Written homework due	Topic and class activities
Thu, Apr 10		Homework 9	Homework 9 discussion. Proportional reasoning. Math Field Day games.
Sat, Apr 12	approx. 8:00AM-4:30 PM, various locations on campus. Math Field Day , grades 6-12 - helpers needed.		
Tue, Apr 15	Spring break		
Thu, Apr 17			
Tue, Apr 22			Final Project Discussion on Service Learning: mathematics in everyday life.
Wed, Apr 23	5:30-7:30 PM, Location TBD. Math Circle , grades 9-12 - participants welcome.		
Thu, Apr 24		Homework 10	Homework 10 discussion. Review.
Sat, Apr 26	10:00-11:30 AM, PB 011, 012, 013. Math Circle , grades 3-8 - observers welcome.		
Tue, Apr 29			Test 3 (on topics from Polynomials to Similarity).
Thu, May 1			Presentations: Service Learning
Tue, May 6			(Last class) Presentations: Service Learning (cont.) Discussion on Service Learning: how did our work benefit the students and the community?

Finals week	Dates
Final Exam Preparation & Faculty Consultation Days:	Thu, May 8 and Fri, May 9
Dr. Nogin's Consultation Hours	To be determined
Final Examinations	Mon, May 12 through Thu, May 15
Final Meeting in this course	Tue, May 13, 1:15-3:15 PM
Final Project due	Tue, May 13, 11:59 PM