California State University San Marcos • COURSE CHANGE(S) • FORM C-2 MATH 350

ORIGINATOR'S SECTION:		
1. College: ☐ CHABSS ☐ CoBA ☐ CoEHHS ☒ CSM	Desired Term and Year of Implementation (e.g., Fall 2008): Fall 2017	
2. Current Course abbreviation and Number: MATH 350		

TYPE OF CHANGE(S). Check √ all that apply.

Course Number Change	☐	Delete Prerequisite	☐	Other Prerequisite Change	☒
Course Title Change	☐	Add Corequisite	☐	Grading Method Change	☐
Unit Value Change	☐	Delete Corequisite	☐	Mode of Instruction Change (C/S Number)	☐
Description Change	☒	Add Consent for Enrollment	☐	Consider for G.E. If yes, also fill out appropriate GE form.	☐
Add Prerequisite	☐	Delete Consent for Enrollment	☐	Cross-list	☐

Information in this section– both current and new – is required only for items checked (√) above.

CURRENT INFORMATION:	NEW INFORMATION:
	Course abbreviation and Number:
3. Title: **Foundations for Theoretical Mathematics**	Title: *(Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.)*
4. Abbreviated Title for Banner *(no more than 25 characters):*	Abbreviated Title for PeopleSoft: *(no more than 25 characters, including spaces)*
5. Number of Units:	Number of Units:
6. Catalog Description:	Catalog Description: *(Not to exceed 80 words; language should conform to catalog copy. Please consult the catalog for models of style and format; include all necessary information regarding consent for enrollment, pre- and/or corequisites, repeated enrollment, crosslisting, as detailed below. Such information does not count toward the 80-word limit.)*
Bridge course between computation-driven mathematics and theoretical mathematics. Designed to familiarize the student with the language and process of rigorous mathematical thought, speech, and writings through the introduction of typical and important examples from algebra, analysis, combinatorics, and geometry. Covers elementary logic, methods of proof, mathematical induction, sets, relations, including order relations and equivalent relations, functions and inverse functions, and binary operations. Mathematics majors are encouraged to take this course as early as possible. *Prerequisite: MATH 160 with a grade of C (2.0) or better.*	Bridge course between computation-driven mathematics and theoretical mathematics. Designed to familiarize the student with the language and process of rigorous mathematical thought, speech, and writings through the introduction of typical and important examples from algebra, analysis, combinatorics, and geometry. Covers elementary logic, methods of proof, mathematical induction, sets, relations, equivalence relations, functions, inverse functions, binary operations, and cardinality. Mathematics majors are encouraged to take this course as early as possible. *Prerequisite: MATH 160 with a grade of A- (3.7) or better, or MATH 162 with a grade of C (2.0) or better.*

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*If Originator is uncertain of this entry, please consult with Program Director/Chair.

CURRENT INFORMATION:	NEW INFORMATION:

7. Mode of Instruction* *(See pages 17-23 at http://www.calstate.edu/cim/data-elem-dic/APDB-Transaction-DED-SectionV.pdf for definitions of the Course Classification Numbers)*

Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)
Lecture		
Activity		
Lab		

Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)
Lecture		
Activity		
Lab		

8. Grading Method:*
- ☐ Normal (N) *(Allows Letter Grade +/-, and Credit/No Credit)*
- ☐ Normal Plus Report-in-Progress (NP) *(Allows Letter Grade +/-, Credit/No Credit, and Report-in-Progress)*
- ☐ Credit/No Credit Only (C)
- ☐ Credit/No Credit or Report-in-Progress Only (CP))

Grading Method:*
- ☐ Normal (N) *(Allows Letter Grade +/-, and Credit/No Credit)*
- ☐ Normal Plus Report-in-Progress (NP) *(Allows Letter Grade +/-, Credit/No Credit, and Report in Progress)*
- ☐ Credit/No Credit Only (C)
- ☐ Credit/No Credit or Report-in-Progress Only (CP))

9. If the NP or CP grading system was selected, please explain the need for this grade option.

10. Course Requires Consent for Enrollment?
☐ Yes ☐ No
☐ Faculty ☐ Credential Analyst ☐ Dean
☐ Program/Department/Director/Chair

Course Requires Consent for Enrollment?
☐ Yes ☐ No
☐ Faculty ☐ Credential Analyst ☐ Dean
☐ Program/Department/Director/Chair

11. Course Can be Taken for Credit More than Once?
☐ Yes ☐ No
If yes, how many times (including first offering)

Course Can be Taken for Credit More than Once?
☐ Yes ☐ No
If yes, how many times (including first offering)

12. Is Course Cross Listed: ☐ Yes ☐ No
If yes, indicate which course

Is Course Cross-listed? ☐ Yes ☐ No
If yes, indicate which course and check "yes" in item #17 below.

13. Prerequisite(s): *MATH 160 with a grade of C (2.0) or better.*

Prerequisite(s): *MATH 160 with a grade of A- (3.7) or better, or MATH 162 with a grade of C (2.0) or better.*

14. Corequisite(s):

Corequisite(s):

15. Documentation attached:
☒ Syllabus ☐ Detailed Course Outline

PROGRAM DIRECTOR/CHAIR - COLLEGE CURRICULUM COMMITTEE SECTION:
(Mandatory information – all items in this section must be completed.)

16. Does this course fulfill a requirement for any major (i.e. core course or elective for a major, majors in other departments, minors in other departments? ☒ **Yes** ☐ **No**
If yes, please specify:
1. MATH 350 (or MATH 370, which is no longer offered) is a required course in the Mathematics major.
2. MATH 350 (or MATH 370, which is no longer offered) is a requirement in the Single Subject Preparation Program (SSPP) in Mathematics.
3. MATH 350 (or MATH 270 with a minimum grade of B) is a requirement in the Mathematics minor.
4. MATH 350 is a required course in the Mathematical Methods Depth of Study in the Liberal Studies major.

17. Does this course change impact other discipline(s)? ***(If there is any uncertainty as to whether a particular discipline is affected, check "yes" and obtain signature.)*** Check "yes" if the course is cross-listed. ☒ **Yes** ☐ **No**
If yes, obtain signature(s). Any objections should be stated in writing and attached to this form.

Liberal Studies Discipline — Kim Knowles-Yánez (Signature) — 2/2/17 (Date) — ✓ Support ____ Oppose

____ Discipline — ____ (Signature) — ____ (Date) — ____ Support ____ Oppose

CURRENT INFORMATION: **NEW INFORMATION:**

18. Reason(s) for changing this course:

Prerequisite changes:
The Originator has analyzed records of the 257 students enrolled in this course over eight semesters (Spring 2013 through Fall 2016). 80 of those enrollments are "repeat" enrollments (i.e., students who either withdrew or received a grade below C in earlier attempts of the course), another 15 were post-baccalaureate students, and another 9 had incomplete prior course histories in their PeopleSoft records. The outcomes of the remaining 153 undergraduates who took the course for the first time were sorted according to what courses those students had completed prior to taking MATH 350 for the first time. The results were striking:

- Only 1 out of 35 students who had previously successfully completed MATH 160 (first semester calculus) with a grade less than an A and who had not completed MATH 162 (second-semester calculus) prior to taking MATH 350 was able to earn a grade of C or better in MATH 350 on her/his first attempt. The collective GPA on first attempts for this group was 0.3, and the C-/D/F/WU/W rate was 97%.
- 8 of the 13 students who earned a grade of A in MATH 160 but who had not completed MATH 162 before taking MATH 350 passed MATH 350 with a grade of C or higher. The collective GPA was 2.5, and the C-/D/F/WU/W rate was 38%.
- 63 of the 104 students who successfully completed MATH 162 before taking MATH 350 passed MATH 350 with a grade of C or higher. The collective GPA was 2.1, and the C-/D/F/WU/W rate was 39%.

(Astute readers will wonder why there are a total of 35+13+104 [=152] undergraduate students described in the three preceding bullets when the first paragraph stated that a total of 153 undergraduate student records were analyzed. This discrepancy is resolved due to the fact that the 153 records include one student who received a grade of WU in MATH 350 when taking it after having failed MATH 160.)
While the Mathematics Department wants its students to begin taking proof-based courses (of which MATH 350 is the "gateway" course) as early in their careers as they are ready to take them, it is clear that students who have not earned an A in the first-semester calculus need the additional experience of another semester of calculus before they are sufficiently prepared for MATH 350.

Course content changes:

1. Order relations are typically mentioned in passing as examples of relations, but this treatment is too slight to warrant inclusion in the list of the ten topics specifically named in the course description. So, order relations are being removed from the course description.
2. Changing "equivalent relations" (there is no such thing in mathematics) to "equivalence relations" corrects a typo that has existed since the current course description debuted in the 2008-2010 General Catalog.
3. Cardinality is an important focal point of the course, so it has been added to the list of topics included in the course.

SIGNATURES : (COLLEGE LEVEL) :

David J. Barsky January 23, 2017
1. Originator (Please Print) Date

2/6/17
2. Program Director/Chair Date

4/19/17
3. College Curriculum Committee Date

4/20/17
4. College Dean (or Designee) Date

(UNIVERSITY LEVEL)

5. UCC Committee Chair Date

6. Vice President for Academic Affairs (or Designee) Date

7. President (or Designee) Date

Tracker ✓
PS
RP

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Course Number and Name:	MATH 350 (Foundations for Theoretical Mathematics)
Semester:	Spring 2017
Class Time and Location:	MWF 10:30-11:20am in Commons (COM) 206
Instructor:	Dr. Barsky
Office:	Craven (CRA) 6228 (but note that my "office hours" will be held elsewhere)
Office Hours and Location:	Friday noon-3:30* in Craven (CRA) 6242** And by appointment * On most days, I will be willing to stay later if there still are students attending office hours at 3:30. ** Just two doors down from my office. Note that some office hours may need to be cancelled or moved to another room; such changes or cancellations will be announced at class and/or through the Cougar Courses "News Forum."
Phone Number:	(760) 750-3064 (but email is generally a **much** better way to reach me)
Email Address:	djbarsky@csusm.edu
Cougar Courses Website:	Access through Cougar Courses (http://cc.csusm.edu)

Course Graduate Assistant:	Justin Mulvany
Graduate Assistant Office Hours:	Wednesday 9:15-10:15am; CRA 6242
Supplemental Instruction (SI) Leader:	David Mosley
Supplemental Instruction Sessions:	Monday 4:00-5:30pm; ACD 204 Wednesday 12:30-2:00pm; ACD 201

Catalog Course Description:

Bridge course between computation-driven mathematics and theoretical mathematics. Designed to familiarize the student with the language and process of rigorous mathematical thought, speech, and writings through the introduction of typical and important examples from algebra, analysis, combinatorics, and geometry. Covers elementary logic, methods of proof, mathematical induction, sets, relations, including order relations and equivalent relations, functions and inverse functions, and binary operations. Mathematics majors are encouraged to take this course as early as possible. *Prerequisite: MATH 160 with a grade of C (2.0) or better.*

Expanded Course Description:

The primary goal of this course is to give you the tools to begin taking the more theoretical mathematics courses found in the upper-division curriculum. For most students, this will be the first college-level course in which the emphasis is no

longer on doing computations, but in combining ideas and arguments to construct proofs. As the title of the course correctly indicates, the methods that you will learn in this course will serve as the foundation for much of the upper-division mathematics curriculum.

One way to think of this is that you are learning the rules to a game that you may have never seriously played before, but the amazing thing about this course is that if you learn these rules well, you will discover that you haven't learned how to play just one game, you will have learned to play many games. That's why this course is the gateway to advanced courses in such different areas of mathematics as analysis (underpinnings of calculus), algebra, geometry, combinatorics, and graph theory. Alternatively, you can think of this course as learning the grammar and syntax of a new language (theoretical mathematics); once you've done this, you will have unlocked the possibilities of both accessing the vast literature in this area and being able to create your own mathematical compositions (i.e., proofs).

Note: Although the minimum prerequisite requirement for this course is a minimum grade of C in MATH 160, the Mathematics Department is in the process of changing the course prerequisite to the following:

- A minimum grade of *A-* in MATH 160, OR
- A minimum grade of *C* in MATH 162.

If you have not met either of these requirements it is highly advised that you withdraw from this class and register instead for MATH 162.

Learning Outcomes:

***Programmatic* Student Learning Outcomes (PSLOs):**

This course addresses, at varying levels, four of the five PSLOs in the Mathematics major:

- Explaining mathematical ideas, written and verbally, in a clear and organized way
- Developing and writing mathematical proofs
- Recognizing the interdependency of different areas of mathematics
- Applying core concepts of algebra and analysis

***Course* Learning Outcomes:**

Upon successful completion of this course, students will be able to

- Explain the axiomatic method and why mathematical statements need to be proved;
- Analyze logical statements involving connectives and quantifiers;
- Write clear and correct proofs using a variety of proof techniques, including direct proof, proof by contradiction, and proof by induction;
- Prove basic results in set theory; and
- Use elementary set theory to prove elementary results in different branches of mathematics such as algebra, analysis, combinatorics and geometry.

Required Materials: A Transition to Advanced Mathematics, 7th Edition
By Douglas Smith, Maurice Eggen and Richard St. Andre

(Note that there is a [more expensive] 8th edition, but that's not the edition that we'll use in this course.) It won't make a difference whether you purchase or rent a hard copy version or if rent a digital version, but you *will* need the [7th edition] text for the course. You may be able to find better prices elsewhere, but you can get relatively inexpensive print or digital copies of the text through VitalSource (https://www.vitalsource.com/products/a-transition-to-advanced-mathematics-douglas-smith-v1133007457):

Digital copy:	$ 39.49	for 180 days
	$ 53.99	for 1 year
	$154.49	for non-expiring access
Print copy:	$ 39.49	for the hardcopy print version

Grades: Course grades will be based upon the following factors with the specified weights:

Homework	12.5%
Quizzes	10 %
Group Work	7.5%
Three "Hour Exams"	15, 15 & 15 %
Final Exam	25 %
	100 %

Homework: It would be impossible to overstate the importance of doing the homework: Mathematics is something that you only really learn by doing! Please don't think of Homework as "only one eighth of your grade." Instead, think of it as the learning experience that forms the foundation for your performance in every other part of the course!

Homework assignments will be posted in Cougar Courses. Generally, homework will be assigned every class day (on material covered that day in class) and will be due one week later. As we approach the exams, review assignments will be assigned instead of homework; the only difference between these is that the review assignments are not handed in and graded.

There are some important rules for the homework. The basic principle underlying all of these is that any work that you submit needs to be your own authentic work, written in your own words.

I encourage you to work with one another, but I must insist that you write up your homework exercise separately. The very act of having to wrestle with finding exactly the right words to express an idea is exactly what you

need to go through in order for this to be a real learning experience. You should neither look at another classmate's written work before completing your own assignment nor show your work to a classmate their own work has been completed. To avoid temptation, I recommend that you avoid comparing solutions until work has been turned in.

Second, because this is an introductory course in the development of proof, the results that we will be covering are "basic," and can be found in a variety of texts, websites, etc. Although the results are important, what is even more important is that you go through the (sometimes difficult) process of developing them yourself and not just reading somewhere else how this is done.

Your primary resources (unless specifically directed otherwise) are to be the course text and your class notes. In particular, there are NO circumstances under which students are permitted to use a resource intended for the instructor or made available by another instructor or found on the internet. If you find a resource that you would like to use and aren't sure whether it is permitted, simply ask me in advance.

I expect your homework to represent your best effort as an emerging mathematician. When you are writing proofs for homework, your work should be legible and organized. There should be real paragraphs containing complete sentence that use good grammar to connect correctly spelled words. To use an analogy with the process used by an artist, you should be submitting your finished masterpieces, not the crude initial attempts that you might make while getting your inspiration. You should get in the habit of sketching out your proofs (perhaps on scrap paper) and then carefully rewriting the work that you will submit.

You should do your scratch work on a separate sheet of paper that is not turned in. Please only turn in problems that you believe you have solved and proofs that you believe that you have correctly written. If you can't come up with a proof (or solve a problem), instead write a clear paragraph (or paragraphs) about what approach you used, where you got stuck, and how you tried to get unstuck. Note, however, that you will often find that in the very act of carefully writing out why you are unable to complete a proof, you will see where you were going wrong. The good news is that you now know how to write the proof. The bad news is that you probably will need to rewrite what you have already written because you should be showing me a proof instead of telling me why you can't come up with one.

Please make it easy for me (or the grader) to find and read your work.

- Leave spaces between your problems so that we have room to write some comments.

- Unless your cursive is very easy to read, please print and use a traditional color like (plain) pencil, dark blue ink or black ink. Do not use red ink, any of the other bright non-traditional inks, crayon, etc.
- I allow, but do not recommend, typing (or typesetting) your homework assignments; you exercise different mental processes when you write than when you type, and you will end up learning better if you have written out the assignments by hand.
- If your assignment uses multiple pages, please staple them together and do not write anything (for instance the problem number in the upper left-hand corner) that is then going to be hidden underneath a staple.
- Please remember to put your name on your paper!

Of course, the homework exercises will meet the All University Writing Requirement.

Proliferation of solutions to homework exercises is a growing problem in college mathematics courses. To avoid contributing to this problem, complete solutions to the homework assignments will not generally be posted. I may, however, post solutions in Cougar Courses for certain problems that the class has found to be more difficult than usual.

If an assignment has a significant number of problems that you are unable to do, then you need to do something about this as soon as possible. Please come see me or Justin Mulvany in our office hours and/or attend the SI sessions associated with this course and/or seek help in the STEM Center. Of course, the sooner you attempt the homework, the sooner you'll know whether you need additional help…

Quizzes: In order to facilitate discussions and group work at class, readings (and sometimes videos) will be assigned ahead of time, and you will be expected to have completed the reading and/or viewed the videos ***before*** the class session. Although there might not be a quiz at the start of every class, you should arrive prepared to take such a quiz every day. (So be on time!)

There will be no make-ups for missed exams, but these will be excused for verified emergencies. Depending on how many quizzes are given, your lowest 1-3 quizzes will be dropped.

Group Work: Three "group work" days will be scheduled for this course. During these days you will break into groups and pretend to be editors and referees who are reviewing proofs that have been submitted to you. You will need to decide whether the proofs are correct, flawed but salvageable, or entirely fallacious. Then you and your partner will share your conclusions with other members of your group (who will have been reviewing other proofs, and who will share their conclusions with you). After class, each

referee will prepare a report (you'll get instructions in class about the format for these reports) and give it to the editor for feedback. The final versions of these reports will be submitted at some later class.

Hour Exams: Tentative dates for three Hour Exams are

- Friday, February 24;
- Wednesday, March 15; and
- Friday, April 21.

Note however that these are only tentative dates and the actual exam dates (which should not differ from the tentative dates by more than a week) will be announced in class and in Cougar Courses at least one week in advance.

No make-up exams will be given. If an exam is missed for reasons beyond the control of a student, then the final exam score will also be applied toward the hour exam grade, meaning that the final exam will actually count for 40% of that student's grade (25% for the final itself, and 15% for the hour exam being 'made up').

Final Exam: The final exam will be comprehensive, but with added emphasis given to the material covered at the end of the course (which was not covered on the hour exams). The final exam for this class has been scheduled for 11:30am – 1:30pm on Monday, May 15.

Tentative Course Outline and Schedule:

- First "Third*" of the Course (January & February)
  - Preface to the Student
  - Section 6.1
  - Chapter 1
- Second "Quarter*" of the Course (March)
  - Sections 2.1 – 2.5
- Third "Quarter*" of the Course (April)
  - Sections 3.1 & 3.2
  - Sections 4.1 – 4.4
- Fourth "Sixth*" of the Course (May)
  - Chapter 5
  - Section 2.6

* Of course, these fractions are only approximations.

The following table shows the alignment between

- the topics cited specifically in the course description,
- the "Sections and Prerequisites" diagram in the front inside cover of the text,
- the Table of Contents, and
- the prerequisite relationships between courses in the CSUSM Mathematics Department

Topics found in the official course description (i.e., in the Catalog)	**Sections identified as "Core" in the text's "Section and Prerequisites" diagram**	**Sections which are important for MATH 350, but not "Core" in the text's "Section and Prerequisites" diagram**	**Sections which are neither essential for MATH 350 nor "Core" in the text's "Section and Prerequisites" diagram, but which warrant consideration)**
	Preface to the Students		
Elementary Logic, Methods of Proof	§1.1 – §1.6 Logic and Proofs	§1.7 Additional Examples of Proofs	
Mathematical Induction, Sets	§2.1 – §2.5 Set Theory		§2.6 Principles of Counting (Useful for MATH 474 Introduction to Combinatorics)
Relations, including Order Relations and Equivalence Relations	§3.1 – §3.3 Relations and Partitions	§3.4 Ordering Relations (Actually, the Mathematics Department is removing this from the course description.)	§3 .5 Graphs (Useful for MATH 472 Introduction to Graph Theory)
Functions and Inverse Functions	§4.1 – §4.4 Functions		§4.5 & §4.6 Images of Sets & Sequences (Useful for MATH 378 Number Systems)
(More on) Sets		§5.1 – §5.3 Cardinality	§5.4 & §5.5 Cardinal Numbers (Not directly used in other undergraduate courses at CSUSM)
Binary Operations		§6.1 Algebraic Structures	§6.2 Groups (Useful for MATH 378 Number Systems and MATH 470 Introduction to Abstract Algebra)
			§7.1 Completeness of the Real Numbers (Useful for MATH 378 Number Systems)

We will most likely not cover any of the subjects in the last column (nor Ordering Relations in the middle column), but – if you keep the course text – you may wish to look at these, and also the sections in Chapters 6 and 7 that are not included in this table, prior to (or while you are) taking MATH 378, 430, 470, 472 and 474.

Academic Honesty:

Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. Violations of academic honesty will be reported to the Dean of Students, and sanctions at the University level may include

suspension or expulsion from the University. Furthermore, I reserve the right to assign any academic punishment for academic dishonesty, including a zero on the assignment or an F in the course.

Disabilities:
Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 4300, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with me during my office hours in order to ensure confidentiality.

Expected Student Effort:
MATH 350 is a 3-unit course and is designed with the expectation that you will be spending a *minimum* of 6 hours every week outside of class reading the textbook, reviewing notes from class, solving homework problems, and generally immersing yourself in the course. You should plan on spending more than 6 hours each week on this course. According to the course evaluation forms submitted last semester, a quarter of the students reported spending 10 or more hours per week on this course, and another third reported spending 8 or 9 hours/week on the course.

Success Strategies:
- Read ahead. Annotated reading assignments will usually be posted by the end of each class day. There are at least two important reasons for doing these readings in advance of the next class meeting. First, the classes are planned around the assumption that you have already done these readings; instead of going over the same examples in the same way in class we will often discuss topics in class that build upon and which complement these readings. Second, there will sometimes be quizzes on the readings; these shouldn't be too hard if you've done the reading for that day, but they'll generally be impossible if you haven't.
  - Sometimes a reading assignment will also contain a 'viewing assignment,' in that I'll also ask you to view a video. Try to make time to watch these as soon as you can. As you'll see a little further down in the Success Strategies (part 4 under Take Notes), watching these videos shouldn't be a passive activity. You should be actively involved in taking notes and – as directed in the video – hitting the pause button and trying to answer whatever question has just been posed.
- Learn definitions. There will be a lot of technical terminology in this course. It will be our basic vocabulary, and you need to know what these terms mean. I recommend flashcards (either the old-fashioned kind on index cards, or some of the new-fangled apps that you can put on your phone). Find (or make) a friend in class and make a game out of drilling each other on definitions.
- Take notes. Taking notes is an important learning strategy. There is a lot of research that shows that the act of writing something down facilitates learning and memory.

There are four different contexts in which you should be taking notes, and each of these should be approached differently.

1. *From a part of the lecture that's on PowerPoint slides*: Don't try to copy down the information on the slides; there's too much information there and the slides don't stay up for very long (and they'll be posted for you in Cougar Courses later that same day). Instead, here's what you should do. As soon as you get to class, jot down the outline for the day (I'll usually project that onto the screen as soon as I arrive in the room). Use a full sheet of paper for this and leave enough space between the various items on the outline for you to add comments. Once the lecture starts, try to follow the flow of the ideas being discussed and jot down any key insights that occur to you that aren't already on the slides (write these in the spaces you've left in the course outline so that you remember how to connect them to the material on the slides when you review the slides after they're posted in Cougar Courses).
2. *From an extended part of the lecture where an example is being worked (or a theorem is being proved) on the whiteboard*: Unless I tell you in class that I'll be putting this into the slides that will be posted in Cougar Courses, you should copy these down in their entirety. On the other hand, if I tell you that I'll be putting these into the posted slides, then treat this as if it already is in the PowerPoint slides and just jot down key points and observations.
3. *From the PowerPoint slides that are posted in Cougar Courses*: These slides will generally be posted each class day sometime in afternoon or early evening. You should get in the habit of reviewing these as soon as you can. That means not just looking at them, but actually writing them out and synthesizing them with any of the comments and notes that you took in class. As you write out these notes, make certain that you understand what it is that you're writing. If you don't understand something, make certain that you come to my office hours (or Justin Mulvany's office hours, David Mosley's SI sessions, or the STEM Center) and ask about it.
4. *From the MediaSite videos posted in Cougar Courses*: Since you can always replay parts of the video if it goes faster that you are able to write out the notes, you should be taking complete sets of notes here the way that you would in a traditional lecture course. Be aware that sometimes I'll give you specific suggestions in the video about how to organize your notes.

- Do the Homework. A homework assignment, based on what was covered in class that day, will usually be posted by the end of each class day. Homework assigned following a Monday class will generally be due the following Monday, homework assigned following a Wednesday class will usually be due the following Wednesday, and homework assigned following a Friday class will be due the following Friday. This means that at any one point in time, you are likely to have three homework assignments on which you are working. Starting work on these right away is a good way to keep yourself from getting overwhelmed. Of course, it's also a good idea to work on these problems closer to when we discussed the material in class, i.e., right away!
- Form a Study Group. One of the best ways to learn anything new is immersion. Immerse yourself in this course by finding classmates with whom you can continue

discussing and learning the material outside of the classroom. (But keep in mind that you still need to write up the homework that you are submitting by yourself…)

Resources to Promote Your Success in MATH 350:

- **My Office Hours**:
  Although I will need to occasionally cancel an office hour, I will generally hold at least as many *office* hours as *class* hours in a typical week. Take advantage of these! I will generally schedule additional office hours prior to the exams; these will be announced in class.

- **Supplemental Instruction (SI)**:
  This course is challenging and will require you to be pro-active in your learning and study strategies. This is a fantastic program offered by our Office of Undergraduate Studies to help students succeed in certain difficult courses in Biology, Chemistry, Psychology and Mathematics; MATH 350 is the only mathematics course supported by SI. While it is true that MATH 350 is a difficult course, it also is true that many students successfully make the transition from computational to abstract/theoretical mathematics. One such student is the SI Leader for this course, David Mosley. David was a student in my MATH 350 class two and a half years ago (he knows what it takes to do well in this course, and he wants to help you follow successfully in his footsteps), and he has been the SI leader for this class ever since then. I'm thrilled that David will be the SI leader for this class again this semester.

  Supplemental Instruction is available to all students enrolled in the class and provides peer facilitated study sessions led by a past student who has mastered the course material. As your SI leader, David Mosley, will facilitate discussions, problem solving, help you prepare for exams, and identify effective study strategies that can help you better understand course concepts. Attendance at SI sessions is free and voluntary. On average, students who attend SI sessions weekly earn higher final course and exam grades than students who do not participate in SI; see the following pair of tables with data from 2015-16:

Students attending…	% of Students Receiving a Grade of C or Higher	Average Course Letter Grade (1.0 = D, 2.0 = C, etc.)
10 or more SI sessions	79.3%	2.16
9 or fewer SI sessions	40.4%	1.30

Students attending…	% of Students Receiving a Grade of C or Higher	Average Course Letter Grade (1.0 = D, 2.0 = C, etc.)
15 or more SI sessions	81.8%	2.20
14 or fewer SI sessions	39.6%	1.30

You'll learn more about SI from David in the first week of class and you will get to vote for the weekly review session times. Sessions will start by the second week of classes. I highly recommend you attend these! Doing so will keep you from falling behind in the fast-moving course!!

- **Graduate Assistant Office Hours**:
  The Mathematics Department has further invested in your success in this course by assigning Justin Mulvany to support this course as the MATH 350 Graduate Assistant. Justin is a master's student who took (and excelled in) this course several years ago when he was an undergraduate, and he was the Graduate Assistant for this course last semester. He will hold regular office hours where you can get additional help, he will be here on days when we do the group work projects, and he will conduct the class on certain days when I will be called away from the course for some of my other duties. He also will grade most of the homework for our course.

- **STEM Center**:
  MATH 350 is one of the courses for which tutoring is available at the STEM Center in ACD 202. The STEM Center is open Monday-Thursday 9-5 and 9-noon on Fridays. The times when the tutors who support MATH 350 will be available has not yet been posted. Check http://www.csusm.edu/stem/stemtutoring/ later in the semester, or (even better) drop by the STEM Center to find out directly when you can get help. Use this as a fourth form of support.

Fine Print: This syllabus is subject to change with fair notice.