MATH 3180.001 Mathematical Explorations - Spring 2024

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936.468.1533, Math 336
OH: MWF 8-9, TR 11-12, M 1-2

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OH: MW 11-11:30 and 1-3

Classroom: MATH 205 Meeting time: M 4:00-5:30 PM

Course Description: Mathematical Explorations is a course designed to give students an opportunity to enhance their problem-solving skills, practice communicating mathematical ideas, and explore potential career opportunities in mathematics. We will focus more on ideas and imagination to solve non-standard problems. This course will serve as a platform tool upon which students build their investigatory skills and mathematical curiosity. No textbook is required.

Program Learning Outcomes (PLO): Students graduating from SFASU with a B.S. Degree and a major in mathematics will enrich each of the following:
1. Written Communication - SFA Mathematics majors communicate mathematical ideas effectively in written form, integrating mathematical notation correctly and consistently.
2. Verbal Communication - SFA Mathematics majors communicate mathematics effectively to diverse audiences.
3. Mathematical Maturity - SFA Mathematics majors grow from a computational understanding of mathematics to an integrated approach which includes critical thinking proficiency, computational facility, conceptual understanding, and problem-solving persistence.

Grade Components:

<table>
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<th>In-class participation</th>
<th>At-home Reflections &amp; Homework</th>
<th>Presentation (including preparation)</th>
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<td>30%</td>
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Grading Scale:

90% - 100% A
80% - 90% B
70% - 80% C
60% - 70% D

Course Requirements:

• In-Class Participation:
  ∆ In-class problem-solving activities will be assigned throughout the semester. They are designed to foster critical thinking, perseverance, and synthesis of different types of mathematical information. Active engagement in these activities is expected. If you plan to be absent from any of the classes, you must make arrangements beforehand for a makeup assignment. Most of the problems we will use for presentations will come from the ones we discuss in class.

• At-Home Reflections & Homework:
  ∆ Reflections on videos and essay will be assigned. After our presenter from the Center for Career and Professional Development presents, you will also be asked to prepare a resume.
  ∆ Attendance at three extracurricular mathematical activities, which may include the Texas Undergraduate Math Conference, math teachers’ circle meetings, department colloquia, or other activities. You will be expected to turn in a ½-page reflection for each activity.
  ∆ Meeting with your faculty mentor is expected. You will be assigned a faculty mentor and will meet at least three times. The first time will be a “get-to-know-you” session. The second times will be to discuss your assigned problem. The third will be to practice your presentation.
  ∆ A journal will be required where you will keep weekly journal entries on the in-class activities as well as on your reflections and other activities.

• Presentation and Preparation:
  ∆ Presentations will be on a nonstandard mathematical problem which we have discussed together and have continued on your own. Your work on this problem and its presentation will be a central focus of this course. You will present twice; the second presentation will be in front of the class and should incorporate feedback you receive on your first presentation. Your presentation should incorporate slides (PowerPoint, or other) and should last 10-20 mins. Math faculty and students are encouraged to attend our presentations, and your presentations will be recorded.
  ∆ Providing feedback on your peers’ presentations: Written rubrics will be provided.
General Policies and Information

• You earn your grade by communicating your understanding of the material through the assignments and tests. Clearly communicating mathematics will be essential in this course.
• e-mails will be sent regularly to the entire class during the semester. Check your SFA e-mail frequently.
• To contact an instructor, call the office, stop by the office, or e-mail. Best efforts are made to respond quickly.
• Students are expected to respect the learning environment of their fellow students. Towards this end, use of mobile phones, mp3 players, PDAs, etc., is forbidden during class.

University Policies

• Academic Integrity (Policy A-9.1)
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism. The penalty for a student found cheating on any part of an assignment, quiz, or exam in this class will range from a grade of zero on the work to a grade of F in the course, and may result in additional, more severe disciplinary measures. A student who allows another to copy his work and the student copying the work are both guilty of cheating. Do your own work. Do not show your completed work to others. Do not allow others to copy your work.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one’s own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one’s paper without giving the author due credit. Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp.

• Withheld Grades Semester Grades Policy (A-54)
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

• Students with Disabilities
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices.

• Acceptable Student Behavior
Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1 http://www.sfasu.edu/policies/student_conduct_code.asp). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.
• **Mental Health and Wellness**
SFA values students’ mental health and the role it plays in academic and overall student success. SFA provides a variety of resources to support students' mental health and wellness. Many of these resources are free, and all of them are confidential.

**SFA Counseling Services**
[www.sfasu.edu/counselingservices](http://www.sfasu.edu/counselingservices)
Rusk Building, 3rd Floor
936.468.2401

**SFA Human Services Counseling Clinic**
[www.sfasu.edu/humanservices/139.asp](http://www.sfasu.edu/humanservices/139.asp)
Human Services, Room 202
936.468.1041

**Crisis Resources:**
Burke 24-hour crisis line: 1.800.392.8343
Suicide Prevention Lifeline: 1.800.273.TALK (8255)
Crisis Text Line: Text HELLO to 741-741
**Tentative Course Calendar**

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>In-Class Activities</th>
<th>Outside Reflections &amp; Homework</th>
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</thead>
</table>
| 1    | M Jan 22| Course Orientation                                                                  | Journal:  
• Reflection: Growth Mindset video  
• Summarize problem solving activities                                      |
|      |         | Problem solving activities                                                          | Mentor Meeting #1:  
• Meet with math/stat prof to discuss what they do and how they got there  
Journal:  
• Summarize problem solving activities                                           |
| 2    | M Jan 29| Problem solving activities (motivating precise proof)                                | Video Project:  
• Find your own problem and summarize it in a short video (1-minute max).  
Journal:  
• Summarize problem solving activities  
• Reflection: “What are my strengths?”                                             |
|      | M Feb 5 | Problem solving activities                                                           |                                                                                                   |
|      |         | Class Discussion: “What are qualities of a professional mathematician?”              |                                                                                                   |
| 3    | M Feb 12| Problem solving activities                                                          | Journal:  
• Summarize problem solving activities                                           |
| 4    | M Feb 19| Problem solving activities                                                          | Job Prep:  
• Sign up, prepare, and complete a mock job interview  
Journal:  
• Summarize problem solving activities                                           |
| 5    | M Feb 26| Problem solving activities                                                          | Mentor Meeting #2:  
• Discussion your problem with mentor  
Journal:  
• Summarize problem solving activities                                           |
| 6    | M Mar 4 | What is Topology?                                                                   | Journal:  
• Summarize What is Topology?                                                                 |
| 7    | M Mar 11| SPRING BREAK                                                                       |                                                                                                   |
| 8    | M Mar 18| What is Mathematical Modeling?                                                       | Journal:  
• Summarize What is Math Modeling?  
• Reflection: “What concrete steps could I take now to prep for my ideal profession?” |
| 9    | M Mar 25| What is Data Science?                                                                | Journal:  
• Summarize What is Data Science?                                                   |
| 10   | M Apr 1 | What is Number Theory?                                                              | Journal:  
• Summarize What is Number Theory?                                                   |
| 11   | M Apr 8 | Problems of Class Interest                                                          | Journal:  
• Summarize What is Number Theory?                                                   |
| 12   | M Apr 15| Problems of Class Interest                                                          | Mentor Meeting #3:  
• Give draft presentation to Mentor (30 minutes)                                       |
| 13   | M Apr 22| Presentations                                                                       | Mentor Meeting #3:  
• Give draft presentation to Mentor (30 minutes)                                       |
| 14   | M Apr 29| Presentations                                                                       | Mentor Meeting #3:  
• Give draft presentation to Mentor (30 minutes)                                       |
| 15   | F May 10| Presentations (10:30am – 12:30pm)                                                   | Mentor Meeting #3:  
• Give draft presentation to Mentor (30 minutes)                                       |

Per SFA policy 5.4, this schedule reflects that there is (1) an amount of student work per credit hour that reasonably approximates not less than one hour of class or direct faculty instruction and two hours of out-of-class student work per week for fifteen weeks over a long semester, or the equivalent amount of work over a different amount of time; or (2) at least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practice, studio work, and other academic work leading to the award of credit hours.
Math 3180 – Seminar in Mathematics I  
Course Syllabus

**Course description:** Student participation in general and specific topics in mathematics, primarily focused on developing elementary skills required in mathematical fields. Mathematical models will serve as the tool to build investigatory skills and mathematical curiosity. May be repeated for credit on a different seminar topic with departmental approval.

**Credit hours:** 3

The following is an excerpt from SFA Policy 5.4:

> The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or;

2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students in courses offered by the Department of Mathematics and Statistics that wish to be successful should plan to spend a minimum of two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

**Course Prerequisites:** MATH 2314 and CSCI 1462, or concurrent enrollment. This course is designed to be taken early in a student’s course of study in the Bachelor of Science in mathematics program.

**Course Calendar: Subject to change**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>• Course Orientation</td>
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<tr>
<td></td>
<td>• Introductions</td>
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<tr>
<td></td>
<td>• Introduction to modeling</td>
</tr>
<tr>
<td>2</td>
<td>• Modeling activity</td>
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<tr>
<td>3</td>
<td>• Careers panel discussion</td>
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<tr>
<td>4</td>
<td>• Modeling activity</td>
</tr>
<tr>
<td>5</td>
<td>• Modeling activity</td>
</tr>
</tbody>
</table>
| 6   | • *Technically Speaking* response due (in D2L)  
     | • Group Posters: modeling assignment and date sign-ups  
     | • Discussion of text |
| 7   | • Discussion of text |
| 8   | • Visitor presentation  
     | • Discussion |
| 9   | • Visitor presentation  
     | • Discussion |
| 10  | • Visitor presentation  
     | • Discussion |
| 11  | • Group work on modeling project |
| 12  | • Group work on modeling project |
| 13  | • No Class – Thanksgiving Holiday |
| 14  | • Group work on modeling project |
| 15  | • Group work on modeling project  
     | • Resumé Critique, Mock Interview completed** |
| 16  | • Final Exam Week meeting, 4-6pm (poster presentations)  
     | • Class Engagement Self-Assessment, extracurricular activity reflections due at this week’s meeting |

**Course Goals:** The goals of this course is to provide opportunities for student growth in:

- Comprehension of core mathematical concepts;
- Procedural fluency and persistence;
- Competencies in using various mathematical tools for problem solving;
- Sound mathematical reasoning;
- An understanding of the development and connectedness of mathematical ideas;
- Proficiency in communicating mathematics in a format appropriate to expected audiences; and
- An ability to work in groups/teams to complete projects.

**Student Learning Outcomes:**

Students graduating from SFA with a B.S. degree and a major in mathematics will:

- Demonstrate comprehension of core mathematical concepts;
- Execute mathematical procedures accurately, appropriately, and efficiently;
- Apply principles of logic to develop and analyze conjectures and proofs;
- Demonstrate competence in using various mathematical tools, including technology, to formulate, represent, and solve problems; and
- Demonstrate proficiency in communicating mathematics in a format appropriate to expected audiences.

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Academic Integrity

The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff, and students to adhere to and uphold this policy.

Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

Withheld Grades Semester Grades (SFA Policy 5.5)
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**Students with Disabilities**

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**Student Wellness and Well-Being**

SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc.

If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

**On-campus Resources:**

**The Dean of Students Office** (Rusk Building, 3rd floor lobby)

[www.sfasu.edu/deanofstudents](http://www.sfasu.edu/deanofstudents)

936.468.7249

dos@sfasu.edu

**SFA Human Services Counseling Clinic** Human Services, Room 202

[www.sfasu.edu/humanservices/139.asp](http://www.sfasu.edu/humanservices/139.asp)
The Health and Wellness Hub “The Hub”

Location: corner of E. College and Raguet St.

To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:

- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education

www.sfasu.edu/thehub

936.468.4008

thehub@sfasu.edu

Crisis Resources:

- Burke 24-hour crisis line: 1.800.392.8343
- National Suicide Crisis Prevention: 9-8-8
- Suicide Prevention Lifeline: 1.800.273.TALK (8255)
- Crisis Text Line: Text HELLO to 741-741

Acceptable Student Behavior

Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy 10.4). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom.

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