



### Math 2113 – Calculus I (Lab) Course Syllabus

**Course description:** Limits, continuity, differential calculus of algebraic and transcendental functions with applications, basic antidifferentiation with substitution, definite integrals.

**Credit hours:** 1

**Course Prerequisites and Corequisites:** Prereq MATH 1318 or MATH 2212, corequisite MATH 2313

**Course outline:**

	<u>Approximate time spent</u>
• Limits and continuity	30%
○ Limits at a point	
▪ Formal definition	
▪ Existence	
▪ Infinite limits/vertical asymptotes	
○ Limits to infinity/horizontal asymptotes	
○ Algebraic evaluation	
▪ Basic rules/techniques	
▪ Sandwich Theorem	
○ Continuity/Intermediate Value Theorem	
• Derivatives and antiderivatives	30%
○ Definition of derivative/interpretations	
○ Derivative rules	
▪ Basic rules	
▪ Transcendental rules	
▪ Product and Quotient rules	
▪ Chain rule/implicit differentiation	
○ Antiderivative rules	
▪ Basic rules	
▪ Transcendental rules	
▪ Substitution	
• Applications of derivatives	30%
○ Related rates	
○ Position, velocity, and acceleration	
○ Extreme values/optimization	
○ Mean Value Theorem	
○ Curve sketching	
○ Newton's method	
○ L'Hopital's Rule	
• Definite integration	10%
○ Definition of the definite integral/interpretations (area, etc.)	
○ Riemann sums	
○ The Fundamental Theorem of Calculus	
○ Definite integrals with substitution	

**Program Learning Outcomes (PLO):** Students graduating from SFA with a B.S. Degree and a major in mathematics will:

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 Maturation - 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.

**Student Learning Outcomes (SLO):** At the end of MATH 2313/2113, a student who has studied and learned the material should be able to:

1. Find limits using graphs, algebraic techniques, and L'Hopital's Rule. [PLO: 1,2,3], [EEO: 2, 4, 5]
2. Demonstrate an understanding of the connection between limits and asymptotic behavior in functions. [PLO: 1,2,3], [EEO: 2, 3, 5]
3. Recognize and construct continuous functions. [PLO: 1,2,3], [EEO: 2, 5]
4. Connect the definitions of the derivative and definite integral to their geometric interpretations and applications. [PLO: 1,2,3], [EEO: 1, 2, 5]
5. Find derivatives and antiderivatives of algebraic and transcendental functions, including compositions of functions. [PLO: 1,2,3], [EEO: 2, 4]
6. Use implicit differentiation to solve related rates problems and to determine derivative rules for inverse transcendental functions. [PLO: 1,2,3], [EEO: 1, 2, 4]
7. Use information revealed by limits and derivatives to sketch graphs of functions and find extreme values of functions on given intervals. [PLO: 1,2,3], [EEO: 2, 4, 5]
8. Convey the connections between limits, derivatives, and integrals. [PLO: 1,2,3], [EEO: 2, 3, 6]
9. Use the Fundamental Theorem of Calculus to evaluate definite integrals. [PLO: 1,2,3], [EEO: 1, 4, 5]

*This course meets educator preparation standards for one or more certification programs; a complete listing of all the educator preparation standards this course meets can be found at:*

<https://sfasu.edu/docs/jacksteach/jacksteach-standards-alignment-chart.xlsx>.

### **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.



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## Department of Mathematics and Statistics

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)**

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. For additional information, go to <https://www.sfasu.edu/policies/course-grades-5.5.pdf>.

### **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>.

### **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, 3<sup>rd</sup> floor lobby)

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

936.468.7249

[dos@sfasu.edu](mailto: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)

936.468.1041

**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](http://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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