South Plains College
Common Course Syllabus: MATH 2413
Revised December 2019

Department: Mathematics, Engineering, and Computer Science

Discipline: Mathematics

Course Number: MATH 2413

Course Title: Calculus I

Available Formats: conventional

Campuses: Levelland and Reese

Course Description: Limits and continuity; the Fundamental Theorem of Calculus; definition of the derivative of a function and techniques of differentiation; applications of the derivative to maximizing or minimizing a function; the chain rule, mean value theorem, and rate of change problems; curve sketching; definite and indefinite integration of algebraic, trigonometric, and transcendental functions, with an application to calculation of areas.

Prerequisite: Successful completion with a grade of 'C' or better in MATH 2412 or successful completion with a grade of 'C' or better in MATH 1314 and MATH 1316.

Credit: 4 **Lecture:** 3 **Lab:** 2

Textbook: *Calculus, Volume 1*, Strang and Herman, OpenStax

Supplies: Please see the instructor's course information sheet for specific supplies.

This course partially satisfies a Core Curriculum Requirement: Mathematics Foundational Component Area (020)

Core Curriculum Objectives addressed:
- **Communications skills**—to include effective written, oral and visual communication
- **Critical thinking skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- **Empirical and quantitative competency skills**—to manipulate and analyze numerical data or observable facts resulting in informed conclusions

Student Learning Outcomes: Upon completion of this course and receiving a passing grade, the student will be able to:

1. Develop solutions for tangent and area problems using the concepts of limits, derivatives, and integrals.
2. Draw graphs of algebraic and transcendental functions considering limits, continuity, and differentiability at a point.
3. Determine whether a function is continuous and/or differentiable at a point using limits.
4. Use differentiation rules to differentiate algebraic and transcendental functions.

5. Identify appropriate calculus concepts and techniques to provide mathematical models of real-world situations and determine solutions to applied problems.
6. Evaluate definite integrals using the Fundamental Theorem of Calculus.
7. Articulate the relationship between derivatives and integrals using the Fundamental Theorem of Calculus.

Student Learning Outcomes Assessment: A pre- and post-test questions will be used to determine the extent of improvement that the students have gained during the semester

Course Evaluation: There will be departmental final exam questions given by all instructors.

Attendance Policy: Attendance and effort are the most important activities for success in this course. Records of your attendance are maintained throughout the semester. Five (5) absences, *for any reason*, are allotted to the student for the semester. Tardies count as one-half (1/2) of an absence. Tardies will be applied for consistently being late to class, as deemed by the instructor and leaving class early. If this number is exceeded, the instructor has the right to drop you with a grade of F or an X, depending on their discretion.

Plagiarism violations include, but are not limited to, the following:
1. Turning in a paper that has been purchased, borrowed, or downloaded from another student, an online term paper site, or a mail order term paper mill;
2. Cutting and pasting together information from books, articles, other papers, or online sites without providing proper documentation;
3. Using direct quotations (three or more words) from a source without showing them to be direct quotations and citing them; or
4. Missing in-text citations.

Cheating violations include, but are not limited to, the following:
1. Obtaining an examination by stealing or collusion;
2. Discovering the content of an examination before it is given;
3. Using an unauthorized source of information (notes, textbook, text messaging, internet, apps) during an examination, quiz, or homework assignment;
4. Entering an office or building to obtain an unfair advantage;
5. Taking an examination for another;
6. Altering grade records;
7. Copying another's work during an examination or on a homework assignment;
8. Rewriting another student's work in Peer Editing so that the writing is no longer the original student's;
9. Taking pictures of a test, test answers, or someone else's paper.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect on the part of the student and the instructor. Neither instructor nor student should be subject to others' behavior that is rude, disruptive, intimidating, aggressive, or demeaning. Student conduct that disrupts the learning process or is deemed disrespectful or threatening shall not be tolerated and may lead to disciplinary action and/or removal from class.

Diversity Statement: In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about

ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

Disability Statement: Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland (Student Health & Wellness Office) 806-716-2577, Reese Center (Building 8) 806-716-4675, or Plainview Center (Main Office) 806-716-4302 or 806-296-9611.

Nondiscrimination Policy: South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360.

Title IX Pregnancy Accommodations Statement: If you are pregnant, or have given birth within six months, Under Title IX you have a right to reasonable accommodations to help continue your education. To activate accommodations you must submit a Title IX pregnancy accommodations request, along with specific medical documentation, to the Director of Health and Wellness. Once approved, notification will be sent to the student and instructors. It is the student's responsibility to work with the instructor to arrange accommodations. Contact the Director of Health and Wellness at 806-716-2362 or email cgilster@southplainscollege.edu for assistance.

Campus Concealed Carry: Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations and Frequently Asked Questions, please refer to the Campus Carry page at: http://www.southplainscollege.edu/campuscarry.php
Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses. Report violations to the College Police Department at 806-716-2396 or 9-1-1.

SPC Bookstore Price Match Guarantee Policy: If you find a lower price on a textbook, the South Plains College bookstore will match that price. The difference will be given to the student on a bookstore gift certificate! The gift certificate can be spent on anything in the store.

If students have already purchased textbooks and then find a better price later, the South Plains College bookstore will price match through the first week of the semester.   The student must have a copy of the receipt and the book has to be in stock at the competition at the time of the price match.

The South Plains College bookstore will happily price match BN.com & books on Amazon noted as *ships from and sold by Amazon.com*. Online marketplaces such as *Other Sellers* on

Amazon, Amazon's Warehouse Deals, *fulfilled by* Amazon, BN.com Marketplace, and peer-to-peer pricing are not eligible. They will price match the exact textbook, in the same edition and format, including all accompanying materials, like workbooks and CDs.

A textbook is only eligible for price match if it is in stock on a competitor's website at time of the price match request. Additional membership discounts and offers cannot be applied to the student's refund.

Price matching is only available on in-store purchases.   Digital books, access codes sold via publisher sites, rentals and special orders are not eligible. Only one price match per title per customer is allowed.

Note: The instructor reserves the right to modify the course syllabus and policies, as well as notify students of any changes, at any point during the semester.

MATH 2413 - Calculus I Syllabus

Instructor: Jason Groves   **Office:** 2032 (Lubbock Downtown Center)
e-mail: jgroves@southplainscollege.edu
Phone: 806-716-2739
Office Hours: Mon-Thurs: 9 am - Noon, Fri: 8 am - 11 am
or by appointment.

Materials: Students must have regular access to the materials listed below.

Textbook: <u>Calculus, Volume 1</u> OpenStax CNX.. This text my be retrieved at `https://openstax.org/details/books/calculus-volume-1` (a direct link is also available on blackboard).

Writing: Suitable writing instruments and paper for taking notes and completing assignments. Written work will be handed in virtually by use of blackboard or email (instructions for how to do this are in a later section). Turned in work should be done in pencil, dark enough to be clearly seen on a digital scan.

Calculator: Calculators with e^x, ln, and trigonometric function keys will be required. These can be found on scientific calculators (inexpensively obtained from Wal-Mart or any other big-box store) or graphing calculators. There are free online options such as Wolfram Alpha (`wolframalpha.com`), Desmos (`www.desmos.com` Desmos also has smartphone apps) or GeoGebra (`www.geogebra.org`). Smartphone apps such as Panecal or ClassCalc are also available for low cost (or free).

Computer: Regular access to a reliable computer and internet connection will be required for study and for completion of assignments. Access to a printer may be needed to print out some assignments. If you do not currently have a computer, or the technology you have becomes unusable, each computer lab at any of SPC's campuses will be available throughout the semester as well. Students will also need a scanner, or a smartphone scanning app for submitting written assignments. As part of their enrollment at SPC, all students have access to Microsoft OneDrive via their SPC email and login. Instructions on how to use OneDrive to scan and submit assignments can be found in the Syllabus and Materials section of the blackboard course (instructions are similar for other scanning apps).

Blackboard: Blackboard (accessible via the SPC website) will be used as a central hub for the course. Students will find this syllabus, and all other course materials, as well as assignments, the textbook, etc. Students should be checking Blackboard often for announcements and updates, and to access the text. Blackboard utilizes students' SPC email, and students should be checking their SPC email regularly. *While there is an app for blackboard access, some features in the mobile app are suppressed. Students should plan on accessing blackboard from a computer at least a few times each week.*

Gradescope: The gradescope app will be used to submit most, if not all assignments. It can be downloaded from both Google Play and iOS app stores.

Class Attendance: Attendance for this course will be assessed by participation. Missing more than 2 exams, or any 5 assignments may result in being dropped from the course.

Assessment: Grading will be done according to the standard 10 percent scale (i.e. 100% - 90% is an A, etc.) with assignments weighted according to the following:

Homework:	30%
Exams	50%
Final Exam	20%

Homework: Homework will be assigned weekly, and each assignment is found in the current week of course content. Please see the document "How to: Writing Mathematically (showing your work)" to learn how written work should be submitted. All work on homework or exams should be neat, organized, well explained, and legible. Graphs, diagrams, tables, and other visual aids are welcome and encouraged wherever appropriate, and should be created with care.

Exams: There will be four midterm exams given during this course, as indicated in the course calendar. Your local faculty member/facilitator will coordinate your exam time with you to proctor the exam. They will administer the exam and collect your work at the end. During the exam all computers, mobile devices, notes and external aides will be prohibited. *Makeup exams are not given.*

Final Exam: The final exam is comprehensive, and a required part of the course. Failure to take the final exam results in an automatic F. The Final Exam must be submitted no later than Wednesday, May 8, 5 pm

Extra Credit: Extra Credit assignments are not offered in this course. Occasionally bonus problems may appear on exams.

Week	Topics	Sections
Week 1 1/16 - 1/19	Definition of Limit Limit Computation	2.2, 4.6 2.3
Week 2 1/22 - 1/26	Continuity Definition of Derivative	2.4 3.1, 3.2
Week 3 1/29 - 2/2	Derivative Rules Exam 1 (2.2, - 2.4, 3.1 - 3.4, 4.6)	3.3, 3.4
Week 4 2/5 - 2/9	Derivatives of Trigonometric Functions Chain Rule	3.5 3.6
Week 5 2/12 - 2/16	Inverses Implicit Differentiation Exponentials and Logarithms	3.7 3.8 3.9
Week 6 2/19 - 2/23	Related Rates Exam 2 (3.5 - 4.1)	4.1
Week 7 2/26 - 3/1	Linear Approximations Mean Value Theorem/Extreme Value Theorem	4.2 4.3, 4.4
Week 8 3/4 - 3/8	Curve Sketching L'Hopital's Rule	4.5 4.8
Week 9 3/18 - 3/22	Optimization Exam 3 (4.2 - 4.7)	4.7
Week 10 3/25 - 3/29	Anti-Derivatives Definite Integrals	4.10 5.1, 5.2
Week 11 4/1 - 4/5	Fundamental Theorems of Calculus, Net Change Integration by Substitution	5.3, 5.4 5.5
Week 12 4/8 - 4/12	Exponential, Logarithmic, and Inverse Trigonometric Integrals	5.6, 5.7
Week 13 4/15 - 4/19	Area Between Curves Exam 4 (4.10 - 5.7)	6.1
Week 14 4/22 - 4/26	Volumes of rotations	6.2, 6.3
Week 15 4/29 - 5/3	Hyberbolic Functions	6.9
Week 16 5/6 - 5/9	Finals Week Final Exam due by Wednesday, 5/10	