

# MATH 3415: Calculus III

Sul Ross State University

Fall 2024

Instructor/Professor: Mohammad Shah Alam, Ph.D.

E-mail: [msa24gn@sulross.edu](mailto:msa24gn@sulross.edu)

[shahalam.mju@gmail.com](mailto:shahalam.mju@gmail.com)

Cell Phone: (832) 877-3205

**Course Description** MTH 3301 is intended as an introduction to calculus of functions of several variables, including partial derivatives, multiple integrals, and vector calculus.

**TEKS** Information on the Texas Essential Knowledge and Skills can be found on the TEA website: <http://www.tea.state.tx.us>

**Class Meetings** M/W, 06:00 PM-07:15 PM (Online)

**Lab Meetings** M/W, 07:15 PM-08:30 PM (Online)

**Required Text** (1) Frank Ayres, Elliot Mendelson, Calculus.  
(2) Stewart, Multivariable Calculus.

**Office Hours** Monday, Wednesday: 8:30 AM - 1:30 PM; or by appointment.

---

## Course Policies

---

### Attendance Policy

Attendance is mandatory. Students are expected to attend class in person in their classroom of registration unless permission is given for extenuating circumstances. You will be held responsible for all material covered in class or the reading assignments. If you have to miss a class, it is your responsibility to obtain all notes, assignments, and announcements from someone else in the class. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved.

### Communication

I will post course documents, reminders, announcements, and assignments on the Blackboard system. You will also submit homework on Blackboard. I may also occasionally send announcements via e-mail. You should make sure you know how to access and use these tools. You are welcome to e-mail, telephone, or text me. However, if you chose to contact me, please make sure to state your name at the beginning of any message. I am here to help you! Ask questions in class, call me, e-mail me, text me, or come to my office. If you don't communicate with me, then I can't help you.

## **Grading Policy**

Your grades will be weighted as follows:

Lab Work	30%
Homework Folder	10%
Midterm Exam	25%
Final Exam	35%

A student who averages at least 90% will receive an A; at least 80% will receive at least a B; at least 70% will receive at least a C; at least 60% will receive at least a D.

## **Lab Work and Homework**

For each section that we cover, you will receive a homework set. The homework should be prepared as neatly as possible, in order, to be checked for completeness at the end of the semester. Pages should not be bound in any way so that they can be fed into a scanner and submitted electronically to me by yourself or an administrative assistant. In addition, we will spend our lab time working problems together. Sometimes they will be drawn from the homework. Sometimes they will be new to you. Your lab work grade will depend on your performance during these periods.

## **Exams**

There will be one midterm exam. Its tentative date is October 8. This is subject to change. You will be notified of a change at least one week in advance. Make-up exams will be given only in the event of an emergency, in which case written justification and/or documentation must be provided and approved. The comprehensive final exam will take place at the time scheduled by the university, during the final exam period at the end of the semester. Official time and date to be announced once the university publishes the final exam schedule.

---

## Subject Outline

---

*Below is a tentative subject outline and schedule for this course. Next to each topic section is the corresponding section from the textbook*

- I. Parametric Equations and Polar Coordinates: curves defined by parametric equations – calculus with parametric curves – polar coordinates – areas and lengths in polar coordinates – conic sections – conic sections in polar coordinates
- II. Vectors and the Geometry of Space: three-dimensional coordinate systems – vectors – the dot product – the cross product – equations of lines and planes – cylinders and quadric surfaces
- III. Vector Functions: vector functions and space curves – derivatives and integrals of vector functions – arc length and curvature – motion in space
- IV. Partial Derivatives: functions of several variables – limits and continuity – partial derivatives – tangent planes and linear approximations – the chain rule – directional derivatives and the gradient vector – maximum and minimum values – Lagrange multipliers
- V. Multiple Integrals: double integrals over rectangles – iterated integrals – double integrals over general regions – double integrals in polar coordinates – surface area – triple integrals – triple integrals in cylindrical coordinates – triple integrals in spherical coordinates – change of variables in multiple integrals

---

## Q E P Mapped Course

---

### Course Design: Communication Infused

To be successful in college and beyond, many sources (e.g., Morreale & Pearson, 2008) indicate that communication competencies are essential. Sul Ross recognizes that the current generation of undergraduate university students should receive training to navigate a global world as competent communicators in various contexts and channels of communication.

Through our Quality Enhancement Plan (QEP) called Compass, Sul Ross aims to equip you to navigate excellence in the 21st century by developing your communication skills across multiple courses. This mathematics course is designed to enhance your communication skills. Therefore, this course has the following QEP Student Learning Outcome:

### QEP Student Learning Outcome

The student will create works that exhibit skill in prepared and purposeful communication (written, oral, or visual).

---

## University Statements

---

**Distance Education Statement:** *Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing a student complaint are located in the student handbook.*

**SRSU Disabilities Services:** *Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. RGC students seeking accessibility services should contact Paulette Harris, Executive Assistant to the Vice President and Dean, at 830-279-3023 or email [pharris@sulross.edu](mailto:pharris@sulross.edu). Ms. Harris's office is at 2623 Garner Field Road, Uvalde, TX 78801 (this is the mailing address, too).*

**University Libraries:** *The Sul Ross Library offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, [library.sulross.edu](http://library.sulross.edu). SRSU RGC students may request InterLibrary Loans (ILLs) and book check outs from the Sul Ross Library to be picked up at the SWTJC library that is most convenient. Access requires your LoboID and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email ([srsulibrary@sulross.edu](mailto:srsulibrary@sulross.edu)), or phone (432-837-8123). The Southwest Texas Junior College (SWTJC) Library is also available on each campus for your physical use of the space or checking out books. Del Rio, Eagle Pass, and Uvalde students may use online resources available through SWTJC website, [library.swtjc.edu](http://library.swtjc.edu). These libraries serve as pickup locations for your ILL or Document Delivery or book requests; to do so, choose the appropriate pick-up location when requesting materials from the Alpine campus.*