Syllabus

Course Description: Vector algebra in two and three dimensions, multivariate differential and integral calculus, optimization, vector calculus including the theorems of Green, Gauss, and Stokes. Applications to economics, engineering, and all sciences, with emphasis on numerical and graphical solutions; use of graphing calculators or computers. May not be taken for credit in addition to AMS 261 or MAT 307.

SBC: STEM+   **Credits:** 4

Prerequisite: C or higher in MAT 127 or 132 or AMS 161 or level 9 on the mathematics placement examination.

Grading Scheme:

    25%: Test 1 (Tuesday 2/21 in Class)   **25%:** Test 2 (Tuesday 4/11 in Class)

    15%: Homework   **10%:** Quiz Average

    25%: Cumulative Final Exam (Tuesday 5/16 from 11:15am to 1:45pm, Location TBD)

Grading Scale: A 90-100, A- 85-89, B+ 80-84, B 75-79, B- 70-74, C+ 65-69, C 60-64, C- 55-59, D+ 50-54, D 45-49, D- 40-44, F 0-39

*NOTE: These letter grades are threshold scores only. Actual final scores needed to earn a certain letter grade may be lowered if warranted based on the difficulty of the exams. In other words, if your overall course percentage at the end of the course is 86%, you will not earn less than an A-; however, the threshold for a A- may be lower.

There will be no extensions for (or exemptions from) any HW, Quiz, or Exam unless your absence is based on a well-documented extenuating circumstance. There will be no extra credit given to any student on an individual basis.

Academic Calendar: All Registrar deadlines can be found here.

Brightspace: This will be our main resource for sharing information regarding grades, announcements, and course materials so please check it regularly.

WebAssign Homework: A WebAssign subscription is required to complete your HW in this course. Registration instructions can be found on Brightspace. Unless otherwise stated, you will receive an assignment posted every Sunday morning on WebAssign. It is strongly advised that you work through these assignments every week, but they will be due in 3 batches (see weekly schedule).

Quizzes: Unless otherwise stated, there will be a short one question quiz given at the end of every recitation. The quiz question will be a problem from the previous week's WebAssign, which is why you are encouraged to keep up with the WebAssign problems as they are posted. At the end of the semester, the lowest quiz will be dropped.

Calculators: Will not be permitted during any quiz or test. It is also strongly encouraged that you stay away from them while you work through your homework.

Textbook: *Multivariable Calculus,* 12th edition by Ron Larson and Bruce Edwards. Your WebAssign subscription includes and electronic copy of the textbook. Please note that the purchase of a physical copy of the textbook is not required.

Meeting Times: A complete table of meeting times can be found by clicking here.

Contact Info/Office Hours: You can find the office hours and contact info for your professors and TAs by clicking here.

Math Learning Center (MLC): Is a place where you can get free tutoring help with any of your math concerns. No appointment is required, just come in and ask for help. The MLC is located in the basement of the Mathematics Tower and virtually through Zoom. For more information, visit: http://www.math.stonybrook.edu/mlc/center-hours.html

Student Accessibility Support Center (SASC) Statement: If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@Stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website: https://ehs.stonybrook.edu/ /programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities and search Fire Safety and Evacuation and Disabilities.

Academic Integrity Statement: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

Anticipated Weekly Schedule

Week 1 (1/24 & 1/26)

- 11.1: Vectors in the Plane
- 11.2: Space Coordinates and Vectors in Space
- 11.3: The Dot Product of Two Vectors

Week 2 (1/31 & 2/2)

- 11.4: The Cross Product of Two Vectors in Space
- 11.5: Lines and Planes in Space
- 11.6: Surfaces in Space

Week 3 (2/7 & 2/9)

- 11.7: Cylindrical and Spherical Coordinates
- 12.1: Vector-Valued Functions
- 12.2: Differentiation and Integration of Vector-Valued Functions

Week 4 (2/14 & 2/16)

- 12.3: Velocity and Acceleration
- 12.4: Tangent Vectors and Normal Vectors
- 12.5: Arc Length and Curvature

Week 5 (2/21 & 2/23)

- HW 1-4 due on WebAssign by 11:59pm on Monday 2/20
- Test 1: Tuesday 2/21 in class covering topics from weeks 1-4 (HW 1-4)
- 13.1: Introduction to Functions of Several Variables
- 13.2: Limits and Continuity

Week 6 (2/28 & 3/2)

- 13.3: Partial Derivatives
- 13.4: Differentials
- 13.5: Chain Rules for Functions of Several Variables
- 13.6: Directional Derivatives and Gradients

Week 7 (3/7 & 3/9)

- 13.7: Tangent Planes and Normal Lines
- 13.8: Extrema of Functions of Two Variables
- 13.9: Applications of Extrema
- 13.10: Lagrange Multipliers

Week 8 (Spring Break - No Classes)

Week 9 (3/21 & 3/23)

- 14.1: Iterated Integrals and Area in the Plane
- 14.2: Double Integrals and Volume
- 14.3: Change of Variables: Polar Coordinates

Week 10 (3/28 & 3/30)

- 14.5: Surface Area
- 14.6: Triple Integrals and Applications
- 14.7: Triple Integrals in Other Coordinates
- 14.8: Change of Variables: Jacobians

Week 11 (4/4 & 4/6)

- 15.1: Vector Fields
- 15.2: Line Integrals

Week 12 (4/11 & 4/13)

- HW 5-10 due on WebAssign by 11:59pm on Monday 4/10
- Test 2: Tuesday 4/11 in class covering topics from weeks 5-10 (HW 5-9)
- 15.3: Conservative Vector Fields and Independence of Path

Week 13 (4/18 & 4/20)

- 15.4: Green's Theorem
- 15.5: Parametric Surfaces

Week 14 (4/25 & 4/27)

- 15.6: Surface Integrals
- 15.7: Divergence Theorem

Week 15 (5/2 & 5/4)

- 15.8: Stoke's Theorem
- Review

Finals Week

- HW 10-14 due on WebAssign by 11:59pm on Monday 5/15
- Cumulative Final Exam on Tuesday 5/16 from 11:15am to 1:45pm (Location TBD)