

Stony Brook University
Mathematics Department
Paul Sweeney
Email: paul.sweeney@stonybrook.edu
Zoom personal meeting:
<https://stonybrook.zoom.us/my/paulsweeney>
Class: MWTh 9:30am-12:35pm
OH: W 12:35pm-1:35pm
MLC: TBD

Calculus III with Applications
MAT 203, online synchronous
Summer 2021

Syllabus

Welcome to online synchronous MAT 203

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.

What to expect

This 6-week online synchronous course. There are homework sets assigned weekly. There are 2 Quizzes. There is also a final exam. I will have office hours via Zoom.

Textbook:

Gilbert Strang Calculus. Volume 3. The book is available for free on Openstax: <https://openstax.org/details/books/calculus-volume-3>

Grading:

Your grade will be based on homework 35%, quizzes 25% and the final exam 40%.

The homework and quizzes will be given through **WebAssign** (WA), an online platform for the course. The final exam will be proctored via Zoom.

Zoom:

We will use Zoom for office hours. Recurring links will be sent out at the start of the course.

WebAssign

WebAssign (WA) is the course online platform for doing assignments (homeworks, quizzes, the final). You have to purchase an access code to WA.

WA interface is student-friendly. You won't get lost! If you have difficulties with solving any WA problem, you may press the button "Watch it" and a similar problem will be solved for you by a WA instructor.

For each HW problem, you get five chances to enter the answer.
You will take your homework, quizzes, and exams through WA.

Important dates.

All HW are available 7 days before the date they are due. All Quizzes are available 2 days before they are due. All Quizzes are timed (45 mins).

Sunday 5/30 11:59pm: HW 12.1,12.4,12.5 due.

Sunday 6/6 11:59pm: HW 13.2, 13.3, 14.1, 14.2 and Quiz 14.3 due.

Sunday 6/13 11:59pm: HW 14.5, 14.6, 14.7, 14.8 due.

Sunday 6/20 11:59pm: HW 15.2, 15.3, 15.5,15.7 and Quiz 15.3 due.

Sunday 6/27 11:59pm: HW 16.1, 16.2, 16.3,16.5 due.

Thursday 4/1 at 9:30am -11:30am Final Exam.

Although there is homework assigned on WA for 7/4 this is not part of the grade but just some practice for some problems you might see on the Final.

A Note about Timed WA Assignments:

Once a student starts the assignment, the timer does not stop, even if the student closes the assignment or signs out of WebAssign. You should plan to complete the assignment in one session.

The actual due date for a timed assignment is either the date and time when the timer expires or the original assignment due date, whichever comes first. If a student starts a ten-minute timed assignment one minute before it is due, the student will have only one minute to complete the assignment.

If the time remaining until the assignment is due is less than the amount of time your student would otherwise have to complete the assignment, the timer displays only the remaining time until the assignment is due

Technology requirements

Windows: Chrome 65 or later Firefox
59 or later
Microsoft Edge 16

MacOS/ OS X: Chrome 65 or later Firefox
59 or later

Linux: Firefox 59 or later

Recommended Bandwidth and Hardware:

Internet: 5+Mbps

RAM: 1+GB

Display: 1024x768

How to reach the instructors

There will be online office hours through Zoom.

You may also reach your instructors by email: paul.sweeney@stonybrook.edu

Course Webpage:

Blackboard for Stonybrook.

Weekly schedule

Week 1: Vectors and Planes and Conics

- Learning objectives
 - Introduce vectors and vector operations in n-dimensional Euclidean space.
 - Define Dot Product and cross product
 - Learn geometric and algebraic definitions
 - Parametric equation of a line
 - Distance from line and a plane
 - Define conics
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Week 2: Curvature, torsion, the Frenet frame, functions of several variables, and differentiability

- Learning objectives
 - Arc length parametrization of a curve
 - Curvature
 - Frenet Frame
 - Osculating circle
 - Unit principal normal
 - Level surfaces
 - Continuity

- Partial derivatives
 - Limits
 - Laplace Operator
 - Total Derivative
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Week 3: Chain rule, directional derivative, implicit function theorem, extreme values, extreme value problems

- Learning objectives
 - Jacobian matrix
 - Chain rule for functions of several variables
 - Gradients
 - Implicitly defined functions
 - Local and global extremes on compact domains with constraints
 - Hessian
 - Second derivative test
 - Closed, bounded, and compact sets
 - Solving global extreme value problem
 - Lagrange multipliers
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Week 4: Non-cartesian coordinates, double integrals, change of variables, triple integrals

- Learning objectives
 - Polar and cylindrical coordinates
 - Solving double integrals
 - Fubini's Theorem
 - Area and volume
 - Change of variables for double integrals
 - Solving triple integrals
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Week 5: Vector fields, line integrals, parametric surfaces, surface integrals

- Learning objectives
 - Conservative vector fields
 - Curl
 - Potential of a vector field

- Parameterizations of surfaces
- Flux integrals

Week 6: Divergence theorem, Stoke's theorem, Green's theorem, Maxwell's equations

- Learning objectives
 - Divergence of a vector field
 - Stoke's and Green's theorem
 - Physical applications

Student Accessibility Support Center 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-people-physical-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.