MAT 127: CALCULUS C
SYLLABUS

FALL 2024

Lecture 01:

Instructor: Runze Zhang, runze.zhang@stonybrook.edu, Math Tower 3-114
Class time & location: MW 3:30–4:50pm, Library W4540
Office and MLC hours: math.stonybrook.edu/cards/zhangrunze.html

Grader: Sepehr Kooranifar, mohammadmehdi.kooranifar@stonybrook.edu
Office and MLC hours: math.stonybrook.edu/cards/kooranifarsepehr.html

Lecture 02:

Instructor: Arindam Mandal, arindam.mandal@stonybrook.edu, Math Tower 4-116
Class time & location: TuTh 9:30–10:50am, Earth&Space 131
Office and MLC hours: math.stonybrook.edu/cards/mandalarindam.html

Grader: Dashen Yan, dashen.yan@stonybrook.edu, Math Tower 2-109
Office and MLC hours: math.stonybrook.edu/cards/yandashen.html

Lecture 03:

Instructor and course coordinator:
Johan Asplund, johan.asplund@stonybrook.edu, Math Tower 3-116
Class time & location: TuTh 5:00–6:20pm, Earth&Space 131
Office and MLC hours: math.stonybrook.edu/cards/asplundjohan.html
Webpage: math.stonybrook.edu/~jasplund/mat127_fall24

Grader: Amad Khan, amad.khan@stonybrook.edu, Math Tower S-240A
Office and MLC hours: math.stonybrook.edu/cards/khanamad.html

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Course description: A continuation of MAT 126, covering sequences, series, Taylor series, differential equations and modeling. May not be taken for credit in addition to MAT 132, MAT 142, MAT 171, or AMS 161.

Prerequisites: C or higher in MAT 126 or level 8 on the mathematics placement examination.

Attendance: Strongly encouraged, but not mandatory.

Textbook: Single Variable Calculus Concepts and Contexts (5th Edition) by James Stewart.

Brightspace: We will use Brightspace for announcements and grades at the end of the course.

Gradescope: We will use Gradescope for returning graded quizzes and exams. You should have received an invitation by the first class; check your Stony Brook email. Else contact the course coordinator.

Homework: Almost every week, there will be homework which consists of in-class quizzes and WebAssign online assignments. "One homework" means "one quiz and one WebAssign assignment".

Quizzes:
- Quizzes will happen at almost every other lecture, the first one being scheduled at Lecture 3. (The actual date depends on which section you belong to.)

Date: August 26, 2024.

WebAssign:
- A WebAssign subscription is required to complete homework in this course.
- Late submissions will **not** be accepted.
- Quiz dates and WebAssignment deadlines may undergo changes at the discretion of the instructors, in which case a Brightspace announcement will appear.
- Weekly homeworks consisting of weekly in-class quizzes, and WebAssign online assignments.
- The two lowest homework scores (meaning the combined score from that weeks' quiz and WebAssign assignment) will be dropped at the end of the course.

Exam dates: You must bring your University ID to all exams.

Exam	Date	Time	Location
Midterm I	Tu Oct 1	8:15–9:35pm	TBA
Midterm II	W Nov 6	8:15–9:35pm	TBA
Final	W Dec 11	2:15–5:00pm	TBA

Grades: Your final grade will be determined as follows.

Homework:	20%
Midterm I:	20%
Midterm II:	20%
Final:	40%

Makeup exams: Not available. If you e.g. miss one midterm exam with documented evidence (for instance, a letter from Student Accessibility Support Center), then your final exam grade will be counted with weight 60% in your final grade. A student must attend the final exam at the scheduled time in order to receive a passing grade in the course.

Tentative schedule: See the course webpage for a more detailed (but still tentative) schedule and for notes. All sections refer to sections in the course textbook.

Lecture #	Contents	Sections
1–2	Sequences and limits	§8.1
3–4	Infinite series, divergence test	§8.2
5–6	Ratio and comparison tests	§8.2, 8.3
7–8	Power series	§8.5, 8.6
9–10	Taylor and Maclaurin series	§8.7
11	Review and Midterm I	
12–13	More convergence tests, absolute convergence	§8.3, 8.4
14–15	No class (Spring Recess)	
16–17	Ordinary differential equations (ODE)	§7.1
18–19	Direction fields and Euler's method	§7.2
20–21	Separable ODEs, Review	§7.3
22	Midterm II, Separable ODEs	§7.3
23–24	Separable ODEs and applications	§7.3, 7.4, 7.5
25–26	Power series solutions and complex numbers	Notes, §I
27–28	Second order ODEs and final review	Notes
	Final	

Course learning objectives: Students should be able to:
- Understand the notion of a sequence. Describe sequences in different ways (e.g. recursively or using a closed formula for the general term). Describe asymptotic behavior and compute limits.
- Understand the notion of an infinte series and understand the notions of convergence and divergence. Recognize common series such as the geometric series, harmonic series, and telescoping series.

- Apply convergence tests (e.g. the divergence test, ratio test, comparison test and the integral test) in order to determine whether an infinite series converges or diverges.
- Understand the notion of a power series, and manipulate them through addition, subtraction, derivation and integration.
- Understand the general form of Taylor series and polynomials and be able to compute Taylor polynomials of a given degree of any function. Use Taylor series in approximation problems and as a tool to compute limits.
- Understand what an ordinary differential equation (ODE) is. Use slope fields to analyze solutions of a first order ODE. Use Euler's method to numerically find approximations of solutions of an ODE.
- Identify and solve separable first order ODEs. Understand how ODEs are used to model exponential growth and decay phenomena, and mixing problems.
- Identify and solve second order linear second order ODEs with constant coefficients.

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.

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 and 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/academicintegrity/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.