

MAT 126: CALCULUS B

Summer I, 2021

Instructor:	Taras Kolomatski	Time:	TuTh 6:00 - 9:25
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Website:	http://www.math.stonybrook.edu/~tkolomat/mat126-sum21/		

Course Overview: The reason that calculus is so widely covered in high schools and so widely taken by first year students of such diverse academic backgrounds is that a calculus course is amenable to being about the development of a general calculus-independent skill set. Thus, while this course “*primarily concerns integral calculus*”, its coverage includes in equal part all associated skills in: algebraic manipulation, the process of translating word problems to pictures and formulas, and critical thinking. In short, a calculus course is a mathematics gauntlet, so welcome to *Maths Gauntlet B*.

From this perspective, it is clear that the challenges posed in this course cannot merely be *more of the same*, but must present several qualitative new twists on the very process of problem solving. In *Calculus A*, we learned of a rather direct recipe for differentiating functions given by algebraic expressions. In *Calculus B*, meanwhile, there is no direct recipe for integration. Rather, you are given a toolbox of techniques and must independently discover a sequence of steps leading to the solution. Similarly, while most word problems in *Calculus A* required drawing and labelling two-dimensional diagrams, most word problems in *Calculus B* will concern three-dimensional figures.

Looking forward, this course will prepare you for *Maths Gauntlet C*. Whether or not you peruse this course sequence, or mathematics, for that matter, further, the knowledge gained here should foster the ideas of systematic problem solving, theory building, and abstraction. It is these skills that our department’s goal is to instill, and they will serve you well for the remainder of your careers.

CHEGG POLICY: In registering for this course, you must solemnly swear that at no point during the semester will you in any way access the Chegg service in any capacity related to calculus. Let it be absolutely clear that Chegg is definitely extremely super hard banned in this course, and that I will regularly search the website for copies of my assignment and exam problems. Any instance of Chegg use will be treated as a serious violation of academic integrity, to be duly reported, *with prejudice*.

Homework Policy: Summer courses compress a sixteen week semester into five weeks. This necessarily means that this course will demand a greater share of your free time than usual. I will approximately design the workload around the assumption that you will spend around twelve hours per week on this course outside of lectures. (Individual mileage may widely vary.) Most of this time will be spent solving homework problems.

I personally prefer assigning a small number of moderately difficult problems over assigning a large number of straightforward problems. I will assign one *Problem Set* per week. This means that, for example, if my first Problem Set consists of eight questions, then I expect each problem to take you ninety minutes on average. (I will later take into account the approximate amount of time that you spend studying for exams.) My intention is that each individual problem that you solve will teach you something new.

Since you will be submitting solutions to a relatively small number of problems, I will maintain a high standard for the quality of the write-ups. Writing mathematics is akin to writing an analytical essay in English; each solution should clearly communicate a complete logical progression conforming to the language of mathematics.

Grading Policy: Five PROBLEM SETS (10% each), a MIDTERM (25%), and a FINAL (25%). I prefer to grade work harshly, but curve final grades generously. Doing so leads to better exposure of your errors (allowing you to learn from them) and raises the skill ceiling of the course.

Prerequisites: If you can't state or apply the chain rule, then you're in the wrong class.

Resources: I am planning on typesetting notes for the entire course, although these may be downgraded to handwritten notes for later sections.

I will not teach the course in strict adherence to any book, but you are allowed and encouraged to read external books. On the other hand, you are Not Allowed to look up homework problems on the internet. The two resources that I will recommend most are Chapters 13-19 in Michael Spivak's *Calculus* and Chapters 5-6 of the Volume 1 of the OpenStax calculus textbook.

UNIVERSITY-WIDE POLICIES:

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, 128 ECC Building, (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 & 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 University 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.