

## MAT 131, SPRING 2022

**Some Topics to be covered:** The limiting value of a function  $f(x)$  as  $x$  approaches a number  $x=a$ ; limit laws; continuity of a function  $f(x)$  at  $x=a$ ; the derivative of a function  $f(x)$  at  $x=a$ , and the derivative as a function; derivatives of “elementary functions” such as polynomials, rational functions, trigonometric functions, exponential and logarithmic functions; applications of the derivative, such as maximizing quantities. In the last portion of this course we study Riemannian integrals of a function  $f(x)$ ; how to compute these integrals using the anti-derivative of  $f(x)$  and the fundamental theorem of calculus; how to find anti-derivatives for some of the “elementary functions” listed above.

**Textbook:** *Calculus (an openStax resource)*, by Gilbert Strang, Edwin Herman, etc., freely available at

*[https://openstax.org/details/books/calculus – volume – 1](https://openstax.org/details/books/calculus-vol-1)*

We will be covering chapters 2-5 of this openStax book.

**Prerequisites:** In order to take MAT 131 you must have either

(1) passed MAT 123 with B or higher

or

(2) received a score of 5 or higher on the mathematics placement exam.

### Teachers For This Course:

**Lowell Jones:** the lecturer for this course; office hours and lectures will both be via zoom – for more details continue reading below; contact either by joining a zoom meeting for office hours, or email at [lowell.jones@stonybrook.edu](mailto:lowell.jones@stonybrook.edu).

**Peter Francis:** the instructor for recitation R01; for office hours and information about this recitation go to the blackboard website for this recitation; contact at [Peter.E.Francis@stonybrook.edu](mailto:Peter.E.Francis@stonybrook.edu)

**Prabhat Devkota:** the instructor for both of the recitation sections R02 and R03; for office hours and information about these recitation sections go to the blackboard webpage for these recitations; contact at [Prabhat.Devkota@stonybrook.edu](mailto:Prabhat.Devkota@stonybrook.edu)

**Timely Course Information:** Please check for “ Announcements” on the blackboard websites (for both your lecture and your recitation), and do this several times a week. From time to time there will be more up-to-date information announced there concerning tests, homework, and other course matters.

### **Homework and WebAssign**

Homework will be assigned each week and will be due during the following week. Each homework assignment will be posted on Webassign. To sign up for Webassign just follow the directions which appear under “Announcements” on our lecture blackboard website.

### **Tests**

There will be 4 Tests in this course: the first of these will be an inperson test given in your recitation meeting; the second and third Tests will be online; and the fourth test will be an inperson final exam. Here are the dates and times of these 4 tests:

(1) Test 1: in (recitation) class test during your second recitation class of the week 2/21-2/25 ; test begins at usual starting time for class, and is of duration equal 50 minutes.

(2) Test 2: online test on Thursday 3/24 from 9:45am to 10:35am

(3) Test 3: online test on Thursday 4/21 from 9:45am to 10:35am

(4) Test 4 = final exam: in person test, on Wednesday May 11 from 9am to 10:45am

**A makeup Test may be given if a student misses a Test for reasons beyond control of the student (such as a health emergency, or car accident); a makeup will not be given for schedule conflicts with other classes, for travel plans, etc. So if you decide to continue with this course make sure that the 4 Test times for this course do not conflict with any of your other course obligations or plans.**

### **Grading Policy**

Homework = 10%,

Each of Tests 1,2,3 = 20%,

Test 4 = 30%

**Lectures:** All lectures will be recorded on Zoom each week in advance of the actual lecture times. All these lectures will be posted on the blackboard lecture website for this course; to find these postings just go to “Zoom Meeting” on the blackboard lecture website for this course and click on “Cloud Recordings”.

**What Happens During the Scheduled Lecture Time? LECTURE TIME OFFICE HOURS:** As already mentioned, some of these scheduled lecture times will be taken up with Tests. During the other scheduled lecture times I will hold Zoom office hours just for the students in this course. To join the zoom meeting for these office hours just go to “Zoom Meeting” on our blackboard lecture website and join the only meeting in progress. You can join at anytime and leave these meetings at any time; and you can just listen or ask some of your own questions.

**General Office Hours:** In addition to the lecture time office hours just mentioned, I will hold 3 more Zoom office hours (open to all students) each week at 11:30am to 12:30pm on Tuesday, Wednesday, Thursday. To join these general office hours just go to [math.stonybrook.edu](http://math.stonybrook.edu), click on “Advising” followed by “Office Hours”, and then scroll down a bit to find my link. You can join these Zoom meetings at anytime and leave at any time.

**Recitations:** Recitations meet twice a week and will be conducted in person. Typically these meetings will be used to address any questions students might have about homework and Test problems.

**Technical and software requirements:** Since lectures, some office hours, some Tests and home work are all delivered online, you will need some technical equipment:

- computer with webcam and microphone capability and PDF viewer
- device with scanning capability
- strong internet connection
- Zoom.us client
- PDF merging software

### **Disability Support Services (DSS) Statement**

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services at 631-632-6748 or at <http://studentaffairs.stonybrook.edu/dss/> . They will determine with you what accomadations 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 are required to report any suspected instance of academic dishonesty to the Academic Judiciary. For

more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>.

### 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 Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, and/or inhibits students' ability to learn.

### Approximate Course Schedule

**week of 1/24-1/28:** cover sections 2.2-2.5 (limits and continuity)

**week of 1/31-2/4:** cover sections 3.1-3.2 (definition of derivative of function  $f(x)$ ; the derivative of  $f(s)$  is a function)

**week of 2/7-2/11:** cover section 3.3 (differentiation rules; derivatives of polynomials and of rational functions)

**week of 2/14-2/18:** cover sections 3.4-3.5 (rates of change as derivatives; derivatives of trig functions)

**week of 2/21-2/25: TEST 1 is in (recitation) class test during your second recitation class for this week;** also, cover sections 3.6-3.7 (chain rule for taking derivatives of the composition of two functions; derivatives of inverse functions)

**week of 2/28-3/4:** cover sections 3.8-3.9 (implicit differentiation; derivatives of exponential and logarithmic functions)

**week of 3/7-3/11:** cover sections 4.1-4.2: (related rates; approximating a function  $f(x)$  by a linear function)  $ax+b$ )

**week of 3/14-3/18:** spring recess (no classes during this week))

**week of 3/21-3/25 TEST 2 on 3/24; online test;** also, cover sections 4.3-4.4 (finding the maximum and minimum values for a function  $f(x)$ ; mean value theorem )

**week of 3/28-4/1:** cover section 4.5-4.6 (determining the shape of the graph of  $f(x)$  from its derivative values; limits at infinity)

**week of 4/4-4/8:** cover sections 4.7-4.8 (applied max-min problems; L'Hopital's rule)

**week of 4/11-4/15:** 4.9-4.10 (Newton's method; antiderivatives)

**week of 4/18-4/22:** **TEST 3 on 4/21, online test;** also, cover sections 5.1-5.3 (representing area under a graph as a definite integral; THE FUNDAMENTAL THEOREM OF CALCULUS = FTC)

**week of 4/25-4/29:** cover section 5.4-5.6 (alternate formulation of FTC; integration by substitution; integrals involving exponential functions)

**week of 5/2-5/6:** catchup and/or review ; 5/5 is our last class day