# MATH 121.G – Calculus III / Fall 2020

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| **Textbook:** | Calculus (Early transcendentals), by J. Stewart, 8 th Ed. |
| **Class Meets:** | MWF: 3:30 – 4:20, T: 4:25 – 5:40 (**Remote instructions via MS Teams**) |
| **Instructor:** | Dr. Taras I. Lakoba, Innovation Hall, Room E436 (pre-COVID location)<br>(802) 656-2610, tlakoba@uvm.edu, **http://www.cems.uvm.edu/∼tlakoba** |
| **Office Hours (via MS Teams)** | M: 1 – 2; T: 3 – 4; F: 2 – 3; and by appointment. |
| **Important deadlines:** | Add/Drop and Pass/no Pass: Monday, September 14;<br>Last day to withdraw: Thursday, October 29. |

**Course contents:** Verbal description: Cylinders and quadric surfaces; Vector functions; Partial and directional derivatives; Extrema in multidimensions; Multiple integrals; Line and surface integrals; Green's, Stokes', and Gauss' (Divergence) theorems. By Section: Chap. 12 (12.1–12.5 — review; 12.6 — new) – Chap. 16. See a **Table** showing interconnection among course topics, posted on the course webpage (accessible through the **website listed above**, i.e., on **http://www.cems.uvm.edu/∼tlakoba** ). See also the 'Learning objectives' rubric on next page.

**Homework:** Homework is posted on the course webpage, just listed above. Most of it **must be done through WebAssign**; see directions posted on the course webpage. Homework for any given section is considered assigned on the day that section has been covered.

The purpose of the homework is to help you master the techniques covered in class. As such, **homework problems will be substantially based on examples and material presented in class. Therefore, you should study your notes before you attempt the homework, and mimic your solutions on the examples in the notes** and the indicated examples from the book. Please watch a 15-minute video on the course webpage explaining how I expect you to work on homework problems. See the instructor for help **as soon as** you find out that you are having difficulty with the homework.

The WebAssign part of homework will be graded (by WebAssign); the rest will not be. **However**, both quizzes and tests will be substantially based on the homework problems; therefore, you should do all of the assigned problems.

**Computer work:** You will do seven Mathematica Labs. They are posted on the course webpage. We will start them in class, and you are expected to complete them outside of class. All of these Labs will be graded. Please review an important note, posted on the course webpage, about my policy on the Labs and on helping you with them during the office hours. Using Mathematica when doing regular homework problems is encouraged but not required.

**Tests and Quizzes:**

(a) Regular Quizzes, sometimes unannounced (see below), will be given via **Blackboard** (Bb) *approximately* once a week. They will be based on the homework problems that have been due at least one day ago. You are encouraged to ask which section's homework will be covered in the next quiz.

The main purpose of the quizzes is to help you monitor your understanding of the material. If you receive a low grade on a quiz, it is a flag that you need to review the corresponding material. A **structured, 3-step process of such a review** is posted on the course website. If you receive a couple of low quiz grades in a row, see the instructor for help as soon as possible.

On the day when a regular quiz is posted on Bb, I will announce this in class, *provided that someone asks me during that or previous class* when the quiz will be.[1] **No electronic announcement** of regular quizzes will be made. The quiz will be available for 2 hours immediately after the class is scheduled to end. By the end of that time, you need to upload back to Bb **a pdf** of your completed quiz, which **must be no more than 3 MB** in size.

(b) Pre-lecture Quizzes will be given via Bb before every lecture. Their purpose is to make you *browse* through the lecture notes[2] of the upcoming class, so that you have some idea of what will be covered. The pre-lecture quizzes will consist of a small number of simple questions verifying whether you have browsed the material. Unlike regular quizzes, pre-lecture ones *will be announced electronically* on Bb. Each pre-lecture quiz will be available no later than at 10 a.m. of the class day and will close at the time when the class is scheduled to commence.

(c) There will be 3 (three) midterm tests during the semester. Their dates will be announced in class at least a week before each test. The midterms will be given via Bb, similar to regular quizzes. Namely, the test will be open for viewing and submission for at least 3 hours. By the end of that time, you need to upload back to Bb **a pdf** of your completed test, which **must be no more than 4 MB** in size.

Make-up exams will be given to those students who have documented excused absence.

(d) The final exam will be on Monday, December 7. Similarly to a midterm, the final exam will be available on Bb for a limited amount of time, after which it must be upload back to Bb as **a pdf of no more than 5 MB** in size.

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[1] *Example*: I give a regular quiz on October 1. If someone has asked me *in class* on October 1 or during a previous class when the next quiz would be, I would answer: 'On October 1". If no one asks, I will still give a quiz on October 1. I will *not answer questions about a quiz asked outside of class*, unless that question has already been asked *in class*. This will be done to encourage your (i) initiative asking questions in class and (ii) attendance.

[2] Lecture notes are also posted on the aforementioned course webpage, towards the end.

**Academic integrity:**

When working on any quizzes and tests, you are allowed to use **only** the following: Your notes, textbook, and any materials posted on the course webpage (the one mentioned above). When working on any quizzes and tests, you are **not allowed to use any of the outside help in any form**.

When working on Mathematica Labs, you are allowed to work with no more than one partner on any given Lab. (You may change partners, or work without a partner, on different Labs.) See the **Policy on Mathematics Labs** on the course webpage. You and your partner may use class notes, textbook, and materials posted on the course webpage. If you decide to use materials found online (which you will *never really need* and hence are *discouraged* from using), you must *conspicuously reference the URL* where the material is found.

Violations of this policy for *any assignment* will be dealt with as described in the above **Policy on Mathematics Labs**.

**See also** the rubrics 'Academic integrity' and 'Prohibition of sharing course materials' in the Generic Syllabus (posted next to this one).

**Grading policy:** 1st midterm test = 12%; 2nd midterm test = 13%; 3rd midterm test = 14%; final exam = 17%; WebAssign homework = 8%; all regular quizzes combined = 18%; all pre-lecture quizzes done after Add/Drop deadline combined = 5%; all Labs combined = 13%. Extra credit may be earned as explained below.

**Note:** I do **NOT** drop your lowest grade. Thus, **ALL** the grades that you earn during the semester will contribute to your final grade, as detailed above.

**Grading scheme:** I do not curve exams and quizzes. Instead, when issuing final grades, I slightly adjust the grading brackets. This will work as follows. The threshold between **A**− and **A** will be set at $X$, where $91.50 \le X \le 92.50$ will be adjusted based on my subjective criteria. The freedom of choosing this $X$ *within the above range* is my equivalent of other instructors' curving exam grades.

Once a value of $X$ is selected, letter grades will be put in correspondence with the following brackets for the numeric grade, which is computed as described in rubric Grading policy:

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| D− | $[X-30-3.33,\ X-30)$; | D | $[X-30,\ X-30+3.34)$; | D+ | $[X-30+3.34,\ X-20-3.33)$; |
| C− | $[X-20-3.33,\ X-20)$; | C | $[X-20,\ X-20+3.34)$; | C+ | $[X-20+3.34,\ X-10-3.33)$; |
| B− | $[X-10-3.33,\ X)$; | B | $[X-10,\ X-10+3.34)$; | B+ | $[X-10+3.34,\ X-3.33)$; |
| A− | $[X-3.33,\ X)$; | A | $[X,\ X+5.00)$; | A+ | $\ge X+5.00$. |

Note that these brackets are *strict*. This means that if your grade doesn't make the next bracket even by 0.01, that is it — it doesn't make it. This is what brackets, and thresholds in general, are for.

**Extra credit 1 (easy):** Post-lecture quizzes will be posted on Bb after a lecture (I will try to do so after every class). They will be available right after the class either for 24 hours or until the next class, whichever comes sooner. They will consist of about 5 questions that will check your general understanding of the covered material (there will be no difficult calculations). Just for completing any one of these quizzes, you will be able to receive 0.01%, added to your overall final grade. If, an addition, you answer some questions on the lecture material correctly, you will receive 0.005% per correct question. I will post those quizzes starting with the second or third lecture, but the earned scores will begin being added to your grade after the Add/Drop deadline.

**No penalty** will be given if you choose not to do any of the extra credit assignments.

**Extra credit 2 (harder):** Additional extra credit problems will be assigned occasionally. They will be posted on the Homework page (see the rubric 'Homework' on the first page of this syllabus). These assignments will be graded (on a coarse scale) by me, i.e., **not** by WebAssign. Before you decide to do a particular extra credit assignment, please review more detailed instructions found on the course website.

Submission of Extra Credit 2: Email me its pdf scan, which must be no more than 4 MB in size. You must use the subject line: '121.G - EC # - Your Name', where the 'EC #' is the number of the Extra Credit assignment found on the Homework page. I will *return without grading* poorly scanned or poorly legible Extra Credit assignments.

I reserve the right, at my sole discretion, to increase the final grade of any student by one level (e.g., from B- to B) for a demonstrated achievement, some examples of which are: active and constructive class participation, regular and active attendance of office hours, excelling on the final exam, being the "most improved" student in terms of performance or attitude, etc. This provision, however, has been used *only in very rare and truly exceptional cases.*

**Learning objectives:** Upon successful completion of this course, the students will be able to recognize and independently work with the following concepts: Parametric equations of straight lines, ellipses, and hyperbolas; Parametric equations of motion on a curve in 2D and 3D; {Partial derivatives, Extrema and saddle points, Local approximation, Chain Rule} of functions of several variables; Double and triple integration over various domains; Polar, Cylindrical, and Spherical coordinates; Jacobians; Gradient, Divergence, and Curl; Line and surface integration; Theorems of Green, Stokes, and Gauss.