

# Calculus II (Math 220) Section 1 Fall 2010 Syllabus and Study Guide (updated October 30)

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**Class Times:** Mon., Wed. and Fri., 10-10:50 and Thursday 9:25-10:40.

**Class Location:** Maybank Hall room 223.

**Final Exam:** Friday December 10, 8-11am (same place.)

**Office hours:** are to be arranged during the first week of classes;  
I am always available immediately after each class.

**Text:** *Single Variable Calculus: Early Transcendentals* by James Stewart, 6th. edition,  
and you need WebAssign access to go with this.

If you plan to continue to Calculus 3 (Math 221), you will need the extended  
version *Calculus: Early Transcendentals*.

The main online communication tools for this course are in WebAssign at  
<http://www.webassign.net/>

The text is also supported by the website *Tools for Enriching Calculus* with many  
worked solutions and tips for exercises,  
<http://www.stewartcalculus.com/tec/>

## Syllabus for Math 220, Fall 2010, Dr. LeMesurier

The main topic areas are

**Integration and its Applications:** Chapters 6, 7 and part of 9

**Infinite Sequences and their Sums:** Chapter 11

**Geometrical Applications of Calculus:** selections from Chapters 8 and 10

For example we study computing areas and volumes, lengths of curves, and solving differential equations which describe phenomena like population growth, and describing functions as “infinite polynomials”, also called “power series”.

We start by looking at a few new functions and their derivatives: the hyperbolic functions and their inverses (Section 3.11).

### Course objectives and expected outcomes

The main objective is to learn the above topics. In addition, it is hoped and expected that some generally useful mathematical skills will be developed:

- Learning correct use of mathematical notation and organization of thinking and written presentations so that it can be understood by peers and instructors.
- Facility and accuracy in basic computational manipulations so that these steps do not get in the way of understanding and solving the main questions at hand.
- Reading, working exercises and developing concise written summaries of important formulas, notation and ideas, to help with study and test preparation.

Students are expected to do not only the graded online-assignments and class exercises but also to review each section the text after it has been covered in class and to attempt the exercises set for each section. This is because, more broadly, it is expected that a majority of the learning in this or any College course comes through students’ efforts outside the classroom.

### Textbook *Calculus: Early Transcendentals* by James Stewart, and WebAssign

The text for this course comes in two versions.

*Single Variable Calculus: Early Transcendentals* by James Stewart, 6th. edition covers this course (and Math 120).

If you go on to do Calculus III (MATH 221) you will need the longer version, *Calculus: Early Transcendentals* which adds five chapters.

In either case, you need access to WebAssign, which can be got by purchasing a “bundled” edition, or by purchasing WebAssign access separately at its website.

You need to self-enroll at the WebAssign site

<http://www.webassign.net/> to do online homework and to access other resources there, like communication tools for getting my help on homework, and a record of your scores for all graded work.

## Exercises, Online Assignments, Class Exercises, Tests and Final Exam

**Exercises.** I will give a list of exercises to be done for each section covered. These are not for grading, but doing them is *essential*: like learning a musical instrument or sport, success requires a lot of practice beyond what your teacher or coach sees and grades you on.

**Online Homework with WebAssign.** There will be online homework assignments on each section, done with WebAssign, with about one week to work on each assignment from when the section is covered in class. WebAssign is a browser-based system that will let you make several attempts at each problem, including saving your work and coming back later to retry a problem after studying some more, or getting help from me. Thus I encourage you to start work on the assignment for each section as soon as we have covered it in class.

**WebAssign, TEC and other homework exercises.** Each section of the notes has a list of exercises from the corresponding section of the textbook. Some WebAssign homework must also be submitted on paper, because it involves sketching graphs or verbal explanations.

The text is supported by the *Tools for Enriching Calculus* website mentioned above. To use it, select our text (the *early transcendentals* version) and then select the chapter needed in menu [Browse Homework Hints](#). The TEC exercises are also marked with a red boxed number in the textbook.

**In-class exercises.** Most weeks there will be an in-class exercise: you are encouraged to discuss these amongst yourselves and to ask me questions, but each of you should write up and hand in your own version of the results. These will not be fully graded, as the idea is that you should be able to get them all right if you ask enough questions, but I will give some extra credit points for participation.

**Tests.** There will be four in-class tests on Thursdays: see the list of important dates below. These will be partially cumulative: each will focus on material covered since the previous test, but some questions will rely on ideas and methods learned earlier in the semester. Mathematics is always like that!

There are no make-up tests. If you miss a test for a good, documented reason, the score can be replaced by your results on the corresponding part of the final exam. Such absences should be documented through The Office of the Associate Dean of Students: see [http://www.cofc.edu/studentaffairs/general\\_info/absence/](http://www.cofc.edu/studentaffairs/general_info/absence/)

If you have scheduling problems such as commitments to other official college activities, let me know soon, not just before a test date.

**The Final Exam** covering the whole syllabus, will be on **Friday December 10, 8-11am, in the normal classroom**. The College does not allow final exams to be rescheduled except for clashes with other exams, so check your exam schedule before booking any flight home!

## Participation Requirements

I do not take the roll in class but do require active participation in all the work described above. Students will be dropped for unexcused absence from any test or for unexcused failure to attempt any three assignments in WebAssign or in-class exercises. You are responsible for knowing what happens in each class including which sections have been covered, study exercises and assignments, information about test topics, and due dates. Thus you should contact me to explain any missed assignment or class, and more so any missed test.

## Reading, Asking Questions, Office Hours and other Communication Options

Reading assignments will be given at the end of class. Classes will start with a few minutes for questions about recent readings, classes, homework exercises, or any related topics, but questions are welcomed at any time, not just at the start of class.

I am available immediately after class: this can be quicker than coming to office hours. I will hold office hours at times to be arranged with the class.

Electronic communication is also useful: WebAssign has a nice system for requesting help on exercises and other messaging, and I will post notices there that you see at login. WebAssign also has a gradebook, where you will have access to your grades for all work including tests. So bookmark <http://www.webassign.net/>

Please email me soon at [lemesurierb@cofc.edu](mailto:lemesurierb@cofc.edu) from the account that you prefer to use, so that I can ensure that it is not rejected by the College's vigorous junk mail filters and add it to my address book.

## Grading scheme

The combined scores for assignments and in-class work will count for 15% of the course total, each test will count for 15% and the final exam will count for the remaining 25% in the course total.

Final course letter grades will be determined by the scale

A	A <sup>-</sup>	B <sup>+</sup>	B	B <sup>-</sup>	C <sup>+</sup>	C	C <sup>-</sup>	D <sup>+</sup>	D	D <sup>-</sup>	F
93-100	89-92	85-88	81-84	77-80	73-76	69-72	65-68	61-64	57-60	53-56	0-52

## Calculators

You are expected to have a graphing calculator, and the standard choice is the Texas Instruments TI-84 Plus, but many others are also fine. If you plan to use any other calculator, check with me, as ones that can compute derivatives and indefinite integrals are not allowed on tests or the exam.

Calculators will be allowed on only part of each test and of the exam, with the non-calculator part being the majority.

## Some Important Dates and Times

<b>Monday August 30</b>	Last day to add/drop courses.
<b>Thursday September 16</b>	Test 1
<b>Thursday October 7</b>	Test 2
<b>Thursday October 21</b>	Last day to withdraw with a grade of "W"
<b>Monday October 11</b>	Fall Break — no class
<b>Thursday November 4</b>	Test 3
<b>Wednesday November 25 to Friday November 27</b>	Thanksgiving Break — no classes
<b>Thursday December 2</b>	Test 4
<b>Monday December 6</b>	Last day of classes
<b>Friday December 10, 8-11am</b>	Final Exam, in MYBK 223.
<b>Wednesday December 22</b>	Final grades available online.

## Topics and Sections Covered, and Study Exercises

We will cover all (or most) of Chapters 6, 7 and 11, and parts of Chapters 3, 8, 9 and 10, in the order below, which follows the grouping into three main topic areas described above.

In the exercises listed, a dagger † denotes exercises on which WebAssign homework is based, and an asterisk \* indicates exercises for which there is help at the *Tools for Enriching Calculus* website <http://www.stewartcalculus.com/tec/> Except as noted otherwise, I recommend that you **review all exercises in each section covered.**

### Chapter 3, Section 11 Hyperbolic Functions

**Study Exercises** 7, 9\*, 15\*, 18†, 20†, 21, 23(e,f,h), 30†, 31, 35\*, 42†, 45\*.

### Chapter 6 Applications of Integration

#### Section 1 Areas Between Curves

**Review Examples 1, 2, 5 and 6 in the text.**

**Study Exercises** 1, 3\*, 4†, 5, 6†, 9\*, 10, 13\*, 21\*, 29\*, 31, 32†, 33.

#### Section 2 Volumes

**Review Examples 1–5 and 8 in the text.**

**Study Exercises** 1, 2, 7\*, 11\*, 12, 31, 32, 39, 42, 43\*.

#### Section 3 Volumes by Cylindrical Shells

**Review Examples 1, 2, and 4 in the text.**

(Also 3 if you wish, but always try to avoid equation solving!)

**Study Exercises** 2, 5\*, 6, 17\*, 18, 24, 25\*, 29\*, 41\*, 45\*.

#### Section 5 Average Value of a Function %

**Study Exercises** 3, 4, 7\*, 9\*, 10, 13\*, 14, 15, 17\*.

### Chapter 7 Techniques of Integration

#### Section 1 Integration by Parts

**Study Exercises** 1, 6†, 8†, 9, 15\*, 17\*, 19, 20\*, 22†, 25, 33, 34†, 35\*, 47\*, 57\*, 63\*.

#### Section 2 Trigonometric Integrals

**Review Examples 1–4 and 7–9 of the text in particular.**

**Study Exercises** 2†, 3\*, 7\*, 8†, 13\*, 23\*, 26†, 29\*, 43\*, 55\*, 61\*.

#### Section 3 Trigonometric Substitution (and Inverse Substitution)

**Study Exercises** 2†, 3\*, 7\*, 10†, 13\*, 17\*, 22\*, 31\*.

#### Section 4 Integration of Rational Functions by Partial Fractions

**Review Examples 1–8 of the text.**

**Study Exercises** 4†, 5\*, 10†, 11\*†, 17\*, 22†, 25\*, 29\*, 31\*, 32†, 43\*, 47\*, 55\*.

#### Section 5 Strategy for Integration

**Review Examples 1–5 of the text.**

**Study Exercises** 7\*, 17\*, 23\*, 31\*, 41\*, 45\*, 49\*, 57\*, 61\*, 69\*.

#### Section 6 Integration Using Tables

**Review Examples 1–4 of the text.**

(We omit the topic Computer Algebra Systems, and thus Examples 5–7.)

**Study Exercises** 4†, 7†, 10\*, 12†, 17\*, 23, 24†, 26\*.

#### Section 7 Approximate Integration

**Review Examples 1–7 of the text.**

**Study Exercises** 3\*, 5, 6†, 35\*.

#### Section 8 Improper Integrals

**Review Examples 1–10 of the text.**

**Study Exercises** 1\*, 2†, 6†, 7\*, 8†, 13\*, 21\*, 29\*, 31\*, 32†, 43\*, 49\*, 57\*, 61\*, 69\*.

**Chapter 9** Differential Equations**Section 1** Modeling With Differential Equations**Review Examples 1 and 2 in the text.****Study Exercises** 3\*, 7\*, 9\*, and 6(a,c,d)<sup>†</sup>: hand in 6 on paper too.**Section 3** Separable Equations**Review examples 1–3 in the text.** Physics students might want to look at Example 4.**Study Exercises** 4<sup>†</sup>, 10\*, 14<sup>†</sup>, 15\*, 25\*.**Section 5** Linear Equations**Review examples 1–3 in the text.** Physics students: see Examples 4 and 5 as well.**Study Exercises** 5\*, 8<sup>†</sup>, 9\*, 12<sup>†</sup>, 19\*, 31\***Chapter 11** Sequences and Series**Section 1** Sequences**Study Exercises** 1, 2, 8<sup>†</sup>, 12<sup>†</sup>, 13\*, 15\*, 18<sup>†</sup>, 19\*, 35\*, 42<sup>†</sup>, 43\*, 54\*, 59\*, 61\*.**Section 2** Series [Sums of Infinite Sequences]**Review examples 1–8 in the text.****Study Exercises** 1, 2, 4\*, 9\*, 16<sup>†</sup>, 17\*, 18<sup>†</sup>, 22<sup>†</sup>, 35\*, 44<sup>†</sup>, 47\*, 55\*, 59\*, 65\*, 71\***Section 3** The Integral Test and Estimates of Sums**Study Exercises** 1, 2, 7\*, 11\*, 12<sup>†</sup>, 17\*, 21\*, 27\*, 33\*, 34<sup>†</sup>.**Section 4** The Comparison Tests**Study Exercises** 1\*, 8\*, 10\*, 12<sup>†</sup>, 17\*, 18<sup>†</sup>, 31\*, 34<sup>†</sup>, 41\***Section 5** Alternating Series**Study Exercises** 2<sup>†</sup>, 3\*, 7\*, 11\*, 13\*, 14<sup>†</sup>, 17\*, 23\*, 24<sup>†</sup>, 32\***Section 6** Absolute Convergence and the Ratio and Root Tests**Study Exercises** 4\*, 10<sup>†</sup>, 13\*, 14<sup>†</sup>, 19\*, 21\*, 28<sup>†</sup>, 29\*, 31\*, 33\***Section 7** Strategy for Testing Series [for Convergence]**The WebAssign Exercises** are 2, 16, 18, 20: also work a selection of other exercises.**Section 8** Power Series**Study Exercises** 3\*, 6<sup>†</sup>, 7\*, 10<sup>†</sup>, 15\*, 18<sup>†</sup>, 23\*, 24\*, 29\*, 37\***Section 9** Representation of Functions as Power Series**Study Exercises** 4<sup>†</sup>, 5\*, 8\*, 13\*, 15\*, 16<sup>†</sup>, 21\*, 23\*, 26**Section 10** Taylor [and McLaurin] Series**Study Exercises** 4<sup>†</sup>, 5\*, 8<sup>†</sup>, 15\*, 27\*, 33\*, 34<sup>†</sup>, 35\*, 39\*, 45\*, 48<sup>†</sup>, 57\*, 63\***Chapter 8** Further Applications of Integration**Section 1** Arc Length**Study Exercises** 2<sup>†</sup>, 7\*, 11\*, 13\*, 14<sup>†</sup>, 33\*.**Section 2** Surface Area**Study Exercises** 1\*, 2<sup>†</sup>, 5\*, 11\*, 15\*.**Chapter 10** Parametric Equations and Polar Coordinates**Section 1** Curves Defined by Parametric Equations**Study Exercises** 4\*, 8<sup>†</sup>, 9\*, 13\*, 20<sup>†</sup>, 21\*, 28<sup>†</sup>, 31\*, 33\*, 34\***Section 2** Calculus with Parametric Curves**Study Exercises** 5\*, 6<sup>†</sup>, 11\*, 23\*, 25\*, 31\*, 32<sup>†</sup>, 40<sup>†</sup>, 41\*, 44<sup>†</sup>, 45\***Section 3** Polar Coordinates**Study Exercises** 11\*, 17\*, 25\*, 32<sup>†</sup>, 34<sup>†</sup>, 35\*, 39, 49\*, 58<sup>†</sup>, 59\*, 63\*, 69\***Section 4** Areas and Lengths in Polar Coordinates**Study Exercises** 10<sup>†</sup>, 11\*, 21\*, 27\*, 41\*, 47\*, 48<sup>†</sup>