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COURSE MATERIALS: *Calculus: Early Transcendental Functions, 3rd edition*, by Smith and Minton. The text should be brought to class every day. The student solutions manual is optional.

Note: The textbook is available for rental for a reduced price, but if there's any chance that you will take Calculus 2, it will be more expensive to rent the text twice than it would be to buy a used version (or possibly even a new version, depending on where you find it) – and if you rent it, you neither have the textbook to keep nor have the opportunity to sell it back.

OVERVIEW:

Most everything in the world changes: DNA, the orbits of the planets, weather, shopping patterns, and your annual income, to name a few. Understanding, predicting, and being able to affect how these quantities change is critical – and for that, we need Calculus! Calculus, widely recognized as one of humanity's outstanding accomplishments, allows us to describe and predict the behavior of changing quantities. Of course, we usually can not predict the behavior exactly, but even a good approximation is helpful. Calculus is all about using approximations. Often we can use better and better approximations until, by deducing what would happen if we continued this process ad infinitum, we find a precise solution.

This semester, you will begin to study this language of change. By the end of the course, you will have the tools necessary to solve many fascinating problems. Several of the topics we will cover this semester allow us to solve problems that do not seem, at first glance, to be mathematical at all.

GOALS AND EXPECTATIONS:

Of course, the primary goal for this class is that you master the topics developed in this course. The others are that you improve at reading technical text and at clearly communicating complicated material. These are lifetime skills that are necessary in nearly every career.

In this class, as with all others, how much you actually learn is entirely up to you. Math is a subject you can only learn by doing—observing me (and others) may give you a start, but it is certainly not enough. The course is structured to give you repeated opportunities to work with the material, at increasing levels of depth and complexity.

Your initial exposure to the material will come through your reading of the text before each class, so that your attention in class may be more focused. Class itself will often combine lecture with opportunities for in-class work with fellow students on introductory problem, so that you *do* what you've just observed in order to help crystallise your understanding of the material, *or* to help you identify where some confusion is arising. This initial exposure is followed by more drill problems for each section to be completed daily on-line; you will get immediate feedback on these, so you will know right away whether you are understanding the basics. To deepen your grasp of the material, you will also have weekly problem sets consisting of more conceptual questions. For a greater variety of opportunities to deepen your mastery of the material, there will be two projects which present questions in a more realistic manner, and of course exams, which encourage you to look at the big picture and fit the material into its place within the course.

Notice that this structure not only aims to maximize your mastery of Calculus, but also to help accomplish the secondary goals as well – improving reading of technical material through guided reading, learning to more clearly communicate complicated ideas—verbally, through working with partners on in-class work, some problem sets, and projects, and in writing, through weekly problem sets and projects.

The rule of thumb for how much work you should expect to spend on any college class is 2 to 3 hours of work outside of class for every hour in class. No matter what your experience has been in other classes,

Plan to spend at least 8 hours a week on Calculus outside of class!

Of course, some weeks you may spend more than 8 hours on this class, especially when studying for exams or finishing up projects, while others you may spend less.

IS THIS THE RIGHT MATH COURSE FOR YOU?

Calculus I is intended to be your first exposure to Calculus. If you've had Calculus before, we encourage you to try Calculus II – you don't need to have received credit for Calculus 1 to do so. If you decide to stay in this course despite having had some Calculus before, please be considerate of those who have *not*, by saving comments or questions on material we haven't yet gotten to for after class or during my office hours – it makes people nervous!

While Calculus 1 is a first exposure to Calculus, it of course does assume a fair amount of previous mathematical experience. Anybody who has passed a Precalculus course has probably seen everything we will be using; if you have not had Precalculus, please come to my office so we can discuss which topics you have seen and which you have not. To help identify potential trouble spots for each student as early as possible, we have prepared on-line preliminary assessments of various skills that this course builds heavily upon.

This course is intended for people who either are interested in math or whose major requires it. Calculus is *not* required for graduation; if you're not particularly interested in math or a major which recommends it, there may be a course that better fits your interests.

PRELIMINARY ASSESSMENTS:

The purpose of the preliminary assessments is to identify any individual trouble areas as quickly as possible, and to provide each student with the opportunity to practice those areas however much they need to in order to clear up the problem, getting help from me or from tutors where necessary. The preliminary assessments are divided into subareas, so that each student only needs to practice the specific areas they have difficulty with. These assessments are done online, and are available through OnCourse. (I will introduce you to the website we're using in lab the first Thursday). Each one can be taken repeatedly, with slightly different problems appearing each time you take it. Once you have successfully passed all of them, I will give you credit equivalent to 1 problem set – what "successfully passed" means will vary from subarea to subarea.

READING ASSIGNMENTS:

I will put a copy of each reading assignment on the web—follow links from the course website. Each assignment will indicate what you are to be reading that day, which parts are especially important and whether any can be skipped. Each assignment will also have questions that you are to answer through OnCourse. The purpose of these assignments is two-fold: to help you continue to develop your mathematical reading skills, and to give you credit for your efforts. These responses are

required.

OnCourse does not accept late assignments

For more details, see the course webpage itself and the link *Suggestions for Reading a Math Book* from the course web page.

HOMEWORK:

Your homework will be divided into two portions: online drill problems, which I will refer to by the system we use, *WeBWorK*; and more conceptual problem sets, which will be handwritten and submitted weekly.

For more details on the homework assignments, see the links *A Description of Calculus 1 Homework Assignments* and *General Guidelines for Problem Set Presentation*.

The assignments will be posted on the web, and can be found through links toward the bottom of the course web page.

Late WeBWorK will not be accepted!
Late handwritten problem sets will have points deducted!

I will drop your lowest WeBWorK score at the end of the term.

If turned in on Thursday after lab but before 2:45 (and if everybody involved was working appropriately in lab), I will deduct 0-20 points depending on the situation. Problem sets turned in after 2:45 pm Thursday and before 2:00pm Friday will receive half credit. I can not accept any problem sets after 2:00pm Friday of the week the problem set is due.

PROJECTS:

You will work on 2 group projects this term. These will consist of questions which are more open-ended than homework problems tend to be. You will have one or two days of class time to work on these projects; the rest of the work you will do with your group outside of class. The project consists not only of the mathematical solution to the situation, but (equally important) your description of the solution and why it is true – in the form of a letter.

Late projects will have points deducted each day!

PRELIMINARY ASSESSMENT:

I will be asking each of you to take a "preliminary assessment" during the first week, consisting of several problems covering some basics from algebra and trigonometry that I feel you should be comfortable with in order to focus on learning Calculus. If the results of the assessment point out some gaps in your background, we will know early enough so that you can begin getting help from me and from the College Learning Center (CLC) before they become a critical part of the class.

How you do on this preliminary assessment will not affect your final grade in any way – the only requirement is that you do, in fact, take it, and if necessary take action to fill those gaps in your background that are indicated by it.

DIFFERENTIATION EXAM:

Differentiation is a fundamental tool for understanding the later concepts of the semester. The

Differentiation Exam will consist of four problems, and is graded with no partial credit. You must get every problem completely correct to get credit on the exam, but you may retake (different versions of) this exam as many times as necessary until you pass. If you pass it before the first deadline, you get 100% on the exam. (There are three later deadlines, for 90%, 75% and for 50%. All of the important dates are on the syllabus.)

EXAMS:

During the semester, I will give three midterm exams to make sure that you are putting together the concepts and skills we have covered. The primary emphasis of the exams will be for you to show me how well you've mastered the underlying mathematical ideas. At the end of the semester, there will be a cumulative final. The dates of all exams are fairly firmly scheduled, and are listed on the course syllabus.

For each of these exams, you may bring one 8.5 x 11 page of notes, **handwritten (by you) on one side**, which you will turn in with the exam. The midterm exams will be given during the lab period, and may be begun at 12:30.

Notify me in advance if you will be missing an exam. If your reason for missing is acceptable, we will arrange that you take the exam **early**. If you miss an exam without notifying me in advance, I reserve the right not to give you a make-up exam. I will not give any student more than one make-up exam during the semester.

ATTENDANCE:

Clearly, missing class is not a wise idea. If you **do** miss class, you are responsible for the material that was covered. *Warning:* – I can only keep one day's worth of events in my head and may not remember something important, so ask your friends as well as me.

ACCOMODATIONS:

In compliance with the Wheaton College policy and equal access laws, Dean Wilhelm is available to discuss appropriate accommodations that may be recommended for students with disabilities. Requests for accommodations are to be made during the first two weeks of the semester so that timely and appropriate arrangements can be made.

Students are required to register with Denyse Wilhelm, Assistant Dean of Academic Resources and Disability Services, ADA/504 Coordinator, whose office is located in Kollett Hall, first floor at the Filene Center for Academic Advising and Career Services. Contact ext. 8215 to schedule an appointment, or email Dean Wilhelm at wilhelm_denyse@wheatoncollege.edu.

EVALUATION

I expect to use the weights below, although I reserve the right to change my mind.

Reading Assignments	4%	Differentiation Exam	4%
Problem Sets	9%	Three In-Class Exams	48%
Two Group Projects	14%	Final Exam	21%

If you question the fairness of any grade, bring it to me **within a week** of receiving it.

HONOR CODE

I expect you to abide by the Honor Code. *Remember: If you see a violation of the Honor Code occurring, you are bound by the Honor Code to report it.*

As part of the honor code, you are required to write *I have abided by the Wheaton College Honor Code in this work*, followed by your signature, on all written assignments. Every time you do, you should be pondering the question "how exactly does the honor code apply to *this* assignment, and did I *really* abide by it?" If, upon consideration, you do not feel you can truthfully write and sign the pledge, please come speak to me immediately!

So, specifically, how does the Honor Code apply in this class?

For all assignments: You may discuss the work with classmates, and you may use references that help you figure out how to do a problem on your own, but you may not use any references (people, other people's projects or assignments, books, the web) which either give you the answer or lead you directly to the solution. When you do use references (as described above), you *must* cite them.

For all group work: You must make every effort to meet with your group at all meetings. You may not purposely exclude any member from a meeting.

You may not divide the work!

You must make every effort to participate and aid in finding the solutions. If you don't understand what someone else is saying, you must ask them to explain it. If someone asks you to explain your ideas, you must take the time to explain it. In the end, you must understand all the work that is being submitted under your name.

Reading assignments: You may discuss the questions with your classmates, but you must enter the responses yourself, in your own words.

Homework: For the individual problem sets, you must write the results on your own, in your own words. For the group problem sets, after your group has jointly figured out every problem, one person will be responsible for recopying your work. This primary author must change from week to week.

Projects: While you may not break the project up into different tasks that you divide up among you, if a repetitive process is called for, you may spread the task among you.

You *may* divide the writing of the paper in whatever way is agreeable to the group. You must proofread the entire paper for consistency and typos.

Dividing Up Group Points: Do not give, or take, credit that is not due.

Differentiation Exam: The different versions of the Differentiation Exam are numbered. If you and a classmate have both finished a certain version of the exam, you may look at it together and discuss it, but otherwise no sharing of the exams is to take place, either while taking it or after the fact.

Midterm and Final Exams: You may not use any notes, books, or colleagues as reference during the exams, except for your "cheat sheet", which must conform to my stated rules. You may not look at anybody's exam or "cheat sheet" until after all exams have been returned. You may not use a calculator unless I specify that you may, and you may not use the graphing aspect of a calculator.