Syllabus for MATH 130-02:
Calculus I
Fall Semester 2013

Professor: Erika L.C. King
Office: Lansing 304
Office Hours: M 2:30-3:30pm, T 12:45-2:15pm, W 2:30-4:30pm, F 1:30-2:30pm, and by appointment
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Class: held MWF 10:10am-11:05am in Napier 101
Lab: held Th 1:30pm-2:55pm in Gulick 206A
Textbook: *Calculus: Early Transcendentals, Single Variable*, by Briggs and Cochran
Website: http://math.hws.edu/eking/math130.html
TA Hours: Upper level mathematics students will be available to answer questions during evening
hours in Lansing 310. Stay tuned for the schedule!

Course Content and Structure

An oil tanker explodes and begins leaking oil into the surrounding sea. In an effort to contain
the spill, the company that owns the tanker wants to figure out how fast the area of the spill
is increasing. Another company that sells canned fruit wants to minimize the cost of packaging.
How do they determine the dimensions of the container that will use the least material for a given
volume of fruit? In MATH 130 we will learn the differential calculus the companies' researchers
use to solve these problems.

This semester we will be covering most of chapters 1, 2, 3, and 4 of the text. We will begin with
a brief review of some key mathematical concepts you will need during the course. Then we will
study the fundamental concept of a limit, and how we can use limits to define derivatives. We will
explore applications of differentiation including answering questions like the ones above, finding
slopes of tangent lines and calculating other rates of change. In addition, we will begin to explore
antidifferentiation, which will be studied in depth in the second semester of calculus.

Our daily classes will resemble work sessions rather than lectures. You will be expected to come
to class ready to share and present work that you have prepared ahead of time. We will have some
whole class discussions, some student presentations by individuals and groups, and lots of group
work everyday. I will be a resource guiding you to achieve deeper understanding of the material; I
am not here to just give you answers, my task is to help you think so that you can find and claim
the answers and, more importantly, understand the concepts on your own.

Prerequisites and Goals

In order to enroll for this class, you must have earned a score of 20 or above on the computerized
mathematics placement test (see http://math.hws.edu/placement/info.html for more information)
or a C or better in MATH 100. No prior calculus experience is needed (indeed it is expected that
you have had **none**), but you **must** have a firm understanding of basic algebra and trigonometry
in order to succeed in this course. Appendix A (pages 1061-1068) and chapter 1 (pages 1-49) of
the text contain material with which you should feel very comfortable. If you have taken calculus
previously, you should review chapters 1-4 of the text to see if you are already comfortable with

that material and should consider moving to MATH 131: Calculus II. If you have **any** questions about whether or not this is the right place for you, please speak with me **immediately**.

This course has two main goals. The first is in terms of content: to gain an understanding of the notion of a limit (the foundation of **all** calculus concepts), to develop a proficiency in differentiating functions, and to learn how to apply these differentiation skills to solve real world problems. The second goal is to increase your mathematical confidence and reasoning abilities by learning how to read a mathematics text carefully, how to discover concepts and pinpoint areas of confusion independently, and how to collaboratively work on and present challenging problems. Most of our class time will be spent in class discussion, group work and student presentation in order to achieve these goals. You will be expected to prepare for each class by reading the text and by working on exercises.

Office Hours

Please use my office hours regularly. Use my posted office hours whenever possible, but if you have classes or other important obligations that conflict with my office hours, please make an appointment at another time. You do not need to tell me in advance that you will be attending my regular, posted office hours. Generally my office hours are like group study sessions with many people at once, so do not wait in the hall for someone to leave unless the door is closed. Come prepared with specific questions and ready to share your work showing attempts of the exercises you wish to discuss. Expect that you will have to work to answer questions and discover solutions yourself in office hours. I will be there to guide you and work with you to come to an understanding of the ideas; I will not just give you the answers. My goal is to be able to help you understand concepts so that you will be able to apply what you learn to new problems and to help you gain confidence in your own abilities.

Assessment

Homework: There will be three, equally important types of homework assignments: Reading Assignments, Warm-up Exercises, and Main Exercises. There will be roughly two Reading Assignments due each week which will involve reading a section of the text and submitting written responses to specific reading questions, creating some of your own questions, and reflecting on your own understanding. Warm-up Exercises will be due three times a week, Monday, Wednesday and Friday. Some Warm-up Exercises will be discussed in class, either in groups or in a whole class discussion, and revisions to your prepared work can be made in class, but you should come to class prepared to write your solutions on the board or compare your finished work with classmates. Each week you will turn in one Main Exercises assignment, usually on Fridays. You are encouraged to work on all these homework assignments with others, however, you should write up your final solutions **individually without comparing your final work to others**. The details of these assignments are explained in a separate handout. Note that most class days you will turn in at least two types of assignments. Homework should be handed in on time, and may not otherwise receive credit or be read. Of course, I realize you may miss a couple of assignments due to illness. Speak with me if your homework is late for a special reason. Occasionally, I may ask you to rework homework that has been handed in on-time, to be handed in one class period after being returned. If substantial further work is needed, I may expect you to do this before receiving credit.

Projects/Labs: In our Thursday labs we will focus on more challenging problems or applications in groups of three. There will be two to four group projects during the semester. You will have one to two weeks to complete each with Thursday labs providing time to collaborate and ask me questions. You will certainly need to work outside of class in addition to your lab work. Each group will turn in one project and each group member will assess the contributions of all group members.

Periodically, I may conduct interviews of individual students to help determine individual grades on projects. When you do not have a project assignment, labs will be used to work on problem sets. I will be available to answer any questions you might have, but you should also utilize the resources you have within your group. Each student must write up his/her own problem set solutions, but I will collect (at random) only one write-up from each group, usually the following Monday. Each member of the group will receive the same number of points. Thus, it will be important that the group members work together to ensure that everyone understands the material. I will drop your lowest lab problem set grade when calculating your final grade. Projects and Lab Problem Sets will be due on Mondays. More details about the projects and problems sets will be discussed in a separate handout.

Exams: Exams are meant to test your ability to perform techniques quickly and efficiently and your ability to illustrate a deeper understanding of the material by combining different concepts from within the material. Non-graphing calculators will be provided for you at each exam; you may **not** use your own calculator. There will be three 60-minute exams and a final exam. The exams are scheduled for the following dates:

- Exam 1: Thursday, September 26th

- Exam 2: Thursday, October 24th

- Exam 3: Thursday, November 21st

- Final Exam: Wednesday, December 11th 1:30-4:30pm

It is impossible to construct fair makeup exams in mathematics. Thus my policy is that there are **no** makeup exams. Write the above dates in your calendar. **You must be present for all exams.** Make your travel plans accordingly. The final exam will be weighted as two exams. I will drop your lowest exam grade when calculating your course grade. (If the final is your lowest grade, it is dropped just once.) Thus you will have four exam grades that will contribute to your exam average.

Bonus: There will be several mathematics and computer science departmental talks throughout the semester, providing a great opportunity for you to have exposure to mathematical topics outside of calculus as well as applications and student research. You may earn bonus points for each mathematics/computer science seminar talk you attend. These points contribute to the homework portion of your grade. If you are actively listening, participating and asking questions at the talks, attending three talks can replace one homework grade with highest marks.

Course Grade: Your Homework grade will be worth 24% of your grade, your Projects and Labs will make up 24% of your grade, and each (non-dropped) exam will be worth 13% of your grade (note that there are four such exams, "two" of which may be your final exam). Your grade will also be influenced by your attendance and class participation. If you are absent for any portion of class, check the website and contact a classmate as soon as possible to get a copy of notes, handouts and assignments, as well as to find out about any announcements you may have missed. Then if you have questions on that assignment, come to office hours. You are allowed four absences (note that this includes labs). **More than four unexcused absences will lower your grade by at least one full letter.** The greater the number of absences, the greater the reduction. Excused absences require documentation such as a letter from a dean. It is impolite to arrive late to class or leave the classroom while class is in session unless it is an emergency. **Habitual tardiness will lower your grade**. On the other hand, if you have perfect attendance in the course and no latenesses, I will add three points to your lowest (non-dropped) exam.

Disclaimer

The above exam dates, quantity of graded work, policies, and course layout are subject to change in the event of extenuating circumstances.

The Center for Teaching and Learning (CTL)

At Hobart and William Smith Colleges, we encourage you to learn collaboratively and to seek the resources that will enable you to succeed. The Center for Teaching and Learning (CTL) is one of those resources: CTL programs and staff help you engage with your learning, accomplish the tasks before you, enhance your thinking and skills, and empower you to do your best. Resources at CTL are many: Study Mentors help you find your time and manage your responsibilities, Writing Fellows help you think well on paper, and professional staff help you assess academic needs. I encourage you to explore these and other CTL resources designed to inspire your very best work. You can talk with me about these resources, visit the CTL office on the 2nd floor of the library to discuss options with the staff, or visit the CTL website at http://www.hws.edu/academics/ctl/index.aspx.

If you are a student with a "disability" (or what I like to call a "nontraditional approach to learning") for which you may need accommodations, you should self-identify and register for services with the Coordinator of Disability Services at the CTL, and provide documentation of your disability. Disability related accommodations and services will not be provided until the registration and documentation process is complete. The guidelines for documenting disabilities can be found at the following website: http://www.hws.edu/disabilities. Please direct questions about this process or Disability Services at HWS to David Silver, Coordinator of Disability Services, at silver@hws.edu or x3351.

Academic Integrity

I highly encourage you to discuss the homework problems with each other in addition to attending office hours. Verbalizing your questions, explaining your mathematical ideas and listening to others will increase your understanding. However, you should **not** feel free to copy someone else's work or make your work available to someone else. **Copying constitutes plagiarism, a violation of academic integrity which could result in failure in the course.** After discussing the concepts, final answers should be written up **in private without comparing your work**. **There is, of course, no collaboration or use of outside resources allowed on exams.** Violation of the Colleges' Principle of Academic Integrity may result in a report sent to your file in the dean's office and/or appearance before the Committee on Standards.

How to Succeed

- Start homework and project assignments as soon as they are assigned!

- Prepare for class by completing all homework on time.

- Turn off all cell phones, etc. and keep all phones, iPads, etc. "stowed" during class.

- Attend all classes and labs on time.

- Ask questions and participate in class.

- Present problems on the board and (politely) challenge or question others who are presenting.

- Discuss questions and problems with your classmates.

- Spend some time **each day** working on the material from this class by yourself – even if it is just 10 minutes of reading.

- Come to office hours, make an appointment, or email me whenever you have questions.

- Visit the mathematics TAs for extra help when I am not available.

- Practice problems with**out** notes, textbook, peers, the TAs or other mentors.

- Have fun!

Homework 0

Write a full one-page typed (usual font size and margin widths) autobiography. Discuss the following in your essay:

- your major and minor (or what you think they will be)

- what you hope to do with your college degree

- the reason you chose to take this course and how it fits into your goals

- whether you have had calculus before and, if you did, why you think it is a good idea to repeat this material

- your favorite and least favorite memories of mathematics

- the ways in which you learn best and how you can then best show what you have learned

- your favorite hobbies, and anything else interesting (for example, what you did over the summer).

The paper is due by 2:15pm tomorrow (Tuesday, August 27th). You may hand it in personally to me or just slip it under my office door. This assignment also includes a short one-on-one meeting with me in my office after I have read your essay. Please bring a photo of yourself, with which you are willing to part, to the meeting (you do not need to have the photo when you turn in your essay). This meeting and the photo help me get to know each of you better and more quickly. Your grade on this assignment will be based on whether you address all the topics requested, as well as the quality of your writing (including good grammar and typography) and your prompt attendance of our meeting, photo in hand. It will be graded on the same scale as Reading Assignments and Warm-Up Exercises.