Syllabus for MATH 130-02:
Calculus I
Spring Semester 2019

Professor: Erika L.C. King (she/her/hers)
Office: Lansing 304
Office Hours: M 1:30-2:30pm, W 1:30-3:00pm, Th 3:30-4:30pm, F 9:30-11:00am, and by appt.
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Class: held MWF 12:20pm-1:15pm in Eaton 111
Lab: held Th 1:30pm-2:55pm in Gulick 2000
Textbook: *Calculus: Early Transcendentals, Single Variable*, by Briggs, Cochran, Gillett, and Schulz, third edition
Website: http://math.hws.edu/eking/math130.html
WeBWorK Home Page for Our Class: http://math.hws.edu/webwork2/Math130-King-S19/
Math Intern, Drew Scammell, Office Hours in Lansing 310: Su 4:00-6:00pm and 7:00-10:00pm, M-Th 3:00-6:00pm and 7:00-10:00pm

Course Content

An oil tanker explodes and begins leaking oil into the surrounding sea. In an effort to contain the spill, an environmental group wants to figure out how fast the area of the spill is increasing. A 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 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.

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 to master certain 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. At least half 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. **Thus you should expect to spend at least seven hours per week on this course outside of class.**

This course significantly addresses Goal 3: the Quantitative Reasoning Goal.

Textbook

We will use our textbook regularly. You will be expected to read it before we discuss each section and we will use it for practice exercises in class. At least one student from each group should bring a copy of the text to class each day (take turns where possible!). I have put a copy of the textbook on reserve in the library. The Math Intern also has a copy that you may use during his office hours. If you purchase an electronic version of the text, ask permission to access it during class time.

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 appointments at other times. 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 several 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 be ready to share your work by showing attempts of the exercises you wish to discuss. Expect that you will have to work to answer questions and discover solutions 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 simply give you answers. My goal is to help you understand concepts so that you will be able to apply what you learn to new problems, and help you gain confidence in your own abilities.

Assessment

Homework: There will be three types of collected homework assignments: Reading Assignments, WeBWorK 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. These will be worth eight points each. WeBWorK Exercises will be due three times a week, Monday, Wednesday and Friday before the beginning of class. These will be done online where you will receive immediate feedback as to whether or not your solution is correct. Each WeBWorK assignment will usually contain 3-6 problems, and each problem will be worth roughly one point each. Each week you will turn in one Main Exercises assignment, usually on Mondays. These will be worth twenty points each. You are encouraged to work on all these homework assignments with others; however, you must 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 there will be at least two types of assignments (one of which will be online) due. Homework should be handed in on time, and may not be graded or read otherwise. Of course, I realize you may miss a couple of assignments due to illness or other emergencies. You may turn in two Main Exercises assignments up to roughly 48 hours late (due by 9:45am in my office on Wednesday) no questions asked. Speak with me if your other 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 any credit. In addition to the collected homework problems, there will be problems that we work on but may not finish in class. You will be expected to make sure you know how to complete each of those problems.

Labs: The Thursday labs will be problem-solving sessions where we will focus on more challenging problems or applications in groups of three. I will be available to answer any questions you might have, but you should first utilize the resources you have within your group. Each student must write up her/his/hir own solutions, and it is important that the group members work together to ensure that everyone understands the material. Groups are expected to be productive and work as a team. The more understanding that is accomplished in class, the less that you need to work towards outside of class. I may give announced or pop quizzes in lab to check team productivity.

Participation: As noted, at least half of each class will be spent in class discussion, group work and presentations. Your active participation in these activities will be vital to your understanding and success in the course. Participation includes contributing questions and answers to the class, and listening attentively to others' questions and answers. Good participation also includes arriving on time to class, leaving all cell phones and other electronic devices off and stowed, and participating until the full class period has been completed.

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, February 21st
- Exam 2: Thursday, March 28th
- Exam 3: Thursday, April 25th
- Final Exam: Monday, May 13th, 7:00pm-10:00pm

The exams during the term are scheduled during our lab to provide you with extra time to complete them. **Note that seating will be randomized for exams.** It is impossible to construct fair makeup exams in mathematics; thus my policy is that there are **no** makeup exams. Religious or Extracurricular conflicts with these dates should be discussed with me immediately. Record the above dates in your calendar now to ensure that you will be present. The final exam will be weighted as two exams. Since there are sometimes situations beyond your control, such as illness and medical or family emergencies, which may require you to miss an exam, I will drop your lowest exam grade when calculating your course grade. (If you have two such emergencies, we will discuss how to proceed.) This policy applies to all class members regardless of whether one experiences such an emergency. (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 five bonus points for each mathematics/computer science seminar talk you attend. These points contribute to the homework portion of your grade. Actively listening, participating and asking questions at the talks will earn you the maximum possible points. You may attend three talks toward extra credit points, but may attend as many as you like for extra knowledge!

Course Grade: Your combined homework and lab scores will be worth 24% of your grade, and each (non-dropped) exam will be worth 19% of your grade (note that there are four such exams, "two" of which may be your final exam). I reserve the right to take class participation into account when determining your final grade. Your grade will also be influenced by your attendance. 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. 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; **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, to name a few. 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 academic accommodations in this course, you should self-identify, provide appropriate documentation of your disability, and register for services with Disability Services at the Center for Teaching and Learning (CTL). Disability related accommodations and services generally 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/academics/ctl/disability_services.aspx

Please direct questions about this process or Disability Services at HWS to Christen Davis, Coordinator of Disability Services, at ctl@hws.edu or x 3351.

Academic Integrity

Although the internet can be a helpful resource, the internet should NOT be consulted for collected homework problems. The homework gives you practice to succeed on the exams and if you do not practice with the homework, you will not succeed on the exams. Some of this practice involves a certain amount of struggle and frustration; you should not expect to be able to solve all questions immediately. Some questions will require you to work for a time, put it away and come back to it again later. Make sure you provide yourself the time and opportunity to do this!

After working diligently on your own, I highly encourage you to discuss 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 quizzes or 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 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 for the entire class period.
- Present problems on the board and (politely) challenge or question others who are presenting.
- Discuss questions and problems with your classmates, listening carefully to what others have to say and sharing your ideas collaboratively.
- 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 Math Intern for extra help when I am not available.
- Practice problems with**out** notes, textbook, peers, the TAs or other mentors.
- Have fun!

Homework: Questionnaire and Small-Group Meeting

The first part of this assignment involves going to the class website: http://math.hws.edu/eking/CalculusI/math130.html, printing the autobiographical questionnaire, filling it out and submitting it in lab by 1:30pm on Thursday, January 24th. You may hand this in personally to me, place it in the homework collection box if I have placed it outside my office door, or just slip it under my office door. The second part is that each of you will meet with me in my office for about ten minutes. You will meet in groups of two or three. I will provide a sign up sheet to schedule these meetings during the first two weeks of classes. Please bring a photo of yourself, with which you are willing to part, to the meeting. This meeting and the photo help me get to know each of you better and more quickly. It also ensures that you know where our course website and my office are and helps you get to know one of your classmates as well. Your grade on this assignment, out of 8 points, will be based on your prompt completion of the questionnaire and attendance of our meeting, photo in hand.