# Syllabus for MATH 131: Calculus II

## Spring Semester 2014

Professor: Erika L.C. King
Office: Lansing 304
Office Hours: M 2:30-3:30pm, TTh 12:45-2:15pm, F 1:30-2:30pm, and by appointment
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Class: held MWF 10:10am-11:05am in Napier 102
Lab: held Tuesdays 10:20am-11:45am in Gulick 206A
Textbook: *Calculus: Early Transcendentals, Single Variable*, by Briggs and Cochran
Website: http://math.hws.edu/eking/math131.html
WeBWorK Home Page for Our Class: http://math.hws.edu/webwork2/Math131_s14_King
Math Intern, Trevor Gionet '12, Office Hours in Lansing 310: Su: 2-5pm, 7-10pm;
M-Th 3:30-5:30pm and 6:30-10:30pm

## Course Content

When lawmakers work to pass energy conservation bills they need to be able to prove that their new restrictions will, for example, significantly reduce the use of oil. How can they defend their predictions? In MATH 130 we focused on differentiation, and in MATH 131 we will focus on integration. One of the key applications of integration, finding the area between two curves, can help the lawmakers build their case.

This semester we will be covering most of chapters 5, 6, 7, 8 and 9. We will begin by studying the definition and basics of integration, and then explore applications of integration such as the one mentioned above and finding volumes of objects created by rotating a curve around a line. Later we will delve into the puzzles of integrating more complicated functions by learning additional techniques and tricks. The last third of the semester, we will begin exploring infinite sequences and series, which give us the ability to estimate function values and integrate functions we cannot integrate with our initial techniques, and which form the foundation of important results in analytical mathematics.

## Prerequisites and Goals

This course has two main goals. The first is in terms of content: to develop a proficiency in many techniques of integration and an understanding of what integration represents, to gain an understanding of the important link between differentiation and integration illuminated in the Fundamental Theorem of Calculus, and to introduce you to sequences and series and the power they give us to solve 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.

In order to enroll for this class, you must have earned a grade of C- or (preferably) above in MATH 130 or earned credit for the AB track of AP Calculus (or the equivalent). If you have not fulfilled this requirement then you must have permission from me to remain in this class.

Throughout this semester, I will assume that you are fluent with the material from MATH 130. That is, I assume you understand how to use the notions of limit and derivative and are familiar with their applications and interpretations, and are familiar with l'Hopital's rule and basic antidifferentiation, as in Sections 4.7 and 4.8 of the text. If you have any questions about whether or not this is the right place for you, please speak with me immediately.

## 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 simply give you 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 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. 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 2-5 problems. Each week you will turn in one Main Exercises assignment, usually on Wednesdays. 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 otherwise receive credit or be read. Of course, I realize you may miss a couple of assignments due to illness or other emergencies. 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 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 Tuesday 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 his/her own solutions, but in class (usually on Friday) I will collect (at random) only one write-up from each group. 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. You cannot expect to complete lab during class if you have not kept up with the daily reading and exercises. I will drop your lowest lab grade when calculating your final grade. More details about the lab set-up will be discussed in the first lab session, Tuesday, January 28th.

*Quizzes:* I may occasionally give an announced quiz. No calculators will be allowed for quizzes. Extra time will not be allowed for those arriving late to class. Under **no** circumstances may a quiz be made up. In **extreme** cases and if you inform me at least two class days **in advance**, I will allow you to take a quiz **before** the scheduled time.

*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 both 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 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: Tuesday, February 18th in lab
- Exam 2: Tuesday, March 11th in lab
- Exam 3: Tuesday, April 15th in lab
- Final Exam: Monday, May 12th, 7:00-10:00pm

Note that the exams during the term are scheduled during our lab to provide you with extra time to complete them. It is impossible to construct fair makeup exams in mathematics. Thus my policy is that there are **no** makeup exams. 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 have the policy that I will drop your lowest exam grade when calculating your course grade. This policy applies to all class members regardless of whether you experience 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 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 towards extra credit.

*Course Grade:* Your combined homework, quiz and lab scores will be worth 35% of your grade, your participation will be worth 5%, and each (non-dropped) exam will be worth 15% 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. 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. 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 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.
- 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 Math Intern and TAs for extra help when I am not available.
- Practice problems with**out** notes, textbook, peers, the Intern, 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
- what you expect to learn in this course
- your favorite and least favorite memories of mathematics
- your favorite hobbies, and anything else interesting (for example, what you did over winter break).

The paper is due by 2:15pm tomorrow (Thursday, January 21st). 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. **Note:** if you had me for Calculus I last semester you do not need to bring a photo, **but** you should make sure this essay is different from the essay you gave me in August. It should update any of the topics listed above that have changed or discuss further topics you think are especially important to who you are. In addition you can answer questions such as: How has your view of calculus or mathematics in general changed since you entered college? What topic did you like best in Calculus I and why? Etc.