MAT 296 – Calculus II Syllabus: Summer Session II – 2016

Instructor

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Office hours will occur immediately following lecture on Monday and Wednesdays. Additional individual meetings to discuss course material or any other concerns can be scheduled by contacting me. You can always feel free to stop by my office at any time to see if I am there. If I am free, I will be more than willing to discuss anything you might have for me.

Class Information

Days: MTWTh   Dates: July 5 - August 12   Time: 11:45am - 2:10pm   Classroom: Physics 106

Course Description

MAT 296 is the second course in a three-semester sequence in Calculus. This sequence is designed for mathematics, science, and engineering majors and for those students in other majors who intend to take more advanced courses in Mathematics. This course covers techniques of integration, applications of integration in a variety of contexts, exponential growth and decay, improper integrals, parametric curves in the plane, polar coordinates, sequences and series (including power series, Taylor and Maclaurin series).

Course Background

Completing MAT 295 (Calculus I) with a grade of C- or better is a prerequisite for MAT 296 (Calculus II). *If you have not satisfied this prerequisite, you must drop MAT 296 and register for MAT 295.* Students who earned a C or less in MAT 295 are at great risk in MAT 296. For these students it is important to review material from earlier courses, especially as it comes up again. At the same time it is also vital not to fall behind with the current material. *Students who have scored a 4 or 5 on the Advanced Placement Calculus BC exam cannot receive both AP credit and credit for MAT 296.*

Course Materials

- **Required Text:** Stewart, James. *Essential Calculus: Early Transcendentals.* Belmont, CA: Thomson Higher Education, 2007.
- **Calculator:** A calculator is not required for this course. No computational device will be allowed on any exam (including the final exam). Using or having available any calculator or other computing device during any exam or during the final exam is a violation of the Academic Integrity Policy.

Course Philosophy

The emphasis in this course is on learning mathematical concepts through solving problems. You learn Mathematics by doing mathematics. It is our conviction that problems are best solved in a cooperative learning situation. Mathematics is not a passive activity! Hence, you will sometimes work in groups, an arrangement that we believe has the following advantages:

- Group problem solving allows for broader, deeper, and more insightful problems.

- Students are exposed to a variety of thinking and problem-solving styles. This interaction can inspire additional insights into problems and concepts.

- Students can motivate one another to excel and to accept more challenging problems. Furthermore, motivation to persevere with a problem can be increased.

- Students learn to depend on themselves and each other (rather than on the instructor) for problem solutions.

- Conceptual understanding is deeper and longer lasting when ideas are shared and discussed.

- Students learn to communicate Mathematics more effectively.

Learning Outcome Goals

(i) To develop a matured perspective on how to approach mathematical problems and concepts.
(ii) To improve your ability to engage in mathematical thinking, reasoning, communication, and problem solving.
(iii) To learn how to take abstract questions, make them concrete, and use mathematics to analyze and answer these questions.
(iv) To properly utilize technology to explore, supplement, or answer mathematical questions.
(v) To encourage you to become a reflective mathematics student.
(vi) To learn to [self] assess mathematical problems, solutions, and concepts.

Grading

The course grade is determined by the following components:

Exam 1	25%
Exam 2	25%
Exam 3 (Final)	30%
Homework	20%

Grade Scale

The grade scale is the standard Mathematics Department grading scale and is as follows:

A	93 - 100	C+	77 - 79
A-	90 - 92	C	73 - 76
B+	87 - 89	C-	70 - 72
B	83 - 86	D	60 - 69
B-	80 - 82	F	0 - 59

Attendance & Participation

This is a Summer session course so that each class is equivalent to roughly two Fall semester classes. It is then essential to your success in this course that you attend each lecture and participate in the discussions. Therefore, you are expected to attend each lecture and to show up on time. Should you need to miss a class for any reason, you are to contact the instructor in a timely manner. Reasons for missing lecture must be documentable and presented if requested. You are responsible for any material covered during the lecture as well as any work assigned during the lecture.

More than two unexcused absences from lectures could result in receiving an F in the course. Furthermore, excessive lateness will also count as an absence. If you are dismissed from lecture due to problems during the lecture, e.g. disruptive behavior or unauthorized cell phone use, then this dismissal will be recorded as an absence.

Often, the second portion of lecture will be an individual or group activity designed to engage you in the material from lecture that day or the previous two days. The problems will be designed to test your understanding of the concepts or computational methods introduced. If you or your group does not finish the activity during the lecture, it would be beneficial to finish it outside of the lecture before attempting more difficult material.

Homework

Homeworks are perhaps the most important factor in learning the course material. Homework gives you the opportunity to work through material on your own and test your understanding and mastery of the material. Homework will primarily be announced and distributed during lecture. While there is no set homework schedule, you can expect to be given a new assignment or have one due approximately every two class days. Homeworks and other course material can be found on the instructors webpage: `https://cgmcwhor.expressions.syr.edu/`

Homework problems will be specifically designed by your instructor to test your mastery of the course material. This is an important distinction from in-class problems. In-class problems are given to test whether you *understand* the material while homework is designed to test whether you have *mastered* the material. Therefore, homework exercises will be very difficult. You should not delay in starting these exercises as soon as they are assigned. Homework should show good mathematical exposition: written up neatly with each step/calculation shown and explained when necessary. Each problem should be clearly indicated and given its own sheet of paper.

I encourage you to work with others on these homeworks. Mathematics is a social activity! However, I do expect each student to independently write up her/his own solutions. Do not simply use others to do your work but rather use others to help work through and engage in the concepts. If you work with others, indicate on the problem assignment with whom you worked. **Plagiarism is unacceptable** and will result in a zero grade for all persons involved and will also result in serious academic repercussions. Even if you are not able to solve the problem - some points may be given for discussion of what you tried and your own thoughts about the problem.

It is important that your grades on an assignment give you meaningful information about your mastery of the material. Therefore, each homework problem will be graded on the following scale:

0 : Incognizant: The solution is blank or was not submitted. The solution is entirely incoherent, shows essentially no understanding of the material, or the solution has fatal errors.

1 : Beginner: The solution shows some understanding of the basic techniques involved in the problem but is seriously flawed. The solution may demonstrate a lack of organization, a lack of good mathematical exposition, or a lack of understanding of the mathematical vocabulary involved.

2 : Novice: The solution shows a basic understanding of the techniques involved in the problem. The solution employs basic mathematical exposition, organization, and vocabulary but has troubling flaws.

3 : Competent: The solution shows a good understanding of the techniques involved in the problem. The solution employs good mathematical exposition, organization, and vocabulary but requires improvement in some areas. The solution may have some errors but contains no serious errors.

4 : Proficient: The solution demonstrates a deeper understanding of the techniques involved in the problem. The solution demonstrates excellent usage of mathematical exposition, organization, and vocabulary – though some areas could use sharpening. The solution has at most minor errors.

5 : Master: The solution demonstrates an excellent understanding of the techniques involved in the problem. The solution demonstrates a command of mathematical exposition, organization, and vocabulary. The solution contains no (or perhaps the most trivial) of errors. The solution may employ innovative techniques to arrive at a solution.

Your homework grade is then an average of the points obtained in each problem. This will allow you to check your mastery of the topic(s) assigned in the homework.

Exams

All exams will take place during normal class hours. You are expected to be present, seated, and ready to take the exam before the exam is to be given. The first two exams will occur in the first half of lecture. The final exam may take up the entirety of the final lecture. If there is to be a take-home portion for any exam, it will be given out at least 24 hours before any in-class portion.

If you must miss an exam, it is imperative that you make the instructor aware before the exam begins. If you cannot be present for an exam, you must make the instructor aware in a timely manner before the exam so that arrangements can be made. Reasons for missing an exam must be documentable and such documentation presented if requested. Each exam case will be handled on an individual basis. The final exam will be cumulative, mandatory, and is scheduled for the final day of class – August 12, 2016 – during your regular lecture time. The final exam may take the entire lecture block.

Students with Disabilities

If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), `http://disabilityservices.syr.edu`, located in Room 309 of 804 University Avenue, or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible. You are also welcome to contact me privately to discuss your academic needs although I cannot arrange for disability-related accommodations. Making arrangements with ODS takes time. Do not wait until just before an exam or other class assignment is to be given.

Academic Integrity

The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see `http://supolicies.syr.edu/ethics/acad_integrity.htm`

Mathematics Help

I am always available for help, either during my office hours or whenever you stop by my office and I am there with time to spare. You may also email me to try to set-up a time to see me. While you may email me with questions, many questions are not effectively answerable in an email and may be deferred till you are in class, to office hours, or to an individual appointment. You can also seek help from any person staffing the Math Clinic, located in Carnegie 120. Hours, location, and staffing information can be found at `http://math.syr.edu/Help.htm`

Problem Resolution

Please inform the instructor of any problems, questions, or concerns that you have with this course. Do not wait to bring issues to the attention of your instructor! Problems not satisfactorily resolved with your instructor should be brought to the attention of the course supervisor without delay. The course supervisor is Professor Dan Zacharia.

Counseling Servies

If at any point during the semester, you feel overwhelmed with your class work, feel thoughts of depression/suicide, experience sexual assault/rape, experience problems with substance abuse or relationship abuse, or have any other struggles with physical/mental health, ***please seek help***! The Counseling Center Services at Syracuse University is a resource offering assistance with any issue you might have - both individually and through group sessions. There is ***never*** any shame in seeking help. If you or someone you know is struggling with any of these issues, speak out! The Counseling Center Services website can be found at `http://counselingcenter.syr.edu/`, is located at 200 Walnut Place, Syracuse NY 13244-4350, and can be contacted at 315.443.4715.

If you or someone you know is having issues with gender or sexual identity issues, the LGBT[QIA] Center is there to create a safe space for those with marginalized genders and sexualities or those who might be struggling with these issues. The LGBT[QIA] Center website can be found at `http://lgbt.syr.edu/`, is located at 750 Ostrom Avenue, Syracuse, NY 13244-4350, and can be contacted at 315.443.3983. Know that my office is a safe space and should you prefer any gender specific pronoun/name, please be sure to make me aware!

Cellular Phones

Following the Mathematics Department guidelines, all electronic devices other than perhaps a calculator should be turned off and put away during class. Calculators on cellular phones or other computational devices are not to be used on quizzes, tests, or other class activities unless otherwise instructed. Unless otherwise instructed, using a cellular or other electronic device can result in dismal from lecture.

Tentative Schedule

The following is a schedule for the course. This schedule is subject to change and should be considered only an approximation to the dates/order of material.

Date	Section	Topics
07/05	8.1, 8.2	Sequences, Convergence/Divergence, Series: Geometric, Telescoping
07/06	8.3, 8.4	Series Tests: Integral, Comparison, Limit Comparison, Alternating
07/07	8.5 - 8.7	Power Series, Taylor/Maclaurin Series
07/11	8.6,8.7	Taylor Series
07/12	8.8	Taylor Remainder Terms
07/13	–	Discussion & Review
07/14	–	Exam 1
07/18	5.5, 6.2, 6.4	Substitution, Integration Tables, Integration by Parts
07/19	6.2, 6.3	Trigonometric Integrals, Partial Fractions
07/20	6.3	Partial Fractions
07/21	6.2	Trig Substitution
07/25	6.6	Improper Integrals
07/26	–	A Menagerie of Integrals
07/27	–	Review
07/28	7.1 - 7.3	Exam 2, Area between curves, Volumes by Shells/Disks
08/01	7.4, 7.5	Arc Length
08/02	7.6	Applications to Science/Engineering
08/03	7.6	Applications to Science/Engineering
08/04	–	Review
08/08	–	Project Presentations
08/09	–	Project Presentations
08/10	–	Course Review
08/11	–	Mathematics in Action, Goodbyes, Exam 3 (Final)