Syllabus for MATH 136 - 01, Calculus 2

College of the Holy Cross, Spring 2024

Instructor: Dr. Neranga Fernando

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Office Hours: 1pm - 2:30pm on Tuesdays and Wednesdays

Meeting Times and Location: 8am - 8:50am on MTWF, Swords 321

Course Objectives: At the end of this course, students should be able to:

- Apply calculus concepts to evaluate lengths, areas, volumes, and to solve simple differential equations
- Explain calculus concepts such as improper integrals, convergence of sequences and series, power series, series, and solutions of differential equations
- Determine convergence of sequences and series using a variety of methods, represent functions with Taylor and Maclaurin series, and determine error of approximating functions with polynomials.

Textbook: OpenStax (*Calculus Volume 2*)

Link to the book is here: `https://openstax.org/details/books/calculus-volume-2`

If you desire, you can get a hard copy of the text from Amazon for $\$15 - \$20$. It is absolutely NOT required that you purchase a hard copy of the text.

Course Materials: All announcements, materials and grades will be posted on Canvas.

Quizzes: There will be six in-class quizzes during the semester. The lowest quiz grade will be dropped.

Here are the dates you will be taking a quiz:
Quiz 1 (February 2), Quiz 2 (February 16), Quiz 3 (March 15), Quiz 4 (March 22), Quiz 5 (April 12), Quiz 6 (April 19)

It is strongly advised that you do all of assigned homework since the quizzes will closely resemble the homework problems.

Homework: Homework Assignments will be posted on Canvas. The solutions must be uploaded to Canvas as one PDF file. Ten points will be deducted from late homework. No homework assignment will be accepted after 5 days from the due date. No homework grade will be dropped.

No help from any Internet sources is allowed. Plagiarism will not be tolerated and will be treated as a violation of the Departmental Policy on Academic Integrity.

By doing mathematics you learn mathematics. You learn math best when you approach the subject as something you enjoy. Learn to explain mathematics to your classmates. Mathematics can be fun and rewarding when there are people around you who enjoy figuring out problems as much as you do. Take advantage of this opportunity and organize study groups. I will not consider working on homework problems with your classmates as a violation of the academic honesty policy in the department. However, you must prepare and submit your own solutions.

Please follow these guidelines when you submit homework assignments:

- Put your name, the date, and the homework assignment number at the top of the first page.
- Write neatly and show all your work.
- On the last page of your assignment, please write the name(s) of your classmate(s) with whom you work on homework problems (with an asterisk).
- Make sure you attach the honor code.

Here are the dates of homework assignments:
Homework 1 (posted on Canvas at 8am on January 31, due by noon on February 9)
Homework 2 (posted on Canvas at 8am on February 7, due by noon on February 16)
Homework 3 (posted on Canvas at 8am on February 21, due by noon on March 1)
Homework 4 (posted on Canvas at 8am on March 1, due by noon on March 15)
Homework 5 (posted on Canvas at 8am on March 14, due by noon on March 22)
Homework 6 (posted on Canvas at 8am on March 27, due by noon on April 5)
Homework 7 (posted on Canvas at 8am on April 8, due by noon on April 19)
Homework 8 (posted on Canvas at 8am on April 24, due by noon on May 2)

Mid-term exams: There will be three mid-term exams during the semester. The mid-term exams are 90-minute exams; they will be held from 6pm to 7.30pm on Tuesdays: February 20, March 26 and April 23. The location of the midterm exams is to be determined. The lowest midterm exam grade will be dropped.

Final Exam: There will be a mandatory cumulative final exam in this course. Location and time of the final exam are to be determined. **Check for final exam schedule conflicts as soon as possible.**

Snow Days: If classes are cancelled due to snow, or for other official reasons, any scheduled quiz or test will occur during next class meeting.

Grading: The course grade will be determined as follows:
Final exam: 15%
Mid-term exams: 28% (14% each)
Quizzes: 10%
Homework: 42%
Attendance and class participation: 5%

An incomplete grade is given if you have a good attendance record, have completed all the assignments with an overall grade of at least 70%, and have missed the final exam for a valid reason. An incomplete grade is given at the discretion of the instructor.

Final Class Grade: Final exam is mandatory. If you score at least a 70% on the final exam, both your class grades before the final and after the final will be considered. Whichever one higher will be your final class grade. If you do not take the final exam, then it will be a zero on the final exam. If you miss the final exam for a valid reason, you must still take a make-up final exam and score at least a 70% on the final to be eligible for the final class grade option explained above. If you miss the final exam for a valid reason and you do not take a make-up final exam, then it will be a zero on the final exam.

If your final exam grade is less than 70%, then you do not qualify for the final class grade option explained in the previous paragraph, and the final class grade will be computed according to the criterion described in **Grading**.

Note: The lowest midterm exam grade will be dropped when computing the final class grade as explained above.

Calculators: Calculators are NOT permitted on quizzes, mid-term exams and the final exam.

Additional Resources: I will let you know the contact details and office hours of the teaching assistant soon.

There is a tutoring program through Academic Services and Learning Resources (ASLR). Calculus 2 is one of the subjects for which students can obtain tutoring. You may not discuss problems on written homework assignments with tutors from ASLR. For more information see:

`https://www.holycross.edu/support-and-resources/academic-services-and-learning-resources`

Issues with the Course/Instructor: If you have issues with this course and/or instructor which you are not comfortable discussing with your instructor, you should contact the Chair of the Department of Mathematics and Computer Science, Professor Ed Soares, at esoares@holycross.edu.

Academic Honesty: A necessary prerequisite to the attainment of the goals of the College is maintaining complete honesty in all academic work. Students are expected to present their own work in exams and in any material submitted for credit. Students may not assist others in presenting work that is not their own. Offenders are subject to disciplinary action. A violation of the Department Policy on Academic Integrity will result in a 0 for that quiz or exam, and a letter describing the occurrence of academic dishonesty will be sent to the Chair of the Department of Mathematics and Computer Science and your Class Dean.

For more on Academic Integrity see:

`https://www.holycross.edu/academics/programs/mathematics-and-computer-science/node/211581/academic-integrity`

Diversity and Inclusion: It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. Any suggestions you have pertaining to diversity and inclusion are encouraged and appreciated.

Important:

(1) Any student with special needs is encouraged to meet with me during the first week of classes to discuss accommodations. The student must bring a current Memorandum of Accommodations from the Office of Accessibility Services. The following is the link to the Office of Accessibility Services:

`https://www.holycross.edu/health-wellness-and-access/office-accessibility-services`

(2) Please note that, consistent with applicable federal and state law, this course may be video/audio recorded as an accommodation only with permission from the Office of Accessibility Services. Students are not permitted to record the contents of this class under any other circumstances.

(3) If you are an athlete and have conflicts with an important class activity (homework, quiz, mid-term, or final), please let me know in advance.

(4) For College's Excused Absence Policy see:

`https://catalog.holycross.edu/requirements-policies/academic-policies/#coursepoliciestext`

(5) All electronic devices (mobile phones, laptops etc.) must be turned off during class time, quizzes, mid-term exams and final exam.

Syllabus: Syllabus is subject to change. It is your responsibility to be aware of any changes I may make to the syllabus as they are announced in class. Students are responsible for all information given when they are absent.

Some Additional Notes:

(1) I will hold an additional 2-hour final exam review session the day before (or two days before) the final exam. We will discuss and find a time that works for all of us. I will let you know the location before you go home for Easter Break.

(2) I will not post solutions to homework problems listed on the syllabus. I have given 3+ hours of office hours every week. Please bring all your questions regarding anything discussed in class, lectures notes, homework problems or anything posted on Canvas to my office hours. It is your responsibility to attend my office hours if you have any questions.

(3) I will hand out problem sheets in class. Since we do not have time to work on all the problems on problem sheets in class, I will post their solutions on Canvas. However, I encourage you all to work on the problems and bring questions to my office hours.

Important Dates:

March 4 – 8	Spring Break: no classes
March 29 and April 1	Easter Break: no classes
April 24	Academic Conference Day: no classes

Schedule of Topics and Suggested Homework Exercises

Section 1.1	1, 3, 7, 9, 11, 13, 17, 19, 21, 25, 27, 34, 35, 39, 43, 45, 53, 54
Section 1.2	61, 63, 65, 67, 69, 75, 77, 79, 81, 89, 93, 95, 97, 99, 101, 105, 107, 109, 111, 115
Section 1.3	144, 146, 147, 149, 151, 153, 155, 157, 159, 161, 163, 170, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 105, 197, 198
Section 1.4	207, 209, 211, 213, 214, 216, 219, 221, 223, 225, 227, 229, 231
Section 1.5	256, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 293, 295, 296, 306, 311, 316
Section 1.6	321 – 365 (odd), 373, 375
Section 1.7	391 – 405 (odd), 411, 413, 415, 423, 425, 427, 429, 431, 435
Section 3.1	1 – 47 (odd), 48, 49, 50, 51, 53, 55, 57, 62
Section 3.2	69, 70, 71, 72, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107 - 125 (odd)
Section 3.3	127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149 - 171 (odd), 172, 173, 175, 176, 177, 178, 180, 181
Section 3.4	183, 185, 189, 191, 193, 195, 197, 199, 201, 203, 205, 229 (odd), 232, 235
Section 3.5	245 – 259 (odd), 279 – 287 (odd), 294, 295, 297
Section 3.6 (Midpoint Rule only)	302, 303, 304, 317
Section 3.7	347 – 395 (odd)
Section 2.1	1 – 19 (odd), 21, 22, 23, 25, 27, 29, 30, 35, 48, 49, 50
Section 2.2	59, 61, 62, 63, 67, 71, 73, 74, 75, 76 – 82, 84, 85, 90, 91, 101, 102
Section 2.4 (Arc Length only)	171, 173, 176, 177, 179, 182, 183, 185, 186, 215
Section 2.7	299, 310 – 321, 322, 323, 324 – 334, 335, 340, 343, 345, 347
Section 2.8	348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 359, 361, 365, 369
Section 5.1	1 – 11 (odd), 13, 15 , 17, 23, 27, 29, 31 – 39 (odd), 41, 43, 47, 49, 51
Section 5.2	67 – 73 (odd), 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107, 109, 111, 113
Section 5.3	139 – 167 (odd)
Section 5.4	195 – 229 (odd)
Section 5.5	251 – 279 (odd)
Section 5.6	317 – 327
Section 6.1	1 – 47 (odd)
Section 6.2	63 – 71 (odd), 79, 81, 87 – 94, 95, 97, 99, 101, 104 – 107
Section 6.3	117, 119, 121, 123, 130 – 135, 141 – 159 (odd)
Section 6.4	174 – 177, 195 – 229 (odd)
Final Exam Review	

May 6, Monday, Last day of classes
May 9, Thursday – May 15, Wednesday, Final Exams
Final Exam is based on all sections covered in class.

The mind is not a vessel to be filled but a fire to be kindled.
— Plutarch