MATH 132-01 and 132L-01, Calculus II and Calculus II Lab
MWF 11:00-11:50am, Tu/Th 11am-12:20pm, S017

Instructor: Dr. Amy DeCelles

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Office Hours*: M 1-1:50, T 1:30-3:20, W 3-3:50, R 10-10:50, F 12-12:50

**If you anticipate wanting to come to office hours regularly, and none of these times work for you, please email me about this within the first week of the semester.*

Course Description: A continuation of MATH 131. Topics include: techniques of integration; applications of integration; infinite sequences; infinite series, including tests of series convergence; power series; Taylor series; introductory polar coordinates; first-order differential equations and initial value problems, including graphical and numerical methods, and analytical solutions of separable and linear equations.

Course Prequisite: Successful completion (C- or better) of MATH 131 (Calculus I), equivalent, or permission of instructor.

Credits and Workload Expectations: 4 credits, 6-10 hours per week outside the classroom.

Course Materials and Resources:

- *Calculus*, by Laura Taalman and Peter Kohn
- Canvas. Notes and other information will be posted there. Students are expected to check Canvas (and Bethel email) regularly.
- Learning Commons: lower level of the Miller/Moore Academic Center (AC)

Course Objectives: Upon successful completion of this course, students will be able to . . .

- utilize various tools from calculus and be able to understand and apply theorems in a variety of contexts;
- explain the concepts behind the calculations and theorems that you are using (e.g., What does it mean for a series to converge, conceptually?);
- use technology (e.g., calculators and computers) appropriately and have an understanding of how technology can help (and hinder) your understanding of calculus;
- study mathematics more effectively;
- identify the many ways in which calculus relates and/or applies to your area of study and every day life;
- communicate more effectively about mathematics.

Program Objectives: This course supports the following math program objectives (as well as similar objectives for Math Education and Engineering programs): M1, M2, M3, M4, M5, M6.

Course Structure: This class is carefully designed to help you progress from a basic understanding of each topic to mastery. We will typically spend two consecutive classes on a given topic: the first class is introductory (lecture with short opportunities for small group work), while the second (the "discussion" day) is for deepening understanding and correcting misunderstandings by collaborating with classmates on problems, writing solutions on the board, and critiquing solutions together as a class. Homework is assigned in a "rolling trio": reading assignments, discussion problems, and written problems. **Reading questions** (RQ) for a given section are due well before that section is covered in class; the purpose is to help you obtain a basic understanding of the key ideas in the section, so that we can focus on areas that need clarification or further development in class. **Discussion problems** are to be prepared (rough drafts, DP) for each discussion day; completed discussion problems (DC) are turned in the following class. After spending two days of class on a topic, you will write up a solution (with an explanation) of one problem, the **written problem** (W), to solidify your understanding of the topic.

Collaboration and Consultation: I encourage you, when working on homework, to collaborate with fellow students, to reread the textbook, and to ask the professor or the Learning Commons tutors for help. You are also free to consult other textbooks or online resources for general information on the topic. However, **you may not at any point consult any worked solution to an assigned homework problem**. This includes but is not limited to: the student solution manual, the instructor solution manual, other students' written homework, and any online solution. Moreover, **you may not use ChatGPT or other AI tools** unless you have been given explicit permission from the instructor in advance. If in doubt about the acceptability of a certain kind of collaboration or consultation, ask the professor. Please see the university policy on academic dishonesty, below.

Group Tutoring: There is a group tutoring session for this class on Tuesday evenings in the Learning Commons Conference Room (Academic Center Lower Level). Participation is strongly encouraged.

Attendance: Attendance in class (both lecture and lab) is expected, and a portion of the final grade comes from preparation for and participation in class. Absences for official university functions will be excused, provided that the instructor is notified in advance. Absences due to qualifying family or medical emergencies will also be excused, though the instructor reserves the right to ask for verification. **In the case of an excused absence, it is the student's responsibility to contact the instructor in a timely fashion and make arrangements for an assignment to compensate for any missed discussion participation.**

Late Work: Written work is due at the beginning of class on the date it is due. **Late work is typically not accepted.** The lowest three scores in each category (RQ, DP, DC, W) will be dropped at the end of the semester. Extensions on DC and W will be considered if requested before the due date, and work may certainly be submitted before the due date, if arrangements have been made with the professor in advance. If there is a serious, unforeseeable reason for missing more than one week of class, it is the student's responsibility to contact the professor as soon as possible and to make an appointment with the professor upon returning to classes to

make a plan, e.g. whether to continue with the course, take an incomplete, or withdraw; and if continuing, how to make up missed work.

Missed Check-Ins and Exams: Each student is allowed to miss one check-in without penalty: the lowest check-in score will be dropped at the end of the semester. Make-up check-ins or midterm exams may be given to students with legitimate excuses such as serious illness, university sponsored events, etc., as long as the make-up can be taken within a reasonable time frame. If it is not possible to schedule a make-up within a reasonable time frame, the grade for the missed assessment may be prorated from the final exam. Written documentation may be required. **Rescheduling the final is not possible except under very extreme circumstances; approval of the dean is required.**

Incompletes: Grades of I are normally not given in this course. However, they may be granted due to extenuating circumstances if (i) at least 60% of the course work has been completed at a level of C or better and (ii) the student demonstrates the ability to complete the remaining coursework outside of the classroom. In such cases, a well-documented petition should be submitted to the professor well before grades are due to the Registrar. Please see the university policies on incomplete grades and withdrawing from a class.

Final Course Grade: The overall score for this course will be computed as outlined below.

- Preparation and Practice (15%): Reading Questions, answering questions about the assigned textbook reading (5%), Discussion Preparation (5%), drafting solutions to discussion problems, Discussion Completion (5%), finalizing solutions to discussion problems.
- Written Problems (25%): a nicely written explanation of one problem for each topic covered
- Check Ins (5%): to check concept and skill mastery and retention
- Midterm Exams (30%): three 50-minute, closed-notes, closed-book exams, equally weighted
- Final Exam (25%): cumulative, date and time set by the Registrar for TR 11am classes; see Final Exam Schedule on MyBethel

Final letter grades will be determined as follows. Final letter grades will be assigned based on the overall score, with the two major components, written solutions and exams also being considered separately. In particular, **the final letter grade will not be higher than one letter grade above the level of the work on written solutions or the work on exams**. Exceptional performance on the final may also be taken into account.

A	93-100	B+	87-89	B-	80-82	C	73-76	D+	67-69	D-	60-62
A-	90-92	B	83-86	C+	77-79	C-	70-72	D	63-66	F	0-59

Education Majors: Please use the link below to review all appropriate standards.
https://bethelcollege.instructure.com/courses/11416/pages/standards-library

Learning Commons: Located on the lower level of the Miller/Moore Academic Center (AC), the Learning Commons offers in-person and online tutoring services to all Bethel students, including help with any sort of writing projects, from conception to completion. Tutors are

trained to give thoughtful feedback and advice on a variety of study skills, understanding concepts pertaining to relevant coursework, and overall writing concerns.

DEI: Bethel University respects the dignity of all God's image-bearers, and stands against racism, prejudice, and discrimination. Because Christ calls us to love our neighbor as ourselves, Christian discipleship includes pursuing the good of those who suffer injustice due to their color, race, or ethnicity. Therefore, we aim to continually transform our classrooms into safe and hospitable spaces where we listen to one another with mercy, learn from and value each other with tenacity, and commit to pursuing justice for the most vulnerable in our community.

Accessibility and Accommodations: Bethel University strives to make learning experiences accessible to all participants. If you anticipate or experience physical or academic barriers based on disability, please contact the Center for Academic Success to discuss options. To schedule an appointment, email `rachel.kennedy@betheluniversity.edu` or call 574-807-7460.

Academic Dishonesty: The student handbook (p. 156) states: "Any act of deceit, falsehood or stealing by unethically copying or using someone else's work in an academic situation is strictly prohibited.

1. A student found guilty of plagiarism or cheating will receive an "F" (zero) for that particular paper, assignment or exam. Should this occur, the professor will have an interview with the student and will submit a written report of the incident to the academic dean.

2. If a second offense should occur, the student will be asked to appear before the professor, the academic dean and the vice president for student development.

The student should realize that at this point continuation in a course and even his/her academic career may be in jeopardy. In the event of a recommendation for dismissal, the matter shall be referred to the Student Development Committee."

Artificial Intelligence: It is expected that any coursework (including, but not limited to, essays, papers, exams, projects, and lab reports) submitted by a student will be a product of their own creation, demonstrating their achievement of the learning outcomes related to the assigned task. With this in mind, note that submitting work that includes unauthorized or undocumented use of Artificial Intelligence (AI) may be considered as cheating or plagiarism. If you are unsure about appropriate use of AI on a given assignment, talk with your professor.

Cell Phones: Cell phones must be turned off and stowed in book bags during class. Any student using a cell phone for any reason (without permission) will be asked to leave the class and an unexcused absence will be recorded. Students using cell phones during exams or graded activities may be cited for cheating (at professor's discretion). In the case of expected emergencies, students may seek permission from the professor to leave their cell phones on during class, but the phone must remain in the book bag. Professors reserve the right to have operational cell phones in class.

Disclaimer: This syllabus is not a legal contract, but serves as a general outline for the semester. The professor reserves the right to announce in advance necessary adjustments to the course as the need arises.

Tentative Schedule: See the next page.

Tentative Semester Plan, MATH 132 Spring 2025

Mon	Tues	Wed	Thurs	Fri
Jan 6, 2025	Jan 7, 2025	Jan 8, 2025	Jan 9, 2025	Jan 10, 2025
			Intro to Course	Review Substitution (5.1)
Jan 13, 2025	Jan 14, 2025	Jan 15, 2025	Jan 16, 2025	Jan 17, 2025
5.2 IBP	D 5.1-5.2	5.3 Partial Fractions	D 5.3	5.4 Trig Integrals
Jan 20, 2025	Jan 21, 2025	Jan 22, 2025	Jan 23, 2025	Jan 24, 2025
D 5.4	5.5 Trig. Substitution	D 5.5	5.6-I Improper Ints	D 5.6-I
Jan 27, 2025	Jan 28, 2025	Jan 29, 2025	Jan 30, 2025	Jan 31, 2025
5.6-II Comparison Test	D 5.6-II	Review FTC2 (4.7)	5.7 Numerical Integration	D 5.7-I
Feb 3, 2025	Feb 4, 2025	Feb 5, 2025	Feb 6, 2025	Feb 7, 2025
5.7 Numerical Integration (con't)	D 5.7-II	Review Absolute Area (4.6)	6.1 Volumes by Slicing	D 6.1
Feb 10, 2025	Feb 11, 2025	Feb 12, 2025	Feb 13, 2025	Feb 14, 2025
Exam 1 (Ch 5)	6.2 Volumes by Shells	D 6.2	6.3 Arc Length and Surface Area	D 6.3
Feb 17, 2025	Feb 18, 2025	Feb 19, 2025	Feb 20, 2025	Feb 21, 2025
6.4-I Applications of Integration	D 6.4-I	6.4-II Applications of Integration	D 6.4-II	6.5-I Differential Equations, IVPs, Separable DEs
Feb 24, 2025	Feb 25, 2025	Feb 26, 2025	Feb 27, 2025	Feb 28, 2025
D 6.5-I	6.5-II Slope Fields, Euler's Method	D 6.5-II	6.5-III Applications	D 6.5-III
Mar 3, 2025	Mar 4, 2025	Mar 5, 2025	Mar 6, 2025	Mar 7, 2025
Spring Break	Spring Break	Spring Break	Spring Break	Spring Break
Mar 10, 2025	Mar 11, 2025	Mar 12, 2025	Mar 13, 2025	Mar 14, 2025
Wrap up Ch 6?	7.1 Sequences	**Exam 2 (Ch 6)**	D 7.1	7.2 Limits of Sequences
Mar 17, 2025	Mar 18, 2025	Mar 19, 2025	Mar 20, 2025	Mar 21, 2025
D 7.2-I	No Class (Deeper Life)	D 7.2-II	7.3 Series	D 7.3
Mar 24, 2025	Mar 25, 2025	Mar 26, 2025	Mar 27, 2025	Mar 28, 2025
7.4 Intro to Convergence Tests	D 7.4	7.5 Comparison Tests	D 7.5	7.6 Ratio and Root Tests
Mar 31, 2025	Apr 1, 2025	Apr 2, 2025	Apr 3, 2025	Apr 4, 2025
D 7.6	7.7-I Alternating Series	D 7.7-I	7.7-II Review Series	D 7.7-II
Apr 7, 2025	Apr 8, 2025	Apr 9, 2025	Apr 10, 2025	Apr 11, 2025
8.1 Power Series	D 8.1	**Exam 3 (Ch 7)**	8.2 MacLaurin and Taylor Series	D 8.2-I
Apr 14, 2025	Apr 15, 2025	Apr 16, 2025	Apr 17, 2025	Apr 18, 2025
D 8.2-II	8.3 Convergence of Power Series	D 8.3	Easter Break	Easter Break
Apr 21, 2025	Apr 22, 2025	Apr 23, 2025	Apr 24, 2025	Apr 25, 2025
8.4 Differentiating and Integrating Power Series	D 8.4	Stewart 17.4 Series Solutions	D 17.4 (Stewart)	Wrap up

Final Exam: Thurs May 1, 10:30 - 12:30

MATH 132, Unit 1 Plan

Mon	Tues	Wed	Thurs	Fri
Jan 6, 2025	Jan 7, 2025	Jan 8, 2025	Jan 9, 2025	Jan 10, 2025
			Intro to Course	Review Substitution (5.1) **Due**: • RQ 5.2 (on Canvas)
Jan 13, 2025	Jan 14, 2025	Jan 15, 2025	Jan 16, 2025	Jan 17, 2025
5.2 IBP **Due**: • RQ 5.3 (on Canvas)	D 5.1-5.2 *Bring your discussion prep. work to receive credit.*	5.3 Partial Fractions and Other Algebraic Techniques **Due**: • RQ 5.4 (on Canvas) • DC 5.1-5.2 (turn in on paper)	Check-In: Antiderivatives D 5.3 *Bring your discussion prep. work to receive credit.*	5.4 Trig Integrals **Due**: • RQ 5.5 (on Canvas) • DC 5.3 (turn in on paper) • W 5.2 (turn in on paper)
Jan 20, 2025	Jan 21, 2025	Jan 22, 2025	Jan 23, 2025	Jan 24, 2025
D 5.4	5.5 Trig. Substitution **Due**: • RQ 5.6-I (p 467-469, 472-475) • DC 5.4 • W 5.3	D 5.5	5.6-I Improper Integrals **Due**: • RQ 5.6-II (p470-471, 475-476) • DC 5.5 • W 5.4	D 5.6-I
Jan 27, 2025	Jan 28, 2025	Jan 29, 2025	Jan 30, 2025	Jan 31, 2025
5.6-II Improper Ints of Power Functions and Using Comparisons **Due**: • RQ 4.1, 4.2, 4.7 • DC 5.6-I • W 5.5	Check-In: Int.Techniques D 5.6-II	Review sigma notation (4.1), Riemann sums (4.2), FTC2 (4.7) **Due**: • RQ 5.7-I (p 480-483, 486-487) • DC 5.6-II • W 5.6-I	5.7-I Numerical Integration: Error in Right and Left Sums **Due**: • RQ 5.7-II (p 483-486, 487-489)	D 5.7-I
Feb 3, 2025	Feb 4, 2025	Feb 5, 2025	Feb 6, 2025	Feb 7, 2025
5.7-II Numerical Integration: Midpoint, Trapezoid, Simpson's **Due**: • RQ 4.6 • DC 5.7-I • W 5.6-II	Check-In: Improper Integrals D 5.7-II	Review Absolute Area (4.6) **Due**: • RQ 6.1 • DC 5.7-II • W 5.7-I	6.1 Volumes by Slicing **Due**: • RQ 6.2 • W 5.7-II	D 6.1
Feb 10, 2025	Feb 11, 2025	Feb 12, 2025	Feb 13, 2025	Feb 14, 2025
Exam 1 (Ch 5)	*6.2 Volumes by Shells*	*D 6.2*	*6.3 Arc Length and Surface Area*	*D 6.3*

Make sure to prepare drafts for each discussion!

Explanation of Abbreviations:

- RQ stands for "reading questions." Read the section(s) in the textbook, answer the reading questions (found on Canvas) and submit your work on Canvas.
- D stands for "discussion." For each class discussion, problems from the textbook have been selected and a list is provided with the unit plan. To prepare for a discussion day, give each of the discussion problems a good try; you will receive full credit for preparation if you have made good progress on the discussion problems. Final drafts of the discussion problems are due the class after the discussion class.
- DC stands for "discussion completion." Finalize and neaten up your work for all discussion problems, and turn it in.
- W stands for "written." One problem from each section is selected as the written problem; the solution to this problem should be written up nicely with a full explanation of all key ideas.

Section	Discussion Problems	Challenge (Bonus)	Written	Recommended Additional Practice
5.1	23, 25, 27, 29, 47, 63, 75, 78			16, 17, 18, 19, 20, 24, 40, 41, 49, 51, 71, 72, 74
5.2	7, 9, 13, 15, 24, 25, 27, 29, 35, 37, 53, 63, 72, 75, 90, 91	2, 83, 85	47	10, 11, 12, 41, 51, 59, 67, 68, 71, 73, 74, 76
5.3	17, 19, 21, 23, 27, 37, 47, 49, 53	39, 60	31	25, 35, 41, 43, 45, 51, 57
5.4	19, 20, 22, 23, 25, 27, 37, 39, 53, 55, 67, 73	33, 79, 80	47	8-18, 21, 29, 35, 41, 43, 45, 49, 69, 70, 72, 75, 77
5.5	5, 11, 17, 37, 39, 43, 44, 49, 53, 63, 75	38, 47, 71, 73	51	8, 45, 52, 55, 61, 62, 76
5.6-I	7, 15, 17, 19, 21, 23, 35, 45, 46, 49, 71	43, 44, 52	37	25, 27, 29, 31, 39, 41, 47, 48, 51,73
5.6-II	2, 8, 9, 12, 13, 57, 61, 75, 77	14, 65	59	58, 60, 62, 63, 64
5.7-I	3, 5, 7, 23, 32, 33, 43	10	41	8, 25, 26, 41, 42, 44
5.7-II	2, 4, 6, 31, 34, 39, 45, 46, 49	22, 54, 61	51	9, 13, 15, 27, 28, 37, 47, 48, 52

Discussion Problems: Bring drafts of solutions on discussion days. Finalize your solutions after class to turn in.

Challenge (Bonus): Completing a challenge problem for discussion earns an extra point for discussion preparation.

Written: Solve and write up an explanation of the written problem to turn in.

Recommended Additional Practice: Not graded, but suggested for sharpening skills and solidifying understanding.