

Math 252X - Calculus II

Fall 2019

Instructor Information

Name: Caleb Jurkowski
Office: Chapman 301C
Phone: 474-7988
E-mail: cjjurkowski@alaska.edu
Office Hours: MR 9-10am
WF 1-2pm

Course Information

CRN: 74435
Section: F03
Credits: 4+1 credits
Prerequisites: C- or better in Math 251X
Lecture: MWF 11:45-12:45 Gruening 412
R 11:30-12:30 Gruening 409

Teaching Assistant

Name: Aye Aye Maung
Office: Chapman 303C
E-mail: amaung@alaska.edu
Tutor Hours: TBD

Recitation

F03: T 11:30-12:30
Gruening 409
F04: T 2:00-3:00
Gruening 405

Course Reading Materials

- *Calculus: Early Transcendentals 8th Edition*, James Stewart, ISBN-13: 978-1285741550 and ISBN-10: 1285741552.
- Optional: *Student Solutions Manual for Stewart's Single Variable Calculus: Early Transcendentals, 8th Edition* ISBN-13: 978-1305272422 and ISBN-10: 1305272420. This book contains fully worked solutions to all of the odd-numbered exercises in your textbook. This is not available through the UAF bookstore, but is available on Amazon (and probably elsewhere) to rent and buy.
- *WebAssign Access Code*. You will be doing a significant portion of your homework online. To do this you must have a WebAssign access code. If you purchase your textbook from the UAF bookstore this code will come packaged with your text. If not, you can purchase one on www.webassign.net. If you have not yet purchased a code, don't fret! WebAssign grants you a two-week "trial" period where you can use the service without paying. You also have access to an eBook on WebAssign.

Course Description

From the UAF course catalog:

"Techniques and applications of integration. Integration of trigonometric functions, volumes including those using slicing, arc-length, integration by parts, trigonometric substitutions, partial fractions, hyperbolic functions, and improper integrals. Numeric integration including Simpson's rule, first order differential equations with applications to population dynamics and rates of decay, sequences, series, tests for convergence including comparison and alternating series tests, conditional convergence, power series, Taylor series, polar coordinates including tangent lines and areas, and conic sections."

Calculus II begins by picking up where Calculus I ended, integration. During the first unit we will discuss some more sophisticated techniques for integration (Chapter 7). Before jumping into applications of integration, the second unit will most likely be completely new for most students: sequences and series (Chapter 11). Sequences and series can be used to attack many problems including, but not limited to, approximation of functions and approximation of integrals. We will then return to applications of integration to physics and engineering (Chapters 6 & 8). We end the course with a few new methods of representing curves (Chapter 10). Specifically, we will discuss how curves can be represented using parameterizations and discuss an alternative system of graphing called the polar coordinate system. This topic functions as a preview to some ideas which will be covered and expanded upon in Calculus III.

Course Goals

In this course students will be expected to master problem solving skills, learn to manipulate abstract symbols and develop deductive arguments in mathematics. Additionally, students will encounter a broad spectrum of mathematical applications including, but not limited to:

- Various techniques of integration,
- Integration of improper integrals,
- Applications of integration to areas, volumes, arc length, work, and centroids.
- Convergence and divergence of sequences and series,
- Power series and their applications,
- Parameterizations of curves and polar coordinates.

Instructional Methods

This course will be primarily lecture-based with daily work assigned on WebAssign, weekly written homework, weekly in-class quizzes, and in-class activities. Instruction will be supplemented with frequent assessment so that the instructor (and you!) can monitor your learning. Participation during class is encouraged, and an attempt to address all questions in full will be made.

Students are required to attend all course sessions. Attendance will be taken daily. **Excessive absences could lead to a faculty-initiated withdrawal since you have not participated substantially in the course.** Successful, timely completion of this course depends on committing yourself early and maintaining your effort.

Blackboard will be used extensively in this class to communicate with students. All announcements, handouts, solutions, and grades will be posted in Blackboard. If you haven't been to the Blackboard page yet, please do so soon: classes.alaska.edu. Your login information is the same as your university e-mail. It is the responsibility of the student to check Blackboard regularly and report any issues to their instructor. Additionally, the student must check their @alaska.edu e-mail daily. If you prefer to use another e-mail it is best to set up your @alaska.edu account to forward to your preferred account.

Policies

Successful, timely completion of this course depends on committing yourself early and maintaining your effort. You are responsible for keeping up with the material and turning things in on time. The pace of this course is fast, and missing even a single class can have long-term detrimental effects.

For virtually every issue that may arise, failure to promptly notify your instructor can only exacerbate things. If something comes up that hinders your ability to come to class or complete assignments, let your instructor know as soon as possible.

I encourage you to work with others and/or talk to me for homework. However, write up all your work on your own. It is okay for a group to have an outline of a solution, but you need to write up the final solution on your own.

Cheating on an exam will result in an automatic zero recorded for the work. Cheating on the final exam will result in failure of the entire course. Should there be multiple instances of cheating by one student, they will be reported to the Dean of Students and will be dealt with appropriately.

Posted grades for assignments, notes, and exams are set by Saturday, December 7. After that, no adjustments to posted grades will be made.

This should go without saying, but in class **PUT YOUR CELL PHONES AWAY**. The instructor has little patience and even less tolerance for the use of cell phones during class. It can wait until after class - if it can't (an emergency), please leave class to take care of business.

Attendance will be taken daily. **Students who miss more than 3 days of class may be withdrawn from the course.**

Evaluation

In this course you will be evaluated mainly based on your performance in homework, quizzes, midterm exams and a final exam. Student grades will be dependent upon: WebAssign homework (7%), written homework (10%), in-class quizzes (10%), four “midterm” exams (48%), and the (cumulative) final exam (25%). This breakdown is absolute, and extra credit will not be offered in lieu of assigned work. More details on each of the categories can be found below.

The grading scale used will be the plus/minus letter grades:

A	93-100%	C	70-76%
A-	90-92%	C-	not given
B+	87-89%	D+	67-69%
B	83-86%	D	63-66%
B-	80-82%	D-	60-62%
C+	77-79%	F	< 60%.

The instructor reserves the right to make the brackets of this scale wider. An incomplete will be given due to extreme circumstances beyond your control (you will need to provide verifiable proof). After the drop date, students who do not wish to continue with the course will be responsible for withdrawing themselves. If a student chooses to stop participating in the course after the withdrawal deadline, this will result in a grade of **F**. Grades of no basis will not be awarded for lack of attendance after the withdrawal deadline.

WebAssign Homework

Daily homework will be assigned using WebAssign. You will learn best if you practice the material that has been discussed in class immediately after learning it. Homework will be due the following (class) day after a lesson is taught at midnight. For example, if a lesson is taught on Monday, the WebAssign problems for that lesson would be due on Tuesday by 11:59 PM — if a lesson is taught on Friday, the WebAssign problems for that lesson would be due on Monday by 11:59 PM. See the course schedule for more detailed due dates. Starting early ensures that the instructor will have adequate time to respond to any questions. Alternatively, utilize the resources in the MathLab to get more immediate help! See the later section titled Tutoring.

You will usually have 5 chances to get a problem correct. The point of these problems is to practice and learn from your mistakes. Use the multiple chances to do so! **Late WebAssign homework will be accepted for 1/2 credit within one week of the due date.** The late penalty is only assessed on the problems which are incomplete or incorrect. For example, if you have a 60% on an assignment and the due date passes, you can work on the remaining 40% and earn a max grade of 80%.

We are going to access WebAssign directly from Blackboard. To do so your browser must be configured to accept third-party cookies. If you are having technical troubles contact OIT (<https://www.alaska.edu/oit/>) or WebAssign directly (<https://webassign.com/support/student-support/>).

The first time you access WebAssign from Blackboard, a new linked WebAssign account is automatically created for you. The link for WebAssign is prominently displayed in the left-hand menu of the Blackboard page. If you already have an account you *may* have to contact WebAssign’s student tech support to link your accounts. If you are having trouble with WebAssign, please let your instructor know **and** contact WebAssign’s student tech support. (<https://webassign.com/support/student-support/>)

WebAssign gives you free access for two week after the start of class. To continue using WebAssign after that either enter an access code or purchase access online. Failure to purchase a WebAssign code in a timely fashion is not a reason for a full credit extension on your homework. Buy your codes right away!

Suggested Problems

There will be suggested, optional problems from the text given at the end of every lesson. If you find yourself struggling, the only way to get better is to practice. The suggested problems will be odd-numbered problems. The answers can be found

in the back of the text and most have fully worked solutions on-line. If you wish to do so, a student solutions manual that contains fully worked solutions to all of these problems could be purchased.

Weekly Written Homework

Written homework give you a chance to tackle more challenging and interesting problems and practice writing up nice solutions. Homework will be posted on Blackboard and handed out in class. Homework will be due on Mondays **at the beginning class** when you walk in the door. The turn in day may be changed due to the exam schedule. No late work is accepted as solutions will be posted Monday afternoon.

All homeworks are open book, open notes, and you may use a calculator. You must show all relevant work, and at the discretion of the grader, points will be deducted if steps are skipped. (For example, if you work a problem in a manner that was not discussed in class, but appears when you select “show work” on Wolfram Alpha, no credit will be given!)

Your solutions should be *nice, neat* solutions. Points will be deducted for sloppiness. The homework that you submit should be your **final** draft! It is best to first work the problems on scratch paper and then rewrite the solution onto the handout. The following is a great template for writing (e.g.) solutions to integration problems. Note I will demonstrate this organization for virtually every problem in this class.

Compute the following definite integral.

$$\begin{aligned}
 1) \int_{\pi/4}^{\pi/2} \cot x \, dx &= \int_0^{\pi/4} \frac{\cos x}{\sin x} \, dx \\
 \left(\begin{array}{l} u = \sin x \\ du = \cos x \, dx \end{array} \right)^\dagger &= \int_{\sqrt{2}/2}^1 \frac{du}{u} \\
 &= \ln|u| \Big|_{\sqrt{2}/2}^1 \\
 &= \ln(1) - \ln\left(\frac{\sqrt{2}}{2}\right) = \boxed{\ln \sqrt{2}}
 \end{aligned}$$

Besides outlining the general organization strategy of working *vertically*, this example demonstrates how to write solutions that have two separate computational threads. The main work is connected through the string of equals signs; there is a side work computation - u -substitution in † . We will have “side work” for most integrals we compute in this class; this work generally needs to be separate (to the left or right) of the main solution to the problem. If the work is too long to be completed in a single column, you may start a next step in a new column.

Compute the following definite integral.

$$\begin{aligned}
 1) \int_0^{\pi/4} \tan x \, dx &= \int_0^{\pi/4} \frac{\sin x}{\cos x} \, dx &= \ln|u| \Big|_{\sqrt{2}/2}^1 \\
 \left(\begin{array}{l} u = \cos x \\ du = -\sin x \, dx \end{array} \right) &= - \int_1^{\sqrt{2}/2} \frac{du}{u} &= \ln(1) - \ln\left(\frac{\sqrt{2}}{2}\right) = \boxed{\ln \sqrt{2}} \\
 &= \int_{\sqrt{2}/2}^1 \frac{du}{u}
 \end{aligned}$$

Remember, if you cannot go back to track a mistake, your work needs better organization.

Recitation and Quizzes

The recitation hour is focused on reviewing material from the previous week, asking questions related to this material, preparing for quizzes and exams, and taking the weekly quiz.

The quiz will cover the material taught in the classes held since the previous quiz; specific topics can be found in the schedule on the course website. Quizzes are equally weighted, and are given under testing conditions; books, notes, and calculators are not allowed. Performance on the quizzes is a better indicator of exam performance, and how well you are learning the course material, than homework which may be done with the input of tutors/friends/internet/etc.

Quizzes cannot be made up except with a documented excused absence. No quiz grade will be dropped. Solutions to quizzes will be posted on Blackboard.

Exams

We will have four “midterm” exams and a final in this course. The midterms will be 1 hour, i.e. the normal class duration. The final exam is cumulative. Exams will be closed book/closed notes and no calculator allowed. For the final, a large standard size note card (front and back) may be used for formulas, etc. The final exam will be 2 hours from 1:00-3:00pm on Tuesday, December 10.

Exam Make-Up Policy

Exams cannot be made up unless you provide a convincing reason and let your instructor know at least one class day in advance. If you have an unplanned emergency (such as a car accident or emergency medical situation) you must let your instructor know immediately. It is the Departments of Mathematics and Statistics policy that final exams cannot be given early or late.

Tutoring

There are many resources available on campus to help you be successful in this course. If you have questions you can meet with your instructor — just e-mail to make an appointment, come by my office during office hours, or drop by my office to see if I’m available. If I am unavailable or you need more immediate help, there are numerous tutoring options:

- Mathlab drop in tutoring — Chapman 305
- One-on-one tutoring — Chapman 210
- Online tutoring

To make an appointment for 1-1 or online tutoring, go to <https://fairbanks.go-redrock.com>. For more information about tutoring services, check out www.uaf.edu/dms/mathlab.

Important Dates to Remember

See <https://catalog.uaf.edu/calendar/> for a more detailed description of these dates.

First day of instruction	Monday, Aug 26
Deadline for adding classes/late reg.	Friday, Sept 6
Last day for student- and faculty-initiated drops	Friday, Sept 6
Deadline for tuition and fee payment	Friday, Sept 6
Last day for student- and faculty-initiated withdrawal	Friday, Nov 1
Last day of instruction	Friday, Dec. 6
Final Exam	Tuesday, Dec 10

Course Calendar

A detailed course calendar is found in a separate document on Blackboard. Besides scheduled content, it includes due dates for notes, homework, and exams.

Support Services

In addition to the MathLab, Student Support Services offers free tutoring (in many subjects) to students that qualify for their program. ASUAF offers private tutoring for a small fee (based on student income).

Disability Services

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials. I will work with the Office of Disability Services (208 Whitaker, 474-5655) to provide reasonable accommodations to students with disabilities.

Student Protections

Every qualified student is welcome in my class. As needed, I am happy to work with you, disability services, veterans' services, rural student services, etc. to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. *As required*, if I notice or am informed of *certain types of* misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: <https://www.uaf.edu/handbook/>.

DMS Academic Policies

1. *Incomplete Grade* Incomplete (I) will only be given in Mathematics or Statistics courses in cases where the student has completed the majority (normally all but the last three weeks) of a course with a grade of C or better, but for personal reasons beyond his/her control has been unable to complete the course during the regular term. Negligence or indifference are not acceptable reasons for the granting of an incomplete grade.
2. *Late Withdrawals* A withdrawal after the deadline from a DMS course will normally be granted only in cases where the student is performing satisfactorily (i.e., C or better) in a course, but has exceptional reasons, beyond his/her control, for being unable to complete the course. These exceptional reasons should be detailed in writing to me, department chair, and dean.
3. *No Early Final Examinations* Final examinations for DMS courses shall not be held earlier than the date and time published in the official term schedule. Normally, a student will not be allowed to take a final exam early. Exceptions can be made by individual instructors, but should only be allowed in exceptional circumstances and in a manner which doesn't endanger the security of the exam.