

MATH 0122 A: Calculus II
Fall Term 2022
Course Description

September 16, 2022

Instructor: John Schmitt

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Office Hours: Tuesday 3pm–4:15pm, Wednesday 10am–11am, Thursday 3pm–4:15pm
and by arrangement

Webpage: <http://community.middlebury.edu/~jschmitt/>

Meeting Times:

Section A

MWF, 9:05am–9:55am Warner Hall 101

R, 9:30am–10:45am Warner Hall **105**

Textbook: James Stewart, *Single Variable Calculus*, **8th edition**, Cengage Learning, 2016.
(Two copies of the 8th edition are held on 2-hour reserve at the Davis Family Library
Circulation Desk.)

Homework: Homework will be assigned on a daily basis. The content of this course is
best learned by *practicing problems*. It is expected that you will read each section of the
text from which problems are drawn in its entirety. I **encourage you to work together**
and attend the help sessions. However, the write-up of homework solutions *should be done*
on your own. Homework will be collected three times a week - Monday, Wednesday and
Friday. Please read my *Thoughts on Homework*.

Quizzes: I reserve the right to give quizzes. If given, they will be short in length and
cover recent homework problems. They will generally be announced beforehand.

Calculus Help is available at the *Drop In* tutoring sessions.

Session Times: Sunday, Tuesday, Thursday 7-9 p.m.

Location: Warner Hall 105

Beginning: Sunday, September 18

Special Needs: If you require special arrangements for class or during tests/exams please talk to me as soon as possible to make such arrangements. Additionally, students who have Letters of Accommodation in this class are encouraged to contact me as early in the semester as possible to ensure that such accommodations are implemented in a timely fashion. For those without Letters of Accommodation, assistance is available to eligible students through the Disability Resource Center (DRC). Please contact ADA Coordinators Jodi Litchfield and Peter Ploegman of the DRC at ada@middlebury.edu for more information. All discussions will remain confidential.

Eligibility: If you have scored a 4 or 5 on the BC Calculus exam you are **NOT** permitted to take this course, per College regulations. More specifically, we have the following from the Mathematics Department’s website, “Students who have earned grades on advanced placement calculus exams that are eligible for credit may not register for the equivalent course at Middlebury College. Thus students who have earned 4 or 5 on the Calculus AB exam or a 3 on the Calculus BC exam may not register for MATH 0121, students who have earned 4 or 5 on the Calculus BC exam may not register for MATH 0121 or MATH 0122, and students who have earned 4 or 5 on the Statistics exam may not register for MATH 0116. This policy applies irrespective of whether students choose to use their AP credits toward meeting Middlebury’s graduation requirements. The following international credentials carry the same credit as a 4 or 5 on the Calculus BC Exam: A-level exam with a mathematics grade of A, B, or C; or IB Higher Level Mathematics with a grade of 6 or 7.”

Grading Percentages:

Homework/Quizzes	10
Three midterms	60 (20 each)
Final	30

Assignment of Grades:

The assignment of grades will follow the scheme below.

90 and above	A
80 - 89	B
70 - 79	C
60 -69	D
below 60	F

Plus and minus will be assigned at the end of the course. The two lowest homework scores will be dropped from consideration.

Midterm Exams: Schedule: Thursday, October 6th; Thursday, October 20th; Thursday, November 17th

Final Exam: Thursday, December 15th, 9am–12noon. The final exam will be given **ONLY** at the assigned time – please plan accordingly.

Absences: Please see me as far in advance as possible for absences that will occur on the day of an exam. Any such absences, or unforeseen ones, must be documented in writing by the appropriate person.

Honor Code: The Middlebury College Honor Code will be observed throughout this class and for all examinations. If you have a question about how the Honor Code applies to this class please ask.

Course Webpage: Problem sets, syllabi, practice exams and other relevant material will be posted on a course website, available by linking from my homepage:
<http://community.middlebury.edu/~jschmitt/>. A Canvas page for the course also exists.

Calculus II - Course Content

1. Review
 - The Fundamental Theorem of Calculus
2. Transcendental Functions
 - The Logarithm Defined as an Integral
 - Derivatives of Inverse Functions and Logarithm
 - Exponential Growth and Decay
 - Relative Rates of Growth
 - Inverse Trigonometric Functions
3. Techniques of Integration
 - Basic Integration Formulas
 - Integration by Parts
 - Improper Integrals
4. Infinite Sequences and Series
 - Sequences
 - Infinite Series
 - The Integral Test
 - Comparison Tests
 - The Ratio and Root Tests
 - Alternating Series, Absolute and Conditional Convergence
 - Power Series
 - Taylor and Maclaurin Series
 - Convergence of Taylor Series; Error Estimates
 - Applications of Power Series
5. Applications of Definite Integrals (time permitting)
 - Arc Length
 - Applications to Physics, Engineering, Economics and Biology
 - Probability
6. Parametric Equations

- Calculus with Parametric Curves

7. Differential Equations

- Slope Fields and Separable Differential Equations
- First-Order Linear Differential Equations
- Graphical Solutions of Autonomous Equations
- Applications of First-Order Differential Equations
- Series Solutions of Differential Equations

Table 1: Below is a fairly accurate schedule for the topics we will cover, and exam dates. These may change, if need be; there are times when flexibility in scheduling is important. I will do my best to warn you of changes.

Week beginning	Monday	Tuesday	Wednesday	Thursday	Friday
September 12	Intro. IVT, MVT, Limits, Derivative of a function		4.3 Fundamental Theorem of Calculus	6.1 Inverse Functions	6.2* The Natural Logarithmic Function
September 19	6.3* Natural Exponential Function		6.4* General Logarithmic and Exponential Functions	6.5 Exponential Growth and Decay	6.6 Inverse Trigonometric Functions
September 26	6.8 Indeterminate Forms and L'Hopital's Rule		Continued	7.1 Integration by Parts	
October 3	7.2 Trigonometric Integrals		7.3 Trig Substitution	EXAM thru 6.8	
October 10	7.4 Partial Fractions			7.8 Improper integrals	Fall break
October 17			11.1 Sequences	EXAM on Chapter 7	11.1 Sequences
October 24	11.1 Sequences		11.2 Series		11.3 The Integral Test
October 31	11.4 The Comparison Test		11.5 Alternating Series	11.6 Abs. Convergence, Ratio and Root test	11.8 Power Series
November 7	11.9 Representations		11.10 Taylor and Maclaurin Series	11.10	11.11 Applications
November 14	11.7 Strategy			EXAM on Chapter 11	
November 21	Happy	Thanks-	giving	Peace	be with you
November 28	9.1 Differential Equations		9.2 Direction Fields	9.3 Separable Equations	
December 5	9.4 Population Growth		9.6 Predator-Prey Systems	10.1 Parametric Equations	10.2 Calculus of Parametric Curves
December 12	Last day			FINAL EXAM	