

MATH 0122 C and D: Calculus II
Spring Term 2012
Course Description

April 13, 2012

Instructor: John Schmitt

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Office Hours: Tuesday 1:30 — 3pm, Wednesday 1:30 — 2:45 pm, Friday 1:30 — 2:45pm,
or by arrangement

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

Meeting Times:

Section C

MWF, 9:05—9:55 am Warner Hall 203

R, 9:30 — 10:45 am Warner Hall 202

Section D

MWF, 10:10 — 11:00 am Warner Hall 203

R, 11:00 am — 12:15 pm Warner Hall 202

Textbook: James Stewart, *Single Variable Calculus, 7th edition*, Thomson-Brooks/Cole, 2012. Four copies of the text are held on reserve in the Davis Family Library.

Homework: Homework will be assigned on a daily basis. The content of this course is best learned by *practicing problems*. 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.

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, and Thursday 7-9 p.m.

Location: Mathematics Common Room, 3rd floor Warner.

Beginning: soon!

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.

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
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 my discretion. The two lowest homework scores will be dropped from consideration.

Midterm Exams: Tentative Schedule:

Thursday, March 8

Thursday, March 22

Thursday, April 26

Final Exam: Saturday, May 19th, 2-5pm in Warner 203 and 208. The final exam will **ONLY** be given 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/>.

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
 - 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
February 13	Intro. IVT, MVT, Limits, Derivative of a function		4.3 Fundamental Theorem of Calculus	6.1 Inverse Functions	6.2* The Natural Logarithmic Function
February 20	6.3* Natural Exponential Function		6.4* General Logarithmic and Exponential Functions	6.5 Exponential Growth and Decay	Winter Carnival (no class)
February 27	6.6 Inverse Trigonometric Functions		6.8 Indeterminate Forms and L'Hopital's Rule	Continued	7.1 Integration by Parts
March 5			7.2 Trigonometric Integrals	EXAM thru 6.8	
March 12	7.3 Trig Substitution		7.4 Partial Fractions		7.8 Improper integrals
March 19			11.1 Sequences	EXAM on Chapter 7	11.1 Sequences
March 26	SPRING		RECESS	NO	CLASS
April 2	11.1 Sequences		11.2 Series	11.3 The Integral Test	11.4 The Comparison Test
April 9	11.5 Alternating Series		11.6 Abs. Convergence, Ratio and Root test	11.8 Power Series	11.9 Representations
April 16	11.10 Taylor and Maclaurin Series		11.10	11.11 Applications	Research Symposium (No class)
April 23	11.7 Strategy			EXAM on Chapter 11	10.1 Parametric Equations
April 30	10.2 Calculus of Parametric Curves		9.1 Differential Equations		9.2 Direction Fields
May 7	9.3 Separable Equations		9.4 Population Growth	9.6 Predator-Prey Systems	
May 14	Last day				