

Math 122 C: Calculus II  
Spring Term 2008  
Course Description

February 10, 2008

**Instructor:** John Schmitt

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Office Hours: Monday 11am-12pm, Wednesday 9am-10am, Thursday 10am-11am, or by arrangement (hours will expand later in the semester)

**Meeting Times:**

**Section C**

MWF, 10:10 am - 11:00 am Warner Hall 203

Thur., 11:00 am - 12:15 pm Warner Hall 208

**Textbook:** James Stewart, *Single Variable Calculus, 6th edition*, Thomson-Brooks/Cole, 2008.

**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, 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.

**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.

**Midterm Exams:** Tentative Schedule:

Thursday, March 6

Thursday, March 20

Thursday, April 24

Some exams may occur in the evening of the indicated day.

**Final Exam:** Tuesday, May 13th, 9am-12pm.

The final exam will be administered at this time only, please make plans 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 and Polar Coordinates

- Calculus with Parametric Curves
- Graphing in Polar Coordinates
- Area and Lengths in Polar Coordinates

7. Differential Equations (time permitting)

- 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.

	Monday	Tuesday	Wednesday	Thursday	Friday
February 11	Intro. IVT, MVT, Limits, Derivative of a function		<b>5.3</b> Fundamental Theorem of Calculus	<b>7.1</b> Inverse Functions	<b>7.2*</b> The Natural Logarithmic Function
February 18	<b>7.3*</b> Natural Exponential Function		<b>7.4*</b> General Logarithmic and Exponential Functions	<b>7.5</b> Exponential Growth and Decay	Winter Carnival (no class)
February 25	<b>7.6</b> Inverse Trigonometric Functions		<b>7.8</b> Indeterminate Forms and L’Hopital’s Rule	Continued	<b>8.1</b> Integration by Parts
March 3	<b>8.2</b> Trigonometric Integrals		<b>8.3</b> Trigonometric Substitution	<b>EXAM</b> thru <b>7.8</b>	More on Trig Substitution
March 10	<b>8.4</b> Partial Fractions		<b>8.8</b> Improper integrals	“say what?”	<b>9.1</b> Arc Length
March 17	<b>9.5</b> Probability		Review/Questions	<b>EXAM</b> thru 9.5	<b>12.1</b> Sequences
March 24	SPRING		RECESS	NO	CLASS
March 31	<b>12.2</b> Series		<b>12.3</b> The Integral Test	<b>12.4</b> The Comparison Test	<b>12.5</b> Alternating Series
April 7	<b>12.6</b> Abs. Convergence, Ratio and Root test		<b>12.8</b> Power Series	<b>12.9</b> Representations	<b>12.10</b> Taylor and Maclaurin Series
April 14	more on Taylor series		<b>12.11</b> Applications	Questions	<b>12.7</b> Strategy
April 21	<b>11.1</b> Parametric Equations		<b>11.2</b> Calculus of Parametric Curves	<b>EXAM</b> on Chapter 12	
April 28	<b>11.3</b> Polar Coordinates		<b>11.4</b> Areas and Lengths	<b>10.1</b> Differential Equations	<b>10.2</b> Direction Fields
May 5	<b>10.3</b> Separable Equations		<b>10.4</b> Population Growth	<b>10.6</b> Predator-Prey Systems	Wrap-up