

Math 31B: General Course Outline

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Catalog Description

31B. Integration and Infinite Series. (4) Lecture, three hours; discussion, one hour. Requisite: course 31A with a grade of C- or better. Not open for credit to students with credit for course 3B. Transcendental functions; methods and applications of integration; sequences and series. P/NP or letter grading.

Textbook

J. Rogawski, *Single Variable Calculus*, (2nd Edition) , W.H. Freeman & CO

Reviews & Exams

The following schedule, with textbook sections and topics, is based on 26 lectures. The remaining classroom meetings are for leeway, reviews, and **two midterm exams**. These are scheduled by the individual instructor. Often there are reviews and midterm exams about the beginning of the 4th and 8th weeks of instruction, plus reviews for the final exam.

In certain cases (such as for coordinated classes), it may be possible to give midterm exams during additional class meetings scheduled in the evening. This has the advantage of saving class time. A decision on whether or not to do this must be made well in advance so that the extra exam sessions can be announced in the *Schedule of Classes*. Instructors wishing to consider this option should consult the mathematics undergraduate office for more information.

Schedule of Lectures

Lecture	Section	Topics
1	7.1	Derivative of exponential functions
2	7.2	Inverse functions
3	7.3	Logarithms and their derivatives
4	7.4	Exponential growth and decay
5	7.5-7.6	Compound Interest, Models involving $y' = k(y-b)$
6	7.7	L'Hopital's Rule
7	8.1	Integration by Parts
8	8.2 - 8.3	Trigonometric integrals, Trigonometric Substitution(A)
9	8.5	Method of partial fractions
10	8.6	Improper integrals
11	8.8	Numerical integration
12	8.8	Error Bounds for Numerical Integration
13	9.1	arc length
14	9.2	fluid pressure and force
15	9.4	Taylor polynomials
16	9.4	Taylor's Theorem, Error Bound(B)

17	11.1	Sequences and Infinite Series(C)
18	11.2	Infinite Series
19	11.2	Infinite Series (cont'd)
20	11.3	Convergence of Series with positive terms
21	11.4	Conditional Convergence
22	11.5	Ratio and root tests
23	11.6	Power Series
24	11.6	Power Series (cont'd)
25	11.7	Taylor Series
26	11.7	Taylor Series (cont'd)

Comments

(A) Instructor should select from the material from Sections 8.3 - 8.5, since it is not possible to cover all integration techniques adequately in two lectures. In Section 8.3, you may require students to know how to integrate powers of $(\sin x)^m(\cos x)^n$ and otherwise be able to evaluate trigonometric integrals given reduction formulas or a table of integrals. You may limit integration of rational functions to distinct linear factors or at most double linear factors, but require that students recognize the form of a partial fraction expansion in general (without having to find it).

(B) Students should learn to apply the Error Bound for Taylor polynomials.

(C) Although the "epsilon-delta" definition of limits in section 2.8 is not covered in Math 31A, the "epsilon-N" definition of limits is appropriate for this course.

Outline update: 8/07

For more information, please contact Student Services, ugrad@math.ucla.edu.