

## Calculus II Syllabus

**Calculus II MAT176:** 4 hours, 4 credits. Riemann sums; logarithmic and exponential functions; integration of functions; applications of the definite integral, including area, volume, and arc length; infinite series and power series in one variable.

**Prereq:** A grade of C or better in MAT 175. **Coreq:** MAT 156 Calculus I Laboratory

**Instructor:** Your instructor will provide contact info, office hours and meeting times for your section.

### Grading Policy

**Expectations:** Students are expected to learn both the mathematics covered in class and the mathematics in the textbook and other assigned reading. Completing homework is part of the learning experience. Students should review topics from prior courses as needed using old notes and books.

**Homework:** Approximately four hours of homework will be assigned in each lesson as well as additional review assignments over weekends.

**Exams:** There will be two midterm exams and a final exam.

**Grades:** The precise grading policy for your section will be distributed by your instructor. There is a uniform departmental final exam that students must pass in order to pass the course.

### Materials, Resources and Accommodating Disabilities

**Textbook:** Larson, Hostetler and Edwards, Calculus: Early Transcendentals Ed. 4 or Ed. 5, Houghton Mifflin, ISBN: 4240-8073-1 or ISBN 1-285-92353-6

**Technology:** Students should purchase a basic scientific calculator able to compute trigonometric and exponential functions, but unable to complete algebraic manipulations and take derivatives.

**Tutoring:** Departmental tutoring is available in the Math Lab on the 2nd floor of Gillet.

**Reliable Web Resources:** See <http://comet.lehman.cuny.edu/calculus>

**Reserve:** Selected books have been placed on reserve in the library.

**Accommodating Disabilities:** Lehman College is committed to providing access to all programs and curricula to all students. Students with disabilities who may need classroom accommodations are encouraged to register with the Office of Student Disability Services. For more info, please contact the Office of Student Disability Services, Shuster Hall, Room 238, phone number, 718-960-8441.

### Course Objectives

At the end of the course students should be able to:

1. Find integrals (as part of dept objectives a,b & e)
2. Solve physical and geometric problems (a, b, c & e)
3. State and Apply the Fundamental Theorem of Calculus and Riemann Sums (b & e)
4. Compute Taylor series and verify convergence of power series (a & b)

*These objectives will be assessed on the final exam along with other important techniques.*

Department of Mathematics and Computer Science, Lehman College, City University of New York

## Course Calendar

*This course and its co-requisite are carefully timed to match topics, so stay on schedule. The assigned homework covers the same types of problems in either edition but the exact exercises are different. Check your answers in the back of your textbook.*

*MAT 175 covers the topics up to and including section 5.5. Sections 5.1 – 5.3 will be recalled very briefly. The course MAT 176 proper begins with a review of section 5.4*

### **Brief Review of 5.1-5.3: Antiderivatives, area, Riemann sums and definite integrals**

HW 5.1/ 1,3,17,19,21,25,27,35,81, 87,89,91,

HW 5.2/ 7, (ed4 23,25,27,29,35) or (ed5 33,35,41,43,45)

HW 5.3/ 1,3,5,7,11,15, 17, 19, 25,27,35,41,

*Review the Definition of Derivative (3.1) before Lesson 1.*

### **Lesson 1: 5.4: Fundamental Theorem of Calculus**

HW 5.4/ 27, 31, 39, 45,47,51,59, 61, 81,83,87,89,91,95,97, 101, (ed 4 109) or (ed 5 113)

*Review the Chain Rule (3.4) before Lesson 2.*

### **Lesson 2: 5.5: Substitution**

HW 5.5/1,3,5, 11-29 odd, 49-65 odd, (ed4 87, 117, 119, 147, 149) or (ed5 91, 121, 123, 151, 153)

---**Approximate Integration (5.6)** will be covered in the co-requisite lab course MAT 156

### **Lesson 3: 5.7-8: Logs and inverse trig functions (especially arctan),**

HW 5.7/1,3,5,7,23,25,27, (ed4 33, 93) or (ed5 37, 103)

5.8/ 1-13 odd, (ed 4 21, 23, 27, 67) or (ed5 25, 27, 29, 75)

### **Lesson 4: 7.1: Polar coordinates and computation of Area**

HW 7.1/1,3,5, (ed4 43, 45, 47) or (ed5 47, 49, 51), Putnam Challenge, polar coordinates sheet

### **Lesson 5: 7.2: Volumes: disk method**

7.2/1,3,5,7,9,11,13,17,21,31, vol of fuel tank,

### **Lesson 6: 7.3: Volumes: shell method, 7.4: Arc-length, surfaces of revolution**

HW 7.3/1,3,7, (ed4 13, 15, 25, 27, 41, 43) or (ed5 15, 17, 27, 29, 45, 47)

7.4/1,3,5,7,11,13

### **Lesson 7: 8.1: Basic integration rules**

HW: 8.1/5,7,9,11,13,17,25,27,39,41,45,

*Review the Product Rule (3.3) before Lesson 10.*

### **Lesson 8: Review**

Repeat homework exercises assigned in Lessons 1-8.

### **Lesson 9: Exam I on Lessons 1-8.**

Extra credit assignment related to 7.6 on Moments could be assigned.

### **Lesson 10: 8.2: Integration by parts**

HW: 8.2/11,13,17,19,27,29,35,49,51,53,83,85

### **Lesson 11: 8.3: Trigonometric integrals**

HW: 8.3/5,7,9,11,13,17,25,27,51,53,65,67,69,71

### **Lesson 12: 8.4: Trigonometric substitution**

HW: 8.4/5,7,9,11,13,15,21,23,25,27,29,35,49,51,65

**Lesson 13: 8.5: Partial fractions (especially distinct linear factors)**

HW: 8.5/7,9,11,19,25, 27, 41, 45, 47

*Review 2.2-2.3 on Limits before Lesson 14.*

**Lesson 14: 8.7, 9.1: L'Hopital's rule and Sequences**

HW: 8.7/11,13,15,19,21,23,27,29, compound interest, indeterminate forms, 9.1/1,3,5,11,13,29,31,33,37,39,41,73,77,

**Lesson 15: 8.8: Improper integrals**

HW: 8.8/ (ed4 5,7,9, 15-37 odd) or (ed5 9,11,13, 19-41 odd)

**Lesson 16: 9.2: Series (emphasizing geometric vs harmonic series)**

HW: 9.2/ 1,3,5, (ed 4 7,11,23,25,27,39,61) or (ed 5 9,13, 25,27,29,37,67)

**Lesson 17: 9.3: Integral test**

HW: 9.3/1,3,5,7,13,15,17,(ed 4 21,23,25,27,51,59,61) or (ed 5 27,29,31,33,57,67,69)

**Lesson 18: 9.4: Comparison of series**

HW: 9.4/3,7,9,11,17,21,25,27,

**Lesson 19: 9.5: Alternating series (AC vs. CC)**

HW: 9.5/11-33 odd, (ed 4 43,45,53,57,59,61) or (ed 5 47,49,51,53,61,67,69)

**Lesson 20: 9.6: Ratio and root tests**

HW: 9.6/13,15,17,21,23,25,29,53,55,61,65 (ed 4 33,35,) or (ed 5 101,103)

**Lesson 21-22: Review and Exam II: (on Lessons 10-18 or 1-18)**

**Lesson 23: 9.7-9.8: Taylor approximations**

HW: 9.7/5,13,17,21,25,27,29,45,49,51

**Lesson 24: 9.8-9.9: Power series and Taylor series (especially near  $x = 0$ )**

HW: 9.8/1,3,5,7,9,11,13,15,25,27; 9.9/1,5,35,39,41,

**Lesson 25: 9.10: Taylor series continued**

HW: 9.10/ 1,3,5,7,9, (ed 4 15,17,21,23,47,77,79,82) or (ed 5 17,21,27,31,57,93,95,98)

**Lesson 26: 6.2-3: ODE: growth and decay,**

HW 6.2/1,3,5,7,9,11,17,19,49,53

**Lesson 27: 6.3: Separation of variables**

HW 6.3/1-17 odd and applications relevant to your major or minor

**Lesson 28: Review for the final**

**Final Exam:** A uniform departmental final exam will be given during Finals Week covering the entire course especially topics needed in future courses. All students must pass this exam in order to pass the course. Sample finals are available in the math department.

This syllabus and others are available at:

<http://lehman.edu/academics/mathematics-computer-science/calculus.php>

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