Calculus I Syllabus

MAT175 Calculus I: *4 hours, 4 credits.* Differentiation of functions of one variable; applications to motion problems, maximum-minimum problems, curve sketching, and mean-value theorems.
Prerequisite: A grade of C (or better) in MAT 172 or placement by the department.
Corequisite: MAT 155 Calculus I Laboratory

Instructor: *Your instructor will provide contact information, 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 two 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.*

Materials, Resources and Accommodating Disabilities

Textbook: Larson, Hostetler and Edwards, Calculus (Early Transcendentals) Ed. 4, Houghton Mifflin
Technology: Students should purchase a basic scientific calculator able to compute trigonometric and exponenetial 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 Hall.
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. Evaluate limits (as part of Departmental Objectives in Mathematics a,b and e)
2. Prove basic theorems using limits of the difference equation (as part of a,b and f)
3. Differentiate algebraic and trigonometric functions using key theorems (as part of a,b and e)
4. Find the tangent line to a given graph at a given point (as part of a,b and e)
4. Solve maximum and minimum problems using differentiation (as part of a,b,c and e)
5. Solve related rates problems (as part of a,b and c)
6. Apply methods of calculus to curve sketching (as part of a,b)

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

Course Calendar

This course and its corequisite are carefully timed to match topics, so stay on schedule.

Lesson 1: Review Graphs and Trigonometry (Sections 1.1, 1.2 and D3)
1.1/ 1, 3, 19, 21, 39-47 odd, 51-55 odd, 63-67 odd;
1.2/27-31 odd, 35, 43, 49-55 odd, 77. (go to the Math Lab for help)
(Review online trigonometry appendix D3 at:
http://college.cengage.com/mathematics/larson/calculus_early/4e/assets/app/appendixd3.pdf
Lesson 2: Review Elementary Functions (Sections 1.3, 1.6)
1.3/5-9 odd, 13, 17-21 odd, 57-63 odd, 95(a).
1.6/ 7-15 odd, 19, 25, 27, 49, 59-63 odd, 77-81 odd, 85, 91, 93.
Lessons 3-4: Limits (2.1-2.2)
2.2/ 11-15 odd, 19-23 odd, 1.5/1,3,5,9-12,29 (*math majors should also* do: 31, 33, 39),
Lessons 5-6: Evaluating Limits and the Squeeze Theorem (2.3) *including Three Special Limits*
2.3/ 9-21 odd, 43, 45,
2.3/ 37, 53, 57, 69, 79, (118, 125).
1.4/19,21,25,27
Lesson 7: Continuity (2.4)
2.4/ 1-5 odd, 11, 37-49 odd, 55, 63.
Lesson 8: Infinite Limits and Asymptotes (2.5)
2.5/ 1, 3, 9-15 odd, 31, 33, 39, 45, 47.
Chap 2 Review/15-19 odd, 29, 31, 37-41 odd, 47, 55, 57, 61, 69, 73, 77;
Lessons 9-10: Review and Exam I
Students who do poorly on this exam should consider dropping this course and attending a class on precalculus before taking calculus. Please consult with your professor or Mr. Rothchild in Gillet 104 for more personalized advice. Bring your exam and homework with you when seeking advice.
Lessons 11-12: Tangent Lines and Derivatives (3.1)
3.1/ 1-7 odd, 11, 21, 3.1/ 37-41, 47, (71, 75)
Review Composition of Functions in 1.3/example 4, 59, 61, 63
Lesson 13-14: Laws of Differentiation including the product rule (3.2-3)
(Review Inverse Functions in 1.5/ 1, 5, 7, 9-12, 13)
3.2/ 3-23 odd, 43-51 odd, 53(a), 55(a), 57-61 odd.
3.3/ 1-7 odd, 17, 19, 25, 31, 35, 37, 41-45 odd, 57, 69(a), 71(a).
Lesson 15: Chain Rule (3.4)
3.4/ 9-15 odd, 23, 25, 29, 49, 51, 55, 59, 63, 67, 79-83 odd, 115(a), 117(a).
Lesson 16: Implicit Differentiation (3.5-3.6)
3.5/ 1, 7, 29, 33, 35; 3.6/ 7, 15, 25, 45.
Lessons 17-18: Related Rates (3.7)
3.7/ 1, 5, 13, 15, 27, 39; Chap 3 Review/ 3, 7, 11(a), 17-31 odd, 43, 51, 57, 59, 67, 73, 87, 105, 121, 143.
3.8 on Newton's Method will be done in MAT155
Lessons 19-20: Review and Exam II on Chapter 3

Lessons 21-22: Extrema, Mean Value Theorem, Increasing/Decreasing (4.1-4.3)
4.1/ 1, 7, 11-15 odd, 21-35 odd.
4.3/ 3, 5, 9-13 odd, 17, 29-35 odd, 43.
Review Old Homework on Limits (2.5).
Lesson 23: Concavity (4.4)
4.4/ 1, 3, 5, 7, 11-15 odd, 19, 21, 23, 27, 29, 39
Lesson 24: Limits at infinity (4.5) and, if time allows, L'hopital's Rule (8.7)
4.5/ 1-7 odd, 17-25 odd; 8.7/ 11-35 odd.
Curve sketching (4.6) will be covered in MAT155
Lessons 25: Optimization (4.7)
4.7/ 3-9 odd, 17, 27, 33;
Lesson 26: Business Applications (Appendix C)
Appendix C: 3,5, 7,9,18,20,21
Lesson 27: Antidifferentiation (5.1) if time allows
5.1/ 5, 7, 21, 31, 43, 53-57 odd.
Lesson 28: Review for the final

Final Exam: The Final Exam will be given during Finals Week covering the entire course especially topics needed in future courses.

This syllabus and others are available at: http://comet.lehman.cuny.edu/calculus/.

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