

MATH 156 Calculus II
Fall Semester 2015

Catalog Data: MATH 156 Calculus II (4-0) Credit 4. Inverse trigonometric functions; hyperbolic functions, indeterminate forms; methods of integration; approximate integration; additional applications of integrals; parametric equations, conic sections and polar coordinates; infinite sequences and series. Prerequisites: Grade of C or better in MATH 155

Objective: This course which is a continuation of Calculus I is designed to teach the students in mathematics, engineering and the sciences the techniques of integration, parametric curves, polar coordinates, infinite series and power series, and some applications of differential and integral calculus.

Outcomes: The student will be:

1. Able to integrate a given function for which an antiderivative can be found using standard integration techniques.
2. Able to find limits using L'Hospital's rule, describe given parametric curves, polar curves, and conic sections.
3. Able to find the length, surface area of revolution and bounded area of curves given in rectangular equations, parametric equations, or polar equations.
4. Able to determine whether or not sequences and series converge, and derive and use power series for analytic functions.
5. Prepared to use integral and differential calculus to solve more advanced problems in engineering and other sciences.

Instructor: Susan Barton, Ph.D., Professor of Mathematics
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Office/phone: Engineering Lab Building 101F / 304-442-3297
Office Hours: MTWRF 8:30 – 9:50; (TR 9-9:50 in the math lab); MW 2:00 – 2:50; F 2:00 – 2:30
Class Meetings: MTWF 12:00 – 12:50 Elab 201
Method: This is a lecture based course meeting 4 times a week. Although a course calendar etc. may be found at community.wvu.edu/~smb031
Resource: Publisher's website at http://stewartcalculus.com/media/10_home.php

Textbook: James Stewart, *Calculus*, Seventh Edition, Brooks/Cole Publishing Company, 2012.

Chapters Covered:

- Chapter 6, sections 7,8
- Chapter 7, sections 1,2,3,4,5,6,7,8
- Chapter 8, sections 1,2,3,
- Chapter 10, sections 1,2,3,4,5,6(if time permits)
- Chapter 11, sections 1,2,3,4,5,6,7,8,9,10,11(if time permits)

Topics:

1. Inverse Functions
 - a) Hyperbolic Functions (1 day)
 - b) Indeterminate Forms and l'Hospital's Rule (2 days)
 2. Techniques of Integration
 - a) Integration by Parts (2 days)
 - b) Trigonometric Integrals (2 days)
 - c) Trigonometric Substitution (2 days)
 - d) Integration of Rational Functions by Partial Fractions (2 days)
 - e) Strategy for Integration (1 day)
 - f) Using Tables of Integrals and Computer Algebra Systems (1 day)
 - g) Approximate Integration (1 day)
 - h) Improper Integrals (2 days)
 3. Further Applications of Integrals
 - a) Arc Length (1 day)
 - b) Area of a Surface of Revolution (2 days)
 - c) Moments and Centers of Mass (2 days)
 4. Parametric Equations and Polar Coordinates
 - a) Curves Defined by Parametric Equations (1 day)
 - b) Tangents, Arc Lengths, and Surface Area (2day)
 - d) Polar Coordinates (2 days)
 - e) Areas and Lengths in Polar Coordinates (2 days)
 - f) Conic Sections (2 days)
 5. Infinite Sequences and Series
 - a) Sequences (2 days)
 - b) Series (2 days)
 - c) The Integral Test (2 days)
 - d) The Comparison Tests (2 days)
 - e) Alternating Series (2 days)
 - f) Absolute Convergence and the Ratio and Root Tests (2 days)
 - g) Strategy for Testing Series (1 day)
 - h) Power Series (1 day)
 - i) Representation of Functions as Power Series (2 days)
 - j) Taylor and Maclaurin Series (2 days)
 - k) Applications of Taylor Polynomials (2 days) (If time permits)
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Grading and Assessment:

Quizzes/Homework: There will be 5 quizzes and 6 homework assignments for 25 points apiece. I will drop the lowest 3 grades. This thus counts for 200 points (about 23.5%) of your course grade.

Participation: One point will be assigned for every day that you are in the room when attendance is taken AND you do not use your cell phone or other distracting device in class. This is a participation point and may be taken away at the instructor's discretion. The result will be scaled (if necessary) to 50 points (about 6%) of your course grade.

Exams: Four in class hourly tests, each worth 100 points (about 12%) of your course grade.

Final Exam: A comprehensive final exam worth 200 points (about 23.5%) of the course grade will be given.

NOTE: Only excused absences will enable a student to make up exams. This means that you must have an excuse for the day of the missed exam and every subsequent day until you have made it up. In general quizzes and homework may not be made-up

Course Grade: Grades are assigned according to the following scale:

A – 90 - 100% (765 – 850 points)

B – 80 - (680 – 764 points)

C – 70 - (595 – 679 points)

D – 60 - (510 – 594 points)

F - below 60%

Borderline grades may be improved based on performance and grade distribution of the whole class.

Calculator Usage: Graphing calculators will be forbidden on most exams and quizzes.

Computer Usage: None **Reference:** None **Laboratory Projects:** None

ABET Category Content: Mathematics - Credit 4 or 100%

Academic Integrity:








The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code http://studentlife.wvu.edu/office_of_student_conduct/student_conduct_code. Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me *before* the assignment is due to discuss the matter.

Social Justice Statement:

"West Virginia University Tech is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran's status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Office of Disability Services (293-6700). "

Disclaimer: The professor reserves the right to make any necessary adjustments and/or modifications to this syllabus.

TENTATIVE Calendar Math 156 T02

Monday	Tuesday	Wednesday	Friday
17 Syllabus/Review	18 6.8	19 6.8/7.1	21 7.1
24 7.1/7.2(hw 1due)	25 7.2	26 7.2/7.3	28 7.3/Quiz 1
31 7.3/6.7	Sep 1 6.7	2 7.4	4 7.4/Quiz 2
7 	8 7.4/7.5	9 7.5	11 7.6 (hw 2 due)
14 Review	15 Exam I	16 7.7	18 7.7/7.8
21 7.8	22 8.1	23 8.2	25 8.2/Quiz 3
28 8.3	29 8.3	30 10.1	Oct 2 10.2 (hw 3 due)
5 Review	6 Exam II	7 10.2	9 10.3
12 	13 	14 10.3	16 10.4
19 10.5/Quiz 4	20 10.5	21 10.6/11.1	23 11.1
26 11.2	27 11.2 (hw 4 due)	28 Review	30 Exam III
Nov 2 11.3	3 11.3/11.4	4 11.4	6 11.4/11.5
9 11.5	10 11.6/Quiz 5	11 11.6	13 11.7
16 11.7	17 11.8 (hw 5 due)	18 Review	20 Exam IV
23 	24 	25 	27 
30 11.9	Dec 1 11.9	2 11.10	4 11.10
7 11.11 (hw 6 due)	8 Review		

Prepared August 2015

Final Exam: Monday Dec 14th, 10:00 – 11:50