

Syllabus

Methods of Calculus (MAC 2233) 3 credits

Prerequisite: MAC 1105 College Algebra or equivalent with a grade of C or better

Instructor:	CRN:
Office:	Office Hours:
E-mail Address:	Phone number:
Lecture Time:	Lecture Room:
Scheduled Lab SE350 Time:	MyMathLab Plus Course ID:
Teaching Asst:	Office Hours:
Office:	Email Address:

Description: The student will be introduced to a description of the basic methods of Differential and Integral Calculus, which together with illustrations and applications to Social Sciences and Business Administration will enable to reach the following objectives.

Objectives, Learning Outcome Goals: Upon successful completion of this course, the student will be able to obtain the following knowledge and skills required for courses requiring methods of calculus:

1. Compute limits.
2. Compute derivatives.
3. Solve problems in related rates and interpret result, with validations.
4. Determine the relative and absolute extreme values of a function, solve applied optimization word problems and interpret the results, validating answers by estimating results.
5. Sketch/graph curves: determine where the function is increasing/decreasing, concave up/down.
6. Compute antiderivatives.
7. Find the area under a curve.
8. Applications of above techniques.

IFP General Education Outcomes:

1. Knowledge in several different disciplines;
2. The ability to think critically;
3. The ability to communicate effectively;
4. An appreciation for how knowledge is discovered, challenged, and transformed as it advances;
5. An understanding of ethics and ethical behavior.

Information available at <http://www.fau.edu/deanugstudies/NewGeneralEdCurriculum.php>

General Education: This course satisfies, in part, the general education requirements for Foundations of Mathematics and Quantitative Reasoning.

http://www.science.fau.edu/student_services/student_info_gen_edu.php

Software: Students must purchase access to a web-based learning and assessment system called [MyMathLab Plus](#) either at the bookstore or directly through the website. All homework will be completed online. Students not registered online by the third week of the semester may be dropped from the course.

Materials: Brief Calculus and its Applications, 12th Edition, by L.J. Goldstein, D.C Lay, D.I Schneider, and N.H Asmar, ISBN 0321616995. Only the online version is required, although some students may prefer to buy the hard copy any way. Online version of the textbook and other course related information will be available at MyMathLab Plus website <http://www.coursecompass.com>. A code will be provided to access the site.

Course Website: Blackboard (BB) <http://blackboard.fau.edu> (sign in as you do to MyFau).

Attendance Policy: You should attend all lectures and actively participate in classroom discussions. Once the lecture or lab discussion has begun, all electronic devices must be turned off. "Attendance" means arriving on time and staying until dismissed by the instructor or lab section leader.

Tutoring: For information about free tutoring, visit <http://www.math.fau.edu/MLC>.

Course Grade: The lowest of the grades of the first four exams will be dropped. The final exam must be taken in order to receive a grade in the course. Completion of all homework (MyMathLab Plus) in due time will also count towards your final grade. A breakdown of the grading scheme is given below followed by the grading scale:

Tests (Best three equally weighted)	60%
Homework (MyMathLab Plus)	10%
Final Exam	30%

Grading Scale:

Percentage:	[90-100)	[87-90)	[83-87)	[80-83)	[77-80)	[73-77)	[70-73)	[67-70)	[60-67)	[0-60)
Grade:	A	A-	B+	B	B-	C+	C	C-	D	F

Exams: Four exams will be given on the days and times stated in the course calendar, in rooms to be assigned. *The lowest grade of the first four exam grades will be dropped and the remaining three exams will each count for 20% of your final grade.* You will need a scientific calculator, however, no graphing or programmable calculators will be allowed. Along with your scientific calculator, please bring a pencil and an eraser. You must have a valid picture ID during a testing session. **DO NOT BRING CELL PHONES, BOOKS, BOOK BAGS, NOTES, OR ANY OTHER ITEMS TO THE EXAM ROOM!** *Entrance to the exam requires a valid picture identification card:* Only FAU Owl Cards, U.S. Passports, or Florida Driver's Licenses will be accepted!

Comprehensive Final Exam: 150 minutes will be given. Date, location and time will be announced in the class. *You must take the final exam to receive grade in the course!* The final must be taken when scheduled. A student who misses taking the final exam cannot take it later in the same semester, but may apply for a grade of incomplete. If an incomplete grade is granted he/she may then take a comparable final the following semester as scheduled with the course coordinator.

Makeup Exams: Makeup exams will be given only under exceptional circumstances. *If you miss an exam, you must provide a written, verifiable excuse, if possible in advance of the scheduled exam.* Approval for a makeup exam must be obtained from your instructor.

Classroom Etiquette : Please refer to the FAU Code of Conduct available at http://www.fau.edu/regulations/chapter4/4.007_Student_Code_of_Conduct.pdf.

Academic Honesty: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf

Students With Disabilities: In compliance with the Americans with Disabilities Act (ADA), students who require special accommodation due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) and follow all OSD procedures. In Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305). OSD website at <http://www.osd.fau.edu>.

Included course topics are subject to reasonable changes at the discretion of the instructor.

1 The Derivative 53

- 1.1 The Slope of a Straight Line 55
- 1.2 The Slope of a Curve at a Point 66
- 1.3 The Derivative 73
- 1.4 Limits and the Derivative 83
- 1.5 Differentiability and Continuity 93
- 1.6 Some Rules for Differentiation 99
- 1.7 More About Derivatives 108
- 1.8 The Derivative as a Rate of Change 115

2 Applications of the Derivative 131

- 2.1 Describing Graphs of Functions 131
- 2.2 The First and Second Derivative Rules 142
- 2.3 The First and Second Derivative Tests and Curve Sketching 151
- 2.4 Curve Sketching (Conclusion) 161
- 2.5 Optimization Problems 167
- 2.6 Further Optimization Problems 175
- 2.7 Applications of Derivatives to Business and Economics 184

3 Techniques of Differentiation 199

- 3.1 The Product and Quotient Rules 199
- 3.2 The Chain Rule and the General Power Rule 208
- 3.3 Implicit Differentiation and Related Rates 215

4 The Exponential and Natural Logarithm Functions 229

- 4.1 Exponential Functions 230
- 4.2 The Exponential Function e^x 233
- 4.3 Differentiation of Exponential Functions 239
- 4.4 The Natural Logarithm Function 244
- 4.5 The Derivative of $\ln x$ 249
- 4.6 Properties of the Natural Logarithm Function 252

5	Applications of the Exponential and Natural Logarithm Functions	259
5.1	Exponential Growth and Decay	260
5.2	Compound Interest	269
6	The Definite Integral	297
6.1	Antidifferentiation	298
6.2	Areas and Riemann Sums	307
6.3	Definite Integrals and the Fundamental Theorem	315
6.4	Areas in the xy -Plane	325
7	Functions of Several Variables	347
7.1	Examples of Functions of Several Variables	348
7.2	Partial Derivatives	354
9	Techniques of Integration	419
9.1	Integration by Substitution	421
9.3	Evaluation of Definite Integrals	431

Homework Assignments

Order	Ch.	Assignment Name	Order	Ch.	Assignment Name
1	0	orientation	19	3	hmwk 3.3 (11)
2	1	hmwk 1.1(13)	20	4	hmwk 4.1 (9)
3	1	hmwk 1.2(12)	21	4	hmwk 4.2 (10)
4	1	hmwk 1.3(16)	22	4	hmwk 4.3 (8)
5	1	hmwk 1.4(19)	23	4	hmwk 4.4 (12)
6	1	hmwk 1.5(9)	24	4	hmwk 4.5 (10)
7	1	hmwk 1.6(17)	25	4	hmwk 4.6 (10)
8	1	hmwk 1.7(10)	26	5	hmwk 5.1 (10)
9	1	hmwk 1.8(8)	27	5	hmwk 5.2 (8)
10	2	hmwk 2.1 (12)	28	6	hmwk 6.1 (14)
11	2	hmwk 2.2 (10)	29	6	hmwk 6.3 (14)
12	2	hmwk 2.3 (10)	30	6	hmwk 6.4 (8)
13	2	hmwk 2.4 (5)	31	9	hmwk 9.1 (13)
14	2	hmwk 2.5 (8)	32	9	hmwk 9.3 (5)
15	2	hmwk 2.6 (6)	33	7	hmwk 7.1 (7)
16	2	hmwk 2.7 (9)	34	7	hmwk 7.2 (6)
17	3	hmwk 3.1.(16)			
18	3	hmwk 3.2 (13)			