Departmental Syllabus

Textbook for students who intend to take MATH241 but not M242 and M243:
"*Single Variable Calculus: Volume 1 (Calculus 1) Early Transcendentals***",** by James Stewart, 7th edition, Calc for Udel Edition, Loose-Leaf version with Enhanced Web Assign(EWA), UDel Customized Book + EWA = ISBN: 9781285731834

Textbook for students who intend to take MATH241/MATH242 and MATH243:
"*Calculus 241/242/243- Calculus Early Transcendentals***",** by James Stewart, 7th edition, University of Delaware Edition, Loose-Leaf version with multi-semester access to Enhanced WebAssign (EWA), UDel Customized Book + EWA+ Calclabs with Mathematica for Single Variable Calculus + Calclabs with Mathematica for MultiVariable Calculus= ISBN 9781285992426**.**

Important Notes:

- The use of calculators on exams is prohibited.
- The final exam and the midterm exams are common exams for all sections.
- The midterm exams are scheduled at 5 PM on Tuesday, March 18, and on Tuesday, April 29, 2014.
- The final exam is cumulative, and could be scheduled on any of the final exam days: May 21, May 22, May 23, May 27, May 28 or May 29, 2014. Please note that the Memorial Day weekend is in the middle of the finals' week.
- No make-up exams or quizzes.
- It is expected that the textbook topics which follow will be covered.

Textbook topics and sections to be covered:

Chapter 1: Functions and Models

1.5 Exponential Functions (review)
1.6 Inverse Functions and Logarithms (review)

Chapter 2: Limits and Derivatives

2.1 The Tangent and Velocity Problems
2.2 The Limit of a Function
2.3 Calculating Limits Using the Limit Laws
2.5 Continuity
2.6 Limits at Infinity: Horizontal Asymptotes
2.7 Derivatives and Rates of Change
2.8 The Derivative as a Function

Chapter 3: Differentiation Rules

3.1 Derivatives of Polynomials and Exponential Functions
3.2 The Product and Quotient Rules

3.3 Derivatives of Trigonometric Functions
3.4 The Chain Rule
3.5 Implicit Differentiation
3.6 Derivatives of Logarithmic Functions
3.8 Exponential Growth and Decay
3.9 Related Rates
3.10 Linear Approximations and Differentials (*Do linear approximations*)
3.11 Hyperbolic Functions (*Don't cover inverse hyperbolic functions*)

Chapter 4: Applications of Differentiation

4.1 Maximum and Minimum Values
4.2 The Mean Value Theorem
4.3 How Derivatives Affect the Shape of a Graph
4.7 Optimization Problems
4.9 Anti-derivatives

Chapter 5: Integrals

5.1 Areas and Distances
5.2 The Definite Integral
5.3 The Fundamental Theorem of Calculus
5.4 Indefinite Integrals and the Net Change Theorem
5.5 The Substitution Rule

Chapter 9: Differential Equations

9.4 Models for Population Growth
9.6 Predator-Prey Systems (*optional*)

Suggested List of Textbook Problems from "Calculus – Early Transcendentals" by J. Stewart, 7th edition.

The following list of problems includes problems that address students' needs for both mastering the calculus material and solving a variety of applied problems to real world situations. The student aiming for an A grade in the course should master problems from all clusters in a homework set. The problems listed in chapter 1 and Appendices provide a basic review of Precalculus topics that all students are supposed to know before enrolling in this class. The students who do not take the other calculus courses in the M241/242/ 243 sequence nor MATH 302, should pay more attention to the problems in Chapter 9 which gives an overview of differential equations as the most important application of calculus to modeling phenomena from real life situations.

Section 1.1 Problems 1-4, 7-12, 15, 25-52, 54-65, 69-78.
Section 1.2: 1-9, 12-13.
Section 1.3: 1-5, 29, 31-37, 39, 41-51, 57
Section 1.5: 1-4, 19-22
Section 1.6: 35-41, 51-56, 63-68.
Chapter 1 Review: 1-3, 5-8, 19, 20, 25, 26.
Appendix A: 1-13, 15, 17, 19, 21, 23, 25, 27, 29, 37, 43, 44, 47, 49.

Appendix B: 1, 7, 11, 21, 24, 29, 31, 32, 33, 35, 41, 55, 57, 58.
Appendix C: 1-4.
Appendix D: 1-14, 65-71
Section 2.2: 1-11, 29-37, 38a, 39a,
Section 2.3 # 1-32, 35-50, 57-58, 62, 63;
Section 2.6# 3-10, 13-38, 41-46, 57a, 61;
Section 2.5# 1-8, 11-28, 39-47b, 49-57a, 58a,
Section 2.7# 1, 3a, b, 4a, b, 5-24, 25a, 26a, 27-40, 45, 47,
Section 2.8# 1-11, 21-29, 37-40, 43- 49, 51, 52a,b,c, 53, 56
Chapter 2 Concept Check(all), True-False Quiz 1-22,
Chapter 2 Review Exercises #1-20, 23, 24, 29, 30, 33-37, 39a, b, 40, 45a,b, 47, 48, 51
Section 3.1 # 3-38, 43-44, 47, 48a, b, 51, 54, 55, 57-60, 63-75.
Section 3.2 #1-34, 35a. 36a, 37a, 38a, 39a, 40a, 41, 43-56, 59, 62
Section 3.3 # 1-24, 25a, 26a, 27a, 28a, 29-36, 38ab, 39-48.
Section 3.4 # 1-54, 55a, 57a, 59-73, 79-82, 84a, b.
Section 3.5 # 1-4a, 5-32, 33a, 34a, 35, 42b, 49-60, 72a, 73, 74a, 75, 76
Section 3.6 # 2-34, 36a, 37, 39, 44, 49, 50
Section 3.8 # 1-4, 8-10, 12, 13, 15, 16, 19
Section 3.9 # 1-17, 19, 21, 29, 30, 31, 33, 34, 35, 36, 37, 44
Section 3.10 # 1-4, 5a, 6, 23-28, 32a
Section 3.11 # 1-21, 23, 30-41
Chapter 3 review # 1-45, 51, 52, 57-61, 63a,b, 64a, 65-67, 69-81, 83-89a,b,c, 90, 92-98, 102a, 103a, 106-111.
Section 4.1:#1-44, 47-63, 65-68b), 74-76.
Section 4.2:#1-12, 15-19, 23-25.
Section 4.3: #1, 2, 5-53, 61, 67-70, 77, 82, 86.
Section 4.7: # 2-17, 32-38, 42, 44a, 57-59, 69, 73, 76.
Section 4.9#1-52, 59-65, 72-79
Chapter 4 Review: 1-6, 65-74
Section 5.2 # 33, 35-40, 43, 48-50, 52
Section 5.3 # 2-46, 55-63, 67, 68, 76.
Section 5.4: 1-46, 49-62, 64, 69.
Section 5.5: 1-45, 53-74, 80-83, 85, 86.
Chapter 5 review: 8-38, 43-48, 56, 57, 66.
Section 9.1 #1-4, 9, 10, 11, 14, 15
Section 9.2 # 1, 3, 4, 5, 6, 7, 18, 28
Section 9.3 # 1, 3, 6, 10, 13, 14, 16, 19, 38, 39, 40, 41, 43, 45
Section 9.4 #1-4, 6, 9, 11, 15, 17, 18, 19, 21
Section 9.5 # 1-5, 7, 9, 11, 15, 19, 26, 31, 33
Section 9.6 # 1-5, 10, 11

Updated by Cristina Bacuta and approved by Lou Rossi on August 1, 2012.
Updated by Cristina Bacuta and approved by Lou Rossi and Gilberto Schleiniger on August 15, 2013, and on January 31, 2014.