

M112 Short Course in Calculus

Spring 2015

CRN: 36556/37076

Meeting times:

MWF Dana 204 1030 – 1120 (36556)

MWF Dana 204 1230 – 1320 (37076)

Credits: 3

Prerequisite:

M 110 or equivalent

Professor: Vincent J. Motto

Phone: 860-769-4684

Email: motto@hartford.edu

Office: Dana 220/Dana 208

Office hours:

MWF 1000 - 1100 and by appointment

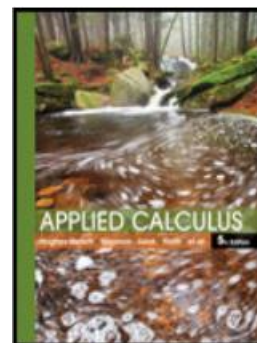
Course site: www.vincesplace.com

Texts & Supplies:

You will need the following items:

- A calculator (graphing --- TI-89 (recommended))
- A straightedge
- Graph paper
- Three-ring binder or large notebook (optional)

The text book for the course is **Applied Calculus** by Hughes-Hallett et al. (5th Edition) published by Wiley. The book is available in the bookstore.



Catalog Description:

A one-semester introduction to the basic concepts and applications of differential and integral calculus. No credit given to students who have previously received credit for M 144 or its equivalent.

Prerequisite: M 110 or its equivalent.

Course Objectives:

At the completion of this course the student will

- become familiar with the following conceptual and theoretical constructs of calculus
 - Limit
 - Derivative
 - Definite Integral
 - Indefinite Integral
- employ algebra to calculate limits, derivatives and integrals in the class of functions including polynomials, rational functions, exponential function and logarithmic functions
- understand the connections between theoretical constructs of calculus and generic applications such as rate of change, linear approximations, optimization problems, curve analysis by derivatives, marginals, and estimating changes such as distance traveled.
- Students will apply calculus concepts to real-world situations extracted from various disciplines. In applications, students will learn
 - to recognize and apply the appropriate calculus techniques needed to analyze the situation.
 - to explain conclusions and limitations of their analysis.
- apply technology (TI-89) to the solution of problems
- develop their ability to express mathematical ideas and concepts through written (electronically prepared) solutions to two laboratories.

Evaluation:

Teaching Methods:

Instruction: Some material will be present in a “flipped method” - instruction outside the class and workshop/discussion during class time. Important material from the text and outside sources will be covered in class. Students should plan to take careful notes. Discussion and group work is encouraged.

Supportive Homework: Problems and readings will be assigned daily to help support and supplement material found in the text. Assigned problems from the textbook are not always collected. There will usually be time to answer questions about the homework at the beginning of class.

Tests: There will be five tests. If due to emergency or illness you miss a test, you must notify me before or during the test. You must provide documentation explaining why you missed the test. If you fail to contact me or fail to provide written documentation for a missing test, you will receive a zero on the test. The make-up will be more difficult than the original and must be made up within a week. All test dates are published on the course schedule.

Quizzes: Through the semester, there will be in-class quizzes. There are **NO** make-ups for quizzes.

Laboratories: There will be three lab projects during the course of the semester.

Worksheets: These will be used for group work to provide review, extension, and practical problems. Often these will be collected for a homework grade.

Final Exam Date: There is a common departmental final. May 8, 2015 at 8 AM, room TBA.

Internet: All materials will be distributed on the Internet at www.vincesplace.com. Class notes, instructional material, and student assignments will be posted on my web site.

More information for this course is available on the Website.

Grading:

Your final grade will be determined on the total points which you have accumulated.

Five Exams	45%
Three Laboratories	15%
Homework	10%
Quizzes	10%
Final Exam	20%

No grade will be assigned until all of the assignments are completed. Submission of assignments in electronic form (e-mail) is preferred when possible.

Grade	Range	Grade	Range
A	94 - 100	C	74 -76.9
A-	90 - 93.9	C-	70 -73.9
B+	87 - 89.9	D+	67 - 69.9
B	84 - 86.9	D	64 - 66.9
B-	80 - 83.9	D-	60 - 63.9
C+	77 - 79.9	F	below 60

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Policies

Below you will find a summary of course and University policies. More information about my course policies can be found on my [website](#) and information about University policies on the University of Hartford [website](#). These summaries are given for your convenience.

- Attendance---All students are expected to attend every class.
- Work Integrity---Honesty and integrity are expected in all academic work. Your work should be yours alone.
- Social Interaction
 - Civility---All people at the college deserve to be treated with respect and courtesy.
 - Electronic Devices---Please place you phones in a “courtesy” mode and put away your portable music playing devices. If you need to carry on a conversation please leave the classroom.
 - Emails---When communicating with me please include your class in the subject heading and your name.
 - Sexual Harassment will not be tolerated.
- Special Needs---Students with documented special needs will be accommodated. If you are being tested outside the class time, you must make those arrangements
- Student Rights---The process of Academic Grievances can be found on the University [website](#).
- Notice of Modifications to the syllabus---Any changes to the syllabus will be discussed with you

Tentative Schedule of Events Spring 2015

Date	Activity
01/21	Introduction, Section 1.1 Linear Functions
01/23	Section 1.2 Average Rate of Change and Relative Change Section 1.3 Review of Linear Functions
01/26	Section 1.4 Applications of Functions to Economics Section 1.5 Exponential Functions
01/28	Section 1.6 The Natural Logarithm Section 1.7 Exponential Growth and Decay
01/30	Section 1.8 New Functions from Old Section 1.9 Proportionality and Power Functions Laboratory One Assigned: The Nature of the Beast
02/02	Section 1.10 Periodic Functions
02/04	Problem Day
02/06	Exam I
02/09	Section 2.1 Instantaneous Rate of Change
02/11	Section 2.2 The Derivative Function
02/13	Section 2.3 Interpretations of the Derivative Laboratory One Due
02/16	Section 2.4 The Second Derivative Section 2.5. Marginal Cost and Revenue
02/18	Problem Day Laboratory Two Assigned: Logistic Growth
02/20	Exam II

Date	Activity
02/23	Section 3.1 Derivative Formulas for Powers and Polynomials
02/25	Section 3.2 Exponential and Logarithmic Functions
02/27	Section 3.3 The Chain Rule
03/02	Section 3.4 Derivatives of Periodic Functions
03/04	Problem Day
03/06	Exam III
03/09	Section 4.1 Local Maxima and Minima Laboratory Two due
03/11	Section 4.2 Inflection Points
03/13	Section 4.1 Local Maxima and Minima
03/16	Spring Break – No Class
03/18	Spring Break – No Class
03/20	Spring Break – No Class
03/23	Section 4.2 Inflection Points
03/25	Section 4.3 Global, Maxima and Minima
03/27	Section 4.4 Profit, Cost, and Revenue Laboratory Three Assigned: The Highs & Lows
03/30	Section 4.5 Average Cost
04/01	Section 4.4 Elasticity of Demand
04/03	Section 4.7 Logistic Growth

Date	Activity
04/06	Section 4.8 The Surge Function and Drug Concentration
04/08	Problem Day
04/10	Exam IV
04/13	Section 5.1 Distance and Accumulated change Section 5.2 The Definite Integral Laboratory Three Due
04/15	Section 5.3 The Definite Integral As Area
04/17	Section 5.4 Interpretations of the Definite Integral
04/20	Section 5.5 Total Change and the Fundamental Theorem of Calculus Section 5.5 Average Value
04/22	Problem Day
04/24	Exam V
04/27	Section 6.1 Analyzing Antiderivatives Graphically and Numerically Section 6.2 Antiderivatives and the Indefinite Integral
04/29	Section 6.3 Using the Fundamental Theorem to Find the Definite Integral Section 6.4 Application: Consumer and Producer Surplus
5/01	Section 6.5 Application: Present and Future Value Section 6.6 Integration by Substitution
05/03	Review for Final Exam
05/08	Final Examination 8:00 – 10:00 AM Room TBA

If you have any problems with class/instructor, discuss them first with their instructor and then, for additional assistance contact the Department Chair, Dr. James McDonald (860.768.4628).

