# MATH 111, Calculus I (Section 2) Fall 2012

# Instructor: Ryan Vinroot Office/Hours: Jones 130/ Times TBA (also by appt)

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**Course/Section Webpage: http://www.math.wm.edu/~vinroot/111F12.html**

**Text:** 1)*Single Variable Calculus, Early Transcendentals, 7th edition* by James Stuart. The W&M Bookstore sells this as well as a student solutions manual. This course covers 2.1 – 5.4 (omit 3.11 and 4.6)

2) *Calculus Lab Manual, Math 111*. This is available on the Math 111 website: http://www.wm.edu/as/mathematics/undergrad/wheretostart/math111/index.php

**Topics:** Limits, continuity, derivatives, techniques of differentiation, linear approximations, optimization, Newton’s Method, curve sketching, Fundamental Theorem of Calculus, and integration. Some applications of calculus in economics, social sciences, and physical sciences are included. Topics are presented with an emphasis on understanding using definitions and proofs as well as applications.

**Calculators:** The TI-83, TI-83 Plus, or TI-84 calculator is recommended for completing labs and homework. Most tests and quizzes will be completed **without a calculator**.

**Tests and Quizzes:** There are three mid-semester tests on the following Thursday labs: September 27th, October 25th, and November 15th from 8am to 9:20 am (start time 30 min earlier on test days). Make-up tests are considered only in extreme circumstances such as documented serious illness or personal circumstance as noted by the Dean of Students. Such documentation must be obtained ***prior*** to the start of the test. If your Final Exam score is higher than your lowest test score, it will replace your lowest test score. A weekly quiz covering 2-3 sections is administered during other lab sessions. There are no make-up quizzes, even for legitimate absences such as illness, family emergency, or a college sponsored event. Your lowest two quiz scores will be dropped, however, before your final grade is calculated.

\*To prepare for quizzes and tests, rework all the assigned homework problems as well as all the example problems from class lectures; recreate the steps shown in class. Know definitions and review proofs and concepts presented in lecture. Each step of a problem is assigned points and graded on accuracy and correctness; the final “answer” is only one part of the complete solution. Work must also be neatly presented in a logical and understandable fashion to receive full credit.

**Final Exam:** The common final exam is a “block” exam taken by all sections of Math 111 from 9am-noon on Thursday, December 13th. Your final exam score may replace your lowest attempted test score if it is higher. A practice final exam is located on the Math 111 website.

**Homework:** Routine homework problems are assigned for each lecture but not usually graded. Understanding and completing the homework is essential for success in the course.

**Labs:** The 4th hour of this course is a lab session, on Thursdays, 8:30-9:50 AM. You are required to attend all your lab sessions and bring a printed copy of the week’s lab assignment (not completed.) The lab assignments are located on the Math 111 website; use your schedule to determine which lab is needed each week. Your assigned Teaching Assistant (TA) will give you helpful instruction for each lab and then administer the weekly quiz. Most completed labs are submitted the following week (see schedule) and then graded by the Teaching Assistant (TA). The lab scores count toward your overall grade for the course. Lab 0, also on the Math 111 website, is a Calculus Readiness Test. You should complete this independently (you may use a textbook source but not help from others.) **Lab 0 is due Thursday, September 6th.**

**GER1 Criteria:** Course content includes necessary numerical calculations, mathematical justifications and applications.

**Attendance:** Regular attendance is critical for your success in this course. If you miss class, you are expected to get notes and missed material from a classmate. Please keep all cell phones/hand held devices/laptops put away during lecture/lab.

**Grading:** Your final grade is calculated as follows: Mid-semester Tests 15% each

 Quizzes 15%

 Labs 15%

 Final Exam: 25%

The final letter grade is assigned using the scale: A 93-100, A- 90-92, B+ 87-89, B 83-86, B- 80-82,

C+ 77-79, C 73-76, C- 70-72, D+ 67-69, D 63-66, D- 60-62, F < 60

**Tutoring:** (free) is available Sunday through Thursday evenings from 5-8pm, Jones 112.

**Honor Code:** Uphold William and Mary’s honor code as it is written; infractions are submitted to the Honor Council.

Tentative Schedule for Math 111, Fall 2012, Instructor: Ryan Vinroot

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| --- | --- | --- | --- |
| Week | Lecture Date | Section or Topic  | Tuesday Lab Sessions  |
| 1 | W Aug 29 | Intro and 2.1 The Tangent and Velocity Problem | No lab meeting, complete Lab 0 independently |
|  | F Aug 31 | 2.2 The Limit of a Function |
| 2 | M Sept 3 | 2.3 Calculating Limits Using the Limit Laws | Sept 6 Lab 2: Inverse Functions(submit Lab 0) |
|  | W Sept 5 | 2.4 Precise Definition of the Limit |
|  | F Sept 7 | 2.4 (continued)  |
| 3 | M Sept 10 | 2.5 Continuity | Sept 13 Lab 3: Exploring the Limit(submit Lab 2)  |
|  | W Sept 12 | 2.6 Limits at Infinity; Horizontal Asymptotes |
|  | F Sept 14 | 2.7 Derivatives and Rates of Change |
| 4 | M Sept 17 | 2.8 The Derivative as a Function | Sept 20 Lab 4: Exploring the Derivative(submit Lab 3) |
|  | W Sept 19 | 3.1 Derivatives of Polynomials and Exponential Functions |
|  | F Sept 21 | 3.2 The Product and Quotient Rules |
| 5 | M Sept 24 | Catch Up/Review  | Sept 27: Test #1 (2.1 – 3.2) |
|  | W Sept 26 | 3.3 Derivatives of Trigonometric Functions (submit Lab 4) |
|  | F Sept 28 | 3.4 The Chain Rule |
| 6 | M Oct 1 | 3.4 (continued) | Oct 4 Lab 5: Linear Motion |
|  | W Oct 3 | 3.5 Implicit Differentiation |
|  | F Oct 5 | 3.6 Derivatives of Logarithmic Functions |
| 7 | M Oct 8 | 3.7 Rates of Change in the Natural and Social Sciences | Oct 11 Lab 7: Related Rates (submit Lab 5) |
|  | W Oct 10 | 3.8 Exponential Growth and Decay |
|  | F Oct 12 | 3.9 Related Rates |
| 8 | M Oct 15 | FALL BREAK | Oct 18 Lab 6: Linear Approximation(submit Lab 7) |
|  | W Oct 17 | 3.9 (continued) |
|  | F Oct 19 | 3.10 Linear Approximation and Differentials |
| 9 | M Oct 22 | 4.1 Maximum and Minimum Values | Oct 25: Test #2 (3.3-3.10) |
|  | W Oct 24 | Catch Up/Review (submit Lab 6) |
|  | F Oct 26 | 4.1 Max/Min Values (Continued) |
| 10 | M Oct 29 | 4.2 The Mean Value Theorem | Nov 1 Lab 8: Graphing and the Derivative |
|  | W Oct 31 | 4.3 How Derivatives Affect the Shape of a Graph  |
|  | F Nov 2 | 4.4 Indeterminate Forms and l’Hospital’s Rule |
| 11 | M Nov 5 | 4.4 (continued) (submit Lab 8) | Nov 8 Lab 9: Newton's Method (submit Lab 8) |
|  | W Nov 7 | 4.5 Summary of Curve Sketching |
|  | F Nov 9 | 4.7 Optimization Problems |
| 12 | M Nov 12 | 4.7 (continued) | Nov 15: Test #3 (4.1-4.7) |
|  | W Nov 14 | 4.8 Newton’s Method (brief)Catch Up/Review |
|  | F Nov 16 | 4.9 Antiderivatives |
| 13 | M Nov 19 | 5.1 Areas and Distances(submit Lab 9) | No Lab (Thanksgiving Break) |
|  | W Nov 21 | THANKSGIVING BREAK |
|  | F Nov 23 | THANKSGIVING BREAK |
| 14  | M Nov 26 | 5.2 The Definite Integral | Nov 29 Lab 10: Definite Integral as Area under Curve |
|  | W Nov 28 | 5.2 (continued) |
|  | F Nov 30 | 5.3 The Fundamental Theorem of Calculus |
| 15 | M Dec 3 | 5.4 Indefinite Integrals and the Net Change Theorem | Dec 6 Submit History of Calculus Assignment from Math 111 website, submit Lab 10. |
|  | W Dec 5 | Catch Up/Review |
|  | F Dec 7 | Catch Up/Review |
| EXAM | Thurs Dec 13 |  | 9 AM – Noon, Cumulative, block final (Location TBA) |