

MAT 111
Calculus with Precalculus
Spring, 2012

Classes: Mon, Wed, 9.00 – 10.15 am & Fri 9.30 – 10.15 am (Fanning 302)

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Office Hours: Mon 4.00–5.00 pm, Wed 1.15–2.45 pm, Fri 10.25–11.40 am.

Textbooks: There are two *required* textbooks for this course, for which e-books are also acceptable:

– *Precalculus: A Self-Teaching Guide*, by Steve Slavin & Ginny Crisonino (John Wiley, 2001)

– *Calculus Lite*, 3rd Edition, by Frank Morgan (AK Peters, 2001)

Course Webpage: Accessible via Moodle at <http://moodle.conncoll.edu/>

Prerequisites: Students must have command of high-school algebra and geometry. Precalculus concepts such as trigonometry, exponentials, logarithms and limits are *not* prerequisites.

Homework: Homework will usually be assigned weekly, but not collected. Solutions will be made available.

Quizzes: In-class quizzes will be held *every Wednesday* at the beginning of class, except in weeks in which we have exams. The quizzes will cover material from the corresponding homework set.

Midterm/Final Exams: There will be 3 exams, which will carry equal weight. These will be closed-book and non-cumulative. They will be held during our Wednesday class times on *February 29* and *April 11*, and during the final exam period.

Policy: To avoid earning a zero, the exams and quizzes *must* be taken at the scheduled date and time (emergencies and medically documented situations are the only extenuating circumstances that will be considered). *This policy will be strictly enforced.*

Final Grades: Your final grade will be based on the following weighting.

Exams (3, at 24 % each)	72 %
Quizzes	23 %
Attendance/Participation	5 %

Calculators: Using the *graphing, programming, differentiating* and *integrating* capabilities of your calculator in graded quizzes and exams is prohibited. (You may use your calculator for arithmetic computations should you wish, although exams will be designed such that you can manage without a calculator.)

Honor Code: The Connecticut College Honor Code will apply. Its impact on individual assessment tasks will be made specific when those tasks are handed out. Any violations will result in referrals to the Honor Council, with potentially serious consequences. The instructor reserves the right to award a course grade of "F" for guilty verdicts.

Special Accommodations: If you have a physical or mental disability, either hidden or visible, which may require classroom, test-taking, or other reasonable modifications, please see me as soon as possible. You must also register with the Office of Student Disability Services (Crozier Williams Room 221, or barbara.mcclarky@conncoll.edu or lillian.liebenthal@conncoll.edu, or x5240 or x5428).

Help Center: Will be open in Fanning 313 on selected evenings (to be announced). Upperclass tutors will be available to help with calculus. This has proven to be an excellent resource in the past – take advantage of it!

MAT 111

CALCULUS WITH PRECALCULUS

Course Summary

This is a *first* course in calculus, in which precalculus concepts are developed as needed. It covers material useful in applications in areas such as biology, chemistry, physics and economics. The two basic concepts of *differentiation* (derivatives) and *integration* (integrals) will be covered. Several applications of both operations will be presented. The relationship between these two concepts will be established through the *Fundamental Theorem of Calculus*.

Course Topics

- Functions (Slavin & Crisonino §2)
- Derivatives (Morgan §1–14)
 - Definition (Morgan §1)
 - Slope of tangent lines (Morgan §2)
 - Product and Quotient Rules (Morgan §3)
 - Chain Rule and implicit differentiation (Morgan §4)
 - Extended Power Rule (Morgan §5)
 - Sines, cosines and their derivatives (Slavin & Crisonino §5–6, Morgan §6)
 - Maxima and minima (Morgan §7)
 - Applied optimization (Morgan §8)
 - Exponential and logarithms (Slavin & Crisonino §4, Morgan §9–10)
 - Second derivative (Morgan §11)
 - Antidifferentiation (Morgan §12)
- Integrals (Morgan §15–26)
 - Definition of the Riemann integral (Morgan §15)
 - Fundamental Theorem of Calculus (Morgan §16)
 - Properties of definite integrals (Morgan §17)
 - Integration by substitution (Morgan §18–19)
 - Review of integration (Morgan §20)
 - Applications: area, volume and length (Morgan §22)

Notes

- Students may use the other chapters of Slavin & Crisonino as review of pre-precalculus topics, such as basic algebra and geometry, but these will *not* be explicitly covered in this course.
- The above list of course topics is somewhat ambitious for a one-semester course, and is subject to change.
- If you plan to study mathematics further, you are advised to take MAT112 (Calculus I) instead of this course.