# MATH 231 – Scientific Calculus I

Fall, 2007

| **Instructor:** | **Dr. Lester Caudill** | **Dr. James Davis** | **Dr. Michael Kerckhove** |
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| **Office Hours:** | W: 2pm – 3pm<br>R: 10am – 12noon<br>F: 1pm – 2pm<br>and by appointment | MWF: 8am – 9am<br>T: 10am – 11am<br>and by appointment | M: 2pm-3:30pm<br>R: 9am-11am<br>and by appointment |

## Course Website:

http://www.mathcs.richmond.edu/~caudill/localhome_links/f07node2.html

**Text:** *Calculus Concepts and Contexts, Third Edition*, by James Stewart. In addition, there will be a number of instructor-provided supplements.

**Class Computers and *DyKnow*:** Each day in class, we will use a special computer program called *DyKnow* (which is short for "Dynamic Knowledge Transfer"). Among other things, this program will take many of your class notes for you, so you can focus on understanding the lesson, instead of worrying about writing every single word and chalk-stroke. THIS IS A VERY GOOD THING!

**Assignments:** Homework will be collected daily and graded periodically. Students are allowed to consult with one another provided everyone does their share.

**Computer Work:** A number of assignments will involve the use of the computer software packages *Mathematica* and *Microsoft Excel*. No special knowledge of computers is necessary for the course.

**Seminars:** There are six (as of August 27) < 1-hour seminar presentations scheduled this semester in a program entitled, *Research Introductions*. Each presentation consists of two members of the UR faculty in science, math, and computer science, who take turns telling about their fields of research, in a way that everyone can understand. **As a member of this class, you are expected to attend two of these < 1-hour-long presentations.** Further details on this assignment are forthcoming. The schedule for these seminars can be found at http://as.richmond.edu/hhmi/ResearchIntroductions.htm.

**Exams:** There will be three in-class exams and a (comprehensive) final exam. The exams will be given on the following dates:

- **Exam 1:** Monday, October 1.
- **Exam 2:** Wednesday, October 31.
- **Exam 3:** Wednesday, November 28.
- **Final Exam:**
    - **Section 1:** Friday, December 14, 9am – 12N
    - **Section 2:** Monday, December 17, 2pm – 5pm

## Grading Policy:

- Homework: 15%
- Exams (each): 20%
- Final Exam: 25%

**Attendance:** Students are expected to attend all class meetings. If an absence is unavoidable, you are still responsible for all material covered and assignments made. *THERE ARE NO MAKE-UP EXAMS.* If an exam is missed, and the excuse is offered within 24 hours, and the excuse is allowed, then the grade on the Final Exam will replace the exam grade. A student who must miss an exam because of a University-sponsored activity should notify me as soon as possible, as you may be able to arrange to take the exam early (but **not** late).

**Academic Honesty:** Students are to abide by the official University policy on academic honesty. Each student will be required to sign their exam papers, thereby signifying their compliance with the University Honor Pledge.

## Symbolic Reasoning Field-of-Study Statement:

MATH 231 is an introduction to calculus, the mathematical language of change, with a special focus on its relevance to the sciences. Calculus is used to model phenomena in a surprisingly wide variety of applications, in such areas as the physical and biological sciences, economics, epidemiology, and personal finance. In addition, this course includes a significant introduction to linear algebra and discrete dynamical systems.

Students in MATH 231 will be expected to develop skills in formulating problems, solving them, and communicating their solutions to others (usually in written form). Successful formulation of a problem often requires that the student recognize how the basic concepts of calculus are involved in the problem at hand, and be able to translate the problem into appropriate symbolic form. This process of formulation and solution helps students to develop analytical skills applicable to a wide variety of situations. Some problems are designed to have students construct and analyze mathematical models of real world phenomena, while other problems help students make conceptual leaps from specific examples to general principles.