MATH 140: Calculus I

Springfield College - Fall 2004 -   MWF 10:00-10:50

Instructor: Andrew B. Perry, Ph.D.

Office: Schoo 118

Office Hours:
>   Mon/Wed/Fri 9:00-10:00 AM
>   Tues/Thurs 9:30-10:30 AM
>   Also available by drop-in or appointment

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Course Description :   This course covers functions and graphs, limits, continuity, and differentiation of rational, logarithmic, exponential, and trigonometric functions, the chain rule, and applications of differentiation.

Prerequisites: High School Precalculus or MATH 125 (Precalculus)

Textbook: Larson, Hostetler, and Edwards, Calculus, Alternate Sixth Edition, Houghton Mifflin

Grading Procedures: Final grades will be computed as follows:

Three Tests . . . 60 % (each worth 20 %)
Final Exam . . . 30 %
Homework   . . . 10 %
Attendance . . . may affect grade - see below

Students will be guaranteed minimum grades according to the following schedule: 95 % = A ; 90 % = A- ; 87 % = B+ ; 83 % = B ; 80 % = B- ; 77 % = C+ ; 73 % = C ; 70 % = C- ; 67 % = D+ ; 63 % = D ; 60 % = D-

Class Web Sites:

We will use the **Manhattan** course management system . At the beginning of the semester please go to www.spfldcol.edu , and follow the links to this class (current students-manhattan online classwork- etc.) . Log in, using the first letter of your first name and first seven letters of your last name as your login name (for example, Tom Brady would use tbrady). The last 4 digits of your student ID are your password. During the first week of classes, please go to the Post Office module and send me (Andrew Perry) an email for practice.

I also have my own web site **www.professorperry.com** , which has various useful information about myself and this class, as well as useful links.

Attendance: Attendance at all classes is required, unless you have arranged an excused absence BEFORE the class in question. See the *Student Handbook* for examples of excusable absences. Generally I will be quite flexible and lenient IF YOU INFORM ME IN ADVANCE that you will have to miss class. At the end of the day you missed class, if I still haven't heard from you, you may be marked as absent-unexcused. Of course, under certain circumstances (such as accidents), it may be difficult to request an excused absence in advance; in such cases, try to contact me as soon as possible after the class.

Lateness may count as $\frac{1}{2}$ of an absence, at the instructor's discretion.

Attendance will affect your final grade as follows:

Zero (0) unexcused absences: special positive consideration in case of borderline grades
Over 3 unexc. abs.: decrease final grade by 2 % for each unexc. abs. after the first 3

Late Submission of Assignments: Students may submit up to three (3) assignments late during the semester for full credit, but **only** if these assignments are received by the **beginning of the next class meeting** after the due date. If more than three assignments are submitted (no more than one class period late), they may be subject to a small penalty at the discretion of the instructor, depending on extenuating circumstances.

Any work submitted more than one class period late will receive a grade of ZERO PERCENT (0 %) unless prior arrangements had been made with the instructor in advance of the due date.

Approximate Examination Dates:
Regular exams: October 4; October 27; November 22. Final exam: Wednesday December 22, 10:15 a.m.
(Exact examination dates will be announced in class.)

Classroom Format: Lecture, Problem Solving

Course Outcomes:

1. Students will be able to calculate limits algebraically, or from graphs or tables of data.

2. Students will be able to calculate derivatives directly from the formal limit definition.

3. Students will be able to find the local linear approximation of a function.

4. Students will be able to calculate derivatives of various functions algebraically using efficient techniques.

5. Students will be able to use the derivative to analyze functions for local and global extrema, concavity and asymptotes.

6. Students will be able to use implicit differentiation to calculate the derivative of an implicitly defined or inverse function.

7. Students will be able to solve application problems using the techniques of calculus.

8. Students will be able to model a written description of a physical situation with functions and/or simple differential equations.

9. Students will be able to use technology to help solve problems, experiment, interpret results, and verify conclusions.

Assessment of Outcomes: Homework, Exams

Course Outline:

1. Review of Analytic Geometry (approx. 1 week)

2. Limits (approx. 3-4 weeks)

    (a) Evaluating Limits
    (b) Continuity
    (c) Infinite Limits

3. Differentiation (approx. 4 weeks)

    (a) Local Linear Approximations
    (b) The Tangent Line Problem
    (c) Velocity and Acceleration
    (d) Differentiation Rules including Power and Quotient Rules
    (e) The Chain Rule
    (f) Implicit Differentiation
    (g) Related Rates

4. Applications of Differentiation (approx. 4-5 weeks)

    (a) Extrema on an Interval
    (b) Mean Value Theorem
    (c) First and Second Derivative Tests
    (d) Curve Sketching
    (e) Optimization Problems
    (f) Differentials

5. Introduction to Integral Calculus (if time permits)

Statement on Academic Honesty : Academic dishonesty of any sort will not be tolerated. Students cheating on exams or engaged in any other improper behavior will be reported to the Dean of Students for appropriate disciplinary action, and at the instructor's discretion, will normally receive a grade of F for the course.

Statement on Classroom Decorum : Students are expected to behave in an adult manner during class time. No eating or drinking is permitted. If students must talk to one another during a lecture, it should be very quiet. Students creating a disturbance will be asked to leave class.

Statement on Special Needs: If you have a documented physical, learning, or psychological disability on record with the Director of Student Support Services (748-3768), you may be eligible for reasonable academic accommodations to help you succeed in this course. It is your responsibility to request such accommodations in advance and to provide appropriate documentation to the Director of Student Support Services. Please let me know of your request as soon as possible, so that I can work with you and the director to arrange for reasonable accommodations.

College Policies on Attendance and Academic Honesty: See the *College Catalog* or the *Student Handbook* for the complete text of these policies.

Homework Assignments- subject to change

1.1 # 15,17,19,25,33,43

1.2 # 7,15,23,33,41,43,45,47

1.3 # 9,13,15,21,25,51

1.4 # 13,17,19,21,34,35,41,43,53,55

1.5 # 7,8,9,15,23,25,29,31

2.1 # 3,5,7,9,11,13,15,17,19,21,23,25,27,30

2.2 # 5,7,9,11,13,15,19,20,22,23,33,39,41,43,45

2.3 # 10,14,19,39,48

2.4 # 3,7,20,27,29

3.1 # 7,9,11,19,23,41,43

3.2 # 8,9,19,20,23

3.3 # 13,15,17,28,29,33,35,43,45

3.4 # 9,11,18,23,32

3.5 # 11,13,15,21,27,39

3.6 # 9,15,21,25,34,35

3.7 # 2,3,4,10,21

4.1 # 9,10,11,12,13,15,17

4.2 # 7,9,11,14,16,20

4.3 # 7,11,13,15,19,23

4.4 # 7,11,13,15,19,23

4.5 # 11,13,17,19,21,23,32

4.6 # 1,3,6,21,27,34

4.7 # 5,6,11,13,15