Syllabus for Math 171 [N]: Calculus 1, Section 1 (SLN 71480): Spring 2008

Lecture: M, W 12 – 1:15 pm in VMMC 1
Lab: Section 1: T, Th 10:35 – 11:50 am in VCLS 14
Section 2: T, Th 2:50 – 4:05 pm in VCLS 14

Instructor: Dr. Mark Martin

Office Hours: M, W 10:30 – 11:30 am; T 12 – 1 pm; or by appointment
Office: TBD
Phone: 360-546-9620
Email: TBD

Course Description: Differential and integral calculus of 1 variable with associated analytic geometry

Prerequisites: Math 107 with a grade of C or better, or satisfactory math placement score

Textbook: Haas, Weir, and Thomas; *University Calculus*; Pearson Education, Inc.; Boston; 2007

Material Covered: We will cover Chapters 2 – 5 of the text with a very brief review of the highlights of Chapter 1. This will include learning the meanings of and ways to calculate limits, derivatives, and integrals for functions of a single variable and studying some applications of these techniques.

Links to Other Courses: Many of the applications that students will encounter in their work or in examples will be taken from other fields, particularly physics and mechanical engineering. The course has connections to Physics 101, 102, 201, and 202; Mechanical Engineering 211; Economic Sciences 404; and Statistics 360 and 412. Problems assigned during the course may relate to any of these areas or others.

Course Objectives: It is my sincere hope that every student will develop a good understanding of the fundamental principles and methods of calculus through this course. These ideas have been used for hundreds of years to explore a vast array of applications and they are pervasive in our culture, our science, and our technology. Mathematics is the language through which we express precise quantitative concepts and calculus is a central component of that language.

Aside from our study of the conceptual and theoretical underpinnings of calculus, we will apply what we learn to a topic related to the 2007 Campus Theme, *Global Change in a Local Context*, during the laboratory sessions. I have gathered weather observations recorded over decades from weather stations in Washington, Oregon, and Alaska. We will use the mathematical tools we develop in the course to look for signs of recent climate change in this data. We will also investigate some of the principles and methods of climate modeling and will implement some simple global climate models on the computer. We will explore the properties of these models in the contexts of various climate scenarios.

This course addresses the *quantitative and symbolic reasoning* component of WSUV's educational mission. It will develop the students' logical reasoning and problem-solving skills and their ability to think critically about issues involving numerical information. The concepts covered provide students with tools to represent, interpret, and evaluate quantitative information, and to make reasonable estimates. Students will learn how to use the mathematical techniques to analyze and solve problems, and will learn to effectively communicate their solutions. Students will become familiar with formal mathematical notation, terminology and techniques, and will learn how to effectively use these tools to address both mathematical and non-mathematical problems.

The course emphasizes exploration and understanding of how to use the powerful methods of calculus

in a variety of applications. We will analyze the concepts we work with from a variety of perspectives, using visual aids, empirical information, mathematical techniques and examples. We will use technology appropriately to allow us to work on more interesting and complex problems. Projects and assignments will emphasize investigation, critical thinking and analysis rather than rote computation.

Methods of assessment: Homework = 60%, 2 Mid-Term Exams = 10% each, Final Exam = 20%

Homework will be collected each Monday, except on days when there are exams. Please make sure that your homework is stapled and that you have written your name clearly on each page. Each homework assignment will be weighted equally in your final grade. Almost universally, following along in class is insufficient for developing an understanding of the material and working through problems yourselves is absolutely necessary. Consequently, your homework score will constitute a large percentage of your grade.

Solutions to assignments should be written legibly and carefully using complete sentences. A solution is complete if it is correct, makes appropriate use of the relevant mathematical notation, and states all assumptions, definitions, theorems and formulas used. Every step of the solution must be clearly demonstrated and your reasoning should be plain to the reader. Graphs must be drawn neatly with axes labeled and relevant points marked. In applications, you are expected to use the given units. You are expected to become familiar with the formal mathematical notation. Streams of symbols, numbers, or formulas on the paper with insufficient reasoning or explanation is not a valid solution and will be assigned no credit. In general, I expect the solution to be written in a way that you (or anybody else) can read it a year from now and can understand exactly how you solved the problem.

I encourage you to discuss the problems with other students or with me, and to work in groups if you like. However, you are expected to write up your solutions independently. If you have questions about what is (or is not) appropriate collaboration, please come talk to me or refer to the relevant section in the Student Handbook.

Late homework will not be graded unless you have a properly documented medical reason. I still encourage you to complete the assignment and discuss the problems with me or other students since the exams will be based on the homework.

Questions regarding the grading of work must be handled within one week of the date the material was handed back. For questions regarding the grading of homework, please submit a written description of the problem for me to consider.

You will be required to post at least 2 lab assignments of your choosing to your ePortfolio. Failing to do so will result in the reduction of half a letter in your final grade.

Each mid-term exam will cover the material discussed in lecture and the associated homework problems for the sections of the book indicated in the schedule below. The final exam will cover the entire course. Use of calculators, notes, textbooks, computers, slide rules, or other aids will not be allowed during exams. Counting on your fingers or toes is allowed.

Attendance Policy: Attending your lab section is required. You may miss two lab sessions and only lose the credit corresponding to the days' assignments, if any. However, missing additional labs will cause your final grade to drop a quarter of a letter for each additional lab missed.

Attending the lecture is not required but is very strongly recommended! You will be responsible for all assignments regardless of whether you attend class and your work must be handed in on time to receive full credit.

Make-Up Labs: There will not be any make-up labs.

Make-Up Exams: are only allowed with a properly documented medical excuse.

Schedule of topics covered, readings, assignments, tests, and dates due:

The following table lists the sections that will be covered on the given dates.

Week	Dates	Monday	Wednesday
1	1/7, 1/9	Introduction, Chapter 1 Functions	Sections 2.1, 2.2 Rates of Change, Tangents Limits of Functions
2	1/14, 1/16	Sections 2.2, 2.3 Limits of Functions Precise Definition of Limit	Sections 2.3, 2.4 Precise Definition of Limit One-Sided Limits & Limits at ∞
3	1/21, 1/23	Sections 2.5, 2.6 Infinite Limits & Asymptotes Continuity	Sections 2.6, 2.7 Continuity Tangents & Derivatives at a Pt
4	1/28, 1/30	Sections 2.7, 3.1 Tangents & Derivatives at a Pt The Derivative as a Function	Sections 3.2, 3.3 Some Differentiation Rules Derivative as Rate of Change
5	2/4, 2/6	Sections 3.3, 3.4 Derivative as Rate of Change Derivatives of Trig Functions	Sections 3.4, 3.5 Derivatives of Trig Functions Chain Rule & Parametric Eqns
6	2/11, 2/13	Sections 3.6, 3.7 Implicit Differentiation Derivs for Inverse Fns & Logs	Sections 3.7, 3.8 Derivs for Inverse Fns & Logs Inverse Trig Functions
7	2/18, 2/20	Sections 3.8, 3.9 Inverse Trig Functions Related Rates	Review for Exam 1
8	2/25, 2/27	Exam 1 on Sections 2.1 – 3.8	Sections 3.10, 3.11 Linearization & Differentials Hyperbolic Functions
9	3/3, 3/5	Sections 3.11, 4.1 Hyperbolic Functions Extreme Values of Functions	Sections 4.1, 4.2 Extreme Values of Functions Mean Value Theorem
10	3/10 - 3/14	Spring Break	
11	3/17, 3/19	Sections 4.3, 4.4 Monotonic Fns & 1st Derivative Concavity & Curve Sketching	Sections 4.4, 4.5 Concavity & Curve Sketching Applied Optimization
12	3/24, 3/26	Sections 4.5, 4.6 Applied Optimization L'Hopital's Rule	Sections 4.7, 4.8 Newton's Method Antiderivatives
13	3/31, 4/2	Sections 4.8, 5.1	Sections 5.1, 5.2

		Antiderivatives Estimating with Finite Sums	Estimating with Finite Sums Σ Notation & Limits of Sums
14	4/7, 4/9	Sections 5.3, 5.4 The Definite Integral Fundamental Theorem	Sections 5.5, 5.6 Indefinite Integrals, Substitution, Area Between Curves
15	4/14, 4/16	Sections 5.6, 5.7 Area Between Curves The Logarithm as an Integral	Review for Exam 2
16	4/21, 4/23	Exam 2 on Sections 3.9 – 5.5	Review for Final Exam
Final Exam	4/28 - 5/2	Final Exam Schedule Released in February	

Reading and homework assignments will be given in class throughout the term.

Academic Integrity: Academic integrity is the cornerstone of the university and will be strongly enforced in this course. Academic dishonesty includes cheating, falsification, fabrication, multiple submission, plagiarism, abuse of academic materials, complicity, or misconduct in research. Any student caught committing academic dishonesty on any assignment will be given an "F" for the course and will be referred to the Office of Student Conduct.

Classroom Behavior: Please demonstrate your respect for the class and your fellow students by adhering to the following rules of classroom behavior.

- Please do not arrive late. It is very disruptive.
- Silence all electronic devices.
- No phone use, including text messaging, during class.
- Laptops are allowed as a learning tool within the context of the class. But any other use, such as email, unrelated web browsing, or playing games, is prohibited.
- Please focus on our class while in class. Don't work on assignments for other classes, read unrelated materials, or carry on extraneous discussions during class.

Please help me maintain an environment that will facilitate learning for everyone.

Copyright Policy: WSU requires all users of campus services to comply with all state and federal laws including copyright laws. For more information, see: http://publishing.wsu.edu/copyright/

Disability Accommodation: Accommodations may be available if you need them in order to fully participate in this class because of a disability. Accommodations may take some time to implement so it is critical that you contact Disability Services as soon as possible. All accommodations must be approved through Disability Services, located in the Student Resource Center on the Lower Level of VSSC. (360) 546-9138

Weather Policy: For emergency weather closure policy, see:
http://www.vancouver.wsu.edu/adm/fo/psafety/weather.htm

Evacuation Policy: Emergency evacuation plans are posted in each classroom. Read and be familiar with these plans. In case of emergency, follow these instructions.

The dates, assignments, topics and policies on this page may be changed at any time. Please contact me with any questions you may have regarding the information listed here.