

Course Logistics for Math 196

Instructor: Alexander Hahn, Professor of Mathematics, 238 Hayes-Healy or Honors Program Office. E-mail: hahn.1@nd.edu

Class Times and Location: MWF, 11:45 am to 12:35 am, 119 DeBartolo Hall, and T, 11:00 am to 11:50 am, 231 Hayes-Healy Building.

University Honor Code: In effect throughout the semester

Text: Alexander J. Hahn, Basic Calculus: From Archimedes to Newton to its Role in Science, Springer-Verlag, 1998.

Course Website: <http://www.nd.edu/~hahn/196.html>

Contains: Course logistics; current homework assignments; listing of the course teams; links to the web site for the text and to complete solutions of the homework problems.

Daily Homework: Study and problem solving assignments will be due for every class period. You won't be handing anything in, but you will need to be prepared. Your approach should be a mix between "rolling up your sleeves with paper and pencil by your side" and collaboration with fellow students.

Structure of Classes: At the beginning of each class, I'll ask if you have any questions about the assigned material and problems. Your questions should grow out of your studies and I'll expect them to be specific. Make a serious effort to understand the solutions of the problems on your own before you turn to the solutions on the course website. I'll also ask you questions and the classroom interaction will consist of a combination of explanations and questions/answers - often with you at the board. Towards the end of the class there will be a brief quiz.

Quizzes: These will be about 5 minutes long, and will count 10 points. They will in general consist of two routine questions related to the problem or study assignment due that day or to a point that arose in class.

Teams: These are posted on the Course Website

Team Assignments: There will be one problem set per Chapter of the text for a total of five for the semester (or one about every two to three weeks). These assignments - taken from both the Exercise Section of the text and Additional Exercises Sections on the course website - are to be done as follows: Do the problems on your own first. At a later time, discuss your solutions at a meeting of your team and exchange ideas about your

approaches. If no one has a complete solution to a problem, your team should brainstorm and try to produce one. Drawing on the best work of its members, each team compiles one solution set that is to be handed in. Each team member is to grade - carefully and honestly - his/her own performance on each team assignment from 0 to 10 in two categories: First, the effort expended in solving the problems independently, and secondly, the understanding of the solutions at the time the assignment is handed in by the team. These scores should be placed on the cover sheet next to the name of each team member. These team assignments will be corrected/graded and receive an additional 30 points maximum, so that the highest score that an individual student can achieve is 50 points

Examinations: Wednesday, February 25, and Wednesday, April 7, both in our DeBartolo classroom and at the usual time.

Final Exam: Thursday, May 6 from 8 am to 10 am. (Location to be announced).

Absences: From a quiz: if excused, an average grade will be recorded; if not, a zero will be recorded. Absence from an exam: makeup only if circumstances are serious.

Grading Scheme: The total possible points for the quizzes will be around 300. The five team assignments will count a total of 250 points. The two examinations will be 100 points each, and the final will be 200. An additional maximum of 150 points will be awarded for class participation. Grand total: 1100 points.

Office Hours: By Appointment with Wendy Wolfe. Either in 238 Hayes-Healy or the Honors Program Office.

Course Consultants: Four Honors Program students who took the course last year (and performed very well) will be available to you for assistance, each for a total of 2 hours per week. They will contact you by e-mail and introduce themselves to you. They are

Alicia Lachiondo, Alicia.J.Lachiondo.1@nd.edu

Joey Minta, Joseph.P.Minta.1@nd.edu

Paul, Switaj, Paul.J.Switaj.1@nd.edu

Noel Teske, Noelle.M.Teske.5@nd.edu

Calculators: To be used only in elementary mathematics mode, rather than calculus or graphing calculator mode.

The Course:

Goals:

Mathematics courses often present elements of the subject with an exclusive emphasis on a mastery of routines without making a serious effort to demonstrate the larger impact of this discipline. The purpose of this course is to emphasize the role that mathematics plays within relevant realms of science and economics.

Material to be Covered:

Chapter 8: More basic Differential Calculus

Chapter 9.1: A challenging problem from the world's first calculus text

Chapter 9.2: A study of the Suspension Bridge

Chapter 9.3: An analysis of Galileo's experiment with inclined planes

Chapter 10: Topics from Differential Calculus, e.g., the exponential and logarithm functions

Chapter 11: Radioactivity; nuclear clocks and what they tell us. The dynamics of population growth, both bacterial and human.

Chapter 12: The Calculus of Economics