UNIVERSITY OF CALGARY

FACULTY OF SCIENCE

Mathematics and Statistics - MS 476
Ph: (403) 220-5203

COURSE INFORMATION SHEET

FALL 2009

1. **Course**: MATHEMATICS 273 – Honours Math: Numbers and Proofs
   Lecture/Time: MWF 11:00 – 11:50
   Instructor: Dr. Kristine Bauer
   Office/Phone/Email: MS 578 / 403-220-7675 / Kristine@math.ucalgary.ca

2. **Prerequisites**: A grade of 70 per cent or higher in Pure Mathematics 30. (Alternatives are presented in the paragraph titled Mathematics Diagnostic Test in the Program section of this Calendar.)
   NOTE: The Faculty of Science policy on pre- and co-requisite checking is outlined in the current University Calendar (see www.ucalgary.ca/pubs/calendar) *Faculty of Science, section 5C*. **It is the students' responsibility to ensure that they have the pre- and co-requisites for the course, and if they do not they will be withdrawn from the course without notice.**

3. **Fee policy:** After the last day to drop/add courses, there will be no refund of tuition fees if a student withdraws from a course, courses or the session.

4. **Academic Accommodations**: It is the student's responsibility to request academic accommodations. A student with a documented disability who may require academic accommodation must register with the Disability Resource Centre to be eligible for formal academic accommodation. DRC registered students are required to discuss their needs with the instructor no later than fourteen (14) days after the start of this course.

5. **The University policy on grading and related matters** is described in the current University Calendar, *Academic Standings*. In determining the overall grade in the course, the following weights will be used:

Assignments	[10]	30 %
Lab	[Best 10 of 11]	15 %
Midterm Test		20%
Final Exam		35 %

   A passing grade on any particular component of the course is essential to passing the course as a whole. There will be a final examination scheduled by the Registrar's Office. *** The use of aids such as open book, etc**. is not** permitted.

6. **Missed Components of Term Work.** The regulations of the Faculty of Science pertaining to this matter are outlined in the current University Calendar, *Faculty of Science, section 6A*. It is the student's responsibility to be familiar with these regulations.

7. **Academic misconduct** (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the current University Calendar. See: http://www.ucalgary.ca/honesty/

8. **Dates and times of class exercises held outside of class hours (evening tests, Saturday laboratory examinations, weekend field trips, etc.):**

   *****THERE WILL BE NO OUT-OF-CLASS-TIME ACTIVITY.*****

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME ACTIVITY. If you have a conflict with any out of class time activity, please inform your instructor at least one week in advance of the activity so that other arrangements may be made for you.

Honours Math: Numbers and Proofs (Math 273) is a course for students who intend to deeply investigate mathematics in the course of their studies. This is the gateway course for the various honours math programs. In this course, you will learn to read and write proofs while discovering how mathematics is constructed by investigating numbers. This course is more rigorous than ***Discrete Math for Computer Scientists*** (Math 271), although the two courses cover similar topics and have similar goals. Math 273 will prepare you for future honours math classes, and is meant to be a companion to ***Honours Calculus I*** (Math 281).

There are two main skills needed to succeed in Math 273: *problem solving* and *proof writing.* In order to exercise and develop your skills in problem solving you will be required to participate in problem solving laboratory exercises every week. These labs will be graded during lab time and brief solutions will be made available to you. You may work with other students. In order to exercise and develop your proof writing skills you will be required to turn in weekly homework assignments. You may work with other students to discover the solution to each homework problem, but you must write up your own solution. Homework problems will be carefully graded and returned to you with comments. In some instances I may accept a revised copy of an assignment – be warned that this will only happen when a second attempt may help to improve your skills.

The course meets MWF 11:00 – 11:50 in ST 063. The lab meets on Fridays 12:00 – 12:50 in MS 427 (I am trying to change this). The text book for this course is Mathematical Thinking: Problem Solving and Proofs, 2nd edition, by D'Angelo and West. Assignments, labs and solutions, grades and course announcements can be found on the Blackboard website for this course. There is a continuous tutorial schedule for this course (details to follow) and I will also post office hours after the first week of classes. I encourage all students in this class to investigate SCUM (Society of Calgary Undergraduate Mathematicians), a club for students of mathematics. In addition to providing study aids for many mathematics courses, SCUM is also a group of nice folks who are always happy to talk with other math students – either socially or for math advice. The SCUM office is MS 337A.

Schedule of Lecture Topics (subject to change)

Dates	Lecture Topic	Scheduled Activities
September 9-11	Introduction, logic, language and proof	No class Monday, September 9
September 14 – 18	Induction	Assignment 1
September 21 – 25	Sets and functions	Assignment 2
Sept. 28 – Oct. 2	Bijections & Cardinality	Assignment 3
October 5 – 9	Counting, Inclusion-Exclusion, Binomial Theorem	Assignment 4
October 12 - 16	Divisibility	No class Monday, October 12. Assignment 5
October 19 – 23	Modular Arithemetic	Assignment 6
October 26 – 30	Review, catch up	Midterm Exam, October 30 11:00 – 12:50
November 2 – 6	Rational Numbers & Real Numbers	Assignment 7
November 9 - 13	Real Numbers	No class November 11 – 13
November 16 – 20	Sequences	Assignment 8
November 23 – 27	Limits	Assignment 9
Nov. 30 – Dec. 4	Complex Numbers	Assignment 10
December 7	Review	Last day of class.