

Simon Fraser University

FAN 099: Foundations of Analytical and Quantitative Reasoning

Course Outline

Instructor: Petra Menz

Lectures: TBA

Seminars: TBA

Workshop Coordinator: TBA

Prerequisite: None.

Course Material: *Foundations of Analytical and Quantitative Reasoning. Custom Publication for Simon Fraser University* by James W. Hall & Brian A. Mercer, published by McGraw-Hill. Additional readings are provided by the instructor on WebCT.

Calendar Course Description: Designed for students who need to upgrade their quantitative background in preparation for SFU Q courses. Also recommended for students who wish to refresh skills after several years away from mathematics. An in-depth look at what mathematics is; mathematical reasoning, problem solving and math study skills. Review of fundamental topics and concepts of mathematics and their real-world applications. A combination of lectures and small group seminars will allow students to develop math study skills and build confidence in their quantitative abilities, and to learn how understanding mathematics is both one of the keys to mastering other disciplines, and useful in everyday situations. In addition to regularly scheduled lectures and seminars, students will be encouraged to come to the Q Support Centre for assistance. At the centre students will have the opportunity to meet with the coordinator, teaching assistants and other students, and to work with peers in a friendly and helpful environment.

Enrollment priority is given to students who have not yet met the quantitative proficiency prerequisite of a Q - designated course. Credits from this course do not count towards the 120 credits required for an SFU degree; however, the course grade is included in calculation of the student's cumulative GPA. Free diagnostic testing is also available

Course Content:

- Introduction: What is mathematics? How to study mathematics? Reading mathematical textbook, taking notes. Understanding mathematics.
- Principles and techniques of problem solving.
- Patterns and numbers in mathematics; whole numbers, integers, fractions, decimals.
- Percent, ratio and proportion.
- Mathematical language, notation.
- Order of operations, distributive law, factoring.

- Linear equations and systems of equations.
- Inequalities and systems of inequalities.
- Introduction to graphing and graphic representation of data.
- Graphing linear equations and systems of equations.
- Quadratic equations.
- Exponents, polynomials and factoring.
- Counting and probability.

Learning Outcomes: By the end of this course students will have acquired the necessary analytical and quantitative skills to be prepared for Q-level courses offered at SFU.

Key Transferable Skills: During this course students will be able to acquire skills and attributes that are not specific to this course but are skills and attributes that can be used in a wider range of education and employment activities. Students will be able to

- work in a team setting;
- enhance and widen their oral and written communication skills;
- acquire problem solving skills;
- think critically;
- assess themselves and peers in a fair, competent and respectful manner;
- reflect on their learning;
- revise work;
- enhance their study and work ethics.

Instructional Methods: Each week we will pursue a theme taken from the course content. During lecture time, you will see me use a variety of instructional methods, from lecture style, individual work, discussions, group work, etc., in order to enhance your acquisition of analytical and quantitative skills. In addition to lecture time, seminars are held which are mandatory. During seminars we will discuss and work on problems together to gain insight into the mathematics behind the problems and what approach to take to solve them.

WebCT: WebCT is an online learning management system, which will be used for this course to transmit information and record grades. In the WebCT **FAN X99** container you will find basic information about your course. Under MY GRADES, during the semester, you will be able to check your marks. The DISCUSSION and CHAT ROOMS will be open at all times for you to exchange your questions and ideas about the course topics with each other.

Q Support Centre: Students registered in FAN 099 are encouraged to come to the Q Support Centre (AQ 4100) for assistance with problems and questions any time during posted working hours. At the centre students will have the opportunity to meet with teaching assistants and other students, and work together to understand mathematics in a friendly and helpful environment. Please make use of this valuable resource. The centre **starts** the second week of lectures, Monday, September 11th, 2006. Go to WebCT for actual open hours.

Calculator Policy: You may find it useful to have a simple scientific calculator for working on some problems in class or at home. Even if you are using a calculator you are expected to show all the steps of your solution in writing. You will not be allowed to use a calculator on quizzes and the midterm and final examinations.

Academic Integrity: Simon Fraser University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see <http://www.sfu.ca/policies/teaching>).

Important Dates:

Drop Date

Midterm Exam

Quizzes: Weekly during seminars or lectures

Final Exam

Grading: Your grade will be based on:

5%	Reflections
15%	Assignments
30%	Quizzes
10%	Midterm Exam
40%	Final Exam

Note that all items above will count in the overall course grade, and there will not be an option for an alternative weighting of marks.

Reflections: There will be activities during lectures and seminars or at home, which are designed for you to reflect on mathematical concepts and the learning that occurs for you. The following proverb is an extension of an ancient Chinese saying by Confuzius:

*I hear and I forget
I see and I remember
I do and I understand
I reflect and I improve*

Assignments: There will be weekly assignments that may have an individual and/or a group component that is clearly indicated on the assignment. Complete assignments are to be submitted to the drop boxes outside the Q Support Centre on **Wednesday before 1:30 pm. No late assignments are accepted.** Please include a cover sheet that is posted on WebCT. Assignments are marked out of 10. The lowest assignment mark out of 10 assignments will be dropped at the end of the semester.

Teamwork: For some assignments students will work in teams of four people. It is preferable that you work with the same team throughout the term. Midterms and final exam are designed to be written individually! A group is a great support system in

studying, and a resource for help. However, being a member of a group carries with it the responsibility to insure that others understand the work done. Don't compromise the learning of the group by simply dividing the homework problems amongst the members!

Quizzes: Quizzes will be held weekly at the beginning of the seminar or Wednesday's lecture. The topic on the quiz is directly related to your assignment and the activities we are doing during class time whether it is a lecture or a seminar. A typical quiz will have 10 true/false questions and one problem solving question, but sometimes I will substitute the true/false questions with another problem solving question. The lowest quiz mark out of 10 quizzes will be dropped at the end of the semester.

Note from your Instructor: I am excited to teach this course. This is an action course. You will put your hands, mind and if necessary feet on mathematics. You will marvel at what you know mathematically without knowing the mathematics. Your participation is an integral part of this course and I am looking forward to hearing your suggestions, worries, attempts, wonders, and conclusions. I encourage you to make appropriate use of all sources of available information, including: lecture notes, the textbook, material on WebCT, the Q Support Centre, the teaching assistants, office hours, and other students.