

**UNIVERSITY OF NORTHERN BRITISH COLUMBIA**  
**COLLEGE OF SCIENCE AND MANAGEMENT**  
**MATHEMATICS PROGRAM**  
**MATH 240 Basic Statistics**  
**2008 September Semester**

- Instructor:** Dr. Kevin J. Keen, P.Stat. **Office:** T&LC 10-2524 **Tel:** 250-960-5014 **email:** [keenk@unbc.ca](mailto:keenk@unbc.ca)
- Office Hours:** To be announced in class after consultation with students
- Lectures:** Mon, Wed, & Fri 10:30 – 11:20 am **Room:** Conference Centre 6-213
- Syllabus:** This course is an introduction to the basic principles of statistics and procedures for data analysis. Topics include gathering data, displaying and summarizing data, examining relationships between variables, probability models, sampling distributions, estimation and significance tests, inference for means and proportions in one and two sample situations, contingency tables, and simple linear regression. Students register in a computer lab corresponding to their area of interest.
- Prerequisites:** None
- Text:** *Introduction to the Practice of Statistics* (5th Edition) by Moore and McCabe. W. H. Freeman  
ISBN: 0-7167-4008-7
- Optional:** *Study Guide*, Michael A. Fligner, ISBN: 0-7167-6358-3 (Includes explanations of crucial concepts in each section of the text, detailed solutions to selected even-numbered textbook exercises, and guided step-through process for solving selected textbook exercises.)  
  
*TI-83 Graphing Calculator Manual*, David K. Neal, ISBN: 0-7167-6364-8
- Video:** The *Against All Odds* video series has been developed to accompany the textbook. Excerpts will be shown during class. Individual instalments can be viewed in their entirety in the library as the series is available on reserve loan (on either VHS or DVD) or from the website [www.learner.org](http://www.learner.org) (You will be asked to register for access on the website but there is no charge for streaming video on demand.).
- Calculator:** The TI-83 series (including TI-83+, TI-84, and TI-84+) graphing calculator is highly recommended. Only these calculators will be demonstrated in lecture and supported by the lecturer and lab instructor. This series of calculators was developed to accompany the textbook. Students are free to use other calculators with or without built-in statistical functions, statistical graphics, and the normal, Student's T, chi-squared, and F statistical tables. Students can opt to use the normal, Student's T, chi-squared, and F statistical tables given in the textbook for calculations.
- Computing:** Students will be required to use the statistical software system *R* and its spreadsheet package *Rcmdr* on assignments and in laboratory sessions for calculations and graphical displays.
- Objectives:** To acquire knowledge of some fundamental statistical concepts and to apply this knowledge to problems encountered in all disciplines. Experience with a statistical computer package will also be gained. General objectives are to understand the need for objective evaluation of data and to appreciate the philosophy behind statistical thinking.
- Disabilities:** If there are students in this course who, because of a disability, may have a need for special academic accommodations; please discuss this me, or, if your prefer, contact Disability Services located in the Teaching and Learning Centre, Room 10-1048.

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**Student Conduct, Plagiarism, Cheating, and Examination Impersonation:**

Read the Undergraduate Regulations and Policies on pages 56 through 67, inclusive, in the **2008–2009 Undergraduate Academic Calendar**.

**Electronic Devices:**

Cell phones cannot be used during lectures, labs, tests, or the final examination. Internet connections (wireless or hardwire) for electronic devices cannot be used during in-term tests or the final examination.

**Evaluation:**

Lab Assignments (approx. weekly).....	20%
Term Tests (2 each, 50 minutes).....	40%
Final exam (3 hours).....	40%
Total.....	100%

Term Test	#1	#2
Date	Fri 3 Oct 2008	Fri 31 Oct 2008
<b>Textbook Sections</b>	1.1–1.3, 2.1–2.3	2.4, 2.5, 3.1–3.4, 4.1–4.4

**Grades:**

<b>A+</b> ... 90 – 100%	<b>B+</b> ... 77 – 79.9%	<b>C+</b> ... 67 – 69.9%	<b>D+</b> ... 57 – 59.9%
<b>A</b> ... 85 – 89.9%	<b>B</b> ... 73 – 76.9%	<b>C</b> ... 63 – 66.9%	<b>D</b> ... 53 – 56.9%
<b>A-</b> ... 80 – 84.9%	<b>B-</b> ... 70 – 72.9%	<b>C-</b> ... 60 – 62.9%	<b>D-</b> ... 50 – 59.9%
			<b>F</b> ... 0 – 49.9%

Please note that Monday 15 September 2008 is the last day to add/drop courses without financial penalty and the last day to change September Semester courses from audit to credit and from credit to audit. Also note that the last day to withdraw without academic penalty is Tuesday 14 October 2008.

**Lab Assignments:**

1. Assignments must be submitted at the **end** of lecture on the due date.
2. Marked assignments will be returned during laboratory sessions with the exception of Assignments 2, 4, and 8 which will be returned in lecture before the 1<sup>st</sup> and 2<sup>nd</sup> term tests and the final examination, respectively.
3. Assignments must be neat and stapled in the upper left-hand corner with your name, lab section number, assignment number, and date on the front page.
4. Graphical displays, as required, must be inserted in assignments in locations corresponding to the questions and not in appendices at the end of assignments. Failure to do so can result in a deduction of 50% of the marks for each question.
5. Except for medical or compassionate reasons, assignments submitted late will receive a mark of zero. The final mark for assignments will be based solely on assignments for which marks are recorded and will not include missed assignments that are excused for medical or compassionate reasons.
6. Students are permitted to do assignments in small-groups consisting of no more than 5 students. If you have worked out the solutions with other students, the small group is to submit one assignment only listing each student's name. Small group membership can differ among assignments. Please note that rules for group work may be different in your other courses.
7. Assignments will focus on manipulative skills including the use of *R* software. You will need to do additional exercises from the textbook in order to be prepared for the term tests and the final examination.

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**In-Term Tests and the Final Examination:**

1. Any changes to the dates listed for the in-term tests will be discussed in class at least a week ahead of time. The tests are cumulative in nature with respect to coverage of the course material.
2. Except for illness or compassionate reasons, which must be documented, students who do not write an in-term test or the final examination as of the time and date indicated will receive a mark of zero. There will not be make-up in-term tests. Undergraduate Regulation 42 applies to missed final examinations. The final mark for the course will not include missed in-term tests that are excused for medical or compassionate reasons.
3. If possible, advise the instructor in advance of circumstances that will prevent you from writing an in-term test or the final examination.
4. Please schedule elective surgery, dentistry, and vacation plans (including long-distance flights) after the final examination period. The final examination period for the 2008 September Semester is Wednesday 3 December 2008 to Monday 15 December 2008, inclusive.

**NOTES ABOUT THE COURSE**

*Instructional approach.* The emphasis in the course is on understanding concepts not the rote memorization of statistical formulae so the in-term tests and final examination will be open book. The use of statistical calculators is strongly encouraged rather than using statistical tables because this avoids often tedious and intricate arithmetic calculations. Professional statisticians no longer use printed versions of these tables in practice. Throughout the lectures of the course and on the term tests and final examinations, there will be a balance of examples and exercises drawn from the environmental, biological, biomedical, physical and social sciences, and the humanities.

*Assignments and labs.* The assignments and computer laboratory sessions are designed specifically for one of three themes: health and human development; natural resources and environment; general interest. Students register in a computer lab corresponding to their area of interest and will receive a weekly assignment tailored to their theme.

*Attend class.* If you miss a class, arrange to get notes immediately from another student and review the slides for the missed lecture from the course webpage. Note that no new statistical concepts will be presented during the weekly computer laboratory sessions. The computer laboratory period will be devoted to applying statistical concepts learned during the week's lectures and learning how to use the TI-83 series statistical calculator and the *R* statistical software system, with its spreadsheet package *Rcmdr*, to analyze data with those concepts.

*Keep up.* Review the textbook sections before each class. Do the assigned exercises as soon as the relevant textbook section is covered. The ability to solve statistical problems cannot be memorized or passed from someone else. Statistics takes time to assimilate so take time to practise and to acquire skills. Most students need to spend three hours outside class studying for each hour in class. This studying can be done via reviewing lecture notes, watching a corresponding video episode from the *Against All Odds* video series, reviewing the textbook sections covered in class, using the interactive material on the CD-ROM shipped with the textbook, accessing the students' interactive component of publisher's webpage for the textbook, or working on exercises in the textbook that are not assigned for homework as well as those exercises assigned for homework. For most students, finding a balance among these study activities will lead to a positive outcome in the course.

*Be patient.* You may not understand the first time you see something—leave it awhile and then start over. Talk about your approach and understanding with other students.

*Enjoy yourself!* Be curious. Don't let your concern over marks overshadow everything. People who look for things to enjoy generally end up doing much better than those who are determined that they are not going to enjoy anything. Explore the *R* software package and the use of your statistical calculator, find things out on your own and share your knowledge!

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Tentative list of topics and activities: (Will be adjusted as necessary.)

<b>Textbook Sections</b>	<b>AAO Video Episodes</b>	<b>Classes</b>	<b>Topics</b>
		Wed 3 Sep	<b>Course outline given out to students</b>
1.1	1, 2	Fri 5 Sep	Displaying Distributions with Graphs
1.2	3	Mon 8 Sep	Displaying Distributions with Numbers
1.3	4, 5	Wed 10 Sep	Density Curves and Normal Distributions
2.1	7, 8	Fri 12 Sep	Scatterplots
2.2, 2.3	9	Mon 15 Sep	Correlation, Least-Squares Regression <b>[Assignment #1 Due]</b>
2.4, 2.5	11	Wed 17 Sep	Cautions about Correlation and Regression, The Question of Causation
3.1, 3.2	12	Fri 19 Sep	First Steps, Design of Experiments
3.3	13, 14	Mon 22 Sep	Sampling Design <b>[Assignment #2 Due]</b>
3.4		Wed 24 Sep	Toward Statistical Inference
4.1, 4.2	15	Fri 26 Sep	Randomness, Probability Models
4.3	16	Mon 29 Sep	Random Variables <b>[Assignment #3 Due]</b>
		Wed 1 Oct	<b>Review</b>
		Fri 3 Oct	<b>Term Test #1</b>
4.4		Mon 6 Oct	Means and Variances of Random Variables
4.5		Wed 8 Oct	General Probability Rules
5.1	17	Fri 10 Oct	Sampling Distributions
		Mon 13 Oct	<b>Thanksgiving Day [No Classes]</b>
5.2	18	Wed 15 Oct	The Sampling Distribution of a Sample Mean <b>[Assignment #4 Due]</b>
6.1	19	Fri 17 Oct	Estimating with Confidence
6.2	20	Mon 20 Oct	Tests of Significance <b>[Assignment #5 Due]</b>
6.3		Wed 22 Oct	Use and Abuse of Tests
6.4		Fri 24 Oct	Power and Inference as a Decision
7.1	21	Mon 27 Oct	Inference for the Mean of a Population <b>[Assignment #6 Due]</b>
		Wed 29 Oct	<b>Review</b>
		Fri 31 Oct	<b>In-Term Test #2</b>
7.1	21	Mon 3 Nov	Inference for the Mean of a Population (cont'd)
7.2	22	Wed 5 Nov	Comparing Two Means
8.1	23	Fri 7 Nov	Inference for a Single Proportion
8.2	23	Mon 10 Nov	Comparing Two Proportions <b>[Assignment #7 Due]</b>
		Tue 11 Nov	<b>Remembrance Day [No Labs]</b>
9.1	24	Wed 12 Nov	Data Analysis for Two-Way Tables <b>[No Labs]</b>
9.2	24	Fri 14 Nov	Inference for Two-Way Tables <b>[No Labs]</b>
9.3	24	Mon 17 Nov	Formulae and Models for Two-Way Tables
9.4	24	Wed 19 Nov	Goodness of Fit
10.1		Fri 21 Nov	Simple Linear Regression
10.2	25	Mon 24 Nov	More Detail about Simple Linear Regression <b>[Assignment #8 Due]</b>
10.2	25	Wed 26 Nov	More Detail about Simple Linear Regression
		Fri 28 Nov	<b>Review</b>
		Mon 1 Dec	<b>Review</b>