UNIVERSITY OF WATERLOO

WATERLOO ONTARIO

STATISTICS 220

INTRODUCTION TO STATISTICAL METHODS 1

Course Materials

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Statistics 220 is the first course of a four-course sequence provided for students in the 3-year Bachelor of Mathematics general program; this sequence is designed to develop knowledge of, and skills in, the subject of Statistics. Relevant background information is as follows:

- The sequence of courses is: **STAT 220** ⟶ **STAT 221** ⟶ **STAT 322** ⟶ **STAT 324**
- For students in the 3-year (or 'general') BMATH program, STAT 220 and STAT 221 are *required* courses, STAT 322 and STAT 324 are *optional* but are strongly recommended for students with an interest in statistics (or in applied methods of data-based investigating).
- Each course has, as statistics prerequisite(s), the course(s) to its left in the flow diagram above.
- The *mathematics* prerequisite for STAT 220 is an appropriate level of differential and integral calculus (*e.g.*, MATH 127).
- STAT 220 and STAT 221 are general in scope whereas STAT 322 is concerned with two specific areas of application of statistical methods (*survey sampling* and *experimental design*); the emphasis in STAT 324 is on computing with statistical software.
- Each of the four courses is offered only *once* on campus per academic year – STAT 220 and STAT 322 in the Fall term, STAT 221 and STAT 324 in the Winter term; STAT 220 and STAT 221 are also offered by Distance Education in the Winter and Fall terms respectively.

Note that there are a number of one- and two-term statistics courses with overlapping content offered at the University of Waterloo. If you take STAT 220 and/or STAT 221 *as well as* a one-term course (such as CHE 022, CIVE 224, ENVE 224, ECON 221, ENVS 278, ISS 250R, KIN 222, MSCI 251, ME 202, PSYCH 292, PSCI 214, REC 371, SOC 280, STAT 202, STAT 204, STAT 211), you will usually obtain credit for one *fewer* than the number of these courses you pass.

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NOTE: Please be *sure* you are going to take this course this term – there are *no* refunds on these Course Materials.

Content overview for STAT 220 (about 37 lectures):

- **Part 1:** The subject of statistics (about 1½ lectures).
- **Part 2:** Data characteristics and features: an introduction to measuring (about 2½ lectures).
- **Part 3:** Graphical attributes: pictorial and tabular methods of data presentation (about 2 lectures).
- **Part 4:** Simple numerical attributes: numerical data summaries and their uses (about 3 lectures).
- **Part 5:** Continuous distributions: an introduction to probability modelling (about 7½ lectures).
- **Part 6:** Modelling the behaviour of sample averages: interval estimating (about 2 lectures).
- **Part 7:** An introduction to discrete probability (about 9½ lectures).
- **Part 8:** An introduction to survey sampling (about 5 lectures).
- **Part 9:** Relationships in statistics: association and causation (about 4 lectures).

Content overview for STAT 221 (about 37 lectures):

- **Part 10:** Further discrete probability models (about 10 lectures).
- **Part 11:** An introduction to industrial problem solving (about 7 lectures).
- **Part 12:** An introduction to tests of significance (about 13 lectures).
- **Part 13:** An introduction to simple linear regression (about 7 lectures).

The break in material between STAT 220 and STAT 221 is due *only* to the time constraints on one-term courses; it is best to regard the overall content of the two courses as the logical development of *one* inter-related set of topics.

COURSE CALENDAR

Lectures are at 8.30 a.m. on Monday, Wednesday and Friday, and the tutorial is at 3.30 p.m. on Wednesday. Term begins on Monday, September 12, 2005, and ends on Monday, December 5, 2005. There is a University holiday (Thanksgiving) on Monday, October 10; the Monday lecture is lost on this date. A tentative schedule of course activities is given below; note that the tutorial time slots in the weeks starting September 12 and September 26 are used as additional *lectures*.

WEEK STARTING		LECTURE & TUTORIAL NUMBERS Lect. 1	Lect. 2	Tutorial	Lect. 3	OTHER COURSE OBLIGATIONS
September	12	L1	L2	L3	L4	-----
	19	L5	L6	T1	L7	-----
	26	L8	L9	L10	L11	Assignment 1 due September 28 (W)
October	3	L12	L13	T2	L14	-----
	10	---	L15	T3	L16	Assignment 2 due October 14 (F)
	17	L17	L18	T4	L19	Quiz #1 on Wednesday, October 19
	24	L20	L21	T5	L22	Assignment 3 due on October 28 (F)
	31	L23	L24	T6	L25	-----
November	7	L26	L27	T7	L28	Assignment 4 due November 11 (F)
	14	L29	L30	T8	L31	Quiz #2 on Wednesday, November 16
	21	L32	L33	T9	L34	Assignment 5 due on November 25 (F)
	28	L35	L36	T10	L37	------
December	5	Review	---	---	---	Assignment 6 due on December 5 (M)

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