



AMBROSE  
UNIVERSITY COLLEGE

## BHS 410 BASIC MULTIVARIATE STATISTICS (3)

Fall 2013

<b>Lecture:</b>	Tuesdays and Thursdays	2:30 PM – 3:45 PM	A2141
<b>Lab:</b>	Mondays	1:00 PM – 2:15 PM	A2131

### Calendar Description: (3-3)A

Multivariate analysis as applied to behavioural science. Correlation, simple and multiple regression, discriminant function analysis, canonical correlation, factor analysis, theories and applications of behavioural measurement, reliability, and validity will be presented. Lecture and laboratory components.

**Prerequisite:** BHS 240 and BHS 310. *This course has an existing transfer credit agreement through Alberta Council on Admissions and Transfer. Visit [www.transferalberta.ca](http://www.transferalberta.ca) for details.*

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**Office Telephone:** (403) 410-2000 (Ext. 6915)

**Office Hours:** Wed 12:00 PM – 2:30 PM, or by appointment

**Text:** *Discovering Statistics Using IBM SPSS Statistics*  
4<sup>th</sup> edition

Andy Field

ISBN: 978-1-4462-4918-5

### Attendance:

Students are expected to attend all lectures and labs to ensure success on exams, and quizzes. All quizzes will be written during lab times. Students not attending lectures may find themselves missing information not covered in the textbook. Any student who is absent for an exam should speak to the professor and, where possible, provide a doctor's note.

### Course Information:

This course builds on material learned in the BHS 310 course (a prerequisite). It reviews and expands upon material presented in the BHS 310 course and moves the student toward a working familiarity with multivariate analysis as it may be applied to the behavioural sciences. Emphasis is on assumptions, correlation, simple and multiple regression, comparison of two means (t-tests), comparison of three or more means (factor analysis, or ANOVA), repeated measures, mixed measures, discriminant function analysis (multivariate analysis, or MANOVA), theories of behavioural measurement, reliability, and validity.

The course has lecture and lab components. Classroom time will be devoted mainly to explanation and discussion of theory and methods. Lab time will be devoted to demonstration of statistical software applications by the instructor, and to hands-on practice by the students and/or to completion of assignments (or, occasionally, to the completion of a lecture or the writing of a quiz).

### **Additional Information:**

This course is designed to strengthen the student's understanding of basic statistical methods and to acquaint the student with the theory and application of advanced statistical methods, particularly multivariate. The focus will be on practical issues such as selecting the appropriate analysis, preparing data for analysis, menu-driven programming, interpreting output, and written presentation of results. Four overlapping aspects of basic and advanced procedures will be covered:

- (1) Theoretical – The heuristic basis of the statistical techniques and assumptions underlying their use.
- (2) Practical – The use of *SPSS for Windows* as the statistical package to analyze multivariate data.
- (3) Interpretive – The skills to write accurate and informative results sections based on the techniques used.
- (4) Reflective – A focus on understanding some of the history, controversies, and limitations in the statistical procedures that we use.

Some lab sessions may be used to finish coverage of materials that couldn't be completed in the lecture classroom and some lab sessions may be devoted to the writing of quizzes. The lab sessions are an integral part of the course – attendance at lab sessions is *not* to be regarded as optional.

An electronic calculator with *statistical functions* is required.

The SPSS software (Version 19.0, for Windows) has been installed by Ambrose IT staff on lab computers and library computers. These computers will be available for lab exercises/assignments/quizzes

### **Expected Learning Outcomes:**

Upon completion of this course, students should be able to demonstrate:

- how data is checked to determine if they are suitable for analysis and, if deemed unsuitable, if and how the data can be made suitable for analysis.
- skill in deciding what statistical technique(s) will best answer different research questions.
- ability to input data, run the appropriate statistical technique, and interpret the output, understanding what conclusions can be reached and their limitations.
- ability to cast a critical eye on research literature, especially with respect to

the appropriate use and interpretation of some of the more prevalent multivariate analyses.

## Course Schedule

The following is a Broad Course Schedule.

<b>TOPIC</b>	<b>READING</b>
Review of Descriptive Statistics and Inferential Statistics (Univariate and Bivariate)	Instructor Lectures Notes/Examples on Moodle (largely from recent BHS 310 course) Chapters 1, 2, 3, and 4
Assumptions	Chapter 5
Correlation	Chapter 6
Simple and Multiple Regression	Chapter 7
Comparison of Two Means (t-tests)	Chapter 9
Comparison of Three or More Means (ANOVA)	Chapters 10 and 12
Repeated Measures	Chapter 13
Mixed Measures	Chapter 14
Multivariate Analysis (MANOVA)	Chapter 16
Non-Parametric Tests	Chapter 15

## Important Dates

<u>Date</u>	<u>Topic</u>
Sept. 05	First day of Classes
<b>Sept. 15</b>	<b>Last day to enter course without permission or withdraw from a course</b>
<i>Sept. 16</i>	<i>Assignment 1 due</i>
<b>Sept. 25-26</b>	<b>Spiritual Emphasis Days (No Classes)</b>
<i>Sept. 30</i>	<i>Quiz 1</i>
<b>Oct. 9</b>	<b>Dean's list reception (2:00 PM)</b>
<b>Oct. 14</b>	<b>Thanksgiving Monday (No classes)</b>
<i>Oct. 15</i>	<i>Assignment 2 due</i>
<i>Oct. 24</i>	<i>MIDTERM EXAM (in lecture) <span style="float: right;"><i>Subject to change</i></span></i>
<b>Oct. 28</b>	<b>Last day to request revised time for a final examination</b>
Nov. 11	Remembrance day (No classes)
<i>Nov. 18</i>	<i>Quiz 2</i>
<b>Nov. 12</b>	<b>Last day to withdraw from courses without academic penalty</b>
<b>Nov. 25</b>	<b>Last day to apply for time extensions for coursework</b>
<i>Dec. 2.</i>	<i>Assignment 3 due</i>
Dec. 9	Last class

**FRIDAY DECEMBER 13 FINAL EXAM 1:00 PM A2131**

<b>Marking:</b>	Three Assignments	18% (6% each)
	Two Quizzes	16% (8% each)
	Mid-Term Exam	26%
	Final Exam	<u>35%</u>

Allowed aids in all in-class quizzes include:

- a hand-held, non-programmable, statistical calculator
- statistical tables (provided by the instructor, as needed)
- one sheet of notes (8.5 by 11-inch paper, both sides) containing formulae and notes **generated by the student**. Photocopied pages not permitted.

Allowed aids in the mid-term and final exams include:

- a hand-held, non-programmable, statistical calculator
- statistical tables (provided by the instructor, as needed)
- two sheets of notes (8.5 by 11-inch paper, both sides) containing formulae and notes **generated by the student**. Photocopied pages not permitted.

### Grading Scheme

A+	95-100%	C+	67-69%
A	90-94%	C	63-66%
A-	85-89%	C-	60-62%
B+	80-84%	D+	54-59%
B	76-79%	D	50-53%
B-	70-75%	F	Below 50%

*It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Student Handbook and Academic Calendar. Personal information, that is information about an individual that may be used to identify that individual, may be collected as a requirement as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at [privacy@ambrose.edu](mailto:privacy@ambrose.edu).*

*Although extensions to coursework in the semester are at the discretion of the instructor, students may not turn in coursework for evaluation after the last day of the scheduled final examination period unless they have received permission for a "Course Extension" from the Registrar's Office. Requests for course extensions or alternative examination time must be submitted to the Registrar's Office by the appropriate deadline (as listed in the Academic Calendar <http://www.ambrose.edu/publications/academiccalendar>). Course extensions are only granted for serious issues that arise "due to circumstances beyond the student's control."*

*We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Academic dishonesty is taken seriously at Ambrose University College as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else's ideas, words, or work as one's own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets to give credit to another person's ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or*

*immediate dismissal from Ambrose University College. Students are expected to be familiar with the policy statements in the current academic calendar and the student handbook that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student's permanent record.*

*Course changes, including adding or dropping a course, may be made during the Registration Revision period, as outlined in the Calendar of Events. All course changes must be recorded on a Registration form, available from the Office of the Registrar. Due to circumstances such as class size, prerequisites or academic policy, the submission of a Registration form does not guarantee that a course will be added or removed from a student's registration. Students may change the designation of any class from credit to audit up to the date specified in the Calendar of Events, although students are not entitled to a tuition adjustment or refund after the Registration Revision period.*

*Withdrawal from courses after the Registration Revision period will not be eligible for tuition refund. Students intending to withdraw from some or all of their courses must submit a completed Registration form to the Registrar's office. The dates by which students may voluntarily withdraw from a course without penalty are listed in the Calendar of Events. A grade of 'W' will be recorded on the student's transcript for any withdrawals from courses made after the end of the Registration Revision period and before the Withdrawal Deadline (also listed in the Calendar of Events). 'W' grades are not included in grade point average calculations. A limit on the number of courses from which a student is permitted to withdraw may be imposed. Students wishing to withdraw from a course, but who fail to do so by the applicable date, will receive the grade earned in accordance with the course syllabus. A student obliged to withdraw from a course after the Withdrawal Deadline because of health or other reasons may apply to the Registrar for special consideration.*

*An appeal for change of grade on any course work must be made to the course instructor within one week of receiving notification of the grade. An appeal for change of final grade must be submitted to the Office of the Registrar in writing within 30 days of receiving notification of the final grade, providing the basis for appeal. A review fee of \$50.00 must accompany the appeal to review final grades. If the appeal is sustained, the fee will be refunded. Note that the review could justify an increase, no change, or a decrease in the final grade.*

*Students are advised to retain this syllabus for their records.*