

Course ID:	Course Title:	Fall 2017
BHS 410	Basic Multivariate Statistics	Prerequisites: BHS 240 BHS 310
		Credits: 3

Class Information		Instructor Information		Important Dates	
Days:	Wednesday/Friday	Instructor:	Mitchell Colp, PhD	First day of classes:	Wednesday, September 6
Time:	4:00pm-5:15pm	Email:	TBD	Last day to add/drop, or change to audit:	Sunday, September 17
Room:	TBD	Phone:	TBD	Last day to request revised exam:	Monday, October 23
Laboratory	Monday 4:00pm-5:15pm	Office:	TBD	Last day to withdraw from course:	Monday, November 13
Final Exam:	Friday, December 19 1:00pm in A2141	Office Hours:	TBD	Last day to apply for coursework extension:	Monday, November 20
				Last day of classes:	Monday, December 11

Course Description

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.

Expected Learning Outcomes

Through classes and directed readings, students will:

1. Gain a general understanding of univariate and multivariate analytical approaches.
2. Identify factors that bolster and undermine the validity and reliability of employing multivariate analyses.
3. Develop a rationale for when and how to incorporate multivariate techniques into research methods.
4. Examine statistical theory and thought that underpins the field of applied statistics.
5. Perform sophisticated analyses within the IBM SPSS statistical package.
6. Participate in a simulated scale construction and validation research project.

Textbooks

Field, A., (2013). *Discovering statistics using IBM SPSS statistics* (4th Ed.). Thousand Oaks, CA: Sage Publications Inc.

Course Schedule

Week	Date	Topic	Readings	Deadlines
1	September 6	Introduction to Course	Syllabus	
2	September 11	Introduction to the SPSS Environment Lab	Chapters 3 and 4	
	September 13	Why do we measure? A search for truth		
	September 15	What do we measure? Fishing for constructs		
3	September 18	Preparing Data for Analysis Lab	Chapter 5	
	September 20	How do we measure? Troublesome definitions	Chapters 1 and 2	
	September 22	Should we measure? Pragmatism runs wild		
4	September 25	Basic Descriptive Analysis Lab	Chapter 7	
	September 29	Correlation		
5	October 2	Correlation Lab		Lab #1 Assignment
	October 4	Linear Regression	Chapters 8	
	October 6	Linear Regression		
6	October 11	Multiple Regression		
	October 13	Multiple Regression		
7	October 16	Multiple Regression Lab		Lab #2 Assignment
	October 18	Analysis of Variance	Chapter 11	
	October 20	Analysis of Variance		
8	October 23	Analysis of Variance Lab		Lab #3 Assignment
	October 25	Theoretical Exam #1		Theoretical Exam #1
	October 27	Conceptual Extensions of ANOVA		
9	October 30	Applied Exam #1		Applied Exam #1
	November 1	Multivariate Analysis of Variance	Chapter 16	
	November 3	Multivariate Analysis of Variance		
10	November 13	Multivariate Analysis of Variance Lab		Lab #4 Assignment
	November 15	Discriminant Function Analysis	Chapter 17	
	November 17	Discriminant Function Analysis		
11	November 20	Discriminant Function Analysis Lab		
	November 22	Exploratory Factor Analysis		
	November 24	Exploratory Factor Analysis		
12	November 27	Exploratory Factor Analysis		Lab #6 Assignment
	November 29	Principle Component Analysis		
	December 1	Principle Component Analysis		
13	December 4	Applied Exam #2		Applied Exam #2
	December 6	Advanced Modelling	Chapter 20	
	December 8	Advanced Modelling		
	December 19	Theoretical Exam #2 - Scheduled at 1:00pm in A2141		

Please note that changes to the course schedule may occur in response to student questions and conversations.

Learning Tasks and Assessment:

There are three required Learning Tasks for this course.

Learning Task	Description of Task	Percentage of Grade
Learning Task #1	Laboratory Assignments	30%
Learning Task #2	Applied Examinations	30%
Learning Task #3	Theoretical Examinations	40%

Important Note. Percentage scores will be given for each course assignment. The weighting of each will be calculated and summed to provide the final letter grade. The completion of all assigned tasks is required for a passing grade in this course. With the exception to examinations, all assignments are due by 11:59pm MST of the assigned date.

Late Bank. A 3-day late bank will be provided to all students, and they can use these days at their own discretion and without explanation during the term. For instance, a student could submit their lab #1 assignment 2 days late and their lab #2 1 day late, or just their lab #4 assignment 3 days late. **The late bank cannot be used for the midterm or final applied or theoretical examinations.** This is designed to provide students with some flexibility regarding personal situations, illness, workload management, or other concerns that may arise during the course timeline. Once you have used up your 3 late bank days, a penalty of 10% per day will apply for unexcused late submissions of assignments.

Learning Task #1: Laboratory Assignments (30%) – Various Due Dates

Throughout the semester, students will work independently to complete applied problems associated with assigned readings, lectures, and laboratory learnings. Students will submit completed responses to the instructor by email before 11:59pm MST on the assigned due date. Submitted responses should be no more than 300 words and follow APA 6th Edition guidelines for general style and referencing. No cover page is required for these submissions. These brief assignments will be combined to make up the 30% mark once all have been submitted.

	Assignment Topic	Date Due
Laboratory #1 Assignment	Correlation	October 2, 2017
Laboratory #2 Assignment	Multiple Regression	October 16, 2017
Laboratory #3 Assignment	Analysis of Variance	October 23, 2017
Laboratory #4 Assignment	Multivariate Analysis of Variance	November 14, 2017
Laboratory #5 Assignment	Discriminant Function Analysis	November 20, 2017
Laboratory #6 Assignment	Exploratory Factor Analysis	November 27, 2017

Each question will be marked using the rubric included on page 5 of the course syllabus.

Learning Task #2: Applied Examinations (30%) – October 30, 2017 and December 4, 2017

Students will be given two time-limited laboratory examinations that assess their knowledge and understanding of IBM SPSS to apply multivariate analyses for a variety of applied problems. The examinations are open-book and are expected to be completed independently.

Applied Examination #1 – October 30, 2017: The exam will cover the first six laboratory topics and constitute 15% of the final grade. It will contain 15 multiple choice questions with 4 possible response choices. The exam questions will cover

the application of data entry, descriptive analysis, correlation, multiple regression, and analysis of variance. Students will be given 60 minutes to complete the examination.

Applied Exam #2 – December 4, 2017: The exam will cover the last three laboratory topics and constitute 15% of the final grade. It will contain 15 multiple choice questions with 4 possible response choices. The exam questions will be the application of multivariate analysis of variance, discriminant function analysis, and exploratory factor analysis. Students will be given 60 minutes to complete the examination.

Learning Task #3: Theoretical Examinations (40%) – October 25, 2017 and December 19, 2017

Students will be given two time-limited examinations that assess their knowledge, understanding, and synthesis of course materials and core concepts. The examinations are closed-book and are expected to be completed independently.

Theoretical Examination #1 – October 24, 2017: The exam will cover the first seven weeks of lecture and constitute 20% of the final grade. It will contain 30 multiple choice questions with 4 possible response choices. The exam questions will be taken exclusively from the chapter readings and will include theoretical applications of knowledge. Students will be given 60 minutes to complete the examination.

Theoretical Examination #2 – December 15, 2017: The exam will cover the last six weeks of lecture and constitute 20% of the final grade. It will contain 30 multiple choice questions with 4 possible response choices. The exam questions will be taken exclusively from the chapter readings and will include theoretical applications of knowledge. Students will be given 60 minutes to complete the examination.

Attendance:

Students are expected to regularly attend lectures. Missing class regularly without adequate rationale will not only impact your ability to successfully complete the course, in extreme cases the instructor reserves the right to ask the student to withdraw from the course. You are not required to inform the instructor if you miss a class, but you should coordinate with a friend in the class to obtain any notes and instructions missed. Failure to communicate with the instructor regarding multiple absences or extenuating circumstances severely limits your ability to receive any accommodations.

Grade Summary:

The available letters for course grades are as follows:

Letter Grade	GPA	Percentage	Descriptor
A+	4.00	96-100	
A	4.00	90-95	Excellent
A-	3.70	85-89	
B+	3.30	80-84	
B	3.00	75-79	Good
B-	2.70	70-74	
C+	2.30	65-69	
C	2.00	60-64	Satisfactory
C-	1.70	55-59	

D+	1.30	50-54	
D	1.00	45-49	Minimal Pass
F	0.00	< 45	Failure

Because of the nature of the Alpha 4.00 system, there can be no uniform University-wide conversion scale. The relationship between raw scores (e.g. percentages) and the resultant letter grade will depend on the nature of the course and the instructor's assessment of the level of each class, compared to similar classes taught previously.

Please note that final grades will be available on student registration system. Printed grade sheets are not mailed out.

Marking Rubrics

Criteria for Assessment of Learning Task #1 - Laboratory Assignments

Area of Evaluation	Needs work	Limited	Proficient	Highly Proficient	Score
Thoroughness of Answer	Answer not provided or unclear (0-4 marks)	Answer missing relevant elements (5-7 marks)	Sufficient answer but may miss relevant links between question and background information (7-8 marks)	Well-developed answer. Clear links between question and relevant background information provided (9-10 marks)	/10

Criteria for Assessment of Learning Task #2

Ambrose University Academic Policies:

Communication

All students have received an Ambrose e-mail account upon registration. It is the student's responsibility to check this account regularly as the Ambrose email system will be the professor's instrument for notifying students of important matters (cancelled class sessions, extensions, requested appointments, etc.) between class sessions. If students do not wish to use their Ambrose accounts, they will need to forward all messages from the Ambrose account to another personal account.

Registration

During the **Registration Revision Period** students may enter a course without permission, change the designation of any class from credit to audit and /or voluntary withdraw from a course without financial or academic penalty or record. Courses should be added or dropped on the student portal by the deadline date; please consult the List of Important Dates. After that date, the original status remains and the student is responsible for related fees.

Students intending to withdraw from a course after the Registration Revision Period must apply to the Office of the Registrar by submitting a "Request to Withdraw from a Course" form or by sending an email to the Registrar's Office by the **Withdrawal Deadline**; please consult the List of Important Dates on the my.ambrose.edu website. Students will not receive a tuition refund for courses from which they withdraw after the Registration Revision period. A grade of "W" will appear on their transcript.

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.

Exam Scheduling

Students, who find a conflict in their exam schedule must submit a Revised Examination Request form to the Registrar's Office by the deadline date; please consult the List of Important Dates. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; 2) the student has three final exams within three consecutive exam time blocks; 3) the scheduled final exam slot conflicts with an exam at another institution; 4) extenuating circumstances. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

Electronic Etiquette

Students are expected to treat their instructor, guest speakers, and fellow students with respect. It is disruptive to the learning goals of a course or seminar and disrespectful to fellow students and the instructor to use electronics for purposes unrelated to the course during a class session. Turn off all cell phones and other electronic devices during class. Laptops should be used for class-related purposes only. Do not use iPods, MP3 players, or headphones. Do not text, read, or send personal emails, go on Facebook or other social networks, search the internet, or play computer games during class. Some professors will not allow the use of any electronic devices in class. The professor has the right to disallow the student to use a laptop in future lectures and/or to ask a student to withdraw from the

session if s/he does not comply with this policy. Repeat offenders will be directed to the Dean. If you are expecting communication due to an emergency, please speak with the professor before the class begins.

Academic Policies

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. Personal information (information about an individual that may be used to identify that individual) may be required 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.

Extensions

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 deadline date; please consult the List of Important Dates. Course extensions are only granted for serious issues that arise "due to circumstances beyond the student's control."

Appeal of Grade

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 Registrar's Office in writing and providing the basis for appeal 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. If the appeal is sustained, the fee will be refunded.

Academic Integrity

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 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 acknowledge 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 the university college. Students are expected to be familiar with the policies in the current Academic Calendar 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.

Note: Students are strongly advised to retain this syllabus for their records.