

Department of Marketing and Consumer Studies
MCS*6060/ MGMT 6840
Multivariate Research Methods / Multivariate Techniques
Winter 2017

Instructor(s): Dr. Towhidul Islam, Professor
Room: MINS 206, Ext 53835
Email: islam@uoguelph.ca
Office Hours: Mondays 12:30 – 1:30 pm, 4:00 – 6:00 pm
Wednesdays 1:30 – 3:30 pm

Class Times and Location: **Lecture:** Mondays 10:30 -12:30 am, Room MINS 033
Lab: Mondays: 1:30 – 2:45 pm, Room MACS 243

Course Description and Objectives:

A review of selected multivariate analysis techniques as applied to marketing and consumer research. Topics include linear and logistic regression, mediation and moderation analysis, design of experiments, analysis of variance, and discrete choice analysis (DCA) including latent segmentation. The course uses a ‘hands-on’ approach with small sample databases available for required computer program analysis.

Learning Outcomes:

- A. Analyze experimental, survey or secondary data using multivariate research methods including Regression Analysis, Moderation and Mediation, Analysis of Variance, Discrete Choice Analysis.
- B. Replicate existing research findings in multivariate research methods.
- C. Behave and apply ethical standards when conducting and reporting academic and applied research in marketing and consumer behaviour.

Course Materials and Resources:

This course uses a variety of materials and resources. One of your primary resources will be the course website (<http://courselink.uoguelph.ca>). All announcements, required and recommended readings, assignments and updates will be posted here. You will also be able to access any handouts you may have missed through this site.

Suggested Texts for Reading Selected Chapters (We will not follow any particular text)

Regression, Moderation and Mediation

- ☐ Hayes, A. F. (2013), Introduction to Mediation, Moderation and Conditional Process Analysis - A Regression Based Approach, The Guilford Press, New York.
- ☐ Aiken, L. and West, S. (1991), Multiple Regression: Testing and Interpreting Interactions, Sage Publications, London.
- ☐ Hosmer, DW., Lemeshow, S. and Sturdivant, R. X. (2013). Applied Logistic Regression. 3rd Edition, John Wiley and Sons, New York.

Experimental Designs

- ☐ Montgomery, D. (1997), Design and Analysis of Experiments, Fourth Edition, Wiley
- ☐ Kuehl, R. (2000), Design of Experiments: Statistical Principles of Research Design and Analysis, Second Edition, Duxbury.

Analysis of Variance

- Iacobucci, D. (2016). Analysis of Variance (ANOVA), Earle Lite Book, Inc., Nashville, TN.

Discrete Choice Analysis

- Ryan, M., Gerard, K. and Amaya, M. (2007). Using Discrete Choice Experiments to Value Health and Health Care, Springer
- Louviere, J. J., Hensher, D. and Swait, J. (2000). Stated Choice Methods: Analysis and Application, Cambridge University Press
- Train, K. (2003), Discrete Choice Methods with Simulation, Cambridge
- Aizaki, H., Nakatani, T. and Sato, K. (2015). Stated Preference Methods using R, CRC Press

Multiple Topics

- Trochim, W. (2005) Research Methods: The Concise Knowledge Base, CENGAGE Learning
Free Access: <http://www.socialresearchmethods.net/kb/>
- Tabachnick, B.G. and Fidel, L S. (2016), Using Multivariate Statistics: Pearson International Edition, 6th Edition, Allyn & Bacon

Evaluation Procedure:

		70%	60%
Assignments	Modules	Weight (MSc)	Weight (Ph.D.)
1	Regression Analysis	15%	13%
2	Moderation and Mediation Analysis: Critique and Replication Study	15%	13%
3	Experimental Designs	10%	8%
4	Analysis of Variance	15%	13%
5	Discrete Choice Analysis (DCA)	15%	13%

For each assignment, you will get at least 7 days time for submission from the assignment handover date. Unless you have discussed an extension well ahead of the due date, late penalties will apply at the rate of 5% of your grade for the assignment. If I evaluate 90% on a one day late assignment, your grade will get 85.5%, it will be 81% if delay in submission is two days. Extensions will only be granted on the basis of extenuating circumstances.

Final Exam: Two parts as follows,

- (a) Open book (no laptop, internet access) during exam time: 30%
Concepts, interpretation, article reviews (MSc and Ph.D.)
- (b) Article Critique (Take home: Ph.D.) 10%

Software:

SPSS: Regression Analysis, Analysis of Variance, Moderations and Mediation (using Process Macro)

SAS: Experimental Designs

Class Schedule

Week and Module (and Labs)	Lecture Topics & Readings
<p>Week 1, 2 & 3 (Jan 9, Jan 16 & Jan 23): Regression Analysis</p> <p>Lab Week 1: Introduction to SPSS, Binary & Effect coding, Regression analysis</p> <p>Lab Week 2: Regression with Categorical Explanatory Variables</p> <p>Lab Week 3: Regression with Categorical Dependent Variable - Logistic Regression</p>	<ul style="list-style-type: none"> ○ Introduction to Multivariate Data Analysis and Techniques ○ Multiple Regression Analysis and Diagnostics ○ Regression with categorical explanatory variables ○ Regression with categorical dependent variable: Logistic Regression <p>Readings: Simple and Multiple Regression</p> <ul style="list-style-type: none"> ▪ Hayes (2013) Chapter 2: Simple Linear Regression; Chapter 3: Multiple Linear Regression ▪ Tabachnick and Fidel (2016) Chapter 5: Multiple Regression, <p>Readings: Logistic Regression</p> <ul style="list-style-type: none"> ▪ Peng, CJ, Lee, KL and Ingersoll, GM. (2002). An Introduction to Logistic Regression Analysis and Reporting. <i>The Journal of Educational Research</i>, 96 (1), 3-14. ▪ Hosmer and Lemeshow (2000) Chapter 1: Introduction to Logistic Regression Model; Chapter 3: Interpretation of the Fitted Logistic Regression Model ▪ Tabachnick and Fidel (2016) Chapter 10: Logistic Regression
<p>Week 4-5 (Jan 30 & Feb 6): Moderation and Mediation Analysis</p> <p>Lab Week 4: Introduction to PROCESS and Moderation Analysis</p> <p>Lab Week 5: Mediation Analysis & Moderated Mediation, Mediated Moderation</p>	<ul style="list-style-type: none"> ○ Moderation & Mediation ○ Moderated Mediation & Mediated Moderation ○ Bootstrapping and Monte Carlo Simulations <p>Readings:</p> <ul style="list-style-type: none"> ▪ Hayes (2013) Chapter 4: The Simple Mediation Model, Chapter 7: Fundamental of Moderation Analysis ▪ Baron, R. and Kenny, D. (1986), The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations, <i>Journal of Personality and Social Psychology</i>, 51 (6), 1173-1182 ▪ Muller, D., Judd, C. M. and Yzerbyt, V. (2005), When Moderation is Mediated and Mediation is Moderated, <i>Journal of Personality and Social Psychology</i>, 89 (6), 852-863. ▪ Zhao, X., Lynch, J. and Chen, Q. (2010), Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis, <i>Journal of Consumer Research</i>, 37, 197-206. ▪ Preacher, K.J., Rucker, D.D., & Hayes, A.F. (2007). Addressing Moderated Mediation Hypotheses: Theory, Methods and Prescriptions. <i>Multivariate Behavioral Research</i>, 42(1), 185-227
<p>Week 6 (Feb 13):</p> <p>Experimental Designs for ANOVA, Best-Worst Scaling & Choice Experiments</p> <p>Lab Week 6: SAS - Experimental designs: ANOVA designs, Latin Squares, BIBD, Factorial designs and choice experiments</p>	<ul style="list-style-type: none"> ○ Designs for Analysis of Variance (ANOVA) ○ Blocking ○ Latin Squares ○ Balanced Incomplete Block Design (BIBD) and Applications ○ Orthogonal /Factorial Designs for Discrete Choice Experiments ○ Choice experiments using BIBD ○ Alternative Specific Choice Experiments <p>Readings:</p> <ul style="list-style-type: none"> ▪ Iacobucci (2016): Chapter 7: Experimental Designs ▪ Louviere, Hensher and Swait (2000) Chapter 4: Experimental Design, Chapter 5: Design of Choice Experiments ▪ Green (1974): On the Design of Choice Experiments Involving Multifactor Alternatives, <i>Journal of Consumer Research</i>, 1, 61-68. ▪ Montgomery (1997): Chapter 5: Randomized Blocks, Latin Squares, and Related Designs, Chapter 6: Introduction to Factorial Designs ▪ Kuehl (2000): Chapter 9: Incomplete Block Designs: An Introduction

Week 7 (starting Feb 20)	Winter Break
<p>Week 8, 9 & 10 (Feb 27 & March 6, 13): Analysis of Variance</p> <p>Lab Week 8: Analysis of Variance (ANOVA) and Diagnostics</p> <p>Lab Week 9: Contrasts and Simple Effects, Effect Sizes, Fixed and Random Effects</p> <p>Lab Week 10: Repeated Measures ANOVA</p>	<ul style="list-style-type: none"> ○ Introduction to ANOVA ○ Between and Within Subject Designs ○ Main and Interaction Effects ○ Sources of Interaction Effects using SPSS Syntax ○ Contrasts and Multiple Comparisons ○ Randomized Block Analysis ○ Analysis of Covariance (ANCOVA) ○ Repeated Measures ANOVA <p>Readings:</p> <ul style="list-style-type: none"> ▪ Iacobucci (2016) Chapter 3: Two-Way, Three-Way and Higher Order ANOVA; Chapter 4: Omega-squared and Effect Sizes; Chapter 5: Contrasts and Simple Effects; Chapter 6: Fixed Vs. Random Effects; Chapter 8: Repeated Measures; Chapter 9: Analysis of Covariance ▪ Tabachnick and Fidel (2016), Chapter 6: Analysis of Covariance,
<p>Week 11, 12 & 13 (March 20, 27; April 3): Discrete Choice Analysis</p> <p>Lab Week 11: Discrete Choice Analysis (DCA): Data setup and Coding and Estimation</p> <p>Lab Week 12: Managerial Insights from DCA</p>	<ul style="list-style-type: none"> ○ Stated preference (SP) and Revealed preference (RP) data ○ Decision Making: Individual/Group/ Joint Decision Making ○ Preference Stability, Preference Consistency, Heterogeneity ○ Preference Elicitation using different methods ○ Conceptual Framework : Random Utility Model ○ DCE Surveys, Data Collection and Analysis ○ Aggregate Model: Multinomial Logit Models (MNL), Latent Class Models <p>Readings:</p> <ul style="list-style-type: none"> ▪ Ryan, Gerard and Amaya (2007): Chapter 1: Discrete Choice Experiments in a Nutshell, Chapter 3: Practical Issues in Conducting a Discrete Choice Experiment ▪ Train (2003): Chapter 2: Properties of Discrete Choice Models ▪ Louviere, Hensher and Swait (2000) Chapter 2: Introduction to Stated Preference Models and Methods

Note: The schedule of learning activities may require modification from time to time. Any changes will be announced in class and/or on the Courselink site. If you are registered with the Centre for Students with Disabilities and will require some form of accommodation in the completion of the required learning activities for this course, please meet with me during the first week of classes.

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. The Academic Misconduct Policy is detailed in the Graduate Calendar: http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e1687.shtml

E-mail Communication

All students are required to check their University of Guelph e-mail account regularly. E-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course in writing, with your name, id#, and e-mail contact. See the graduate calendar for information on

regulations and procedures for Academic Consideration:

http://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/sec_d0e1415.shtml

Drop Date

The last date to drop one-semester courses, without academic penalty, is Friday, March 10.

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded in any electronic media without the permission of the presenter, whether the instructor, a classmate or guest lecturer.

Resources

The Graduate Calendar is the source of information about the University of Guelph's procedures, policies and regulations that apply to graduate programs:

<http://www.uoguelph.ca/registrar/calendars/graduate/current/>

Religious Holidays:

Should a student need to miss scheduled tests, mid-term examinations, final examinations, or requirements to attend classes and participate in laboratories for religious reasons, please advise the instructor within two weeks of the distribution of this course outline so that alternate arrangements can be made. For further information see

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml>

University Grading Scheme

This course follows the University grading scheme outlined in the University Calendar*:

A+	90-100%	Excellent: An outstanding performance in which the student demonstrates a superior grasp of the subject matter, and an ability to go beyond the given material in a critical and constructive manner. The student demonstrates a high degree of creative and/or logical thinking, a superior ability to organize, to analyze, and to integrate ideas, and a thorough familiarity with the appropriate literature and techniques.
A	85-89	
A-	80-84	
B+	77-79	Good: A more than adequate performance in which the student demonstrates a thorough grasp of the subject matter, and an ability to organize and examine the material in a critical and constructive manner. The student demonstrates a good understanding of the relevant issues and a familiarity with the appropriate literature and techniques.
B	73-76	
B-	70-72	
C+	67-69	Acceptable: An adequate performance in which the student demonstrates a generally adequate grasp of the subject matter and a moderate ability to examine the material in a critical and constructive manner. The student displays an adequate understanding of the relevant issues, and a general familiarity with the appropriate literature and techniques.
C	65-66	
F	0-64	Fail: An inadequate performance.

Code of Conduct – The Top Ten

As a student in the Department of Marketing and Consumer Studies, College of Management and Economics at the University of Guelph, you are a member of a scholarly community committed to improving the effectiveness of people and organizations, and the societies in which they reside, through groundbreaking and engaging scholarship and pedagogy. We seek to promote a comprehensive, critical and strategic understanding of organizations, including the complex interrelationship between leadership, systems (financial and human) and the broader social and political context. And, we prepare graduates for leadership roles in which organizational objectives, self-awareness, social responsibility and sustainability are primary considerations.

In keeping with this commitment, we expect all of our students (indeed – all members of our community) to act in a professional and respectful manner to fellow students, staff and faculty, as well as to members of the broader university and local community. This expectation is very much in keeping with your preparation for a professional career.

The following conduct is expected of all of our students:

- Come to class prepared to learn and actively participate (having completed assigned readings, learning activities etc.).
- Approach your academic work with integrity (avoid all forms of academic misconduct).

- Arrive on time and stay for the entire class. If you happen to be late, enter the classroom as quietly as possible. At the end of class, apologize to the faculty member for the interruption. If you have to leave class early, alert the faculty member in advance.
- If you know in advance that you are going to miss a class, send an email to the faculty member letting him/her know that you will be absent, with a brief explanation.
- While in class, refrain from using any written material (e.g., newspaper) or technology (e.g., the Internet, computer games, cell phone) that is not relevant to the learning activities of that class. Turn off your cell phone at the start of each class.
- Listen attentively and respectfully to the points of view of your peers and the faculty member. Don't talk while others have the floor.
- Raise your hand when you wish to contribute and wait to be called upon. Challenge others appropriately, drawing on reason and research rather than unsubstantiated opinion, anecdote and/or emotion. Keep an open mind and be prepared to have your point of view challenged.
- Provide thoughtful feedback at the completion of all courses (we are committed to continuous improvement but need your input to help us decide what to focus on).