Course Outline

School: Business
Department: Graduate Studies
Course Title: Research & Analytics- Capstone
Course Code: MKTG 749
Course Hours/Credits: 42
Prerequisites: N/A
Co-requisites: N/A
Eligible for Prior Learning, Assessment and Recognition: Yes
Originated by: Allan Esser
Creation Date: Fall 2014
Revised by: Allan Esser
Revision Date: Fall 2014
Current Semester: Summer 2015
Approved by: Chairperson/Dean

Students are expected to review and understand all areas of the course outline.

Retain this course outline for future transfer credit applications. A fee may be charged for additional copies.

This course outline is available in alternative formats upon request.
Course Description
Success in the area of advanced marketing analytics is built on a foundation of three pillars. First is having a solid understanding of the basic principles of data management and exploratory analysis, and secondly, having the ability to recognize and apply the appropriate methods of statistical data analysis to the marketing problem, and thirdly, having a solid understanding of the operating environment and business model to be able to implement and assess the proposed solution. The Research and Analytics – Capstone course is designed to integrate these three pillars through a combination of;

a) 'in class' lectures on business analysis methodologies 
b) 'in lab' workshops on a series of advanced analytical methods, and 
c) 'in field' application through a student/industry case study research project

Students will identify and apply industry recognized advanced analytical techniques used to support marketing decision making in a range of applications that may include; customer segmentation, predictive modelling for customer behaviour, market basket analysis, conjoint analysis, exploratory data analysis, time series forecasting, design of experiments, and text mining.

Through a rigorous case study approach, students will apply the following skills

- data and information management techniques used to support advanced exploratory data analysis and data quality management
- model development, validation, business impact assessment and implementation
- assessing the suitability of proposed analytical models for implementation

Program Outcomes
Successful completion of this and other courses in the program culminates in the achievement of the Vocational Learning Outcomes (program outcomes) set by the Ministry of Training, Colleges and Universities in the Program Standard. The VLOs express the learning a student must reliably demonstrate before graduation. To ensure a meaningful learning experience and to better understand how this course and program prepare graduates for success, students are encouraged to review the Program Standard by visiting http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/. For apprenticeship-based programs, visit http://www.collegeoftrades.ca/training-standards.

Course Learning Outcomes
The student will reliably demonstrate the ability to:

1. Applying the appropriate marketing research tools to a business problem.
   a) Select and apply techniques for various marketing initiatives including; database marketing campaigns, product placement and positioning, customer segmentation, and predictive modeling
   b) Explain basic statistical and mathematical concepts used to evaluate results
   c) Demonstrate tracking and measurement processes
2. Explore and Prepare data for analysis.
a) Extract data from various data sources and provide preliminary data suitability assessments prior to undertaking analysis
b) Generate Exploratory Data analysis and Data Visualization through application of descriptive statistics and advanced analytical reports
c) Validate, repair, modify and transform data for analysis

3. Demonstrate the steps required in building advanced analytical models for marketing application

a) Apply the techniques of Sampling, Exploring, Modifying, Modeling, and Assessment (SEMMA) on different types of customer level marketing data
b) Identify and perform various statistical analysis and modelling techniques as required by the specific marketing management objectives
c) Demonstrate the steps in building and evaluating output from a predictive model
d) Conduct customer segmentation using the data mining process.
e) Perform required analysis to support business decisions that may involve Enterprise Guide or Enterprise Miner in a range of applications that may include: Predictive Modeling, Classification, Forecasting, or Association Analysis.

4. Demonstrate the ability to evaluate and assess the effectiveness of marketing research

a) Interpret Model Results
b) Select candidate models and validate best model
c) Assess business impact and benefits of proposed analytical solutions

5. Generate clear, concise and logical reports for management

a) Develop effective presentations summarizing analysis results and identifying implications for management decision making
b) Present results in written and presentation format
c) Explain output results from research in business terms (non-technical)

**Essential Employability Skills (EES)**

The student will reliably demonstrate the ability to:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
3. Use a variety of thinking skills to anticipate and solve problems.
4. Analyze, evaluate, and apply relevant information from a variety of sources.
5. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
6. Manage the use of time and other resources to complete projects.
7. Take responsibility for one’s own actions, decisions, and consequences.

*There are 11 Essential Employability Skills outcomes as per the Ministry Program Standard. Of these 11 outcomes, the following will be assessed in this course.

**Global Citizenship and Equity (GC&E) Outcomes**

N/A
Text and other Instructional/Learning Materials

Text Book(s):
SAS, Advanced Business Analytics, Course Notes, Volume 1 and Volume 2

ISBN 978-1-59994-726-6


Online Resource(s):
SAS e-learning Module, Applied Analytics Using SAS Enterprise Miner
(https://support.sas.com/edu/schedules.html?id=1220&ctry=US)

Material(s) required for completing this course:
SAS Enterprise Miner Software and SAS Enterprise Guide Software will be provided on Lab PCs.

Evaluation Scheme

- Capstone Case Study - Part 1. Industry Analysis and Research Design: Perform preliminary industry analysis from secondary sources, and develop a marketing research plan.
- Lab/Case Study #1 – Predictive Modelling: Decision Tree: Development and Interpretation of a Predictive Model, using Decision Trees.
- Lab/Case Study #2 – Segmentation/Classification: Clustering: Develop and interpret an unsupervised, multivariate clustering technique towards and application in market segmentation.
- Lab/Case Study #3 – Association: Market Basket Analysis: Apply a non-supervised method of data mining towards an application in product positioning and placement.
- Capstone Case Study - Part 2. Marketing Research and Analysis: Based on marketing survey results that will be provided, execute the marketing research plan based on what was outlined in Part 1 of the Capstone Case Study.
- Final Exam: Sumative exam that covers all theoretical aspects introduced in the course.

<table>
<thead>
<tr>
<th>Evaluation Name</th>
<th>CLO(s)</th>
<th>EES Outcome(s)</th>
<th>GCE Outcome(s)</th>
<th>Weight/100</th>
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<tbody>
<tr>
<td>Capstone Case Study - Part 1. Industry Analysis and Research Design</td>
<td>1, 5</td>
<td>1, 7, 9</td>
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<tr>
<td>Lab/Case Study #1 – Predictive Modelling: Decision Tree</td>
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<td>Lab/Case Study #2 – Segmentation/Classification: Clustering</td>
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<td>1, 2, 7, 9, 10, 11</td>
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<td>Lab/Case Study #3 – Association: Market Basket Analysis</td>
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<td>Capstone Case Study - Part 2. Marketing Research and Analysis</td>
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<td>Final Exam</td>
<td>3, 4</td>
<td>1, 2, 5</td>
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<td>Total</td>
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If students are unable to write a test they should immediately contact their professor or program Chair for advice. In exceptional and well documented circumstances (e.g. unforeseen family problems, serious illness, or death of a close family member), students may be able to write a make-up test.
All submitted work may be reviewed for authenticity and originality utilizing Turnitin®. Students who do not wish to have their work submitted to Turnitin® must, by the end of the second week of class, communicate this in writing to the instructor and make mutually agreeable alternate arrangements.

When writing tests, students must be able to produce official College photo identification or they may be refused the right to take the test or test results will be void.

Student Accommodation
It is College Policy to provide accommodation based on grounds defined in the Ontario Human Rights Code. Accommodation may include modifications to standard practices. Students with disabilities who require academic accommodations must register with the Centre for Students with Disabilities. Students requiring accommodation based on other human rights grounds should talk with their professors as early as possible. Please see the Student Accommodation Policy.

Use of Dictionaries
- Any dictionary (hard copy or electronic) may be used in regular class work.
- English-Additional Language (e.g. English-Chinese) or Additional Language-English (e.g. Russian-English) dictionaries may be used in regular class work.
- Dictionaries may be used in tests and examinations, or in portions of tests and examinations, as long as they are non-electronic (not capable of storing information) and hard copy (reviewed by the invigilator to ensure notes are not incorporated that would affect test or examination integrity).

Program or School Policies
N/A

Course Policies
N/A

College Policies
Students should familiarize themselves with all College Policies that cover academic matters and student conduct.

All students and employees have the right to study and work in an environment that is free from discrimination and harassment and promotes respect and equity. Centennial policies ensure all incidents of harassment, discrimination, bullying and violence will be addressed and responded to accordingly.

Academic honesty is integral to the learning process and a necessary ingredient of academic integrity. Academic dishonesty includes cheating, plagiarism, and impersonation. All of these occur when the work of others is presented by a student as their own and/or without citing sources of information. Breaches of academic honesty may result in a failing grade on the assignment/course, suspension or expulsion from the college.

For more information on these and other policies, please visit www.centennialcollege.ca/about-
Students enrolled in a joint or collaborative program are subject to the partner institution's academic policies.

**PLAR Process**
This course is eligible for Prior Learning Assessment and Recognition (PLAR). PLAR is a process by which course credit may be granted for past learning acquired through work or other life experiences. The PLAR process involves completing an assessment (portfolio, test, assignment, etc.) that reliably demonstrates achievement of the course learning outcomes. Contact the academic school to obtain information on the PLAR process and the required assessment.

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Topical Outline (subject to change):

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<tr>
<th>Week</th>
<th>Topics</th>
<th>Readings/Materials</th>
<th>Weekly Learning Outcome(s)</th>
<th>Instructional Strategies</th>
<th>Evaluation Name</th>
<th>Evaluation Date</th>
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</table>
| 1-2  | Introductions  
Introduction to the course  
Analytical Systems for Data and Information Management (Part 1) | Lecture Notes | Overview of Information Management  
Data Visualization and Exploratory Data Analysis  
Insight and Knowledge Discovery Systems  
Monitoring and Control Systems  
Operational versus Analytical Data Systems | Icebreaker  
Review of course outline  
Lab Working Session: SAS e-learning Introduction to SAS EM | ASSIGN: Capstone Case Study | |
| 3    | Analytical Systems for Data and Information Management (Part 2) | Lecture Notes | Overview of Data Mining  
Data Management Overview  
Analytical Data Structures and Entity Relationship Models | Lecture  
Lab Working Session: SAS e-learning Introduction to SAS EM | DUE: Capstone Case Study - Part 1. Industry Analysis and Research Design | |
| 4-7  | Advanced Analytical Techniques (Part 1)  
Predictive Modeling | Lecture Notes  
ABA Chapter 2  
ABA Chapter 3 | Model Development Best Practices  
Model Performance Assessment and Validation  
Interpreting Results  
Lift Curves and Gains Curves  
Cut off Analysis  
Logistic Regression  
Overview of Statistical Theory to support Non Linear relationships. How to interpret Logistic regression models. | Lecture | Lab/Case Study #1 – Predictive Modelling: Decision Tree | |
| 8-10 | Advanced Analytical Techniques (Part 2)  
Customer Segmentation and Classification | Lecture Notes  
ABA Chapter 5  
Marketing Research Chapter 18 | Clustering  
CHAID Decision Trees  
Decision Trees using Enterprise Miner  
Overview of Statistical Theory to support Classification Model Development | Lecture  
Lab Working Session: SAS e-learning Pattern Discovery | Lab/Case Study #2 – Classification/Segmentation: Clustering | |
| 11-13| Advanced Analytical Techniques (Part 4)  
Market Research Methods | Marketing Research Chapter 21 | Association Rules Analysis  
Conjoint Analysis  
How to set up and interpret model output from Market Basket Analysis  
Market Basket Analysis using Enterprise | Lecture  
Lab Working Session: SAS e-learning Case Study | Lab/Case Study #3 Association Analysis: Market Basket | |
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<td>Study</td>
<td>Market Basket Analysis</td>
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<td>Final Exam</td>
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