ITIS5432 A
Business Analytics Methods
Thursdays, 2:30pm - 5:30pm, DT701

Instructor: Hugh Cairns
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Office Hours: By Appointment

Course Description: Tools for data analytics; analyzing data beyond statistics; data mining and predictive modeling; time series analysis and forecasting; neural networks algorithms in business analytics.

Learning Objectives: Introduction of the role of data mining in current business organizational strategy. This course will provide an overview of the different Analytics approaches by situating data mining in organizational and commercial context. The students will also participate in exercises in data preparation and profiling and hands on predictive modelling using a variety of data mining techniques and practices.

For the purpose of this course, we will be situating the data mining discussion and assignments in the customer relationship management context. Students will be expected to understand and communicate the business value of the data mining exercises. Students will complete exercises and assignments using a SAS Enterprise Guide and SAS Enterprise Miner.

Course Prerequisites: The prerequisites for this course are: ITIS 5431 and BUSI 5801 (or equivalent).

Textbook(s):

Drop Course Policy:
The deadline for academic withdrawal is the last day of classes (each term).

Grading Scheme:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hands on Assignments (3 of 4)</td>
<td>60%</td>
</tr>
<tr>
<td>Contribution to Class Discussion</td>
<td>10%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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TOTAL 100%
Assignments: Students will be given four assignments of which 3 will be graded. Students wishing to submit all four assignments will receive a grade for all assignments; however only the top three assignments will be counted for the final grade. Assignments must be submitted electronically before the start of the class following the class when the assignment was given.

Final exam date: A final written exam will be held in class on December 17 2015 in regular class time.

Preparation and participation: Students are expected to have read the readings assigned. This will help the students understand the context of the analytical method(s) that will be covered in class.

Missed assignments and deferred examination: All assignments not submitted by the start of class (2:30pm) will receive a grade of zero.

Deferred Final Examination:
Students unable to write a final examination because of illness or other circumstances beyond their control must contact the instructor in writing to request a deferred exam. Permission may be granted when the absence is supported by a medical certificate and or appropriate document/s to support the reason for the deferral. Deferred exams are not granted for students who have made travel arrangements that conflict with examination schedule.

Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic/Agenda</th>
<th>Pre-class Prep</th>
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<tbody>
<tr>
<td>1</td>
<td>5/11/2015</td>
<td>• Discussion on the spectrum of business analytics</td>
<td>• Linoff &amp; Berry chapters 1 &amp; 2</td>
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<td></td>
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<td>• Introduction to the data lifecycle and how it supports analytical activities</td>
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<td>• Software set up</td>
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<td></td>
<td>Date</td>
<td>Topics</td>
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| 2 | 12/11/2015 | - Introduction to the predictive analytical process.  
- Discussion of the Analytics environment  
- Introduction to data manipulation techniques to support analytics  
- Introduction to Enterprise Guide  
  *Assignment 1 distributed: Data Prep and Profiling* | - Linoff & Berry chapters 3 & 4  
| 3 | 19/11/2015 | - Overview of the Customer Lifecycle  
- Discussion of the motivation for Customer Segmentation to the marketing function  
- Discussion of direct vs indirect analytics  
- Overview of Methods of Segmentation  
- Introduction to K-means clustering  
  *Assignment 2 distributed: RFM Segmentation* | - (Assignment 1 due before the start of Class)  
- Linoff & Berry chapter 12 & 13  
- Discussion of problems with response definition  
- Introduction to Regression and Logistical Regression  
- Coping with Censored data and the two stage model.  
  *Assignment 3 distributed: Regression for response models* | - (Assignment 2 due before the start of Class)  
- Linoff & Berry chapter 5 & 6 (pp 195-209)  
| 5 | 03/12/2016 | - Alternate approaches to prediction/classification  
- Introduction of Decision Trees  
- Introduction to Neural Networks  
  *Assignment 4 distributed: Decision Trees and Neural Networks* | - (Assignment 3 due before the start of Class)  
- Linoff & Berry chapter 6 (pp 213-231)  
| 6 | 10/12/2016 | - Model Assessment  
- Further Considerations to the analytical approach to CRM  
- Potential Pitfalls of Analytics for CRM  
- Ethical Considerations of analytics  
- Review  
  *Assignment 4 distributed: Decision Trees and Neural Networks* | - (Assignment 4 due before the start of Class)  
The use of mobile devices IS NOT PERMITTED in this class. It is disruptive to the instructor and class members. If you carry such a device to class, please make sure it is turned off. If an emergency situation requires you to keep it turned on, please discuss this with your instructor prior to class.

Group Work

The Sprott School of Business encourages group assignments in the school for several reasons. They provide you with opportunities to develop and enhance interpersonal, communication, leadership, followership and other group skills. Group assignments are also good for learning integrative skills for putting together a complex task. Your instructor may assign one or more group tasks/assignments/projects in this course. Before embarking on a specific problem as a group, it is your responsibility to ensure that the problem is meant to be a group assignment and not an individual one.

Person with Disabilities

Students with disabilities requiring academic accommodations in this course are encouraged to contact a coordinator at the Paul Menton Centre for Students with Disabilities to complete the necessary letters of accommodation. After registering with the PMC, make an appointment to meet and discuss your needs with me at least two weeks prior to the first in-class test or ITV midterm exam. This is necessary in order to ensure sufficient time to make the necessary arrangements. Please refer to http://www.carleton.ca/pmc/ for all PMC information.

Religious Observance

Students requesting academic accommodation on the basis of religious observance should make a formal, written request to their instructors for alternate dates and/or means of satisfying academic requirements. Such requests should be made during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist, but no later than two weeks before the compulsory academic event. Accommodation is to be worked out directly and on an individual basis between the student and the instructor(s) involved. Instructors will make accommodations in a way that avoids academic disadvantage to the student.

Students or instructors who have questions or want to confirm accommodation eligibility of a religious event or practice may refer to the Equity Services website for a list of holy days and Carleton’s Academic Accommodation policies, or may contact an Equity Services Advisor in the Equity Services Department for assistance.

Pregnancy

Pregnant students requiring academic accommodations are encouraged to contact an Equity Advisor in Equity Services to complete a letter of accommodation. The student must then make an appointment to discuss her needs with the instructor at least two weeks prior to the first academic event in which it is
anticipated the accommodation will be required.

**Academic Integrity**

Violations of academic integrity are a serious academic offence. Violations of academic integrity – presenting another’s ideas, arguments, words or images as your own, using unauthorized material, misrepresentation, fabricating or misrepresenting research data, unauthorized co-operation or collaboration or completing work for another student – weaken the quality of the degree and will not be tolerated. Penalties may include expulsion; suspension from all studies at Carleton; suspension from full-time studies; a refusal of permission to continue or to register in a specific degree program; academic probation; and a grade of Failure in the course, amongst others. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy which is available, along with resources for compliance at: [http://www2.carleton.ca/sasc/advisingcentre/academic-integrity/](http://www2.carleton.ca/sasc/advisingcentre/academic-integrity/).

**Course Sharing Websites**

Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).