

## Advanced Customer Analytics(Marketing Data Science)

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### Overview

In this course, data-oriented techniques for extracting patterns from customer data in order to support customer relationship management, will be presented in detail. Propensity modeling for classification, association analysis, factor analysis, clustering and social network analysis are the main techniques that will be explained. The main objective of the course is to present in detail the methodologies used in relationship marketing in order to gain actionable insights from data. Focusing on business applications rather than algorithms & programming, it aims to fill the gap between theory and real applications in CRM.

### Key Outcomes

By completing the course the students will be able:

- To fully understand & apply standard data mining techniques such as propensity modeling for cross selling activities and data clustering for customer segmentation.
- Learn new trends on advanced analytics & actual case studies that are used by enterprises for effective customer relationship management.
- Gain practical intuition about how to apply these techniques on datasets of realistic sizes using modern data analysis frameworks.

### Requirements and Prerequisites

The course requires a good knowledge in computer science, algorithms and data management. A basic knowledge of statistics and probability theory is essential.

### Required Course Material

There is no required textbook. All course materials will be provided in class and will be available for downloading.

### Books

There are many books on the subject. The students are encouraged to read the following books:

- Data Mining Techniques in CRM: Inside Customer Segmentation
- Effective CRM using Predictive Analytics
- Mastering Data Mining: The Art and Science of Customer Relationship Management

### Software/Computing requirements

Students will be able to run and work with most of the course material on their own computers. The students will be able to complete the two project assignments using any s/w they may prefer

## Grading

Students will be graded on their performance in two project assignments. More precisely, the grading is divided as follows:

- In class participation and effective presentation of projects' results will count towards 20% of the grade.
- The first project assignment will be announced during the third unit and will count for 40% towards the final grade.
- The second assignment will be announced during the seventh unit and will count for the remaining 40% of the final grade.

## Project Assignments

Late assignments will either not be accepted or will incur a grade penalty unless due to documented serious illness or family emergency. Exceptions to this policy for reasons of civic obligations will only be made available when the assignment cannot reasonably be completed prior to the due date. The students should make suitable arrangements, and give notice for late submission in advance.

## Participation

In-class contribution is an important part of our shared learning experience. Your active participation helps us to evaluate your overall performance. Please arrive to class on time and stay to the end of the class period. Chronically arriving late or leaving class early is unprofessional and disruptive to the entire class. Turn off all electronic devices prior to the start of class. Cell phones tablets and other electronic devices are a distraction to everyone. In lectures you need to use laptop you will be informed to do so.

## Attendance Requirements

Class attendance is essential to succeed in this course and is part of your grade. An excused absence can only be granted in cases of serious illness or grave family emergencies and must be documented. Job interviews and incompatible travel plans are considered unexcused absences. Where possible, please notify the instructor in advance of an excused absence. Students are responsible for keeping up with the course material, including lectures, from the first day of this class, forward. It is the student's obligation to bring oneself up to date on any missed coursework.

## Code of Ethics

Students may not work together on individual graded assignments unless the instructor gives express permission. Exercise integrity in all aspects of one's academic work including, but not limited to, the preparation and completion of all other course requirements by not engaging in any method or means that provides an unfair advantage. In any case of doubt, students must be able to prove that they are the sole authors of their work by demonstrating their knowledge to the instructor.

Clearly acknowledge the work and efforts of others when submitting written work as one's own. Ideas, data, direct quotations (which should be designated with quotation marks), paraphrasing, creative expression, or any other incorporation of the work of others should

be fully referenced. No plagiarism of any sort will be tolerated. This includes any material found on the internet. Reuse of material found in question and answer forums, code repositories, other lecture sites, etc., is unacceptable. You may use online material to deepen your understanding of a concept, not for finding answers.

## **Course Syllabus**

The course comprises nine units of three hours each.

### **Unit 1: Introduction to Data Mining in CRM**

Introduction to Data Mining in Customer Relationship Management. Real Case Studies & examples for applying advanced analytics to different industries.

### **Units 2 & 3: Propensity Modeling for Business Applications**

Data management and detail methodology for effective propensity modeling in business applications such as cross/up selling and churn prediction. Evaluation techniques as well as deployment in real life applications.

### **Unit 4: Tips & Tricks for effective Propensity Modeling**

Tips and tricks for propensity modeling & demonstration of a real example using IBM SPSS Modeler. Comparison of different technics by mentioning pros & cons of each category (logistic regression, classification trees, neural networks).

### **Unit 5: Presentations of 1st Assignment on Propensity Modeling**

Students will present the results of the 1st assignment on propensity modeling in Power Point slides explaining not only the analytical findings but also ideas for utilizing the results into real life business.

### **Units 6 & 7: Segmentation types & Methodologies used**

Different types of segmentation used in business such as value based segmentation and behavioral segmentation. Data management and detail methodology for effective segmentation using factor analysis & cluster analysis.

### **Unit 8: Tip & Tricks for effective Customer Segmentation**

Tips and tricks for segmentation & demonstration of a real example using IBM SPSS Modeler. Profiling & delivery segments.

### **Unit 9: Presentations of 2nd Assignment on Customer Segmentation**

Students will present the results of the 2nd assignment on customer segmentation in Power Point slides explaining not only the analytical findings but also ideas for utilizing the results into real life business.

### **Unit 10: Next Best Activity & Big Data Analytics**

Putting them all together for estimating the Next Best Activity per Customer. New Big Data applications in marketing such as: SNA, Text Mining & Geo-location marketing.