

Syllabus  
**Customer Analytics**  
(4 ECTS)

Dr. Alexander V. Krasnikov Loyola University of Chicago  
Aleksandr G. Rozhkov, [arozhkov@hse.ru](mailto:arozhkov@hse.ru), [www.hse.ru/staff/arozhkov](http://www.hse.ru/staff/arozhkov)  
Department of Strategic Marketing HSE

Approved by the Academic counsel of the program  
“Marketing and market analytics”  
Meeting Minute №1, dated 03.09 2019

## 1. Course Description

- **Pre-requisites:**

Mathematics  
Foundations of Marketing  
Probability and Statistics

No prior programming experience is required

- **Abstract**

In this course the students will study how to use data analytics to learn about customer needs and improve targeting individual consumers. The course will encourage students to apply scientific methods and models to predict and respond to customer choices. This is the key part of learning Big Data. The term Big Data is viewed in the broad sense as it relates to various aspects of the consumer behavior, which may be captured, measured, and transformed to the digital form.

Through applications of statistical models to the analysis of the real-world databases, the students will learn how firms may use customer data to serve customers better.

SAS is a programming and analytical environment that is widely used by industry professionals and has capabilities of advanced statistical modeling.

The course is based on the analytic process model that represents the complex analytic process as a sequence of steps starting with the problem identification, selection and preparing of the data sources, analyzing data and preparing report for the decision makers. This process model defines the structure of this course and also illustrates how the information can be used in the different business settings and for different business purposes.

## **2. Learning Objectives. Course goals and objectives**

Provide overview of major models used to classify and describe customers

Learn appropriate analytical methods for collecting, analyzing and interpreting numerical customer information and apply these inputs in business decision-making

Develop specific skills, competencies and points of view needed by analytics professionals in the field.

## **3. Learning Outcomes**

1. Learn appropriate analytical methods and models used in predicting customer responses

2. Learn methods to analyze unstructured textual customer data

3. Develop specific skills, competencies, and points of view needed by analytics professionals in the field.

## **4. Course Plan**

1. Intro to Course. Overview of Sakai.

2. Introduction to SAS-on-Demand.

3. Value-Driven Analytics Process

4. Types of Variables. Associations between Variables

5. SAS Practicum: Descriptive Stats, Association, Regression

6. CRM - Managing Customer Relationships for Profit

7. Experimentation in Marketing

8. STP - Segmentation, Targeting, and Positioning

9. Market Segmentation - Cluster Analysis

10. Prospecting & Targeting Right Customer - RFM

11. Lifts and Gains. Model Assessment I

12. Predicting Response with Logits

13. Predicting Customer Response with Neural Networks

14. Model Assessment II. Confusion Matrix.

15. Decision Trees and Ensemble Models

16. Predicting Customer Responses using Machine Learning

17. SAS Viya: Practicum for Supervised ML (Banking case)

18. Analysis of Unstructured Data. Textual Analytics.

19. Predicting Responses using Textual Analytics

20. Handling of personal customer data: legal and ethics dimensions

## **5. Reading List**

- **Required**

Articles and notes—Available via Sakai and the HSE Library e-resources.

- **Optional**

Delwiche, Lora D. and C. A. Winters. "SAS® Studio: A New Way to Program in SAS®." [Link](#) – supplemental reading to learn interface of SAS Studio.

Chapter 1, 2, 5 in Baesens, Bart. Analytics in a Big Data World: The Essential Guide to Data Science and Its Applications, John Wiley & Sons, 2014.

Chapters 8, 9, 11 in Abbott, Dean (2014). Applied Predictive Analytics: Principles and Techniques for the Professional Data Analyst, John Wiley & Sons.

Logit Regression| SAS Data Analysis Examples. Institute for Digital Research and Education [Link](#)

## 6. Grading System

Class grade course grade will be based on the following components:

Exam – 40%

Assignments (in-class and home) – 40%

Participation and Professionalism – 20%

**Please note: According HSE regulations the Exam is ‘blocking’, if the Exam is failed a student can not obtain a positive final grade.**

A brief description of each component follows. Specific details will be discussed in class.

### Assignments

The class includes the following assignments completed in class and at home, these date are subject to change and will be confirmed during the first class, September 11.

Topic	Assignment	Due date*
2	Register and access course at SAS on-demand site.	Sept 25
5	SAS practicum	Oct 07
10-11	RFM	Oct 28
13	Neural networks	Nov 06
15	Decision Trees	Nov 10
19	Text analysis	Nov 19

\* these dates are subject to change, updates will be provided via LMS and in class

These exercises are intended to give you hands-on experience working with analytical models and approaches introduced in class. The assignments (both home and in-class) will comprise 40% of your final grade. I will discuss submission requirements in class. Remember, completing these assignments will also help your participation grade and will help you develop the skills necessary to do well on exams and understanding value-driven approach to customer analytics. If the assignments submitted after due date, I

will deduct 10% of grade for each day after due date. Late submissions will not be accepted after solution are posted.

### **Participation**

To a large extent, learning in this class is related to your willingness to expose your insights and viewpoints to the critical judgment of your classmates. Thus, each one of you is expected to contribute to class discussions. This includes preparation for class by doing the assigned reading, thoroughly preparing any assigned problems, and presenting your opinions or summaries of material covered in class. The basis for class participation is quality, not quantity. Attendance is a necessary but not sufficient condition for participation. If you do not actively participate, you will receive a very low participation grade even if you attend every class. I will assign a participation grade after each class session using the following scale:

- 1. Detracted from discussion, arrived late, or left classroom early
- 0. Not present
- 1. Present, did not contribute
- 2. Average participation
- 3. Above average participation
- 4. Outstanding participation

I will average participation scores at the end of semester and assign grades based on the above scale.

### **7. Examination Type**

Exam assignment is an individual business case with a complimentary dataset. Student is expected to conduct the analysis, achieve certain quality of the analytical model and provide a short summary of the addressed problem, analytical tools selected and the results achieved.

### **8. Methods of Instruction**

This course will consist of brief lectures, guest speaker presentations, discussions and hands-on exercises in developing, implementing, and operation of analytical models.

As course progresses new and more sophisticated models will be introduced which build on materials from earlier sessions. As such missing classes will negatively affect performance in the course.

Students are encouraged to relate each case to the Analytics Process Model and different roles in the analytics teams (i.e. business expert, data scientist, software specialist, etc.)

**ALL** Online sessions will be complemented by offline discussions to ensure in-depth understanding of the material discussed and analytical and instrumental skills

development. During the discussion sessions instructor will be available to answer questions regarding the course, assignments or how to work with SAS.

## **9. Special Equipment and Software Support (if required)**

This course uses the following software:

- SAS Studio – this is the basic programming interface that uses SAS code  
Accessible online via SAS On Demand from BOTH Windows and Mac OS  
computes
- SAS Enterprise Miner - advanced analytics tool using task flow design  
Accessible online via SAS On Demand ONLY from Windows system computes
- Sakai – platform with course materials and grading
- Zoom – online teaching platform

All software products are provided by the course instructor and are available online free of charge. Access instructions are provided during the first session.

Class materials (Sakai) and online video (Zoom) are also available on tablets and smartphones in addition to desktops and laptops.

### **Class professionalism policies**

**Electronic Gadgets:** Please turn off all phones, email, and Internet connections, and anything that beeps, buzzes, or jingles prior to class. Also, do not electronically record (video or audio) class lectures or presentations without prior permission.

**Punctuality:** Please arrive on time. Arriving late (or leaving early) disturbs professor's concentration and distracts your classmates. In short, tardiness impairs the learning environment.

**Victuals:** Although drinking non-odoriferous beverages are fine, please no eating or nibbling during class. Breaks will be taken and snacks can be consumed at that time.

**Please note:** This class may occasionally deviate from the course outlined above. The instructor reserves the right to make changes as needed to the course syllabus.