Prof. Dr. Claudio Juan Tessone
Prof. Dr. René Algesheimer
Dr. Markus Meierer

Network Analytics I

Syllabus

Fall Semester 2016
Preamble

Welcome to the lecture “Network Analytics I” syllabus!

This course will take place in every fall semester. You’ll find all necessary information concerning the course within this syllabus. From time to time, updates will be communicated on the webpage of the Chair of Marketing and Market Research: http://www.business.uzh.ch/professorships-market-research.html.

We are very happy to welcome you to our lecture.

Enjoy this introduction.

All the best,
Claudio J. Tessone
René Algesheimer
Markus Meierer
QUICK OVERVIEW

Instructor:
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Teaching Assistants:
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Radu Tanase
E-mail: radu.tanase@business.uzh.ch

Type:
Lecture

Target Audience:
This course is acknowledged for MA students and is assigned to the „Wahlpflichtbereich” BWL 4.

Frequency:
Each fall Semester

AP (ECTS):
3

Work load statement:

<table>
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<tr>
<th>Part</th>
<th>Workload</th>
<th>Total Time</th>
<th>ECTS</th>
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<tbody>
<tr>
<td>Course attendance</td>
<td>6 lectures à 180mins</td>
<td>18h</td>
<td></td>
</tr>
<tr>
<td>Lecture preparation</td>
<td></td>
<td>36h</td>
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<tr>
<td>Literature study</td>
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<td>32h</td>
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<td>Assignment</td>
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<td>4h</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>90h</strong></td>
<td><strong>3</strong></td>
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Content:
Practical understanding, application, interpreting and documenting of advanced network science methods using R.

Language:
English
Prerequisites:
Fundamental courses in statistics (e.g. Empirical Method MOEC0021). Solid R programming skills (or the willingness to develop the knowledge PRIOR to the lecture) are a necessary requirement. The required skills are on par with the contents of e.g. the following online courses:

http://tryr.codeschool.com

Access:
Join our course and make up you mind if you want to participate. Then officially register using the Buchungstool at the University of Zurich.

Grading:
Active participation, assignments given in class, multiple choice tests, peer evaluation.

Dates:
Lectures: 25/10/2016, 16:30 - 20:00

Location:
15/11/2016: Room 2.06, Andreasstrasse 15, 8050 Zurich.
The rest: Room 3.46, Andreasstrasse 15, 8050 Zurich.

Further information:
www.market-research.uzh.ch
Before you come to our class, please visit http://cran.r-project.org as well as http://www.rstudio.com and take care that you have successfully installed R on your personal laptop.

Registration:
Don’t forget to officially register using the registration tools at the University of Zurich.

Note:
This information in the syllabus supports the official information in the electronic university calendar (VVZ – Vorlesungsverzeichnis). In cases of doubt, the official information at the VVZ is valid.
1. **Introduction and Objective**

The goal of the course is to provide MA students with an introduction to applied network science in marketing. This course is grounded in theory and applied towards practice. Students will learn how to use available tools for collecting, visualizing, analyzing and interpreting network data as well as designing network experiments. The course mainly deals with consumer networks, but intra-organizational and inter-organizational networks are also discussed. For students who are interested in quantitative methods, this lecture will provide an overview and the basic understanding of the main research methodologies associated with network science in marketing. Topics typically falling under this umbrella include: social structure, social influence, contagion, diffusion, social capital, or collective action. A learning-by-doing approach is strongly encouraged.

In general, this course should (a) give students an overview of network science in marketing. In particular, it should (b) introduce students to the tools that are typically used in network science in marketing; (c) develop students’ abilities to identify, apply and evaluate various network analysis methods, and (d) develop students’ skills in designing experiments, gathering information, visualizing complex networks, drawing conclusions from data sets, and presenting the materials.

2. **Course Material**

**Material Offered**

Students have access to our web-based e-learning platform on OLAT to download the slides presented in class, participate in self-learning modules, find relevant material, datasets and literature, discuss with your classmates the latest topic in class and much more thus benefiting from complementary information available online and in the library.

A system of different learning abilities has been developed. The following procedure is strongly recommended as preparation for the classes.

**Overview of classes**

On the webpage an overview of all classes given by our team can be found. Develop an idea of the classes and how they best fit into your personal agenda. Keep in mind that network analytics classes are only offered once a year. It is also necessary to have successfully completed the prior course to proceed with the following.

**Syllabus**

For each course, a detailed syllabus exists with all details concerning that specific course. This is your guideline for the class and a MUST read. You’ll find everything in here concerning the grading of the course, the agenda, the planned topics, the workload, readings and much more...

The main materials used in this course are:

**The Slides**

The slides presented and discussed in class are available in a digital format. You can download the slides to each class. The slides don’t completely cover the entire syllabus, therefore it is necessary to participate in the class. All slides will be distributed after each module.
All our slides follow our detailed standardized slide format. All presentations in the classroom also have to follow this format.

The Reading List

The reading list is split into three categories depending on your time and involvement in the class. REQUIRED readings are necessary readings before each class and prepare you for the actual content. RECOMMENDED readings are articles that go into more details and widen your knowledge. FOLLOW-UP readings will help you to draw together your newly acquired knowledge of the content or solve some troubles if you are in the middle of your own practical work. EXEMPLARY articles apply the learned knowledge within different marketing areas and allow you to establish utilization of the learned methods.

Additional Materials

The academic and professional papers published online or in journals can also be used by students to obtain additional information. The following journals are reputable and are therefore strongly recommended to the students:

Marketing journals:
- Marketing Science
- Journal of Marketing Research
- Journal of Marketing
- Journal of Consumer Research
- Quantitative Marketing and Economics
- International Journal of Research in Marketing
- Journal of the Academy of Marketing Science
- Journal of Interactive Marketing
- Journal of Service Research
- Journal of Product and Innovation Management
- Harvard Business Review
- Sloan Management Review
- McKinsey Quarterly

Network journals:
- Social Networks
- Network Science
- Journal of Complex Networks
- Physical Review
- Physical Review Letters
- Proceedings of the National Academy of Sciences
3. Course Contents

Required readings:

Recommended readings:

4. Application Procedure

Please enroll to the course using the usual UZH planning tools.

5. Evaluation

The time of the exams is over. Why? Because I believe that learning for an exam is inefficient. Rather I would like to motivate you to learn for life. So, how does your grading take place? The course consists of the following formal assessment opportunities.

5.1 Contributions to the Multiple Choice Questions

Each day, a set of multiple choice questions (MCQ) will be handed out based on last day’s class content. You will have fifteen minutes to solve the MCQs.

5.2 Individual Participation in class and in exercise session

Credits are awarded for thoughtful and active participation in class and in exercise discussions throughout the course. Credits will be given for knowledge of readings, cogent articulation of arguments and comments, and contribution to case discussion. Participation will be evaluated for quality as well as consistency. Attending the class and the exercises regularly and on time is an indication of professionalism and will also improve your participation grade.

We strongly recommend that you participate in all exercises, do the readings and follow our instructions. The conduct of this course is based on student inquiry, experience, opinion and reflection related to the readings and other assignments.

5.3 Assignment

Students will form groups and will solve a topic during the last day of the course.

6. Academic Fraud

The Honor Code of the University of Zurich applies to all work in this course, and will be strictly enforced. The intent of the Honor Code in this course is to ensure that each student claims and receives credits for his/her own efforts. Violations to this are considered academic fraud.

Definition

Academic fraud is an act by a student, which may result in a false academic evaluation of that student or of another student.
All documents you will hand-in are going to be checked by software and manually for plagiates. Documents with a score above 10% are going to be intensively validated and in suspicious cases we hand-out penalties for fraud behavior.
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<th>Day</th>
<th>Time</th>
<th>Unit</th>
<th>Topic</th>
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<tr>
<td>1</td>
<td>16:30 - 17:00</td>
<td>Introduction</td>
<td>Lecture 1: Structure of network data</td>
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<td>17:00 - 17:45</td>
<td>Lecture 1</td>
<td>Lecture 2: Measures and matrices</td>
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<td>17:45 - 18:00</td>
<td>Break 1</td>
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<td>18:00 - 18:45</td>
<td>Lecture 2</td>
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<td>18:45 - 19:00</td>
<td>Break 2</td>
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<td>19:00 - 20:00</td>
<td>Exercise on lecture 1 &amp; 2</td>
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<td>Recommended reading</td>
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<td>Barabasi, Network Science, Chapter 2</td>
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<td>Jackson, Social and Economic Networks, Chapter 2</td>
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<td>Newman, Networks. An Introduction, Chapter 8</td>
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<th>Time</th>
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<th>Topic</th>
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<tbody>
<tr>
<td>16:30 - 16:45</td>
<td>Multiple choice test on lecture 1 &amp; 2</td>
<td>Lecture 3: Global properties of networks</td>
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<td>16:45 - 17:30</td>
<td>Lecture 3</td>
<td>Lecture 4: Network visualization</td>
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<td>17:30 - 17:45</td>
<td>Break 1</td>
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<td>17:45 - 18:30</td>
<td>Lecture 4</td>
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<td>18:30 - 18:45</td>
<td>Break 2</td>
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<td>18:45 - 19:30</td>
<td>Exercise on lecture 3 &amp; 4</td>
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<td>Recommended reading</td>
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<td>Newman, Networks. An Introduction, Chapter 7</td>
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<td>3</td>
<td>16:30 - 16:45</td>
<td>Multiple choice test on lecture 3 &amp; 4</td>
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<td>16:45 - 17:30</td>
<td>Lecture 5</td>
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<td>17:30 - 17:45</td>
<td>Break 1</td>
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<td>17:45 - 18:30</td>
<td>Lecture 6</td>
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<td>18:30 - 18:45</td>
<td>Break 2</td>
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<td>18:45 - 19:30</td>
<td>Exercise on lecture 5 &amp; 6</td>
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<td></td>
<td>16:30 - 16:45</td>
<td>Multiple choice test on lecture 5 &amp; 6</td>
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<td>16:45 - 17:30</td>
<td>Lecture 7</td>
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<td>17:30 - 17:45</td>
<td>Break 1</td>
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<td>17:45 - 18:30</td>
<td>Lecture 8</td>
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<td>18:30 - 18:45</td>
<td>Break 2</td>
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<td></td>
<td>18:45 - 19:30</td>
<td>Exercise on lecture 7 &amp; 8</td>
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**Recommended reading**
- Newman, Networks: An Introduction, Chapter 10
- Jackson, Social and Economic Networks, Chapter 13
- Barabasi, Network Science, Chapter 3 to 6
- Jackson, Social and Economic Networks, Chapter 4 & 5
- Newman, Networks: An Introduction, Chapter 12 to 15
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<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Unit</th>
<th>Topic</th>
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</table>
| 5   | 16:30 - 16:45 | 16:45 - 17:30 | 17:30 - 17:45 | 17:45 - 18:30 | 18:30 - 18:45 | 18:45 - 19:30 | **Multiple choice test on lecture 7 & 8**<br>**Lecture 9**<br>**Break 1**<br>**Exercise on lecture 9**<br>**Break 2**<br>**Lecture 10** | **Lecture 9: Link prediction**<br>**Lecture 10: Social theories**

**Recommended reading**
- Jackson, Social and Economic Networks, Chapter 7
- Newman, Networks, An Introduction, Chapter 6

| 6   | 16:30 - 16:45 | 16:45 - 17:30 | 17:30 - 17:45 | 17:45 - 18:30 | 18:30 - 18:45 | 18:45 - 19:30 | **Multiple choice test on lecture 9 & 10**<br>**Exercise on all lecture I**<br>**Break 1**<br>**Exercise on all lecture II**<br>**Break 2**<br>**Wrap-up of all lectures** |
7. Administrative Comments

7.1 Students with disabilities

Any student with a documented disability needing academic adjustment or accommodations is requested to speak with me during the first two days of class. All discussion will remain confidential. Students with disabilities will need to also contact the directors of the school.

7.2 Getting in contact with me

Emails should be short and to the point. I don’t have time to read novels and to search for the point. Before sending an email, make clear that email is the appropriate instrument for your task. Maybe a telephone call is much easier and more personal. Or just ask me in class.

7.3 Registration cards

Right in the beginning of the class you will receive a Word file that we ask you to fill-out. In this file we ask you to add a personal picture and personal address information. Each information is kept confidential and is only accessible to our team. The reasons for doing this are 1) we would like to learn your names by pictures, 2) we use pictures later on if you ask reference letters to better remind ourselves, and 3) we need your contact information for the administration. Delivering these files if of course voluntary. However, we would highly appreciate your cooperation on this. Many thanks in advance.

7.4 Name cards

Please use name cards regularly in class throughout the term so I can learn your names. I usually have large numbers of students across my class, so this will make it easier for me. If you don’t use name cards, I assume you do not care if I know who you are.

7.5 Sound-emitting devices

It is expected that you turn off/mute all devices that emit sounds and noises that may interrupt the class (e.g., mobile phones, pagers, watch alarms). If an occasion arises in which you may need to receive a telephone call, please inform me before the class. If you leave a class to answer a call or pager without previously notifying me, you will not be allowed to return to class.

7.6 Laptops and calculators

Laptops and programmable calculators are allowed in class if you are asked for them and as far as their usage supports the individual learning process.

We are very much looking forward to meeting you in class!

Enjoy!