MSc in Analytics: Spring 2017

Course Syllabus

***RESEARCH DESIGN FOR BUSINESS APPLICATIONS***

MSCA 31001

SATURDAY 9:00 am – Noon.

April 1, 2017 – June 3, 2017

Gleacher Center Room x

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**COURSE DESCRIPTION**

In addition to theory and experimentation, big data analytics has now emerged as an alternative way to discover new knowledge. This course covers the analytics research process from the translation of business problems into researchable questions that can be addressed by using analytics, development of data sources to address each key researchable issue, to the initial translation of research results back to business implications. By completing the course, students will be able to: frame a business problem, map alternative solutions, and communicate the plan back to a non-technical manager; identify potential sources or relevant data, explain the pros and cons of the selected methodology to the analytical team as well as non-analysts; understand analytical principles that can be applied to design data-gathering experiments. Students will develop a research proposal to produce knowledge from data to address a real business problem in small steps throughout the course.

**BOOKS:**

**Textbook:**

**Sreejesh, S., Mohapatra, S., and Anusree, R.R. (2014). Business Research Methods: An Applied Orientation. Springer: Switzerland (Library Course Reserve).**

Sue Greener. *Business Research Methods*. Free online book at <http://www.ftvs.cuni.cz/hendl/metodologie/introduction-to-research-methods.pdf>.

Ghauri, P. and GrØnhaug, K. (2010). Research Methods in Business Studies. 4th Edition. Pearson: England.

Provost, F. and Fawsett, T (2013). Data Science for Business: What You Need to Know about Data Mining and Data-analytic Thinking. O’Reily Media Inc.: Sebastopol CA.

Neuman, W. Lawrence (2011). Social Research Methods: Qualitative and Quantitative Approaches. Allyn & Bacon: Boston. (Library Course Reserve)

Journal Articles on Library Course Reserve at Chalk site.

**LEARNING OBJECTIVES**

After completing this course, students should be able to:

* Articulate a desired business state or solution.
* Formulate a research question that can be addressed by using analytics.
* Clarify the purpose of the research.
* Identify the data requirements and available data.
* Work with secondary data sources.
* Design studies to collect valid and reliable data.
* Develop a methodology to produce knowledge to achieve the desired state.
* Write a business research proposal.
* Communicate the research process to technical and non-technical audience.

**EVALUATION:**

Your course grade will be calculated as follows:

* 20% Class Participation and Engagement in Class
* 30% Weekly Assignments
* 10% Final Presentation
* 40% Final Project

GRADING SCALE

A = 93%–100%  
A- = 90%–92%   
B+ = 87%–89%   
B = 83%–86%

B- = 80%–82%

C+ = 77%–79%

C = 73%–76%

C- = 70%–72%

F = 0%–69%

**ATTANDANCE**

This course will meet once a week on Saturday from 9 AM – Noon. All course goals, session learning objectives, and assessments are supported through in class lecture, activities, and discussions. Your attendance is thus required and paramount to your success in this class. You are allowed to miss at most one session, provided that you make arrangements with the instructor in advance.

# FINAL PROJECT

Final project is an at most 10 pages (excluding appendices) research proposal to generate knowledge to address a real business problem. Note that, if the purpose of the project is to develop an algorithm to optimize a certain process, the algorithm is the knowledge the research process will produce.

The research proposal will be written by groups of at most three students. There will be peer evaluation of team members at the end of the quarter and the grades of free riding members will be discounted by at least 20%.

Teams are responsible for both, identifying a company with a business problem and resources needed to carry out the research process. Consult [MScA Community Site](file:///C:\Users\semabarlas\AppData\Local\Temp\uchicagoanalytics.org) to find problems submitted by MScA Industry Research Partners.

You will write the proposal throughout the course in several steps. The final project will put together all the sections you wrote from earlier sessions with a short literature review you will complete at the end of the course**. Therefore, it is important that you envision a solution early on to plan your proposal in a way that all sections are designed to produce that solution.** The goal of the project is to develop a coherent, concise, and realistic research proposal that, if carried out, will produce the desired knowledge. It is important that your decisions at each stage are substantiated on the basis of business context or requirements provided by the client and/or resources that are availablein your readings, presented in the earlier courses you have completed in the program, or identified through literature review. Put your detailed information (e.g., description of the dataset(s)) in an appendix and submit together with the written report.

In addition to a brief executive summary of the entire proposal at the beginning, the written report must have the sections listed below. It is important that you write each section in a way that information reader needs to understand the issues is provided either in that or the earlier sections. Also, assume that reader is not knowledgeable on the problem, the company, and the industry.

* Problem Statement: Description of the research problem. This section should also include a brief description of the current practice and business context, significance of the problem, causes of the problem, and a desired solution
* Research Purpose: Describes the knowledge your research aims to produce. You state the objectives of the research in this section
* Research Question: Specific question that would produce the desired knowledge as answer
* Hypotheses: Breaking of the research question into smaller steps (hypotheses) that collectively will produce the desired knowledge
* Data Requirements and Identification and Definition of Variables
* Methodology
* Expected Findings and Project Completion Plan
* References: List of sources you have consulted.

The final project will be graded out of 100 points. Make sure that your writing is clear and free of grammatical and spelling mistakes and that you use APA format for citations (5 points).

# WEEKLY ASSIGNMENTS

There are four assignments. Assignments add up to 100 points. Submit the assignments on or before the due date at the Chalk site for the course. Please name your assignment as the name of your team. For instance, the name for assignment 1 might be: Assignment1\_Team1. Each assignment has sections relevant for the final project. Sections in the assignments will be graded separately from the final project.

Please type your assignments.

**LATE WORK**

All assignments must be submitted to the Chalk site for the course on the due date before 11:59 pm. If you turn in an assignment late, 10% credit will be deducted from the total score for each day after the deadline. Assignments turned in more than one week late will not receive credit. In the case of unexpected events, you must contact the instructor before the assignment due date in order to receive a grace period. Students can only receive up to two grace periods in the course.

**REQUESTING REASONABLE ACCOMODATIONS**

If you are interested in requesting disability accommodations, you may want to begin by reading through the information published on this website <https://disabilities.uchicago.edu/>. Also, please do communicate your requests as soon as possible to Gregory Moorehead, director of disability services, at 773.702.7776 or gmoorehead@uchicago.edu.

**ACADEMIC HONESTY & PLAGIARISM**

It is contrary to justice, academic integrity, and to the spirit of intellectual inquiry to submit another’s statements or ideas of work as one's own. To do so is plagiarism or cheating, offenses punishable under the University's disciplinary system. Because these offenses undercut the distinctive moral and intellectual character of the University, we take them very seriously.

Proper acknowledgment of another's ideas, whether by direct quotation or paraphrase, is expected. In particular, if any written or electronic source is consulted and material is used from that source, directly or indirectly, the source should be identified by author, title, and page number, or by website and date accessed. Any doubts about what constitutes "use" should be addressed to the instructor.

**COURSE SCHEDULE**

***Important Note:*** Changes may occur to the syllabus at the instructor's discretion. When changes are made, students will be notified via email and in-class announcement.

**SESSION 1:**

Part 1: Overview of capstone – Sema Barlas

Introduction to the course - Anil Chaturvedi

Part 2: Problem statement – Anil Chaturvedi

Research Purpose – Sema Barlas

Readings: Sreejesh Chapters 1- 2. Bollen et al. - Twitter mood predicts the stock market.

**SESSION 2:**

Part 1: Business Problem Statement: Anil Chaturvedi

Part 2: Setting the general research methodology - Sema Barlas.

Discussion of the problem statement and research purpose: TeleHug Case Study: Anil Chaturvedi

Reading: Provost, Chapter 2. Sreejesh, Chapter 3.

**SESSION 3:**

Part 1: Formulation of the research question. Research Hypotheses – Anil Chaturvedi

Literature review – Sema Barlas.

Part 2: Selection of Research Methodology: Anil Chaturvedi

TeleHug: Case Study: Anil Chaturvedi

Reading: Sreejesh, Chapter 12. Neuman, Chapter 5

**SESSION 4:**

Part 1: Assessing data requirements**, i**dentification and definition of variables – Anil Chaturvedi

Part 2: Development of metrics, scaling, reliability, validity – Anil Chaturvedi

TeleHug: Case Study: Anil Chaturvedi

Reading: Sreejesh, Chapter 4-5. Peter, P.J. - Construct Validity: A Review of Basic Issues and Marketing Practices.

**SESSION 5:**

Part 1: Primary data collection techniques. Experimental design – Sema Barlas.

Part 2: Survey design. Sampling. Sample size – Sema Barlas.

TeleHug: Case Study Sample Size and Experimental Design: Anil Chaturvedi

Reading: 7. Neuman, Chapter 9. Gideon chapters 4(optional), 5, 6(optional)

**SESSION 6**

Part 1: Quantitative research methodologies – Anil Chaturvedi

TeleHug: Case Study: Anil Chaturvedi

Part 2: Working with secondary data sources – Anil Chaturvedi

Reading: Ghauri, Chapter7, Sreejesh Chapter 6. DatabaseList. Doc (Chalk>Course Material>Lectures)

**SESSION 7:**

Part 1: Qualitative research methodologies – Anil Chaturvedi

Part 2: Phenomenological research – Sema Barlas

Reading: Gideon chapters 4(optional), 5, 6(optional), 7. Neuman, Chapter 9.

**SESSION 8:**

Part 1: Data analysis, and modeling – Sema Barlas

Part 2: Model evaluation and validation – Anil Chaturvedi.

Reading: Ghauri, Chapter12

**SESSION 9:**

Part 1: Interpretation and communication of research and analysis findings – Sema Barlas

Part 2: Class discussion on the projects. Sema Barlas and Anil Chaturvedi

Reading: Provost, Chapter 5 and 7 and Sreejesh Chapter 12

**SESSION 10:**

Team presentations of the Final Capstone Project Proposal by each team. AND Final Capstone Project Proposal due.

**ASSIGNMENTS**

**Assignment 1 (7.5%):**

* Team members and the research topic
* Preliminary Problem statement
* Preliminary Research purpose
* **Due end of Session 3**

**Assignment 2: (7.5%)**

* Problem Statement
* Research purpose
* Preliminary Research question and hypotheses
* Preliminary Data collection techniques and experimental design (if necessary)
* Preliminary Data requirements and identification and definition of variables
* **Due end of Session 5**

**Assignment 3 (7.5%):**

* Problem Statement
* Research purpose
* Research question and hypotheses
* Data collection techniques and experimental design (if necessary)
* Data requirements and identification and definition of variables
* Preliminary quantitative methodology
* **Due end of Session 7**

**Assignment 4 (7.5%):**

* Problem Statement
* Research purpose
* Research question and hypotheses,
* Data collection techniques and experimental design (if necessary)
* Data requirements and identification and definition of variables
* Quantitative methodology
* Analysis, modeling, and model evaluation and validation
* Expected findings and project completion plan
* **Due end of Session 9**

**Final Capstone Project Proposal with Timelines, and Capstone Proposal Presentation**

* **Due end of Session 10**.