

**RSM2415**  
**Predictive Analytics for Effective Business Decisions**  
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**TARGET AUDIENCE**

The course is designed for students interested in analytics and data-driven decision-making techniques. "Analytics" (sometimes called "data science") is increasingly important in a variety of industries and functional areas. In this hands-on course students will be exposed to all aspects of predictive analytics, starting with data acquisition, preparation and transformation, proceeding to data modeling techniques, and then integrating these with decision analysis to support effective decision-making. The focus of the course will be on the practical uses of business analytics and on effective communication of results of analytical studies. The course will expose student to a variety of software, including Excel-based data handling and visualization techniques, Excle-based add-ons for statistics and data mining, as well as to SAS software – one of the workhorses of Predictive Analytics.

**COURSE MISSION**

1. Expose the students to the application of Predictive Analytics, "Data Mining" and decision analysis techniques for a variety of business decisions
2. Enable students to
  - a. Structure business decisions as "analytical" problems
  - b. Identify which data sources are needed to provide an answer
  - c. Structure the data for analysis by applying appropriate extraction and transformation techniques
  - d. Select and apply appropriate analytical tools
  - e. Communicate the findings effectively by using appropriate and effective visualization tools
3. Expose students to a variety of analytical approaches used in real-life business organizations

**COURSE SCOPE**

The course will be organized around the main steps in a typical Predictive Analytics project:

- From a business problem to a set of 'analytical" questions. This involves an in-depth understanding of the business issues at hand, translating these to a set of quantifiable questions and hypothesis, and identifying the key elements of the analytical study to be conducted (unit of the analysis, data to be measured, evaluation of results, implementation issues)
- Acquisition, cleaning and transformation of data
- Conducting preliminary exploratory analysis using descriptive tools, as well as data visualization and dimensionality reduction techniques
- Identifying and applying appropriate analytical models. Our main focus will be on Regression-type techniques, including multiple regression (for cross-sectional, time-series and panel-type studies), logistic regression, and related techniques. However, we will also be using "big data" tools such as clustering, regression trees, and machine learning
- Effective communication of analytical findings to business managers.

Our focus throughout the course will be on the managerial applications of analytics, rather than on the tools themselves. We will discuss applications of analytical techniques to business issues drawn from many functional areas, including marketing, operations, strategy, etc. We will also be focusing on the real-life uses of analytics in business. In the era of big (and growing) data,

this usually means tools that go beyond EXCEL. Thus a combination of Excel-based and SAS-based software tools will be used.

### REQUIRED RESOURCES

- Textbook: *Data Mining for Business Intelligence* by Shmueli, Patel and Bruce
- Case Package: additional cases and reading
- Readings posted on R-World Throughout the course

Software (Provisional list – may be adjusted)

- SAS Enterprise Guide (EG) software
  - SAS Institute will provide software licenses as well as training resources
- StatTools – the statistics component used in 1-st year Statistics course
- XL Miner
  - A powerful Excel add-on implementing a variety of advanced Data Mining algorithms and decision tools (license included with the text)

### COURSE FORMAT

Weekly sessions consisting of lectures, guest speakers, and student presentations.

### EVALUATION AND GRADE DISTRIBUTION (may be adjusted)

Component	Due Date	Weight
Class Participation (including presentations)	Ongoing	20%
Group case assignments	3 submissions	40%
Individual Case assignments	3 submissions	40%