

Module Outline: Business Analytics Finance Project

Code	MIS30090
Title	Business Analytics Finance Project
Credits	5 ECTS
Workload	The main phase of this course comprises a week of hands-on sessions in the Deloitte® Analytics Lab, where students will work in groups and individually, with lectures, practicals, and guest lectures. Over the following five weeks, during their internship, students will be required to monitor an investment portfolio and present their final project during the final week of the summer programme.
Description	<p>In order to obtain the best outcomes from investment strategies, firms need to make optimal use of business information systems for financial data, analyzing that data to make investment decisions. This course uses cases in financial decision making to frame (a) the role of a cutting-edge information system in the business process and (b) the use of large-scale financial data for decision-making using spreadsheet models.</p> <p>This course is based in the Deloitte Analytics Lab in UCD Quinn School of Business, where students will gain hands-on experience in training and use of the Bloomberg® financial information system.</p> <p>Student groups use the Bloomberg [TMSG] Trade Idea Messaging System to evaluate investment proposals and monitor their performance in a simulated context.</p>
Learning Outcomes	<p>On successful completion of this modules, students should be able to</p> <ul style="list-style-type: none"> • Propose and discuss key technologies and information systems used in the financial services investment industry; • Identify, collect, and critically evaluate relevant financial data from live sources in order to propose sustainable investment recommendations; • Use current financial data to prepare and analyse investment strategies using spreadsheet models.

Assessment Strategy	<p>100% continuous assessment. Five individual assignments:</p> <ol style="list-style-type: none"> 1. Preliminary survey (5%). 2. Quiz on introductory readings (10%: in class). 3. Students will use the built-in Bloomberg exam system to gain a Bloomberg Certificate. This exam is not available through standard computers: hence the opportunity to gain the certificate is a key advantage of access to the Bloomberg terminals. The certificate is widely recognized and sought after in recruitment in this sector (10%). 4. Understanding relationships between prices and fundamentals. Students will bring data from Bloomberg to Excel, and use analytics methods in Excel (25%). 5. Price histories in Bloomberg. Students will bring price histories from Bloomberg to Excel and use charting and time-series analysis to understand trends. They will use this data and the data of Assignment 4 to create an asset portfolio with high expected return and low risk, and enter this portfolio to the Bloomberg TMSG trading competition. Students will monitor their portfolios (asset prices, company announcements, overall portfolio performance) during the module. Finally, they will produce a short written report based on the portfolio with reference to news (50%).
Introductory readings	<p>Intro to Machine Learning (Smola and Vishwanathan): http://alex.smola.org/drafts/thebook.pdf (pp. 3--12 only).</p> <p>The efficient market hypothesis (see the video also): http://www.investopedia.com/terms/e/efficientmarkethypothesis.asp</p> <p>“Black swans”: http://www.nytimes.com/2007/04/22/books/chapters/0422-1st-tale.html? r=0</p> <p>Price bands: http://en.wikipedia.org/wiki/Price_channels</p> <p>Algorithmic trading: http://www.investopedia.com/terms/a/algorithmictrading.asp</p> <p>Out-of-sample: http://backtestingblog.com/glossary/out-of-sample-testing</p> <p>“Flash crashes”: http://money.cnn.com/2013/04/24/investing/twitter-flash-crash/index.html</p> <p>Correlation is not causation: http://www.businessweek.com/magazine/correlation-or-causation-12012011-gfx.html</p> <p>A cautionary tale about misuse of Excel: http://www.salon.com/2013/04/16/gops_go_to_economics_study_debunked_partner/</p>
Requirements	<p>Laptop running any version of Excel or equivalent free software. Excel 2010/2011 preferred.</p> <p>Audio headphones.</p>

Prerequisites	We will assume that students know a little about probability and statistics, eg mean, standard deviation, normal distribution, uniform distribution, and the basics of Excel.
Syllabus	<p>Introduction and admin details.</p> <p>Assets, equities, commodities. Price-earnings ratio. Returns. Risk. Sharpe ratios.</p> <p>Portfolio allocation. Correlation. Diversification. Reporting portfolio results.</p> <p>Search and optimization: finding the needle in a haystack. Linear programming.</p> <p>Modelling: predicting the future based on the past. Linear regression, time-series modelling, non-linear regression. Moving averages.</p> <p>Bloomberg terminal. Getting data from Bloomberg to Excel. Bloomberg University self-study videos and exams. Bloomberg TMSG trading competition.</p> <p>Algorithmic trading with genetic programming.</p>