IB9KW-15 Big Data Analytics

26/27

Department
Warwick Business School
Level
Taught Postgraduate Level
Module leader
Tobias Preis
Credit value
15
Module duration
9 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

This module will cover a wide range of cutting edge research in Big Data Analytics. The module has a particular focus on the extensive value of data from the internet, much of which is freely available if students have the skills to mine it.

This module involves learning to program in R, but no prior programming knowledge is required.

It also involves carrying out statistical analyses. Students joining should be confident with basic statistical concepts, including correlations and regressions, as well as basic concepts relating to time series, such as autocorrelation, trends and seasonality. The module's flexible project-based structure also caters for students who already possess more advanced knowledge of statistics.

This is a practical, skills-based module. Students will learn through completing the course assignments, as well as through lectures, seminars, lab sessions and associated exercises. Successful completion of the assignments will involve both programming and implementation of statistical analyses, and will require students to search for information in online resources, with support from the module team.

Module web page

Module aims

The module will enable students to engage with research topics including:

Linking stock market movements to online data

Measuring sentiment with online data

Predicting consumer behaviour with online data

Getting quicker measurements of key economic indicators with online data

Measuring where people are and where they are going with mobile phone data and online data

Predicting crime and epidemics

Understanding social networks

The module will also teach students the practical skills they need to work with online data. Students will learn:

How to mine data on Google searches

How to mine data on Wikipedia page views

How to mine data on online photographs

How to make data visualisations

How to design and execute a small data science project of their own

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Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

This is a practical, hands-on module. The sessions in this module are made up of workshops, lectures, and accompanying interactive online materials. Students will also learn through completing the course assignments.

The course will follow the structure below. Weeks are specified in module weeks, not term weeks.

Week 1

Welcome

What is big data?

Mining Google data

Week 2

Measuring and predicting behaviour with big data

Tips and tricks in R – 1

Correlations and regressions in R

Mining data from photos

Week 3

Big data and the stock markets

Tips and tricks in R – 2

ARIMA models in R

Mining Wikipedia data

Week 4

Big data, crime and conflict

Avoiding “false discoveries” in R

Introducing the assignments

Week 5

Big data and health

Visualisations in R

Tips and tricks for the assignments

Week 6

Big data and happiness

Visualisations and assignments

Week 7

Big data, mobility and disasters

How to write a paper

Final project

Week 8

Big data in the city

Project work

Week 9

Reflections on big data

Project work

Learning outcomes

By the end of the module, students should be able to:

- Demonstrate a comprehensive understanding of research methods and results in big data analytics and computational social science
- Understand and identify links between big data resources and real world events
- Evaluate research results and understand their practical business relevance in the real world
- Critically evaluate empirical research

Indicative reading list

Reading lists can be found in Talis

Specific reading list for the module

Research element

Research skills play a central role in professional data science careers. This module will therefore enable students to develop core research skills, which will also be of benefit for their dissertation and for any further research following this course. These skills include the identification of a question appropriate for a small research project, balancing the interest value of a chosen question with the feasibility of its implementation; and communication of technical research findings in an accessible fashion, both through report writing and data visualisation.

Students will also develop an awareness of a wide array of research findings in the area of data science, as well as the practical quantitative and computational skills required to implement a small data science research project.

Interdisciplinary

This is a strongly interdisciplinary module in the area of data science, aimed to help WBS students make the most of the growing career opportunities in this domain. It will enable students to acquire both practical data science skills and an overview of recent data science research findings, helping students better engage with data scientists trained in other disciplines, such as computer science and statistics.

International

Students on this module will learn about international developments in the field of data science, and will engage with material presented by a range of international experts.

Subject specific skills

Acquire, mine and preprocess large data sets using a range of methods to allow their subsequent

application to real world problems

Visualise extensive data sets, applying methods which both allow the visualisation consumer to ask their own questions, and methods which directly answer specific questions

Formulate hypotheses relating to large data sets and apply statistical methods for their evaluation

Transferable skills

Write in an academically appropriate way

Study

Study time

Type	Required
Lectures	9 sessions of 1 hour (6%)
Online learning (scheduled sessions)	(0%)
Other activity	18 hours (12%)
Private study	51 hours (34%)
Assessment	72 hours (48%)
Total	150 hours

Private study description

Private study to include preparation for lectures and own reading

Other activity description

9 x 2 hr weekly workshops, held F2F in computer labs

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A5

	Weighting	Study time	Eligible for self-certification
Assessment component			
Coursework Exercise	20%	14 hours	Yes (extension)
Reassessment component is the same			
Assessment component			
3000 word individual essay	80%	58 hours	Yes (extension)
Reassessment component is the same			

Feedback on assessment

Individual feedback on assessed project report via online coursework feedback system.

Availability

Courses

This module is Optional for:

- Year 1 of TIBS-N1F2 Postgraduate Taught Business with Consulting
- Year 1 of TIBS-N1F3 Postgraduate Taught Business with Marketing
- Year 1 of TIBS-N1QG Postgraduate Taught Business with Operations Management
- Year 1 of TIBS-N1F4 Postgraduate Taught International Business (MINT)
- TIBS-N2N3 Postgraduate Taught Management
    - Year 1 of N2N3 Management
    - Year 1 of N2N4 Management (Elite Sports Management)