MODULE SPECIFICATION KEY FACTS

Module name	Data Visualisation
Module code	**AF3206**
School	Bayes Business School
Department or equivalent	Undergraduate Programme
UK credits	15
ECTS	7.5
Level	**6**
Pre-requisites	**AF1204 Introduction to Data Science and AI Tools**

MODULE SUMMARY

In the digital era, we face humongous streams of information. Sometimes, the input we receive is not interesting enough to breach the defensive barriers that protect our attention — hence, we decide to pass over. Other times, what we are exposed to seems valuable, but we do not see any neat, meaningful pattern in it (that's the bottom line when it comes to crunching massive datasets!!). According to the popular idiom "one picture is worth a thousand words," all that messengers and audiences need to 'click is — frequently — just a simple, effective visualisation.

This module is a journey into the art and science of creating memorable charts that grab the audience's attention and successfully convey insights and narratives. Pleasant journeys require good companions: infographics — i.e., the field that investigates the representation of information, data, and knowledge — will offer the theoretical platform for the module; Python will make things happen (at least on our screen).

Aims

This module aims to equip students with the knowledge, skills, and abilities to generate and evaluate visual forms for appropriateness, context, and meaning.

Content outline

The topics covered may include:

- The data visualisation process
- Design principles and main visual forms
- Graphical perception and colours
- Interactive data visualisation (including animation and alive data querying)
- Visualizing geo-located data, with a focus on encoding geo-spatial data and cartographies
- Visualizing temporal data, narratives, and sequences
- Exploratory data visualisation with business intelligence software such as Power BI or Tableau

- Multidimensional data visualisation with business intelligence software such as Power BI or Tableau

WHAT WILL I BE EXPECTED TO ACHIEVE?

On successful completion of this module, you will be expected to be able to:

Knowledge

- Design and execute statistical charts with a particular emphasis on massive datasets.
- Design and execute multidimensional visualisations involving temporal and geo-spatial dimensions.
- Design and execute interactive visualisations.
- Express Evaluate the individual steps composing the data visualisation process.
- Appreciate Develop an understanding of the steps composing the data visualisation process.
- Generate and evaluate visual forms for appropriateness, context, and meaning.

Skills

- Appreciate Recognise the informational needs of a chart's target users.
- Implement data visualisation pipelines involving different types of data.
- Leverage Create visualisations using Python modules, namely, Matplotlib and Plotly, and specialized software such as Tableau and Tikz/PGF.

Values and attitudes:

- Organize your data visualisation tasks to achieve the target business objectives.
- Make Implement data visualisation tasks which are accessible to users and reproducible.
- Operate your data visualisation tasks professionally and ethically (with emphasis on diversity concerns regarding a visualisation's data, aesthetic features, and target audience).

HOW WILL I LEARN?

Overview

A variety of learning and teaching methods will be used in this module.

Lectures are used to introduce context, concepts and techniques illustrated with practical and current examples. You will also have the opportunity to participate in class discussions and work through examples and exercises with the support of the lecturer. It is strongly recommended that you attend all lectures.

In addition, there will be regularly scheduled computer labs. The latter are intended to demonstrate the use of technology for the practical implementation of the material covered during the lectures using observational data. The module is highly participative. You are also expected to devote an equivalent amount of learning time through individual and group study on a weekly basis.

Key learning and teaching resources will be put on the module website on Moodle.

Self-directed learning hours are for independent study and account for the minimum amount of time you should spend studying independently. For example, carrying out subject research, practicing and reflecting on techniques learned in class, reading widely around the subject to develop a deeper understanding, carrying out activities using the VLE, attending induction and career development workshops, working in groups to complete assignments and presentations, and completing individual assignments and other homework.

Teaching pattern table

Teaching Topic	Teaching type	Contact hours (scheduled)	Self-directed study hours (independent)	Placement hours	Total student learning hours
Analytics	Lecture	20	110	0	130
Analytics	Tutorial	10	10	0	20
Totals:		30	120	0	150

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessments

The assessment is coursework only and consists of an individual assessment and a group project assessment. each worth 50%.. Each Moodle submission will be up to 10 pages in length and include the relevant visualisations, analysis and accompanying explanations and recommendations, but there may also be an electronic companion that includes miscellaneous analyses, code, data pipeline, etc.

For the individual coursework students will carry out an exploratory data analysis project on the dataset of their choice

For the group courseweork students will work in groups to address a concrete business analytics problem by using data visualization notions, models, and tools

Assessment pattern table

Assessment component	Assessment type	Weighting	Minimum qualifying mark	Pass/Fail?
Individual coursework	Written assignment, including essay	50	0%	N/A
Group project	Project output (other than dissertation)	50	0%	N/A

Assessment criteria

Assessment criteria are descriptions of the skills, knowledge or attributes you need to demonstrate in order to complete an assessment successfully and Grade-Related Criteria are descriptions of the skills, knowledge or attributes you need to demonstrate to achieve a certain

grade or mark in an assessment. Assessment Criteria and Grade-Related Criteria for module assessments will be made available to you prior to an assessment taking place. More information will be available in the UG Assessment Handbook and from the module leader.

Feedback on assessment

Feedback is provided in a number of ways throughout your module. This includes feedback you receive during teaching from both peers and lecturers and that provided for formative assessment.

Following summative assessment, you will be given your marks and feedback in line with the assessment regulations and policy. More information on the timing and type of feedback that will be provided for each assessment will be available from the module leader.

Assessment Regulations

The Pass mark for the module is 40%. Any minimum qualifying marks for specific assessments are listed in the table above. The weighting of the different components can also be found above. The Programme Specification contains information on what happens if you fail an assessment component or the module.

Assessment-and-Feedback-Policy...pdf (city.ac.uk)

INDICATIVE READING LIST

- Tufte, Edward R. “The Visual Display of Quantitative Information”(Second Edition). Cheshire, CT: Graphics Press, 2001.
- Tufte, Edward R. “Envisioning Information.” Cheshire, CT: Graphics Press, 1990.
- Cairo, Alberto. “The Functional Art: An Introduction to Information Graphics and Visualisation.” New Riders, 2012

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APPENDIX

Please complete the following table which is required for correct set up on SITS, and for external reporting. Further information on the HESA cost centres is available using the link. Guidance is also available in the Quality Manual.

Codes

HESA Cost Centre	Description	Price group

133	Business and Management Studies	D
HECOS Code	**Description**	**Percentage (%)**
100079	The study of organisations and the environment in which they operate	75%
100107	The study of financial systems, regulations and reporting	25%