

# Units in Data Analytics (YEAR 3)

*Offered by the department of Social Statistics.*



## Why take our units?

The world needs critical data consumers and producers now more than ever. The department of Social Statistics offers units that give you the opportunity to develop data analytic and statistical skills and gain hands on experience in analysing data with a variety of statistical software. Whatever your degree subject, whatever your career ambitions, acquiring critical data skills will make you a highly valued prospective employee upon graduating. Our units emphasise the application of statistics and data analytics methods to real world problems, making them relevant and exciting as well as useful. We offer options that will suit a range of needs and previous experience. Whether you are a student looking for more advanced training in data analytics or statistics or someone who did not have a positive experience of maths at school and is looking for a more basic introduction, there is something for you

**SOST20131/30031 Answering Research Questions Using Statistical Models (20 credits)** The module introduces the concepts, theory and application of two important statistical modelling techniques in social science: multiple regression and logistic regression. It is a course which combines theory with practical application. It explain how linear and logistic regression may be used to test hypotheses. The course includes training in the use of statistical software to carry out such analyses on survey data and considers issues relating to the substantive interpretation of the results, drawing on examples of the use of linear and logistic regression in the literature

**SOST30062 Data Science Modelling (20 credits)** The course unit gives a hands-on introduction to key core Data Science models. Students will gain sufficient knowledge about machine learning algorithms for prediction and classification tasks to be able to apply these methods in their own field. These methods can be applied to problems ranging from sentiment analysis and image recognition, to classification of clients and prediction of phenomena in crime, economics, politics or society. The course content will be presented and practiced from a problem-oriented perspective using applications from various areas of the social sciences.

**SOST30172 Quantitative Evaluation of Policies, Interventions and Experiments (20 credits)** When trying to make sense of the world, people are generally motivated by causal questions. Researchers, policy takers, business leaders and people in general want to know what would happen to a person or a group of people when one changes their environment (through a new policy, innovation or intervention). In this course, we introduce the statistical language and methods of causal inference. You will learn Rubin's Potential Outcomes framework, and how to use this framework to clarify what data can tell you about a causal effect of interest. You will learn various methods to estimate causal effects from observational and experimental data (including Randomized Experiments, Regular Assignments, Instrumental Variables and Stratification, Regression Discontinuity, Parametric Longitudinal methods and Partial Identification). Critically, you will be able to gain a deep understanding of the role that different assumptions play in determining what one can learn from data regarding causal questions

**SOST30012 Theory and Method in Demography (20 credits)** Set within the framework of the basic demographic equation (population change = births – deaths +/- net migration) the course unpacks the demographer's tool kit. We consider the derivation, use and interpretation of key measures used in the study of population structure and the components of population change (fertility, mortality and migration) concluding with a look at population projection. Throughout the course there is an emphasis on hands-on learning of demographic method with application using real data from UK and overseas. We consider how the study of demographic pattern and process relates to many of the great social policy challenges of the 21st Century

**SOST30022 Advanced Social Network Analysis (20 credits)** The basic premise of this course is that the social world is relational. We can not ignore that we are influenced by people we know, have met and respect; ideas and allegiances are formed and maintained in social settings and organisations; not all people have equal opportunities when it comes to finding a job; we communicate over networks, be they online or offline. In this course we aim to produce a detailed understanding of the web of social contacts that structure our daily life and society. The overarching goal of the course is to provide us with tools that bridge theories on the one hand, and what we can actually observe in observational and archival empirics on the other. Put another way, we aim to avail ourselves of approaches that permit us to test if our theoretical ideas about social interaction are supported by what people, organisations and countries actually do.

# New degree pathways in data analytics

The Department of Social Statistics and the School of Social Sciences now offer a range of **joint degree pathways** that allow students to combine the study of Data Analytics with a range of social science subjects including Economics, Politics, Sociology, Criminology Philosophy and Social Anthropology.

**Why a joint pathway with data analytics?** Our Data Analytics pathways are designed to emphasise the application of methods to real world issues and problems. By combining study of a social science subject like Politics or Sociology alongside training in data analytics you develop not only a theoretical understanding of your subject but the skills to explore the topics and questions that interest you with real data. It is a combination that will help you to understand your subject better as well as enabling you to conduct your own research more effectively in projects and dissertations.

## Our Pathways

### BA Economics (BAEcon) and Social Statistics\*

*\*to be restructured and renamed 'and **Data Analytics**' from 2021*

*Students take the following units in data analytics alongside units in Economics*

|        |   |
|--------|---|
| Year 1 | SOST10142 Applied Statistics  |
| Year 2 | SOST20022 Essentials of Survey Design<br>SOST20131 Answering Research Questions Using Statistical Models  |
| Year 3 | SOST30062 Data Science Modelling<br>SOST30172 Quantitative Evaluation of Policies, Interventions and Experiments<br><i>and at least one from:</i><br>SOST30022 Advanced Social Networks Analysis<br>SOST30012 Theory & Method in Demography |

### BA Social Sciences (BASS) Subject area\*\* and Quantitative Methods\*

*\*to be restructured and renamed 'and **Data Analytics**' from 2021*

*\*\*choose from Politics, Sociology, Criminology Philosophy and Soc Anthropology*

*Students take the following units in data analytics alongside units in their other subject*

|        |   |
|--------|---|
| Year 1 | SOST10021 Measuring Inequalities  |
| Year 2 | SOST20022 Essentials of Survey Design<br>SOST20142 Applied Statistics   |
| Year 3 | SOST30031 Answering Research Questions Using Statistical Models<br><i>and at least one from</i><br>SOST30062 Data Science Modelling<br>SOST30172 Quantitative Evaluation of Policies, Interventions and Experiments<br>SOST30022 Advanced Social Networks Analysis<br>SOST30012 Theory & Method in Demography |

### What do our students say?

*'I never thought maths was my strong suit but the BASS degree enabled me to blend statistics with sociology. I did a quantitative dissertation, on young people's sleep patterns, and I now work as an employment and skills data analyst in the Greater Manchester Combined Authority. My degree opened career options to me I never thought I'd have.'*

*'My internship with the Home Office helped me meet social researchers and data analysts and understand what those roles are, and how I could get into those jobs as a graduate. It's given me a lot more confidence career-wise'*

**Internships:** We have a strong track record in providing high quality paid internships with a wide range of prestigious organisations (from small local charities to government departments). These give students the opportunity to apply and further develop their data skills in a real-world data-driven research project, and develop professional networks.

**Data Analytics Student Network:** Involving all students on our pathways, the network will connect you to the data analytics community at the university and the many organisations we work with. It will offer opportunities to get involved and learn more about the ways you might apply your skills and interests in study and future careers

### More information? Contact..

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