

# GD905-10 Quantitative Approaches to Sustainable Development

**23/24**

**Department**

Global Sustainable Development

**Level**

Taught Postgraduate Level

**Module leader**

Marta Guerriero

**Credit value**

10

**Module duration**

10 weeks

**Assessment**

100% coursework

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

This module builds on the core module “Creating Knowledge for Change” and it aims at further exploring how quantitative research methods may create knowledge for change. With the use of case studies, real-world examples and data, students will learn to conduct advanced quantitative research, and to evaluate the scope, value and limitations of different quantitative approaches for knowledge generation. This module will be taught via a combination of lectures and computer-lab sessions. Hands-on practice in computer-lab seminars will allow students to develop skills in statistical analysis relevant to trans- and cross-disciplinary research. Students will critically engage with applied quantitative research, and gain a comprehensive understanding of the main issues arising from the use of quantitative methods. This will allow them to make informed and evidence-based decisions when designing research interventions that respond in nuanced, robust and imaginative ways to complex and systemic problems.

### Module aims

This module aims to:

- Endow students with advanced and critical knowledge of quantitative methods of research,

as well as theoretical principles and academic debates underpinning them.

- Provide students with practical experience of quantitative research and an ability to evaluate the scope, value and limitations of different quantitative approaches for knowledge generation.
- Critically evaluate the challenges arising when conducting advanced quantitative research.
- Engage with the most current evidenced-based and quantitative research, including impact evaluation studies.

## **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.

The following topics will be covered during the module. Each topic will be approached through case-studies and real-world applications/data:

- Data collection, manipulation and descriptive statistics
- Probability, inference and estimation
- Simple and multiple linear regression
- Causal inference, 'natural experiments' and randomised control trials
- Advanced quantitative methods, such as panel data and quasi-experimental methods
- Methodological and ethical challenges of quantitative research
- Big data in global sustainable development research

## **Learning outcomes**

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

- Develop and utilise advanced research skills in quantitative methods, including an ability to produce, manipulate and interpret quantitative data and research.
- Understand the challenges and issues associated with quantitative and evidence-based research methods.
- Provide intellectual leadership by challenging the assumptions and critically analysing the design and construction of quantitative research.
- Describe complex and technical issues in clear terms and communicate them effectively and succinctly.
- Appreciate the context in which quantitative methods can be applied to real-world data.

## **Indicative reading list**

Reading list to be refined according to case studies and examples used. General readings:

- Gorard, S. (2003). *Quantitative Methods in Social Science*. London: Continuum.
- Nardi, P.M. (2018). *Doing Survey Research: A Guide to Quantitative Methods*. Taylor & Francis Group.
- Ruane, J.M. (2016). *Introducing Social Research Methods: Essentials for Getting the Edge*, John Wiley & Sons, Incorporated.

- Gertler, P. et al (2016). *Impact Evaluation in Practice*, Washington: International Bank for Reconstruction and Development / The World Bank.
- White, H. and Raitzer, D.A. (2017). *Impact Evaluation of Development Interventions: A Practical Guide*. Asian Development Bank, Manila (Philippines).
- Bittmann, F. (2019). *Stata: A Really Short Introduction*, München; Wien: De Gruyter Oldenbourg.
- Pevalin, D. and Robson, K. (2009). *The Stata Survival Manual*. McGraw-Hill Education.
- Acock, A. (2018). *A Gentle Introduction to Stata*, 6th edition. College Station, Texas: Stata Press.
- Stockemer, D. (2019). *Quantitative Methods for the Social Sciences: A Practical Introduction with Examples in SPSS and Stata*, Springer International Publishing.
- Jones, B. (2019). *Avoiding Data Pitfalls: How to Steer Clear of Common Blunders When Working with Data and Presenting Analysis and Visualizations*. Hoboken, New Jersey: John Wiley & Sons.

## Research element

Healey & Jenkins (2009) propose that Research-led-teaching design should consider four discrete opportunities. This module has been designed to include four of these opportunities.

1. Research-led learning, where the module syllabus is developed from current research in relevant fields, being based on contemporary and seminal, peer reviewed and other high quality research literature.  
As such, all knowledge for student engagement will be consciously and specifically chosen for its merits in reference to broader academic understanding. This will include engagement with more general literature on evidence-based quantitative research methods, as well as case-studies and seminal quantitative research in sustainable development.
2. Research-tutored learning, where students engage actively in discussing high quality, contemporary and seminal research literature.  
This module will provide students with the opportunity to discuss and critically engage with quantitative research methods.
3. Research-orientated learning, where students are actively taught methodological understanding and skills for the independent creation of new knowledge.  
This module will provide students with the opportunity to gain practical experience of applying quantitative research methods to real-world data.
4. Research-based learning, where students use developing methodological skills to create original knowledge of their own.  
This module will provide students with the opportunity to carry out quantitative research for their research project.

## Interdisciplinary

Positive global transformations are widely recognised to require transdisciplinary approaches. This module has been designed according to our signature problem-based, response focused pedagogy, and as such will draw on a transdisciplinary knowledge in the design and delivery of learning opportunities.

Authentic assessment will require students to demonstrate transdisciplinary aptitude, applying statistical and econometric methods to real-world social, environmental, economic and policy problems.

Transdisciplinary aptitude will be explicitly embedded in relevant marking rubrics, as adapted from the standard university scale and descriptors.

## **International**

This is a module on the Master's in Global Sustainable Development which offers a transdisciplinary and international learning experience allowing students to achieve breadth and depth of knowledge. Specifically, this module will make use of international and real-world applications and case studies.

## **Subject specific skills**

Advanced Quantitative Methods Skills (including causal inference and impact evaluation). Ability to make informed decisions re. most appropriate research methods when starting a quantitative research project. Critical engagement with and practical experience of quantitative research methods.

## **Transferable skills**

Analytical skills

Critical and reflective skills

Data skills (including manipulation, visualisation, description and inference)

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## **Study**

### **Study time**

<b>Type</b>	<b>Required</b>
Practical classes	10 sessions of 2 hours (44%)
Private study	25 hours (56%)
Total	45 hours

### **Private study description**

Assigned readings and preparations for seminars.

## **Costs**

No further costs have been identified for this module.

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## Assessment

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

### Assessment group A1

	Weighting	Study time
Technical report	70%	35 hours
Carry out a small research project including some form of quantitative research using a real-world dataset. The submission will include a report and a short critical reflection evaluating rationale, scope, values and limitations of the chosen research approach.		
Class test	30%	20 hours
End-of-term class test.		

### Feedback on assessment

Feedback will be provided in writing for each piece of assessment. Complementary oral feedback will also be available during the tutor's office hours.

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## Availability

### Courses

This module is Option list A for:

- Year 1 of TIPA-LA9Z Postgraduate Taught Community, Engagement and Belonging (MASc)
- Year 1 of TGDA-L801 Postgraduate Taught Global Sustainable Development