

FP052-30 Inquiry and Research Skills for Mathematics

22/23

Department

Warwick Foundation Studies

Level

Foundation

Module leader

Credit value

30

Module duration

24 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

The IRS for Mathematics module aims to ensure that students develop the necessary competencies and skills to succeed in Mathematics, Economics, Computer Science and related courses in the United Kingdom. It will provide bespoke skills training and support for students aiming at progressing to an undergraduate degree in the United Kingdom. It will provide competency training in reflective and critical thinking, team-working, and raising the awareness of self to develop greater ability in learners to engage with academic debate and take responsibility to critically inquire and evaluate issues in Mathematics. The module aims to ensure that students become independent learners and researchers who are equipped to think for themselves and explicitly acknowledge, develop and apply a range of highly transferable skills to support both their progress to Undergraduate level study in the UK and beyond into employment.

[Module web page](#)

Module aims

1. To develop students independent learning skills and confidence through inquiry based learning
2. To Introduce students to, and raise their understanding of, university style of research within

Mathematics- including the language and methods used.

3. To develop students' research skills through undertaking a self-led, extended research project linked to Mathematics
4. To introduce students to a range of digital tools to support their Research Project
5. To develop a range of highly transferable skills throughout this module and raise awareness of their relevance and application

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.

1. What is research? learning about what research is and the information literacy skills that support research including asking relevant questions, evaluating sources, using data/ statistics, formulating search strategies, effective searching, reflection and developing coherent lines of argument.
2. Introduction to Problem Based learning – taking part in group based tasks in which students utilise, develop and practise research skills.
3. Research Project – students will be taught about different research methods, including quantitative methods and statistical analysis, use of excel, research ethics. They will propose, design, plan and carry out their own research study which involves the use of statistics leading to a presentation in which they will answer questions about their research.

Learning outcomes

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

- Analyse and evaluate research undertaken by others within the field, drawing comparisons with research done in Mathematics/ Economics/ Computer Science in other countries.
- Investigate and analyse academic debates that arise in Mathematics, Economics and Computer Science
- Engage effectively in reflective and critical thinking .
- Propose, design, manage and carry out an independent Mathematics based research project .
- Utilise relevant digital and information literacy skills as applicable to their chose Research Project.

Indicative reading list

Cottrell S (2008) *The Study Skills Handbook* (3rd edition) Palgrave Macmillan

Cottrell S (2011) *Critical Thinking Skills: Developing Effective Analysis and Argument* (2nd edition) Palgrave Macmillan

Cottrell S (2014) *Dissertations and project reports : a step by step guide* Palgrave MacMillan

Dane, C (2018) *Evaluating research : methodology for people who need to read research* (2nd edition) SAGE

Hackley C. (2003). *Doing Research Projects in Marketing, Management and Consumer Research*. Routledge.

Financial Times

Houston, K (2009). How to think like a Mathematician. Cambridge University Press

ONS Data sets

Probst D et al (2016) Concepts of proof in mathematics, philosophy, and computer science De Gruyter

[View reading list on Talis Aspire](#)

Research element

Culmination of the project is a research project.

Interdisciplinary

Using mathematical skills to analyse issues in Economics/ Computer Science where relevant

International

An assessment allows for students to look at research undertaken in Mathematics/ Economics/ Computer science globally.

Subject specific skills

- Information literacy skills - library skills, effective internet searching, use of databases.
- Using Excel
- Inquiry Skills - asking questions, seeking and analysing different answers, coming to your own conclusion
- Digital Skills development
- Group work skills
- Independent learning skills - planning, time management
- Research skills - e.g. analysing and writing about data, drawing a researched based conclusion.
- Reflective thinking/ writing

Transferable skills

- Information literacy skills - library skills, effective internet searching, use of databases.
- Inquiry Skills - asking questions, seeking and analysing different answers, coming to your own conclusion
- Group work skills
- Independent learning skills - planning, time management
- Research skills - e.g. how to undertake questionnaires, interviews
- Reflective thinking/ writing
- Critical thinking

Study

Study time

Type	Required
Seminars	72 sessions of 1 hour (34%)
Online learning (independent)	6 sessions of 45 minutes (2%)
Private study	133 hours 30 minutes (63%)
Total	210 hours

Private study description

Reading, practising of ideas taught in class. Preparation for seminars.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A3

	Weighting	Study time
Foundations of Research - online learning Selection of information literacy moodle modules and research ethics module.	10%	10 hours
Annotated Bibliography Annotated bibliography of key research, including global research, on the research topic area.	25%	20 hours
Research Project Logbook This is a sustained piece of work that captures planning, decision making and reflection of individual Research project	25%	20 hours
Academic Poster and Presentation of Research Project outcomes This assess involves the creation of an Academic Poster and the presentation of Research Project outcomes	40%	40 hours

Feedback on assessment

Written comments via tabula; tutorials for students who wish to have further guidance

Availability

Courses

This module is Core for:

- FIOE Warwick International Foundation Programme
 - Year 1 of FP18 Warwick International Foundation Programme - Computer Science
 - Year 1 of FP17 Warwick International Foundation Programme - Economics
 - Year 1 of FP16 Warwick International Foundation Programme - Mathematics and Statistics