

MD3A2-30 MD3A2-30 Integrated Science Research Project

21/22

Department

Warwick Medical School

Level

Undergraduate Level 3

Module leader

Anne Straube

Credit value

30

Module duration

30 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

The Year 3 research project is a key module, in which students bring together all the research and practical skills they have been taught in Year 1 and 2 laboratories and the tutorial program. Students select a project and have to produce a research seminar and a 10,000 word thesis.

Module aims

The aim of the module is to give students the opportunity to utilise the research and evaluation skills developed throughout years 1 and 2 in order to produce a substantial piece of research. • Students complete a seminar based on their research project aimed at an educated lay audience.

• Students complete a research project which includes:

A high quality scientific literature review of their chosen research field.

Critical appraisal of source material and statistical analysis

Construction of scientific arguments based on multiple sources

Production of a scientific abstract

Production of a discussion and conclusion which include evidence of independent thought and reasoning

Evidence of laboratory record keeping

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 students will conduct a research project in which they use an integrated science approach to address a specific research question. They will read relevant literature, acquire, analyse and interpret data and produce a thesis and oral presentation summarising their findings.

Learning outcomes

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

- Plan and engage in an independent and sustained investigation and evaluation of a chosen research topic
- Research and present an oral seminar presentation on the project topic
- Identify and appraise relevant scientific literature using on-line literature search engines, relate this to appropriate methodologies and draw appropriate conclusions
- Critically review relevant research papers
- Effectively construct scientific results and arguments, using multiple sources.
- Apply an integrated science approach to a research question drawing from tools of different disciplines to acquire, analyse and interpret research data.

Indicative reading list

Each project will focus on a different research question. Therefore, bibliography is not specified as it will depend on the topic and nature of the research project and will be guided by the allocated supervisor who will provide students with an appropriate list of reviews and original research manuscripts.

For general working in the lab we recommend reading:

At the Bench: A Laboratory Navigator, Updated Edition By Kathy Barker, The Institute for Systems Biology, Seattle © 2005 • 465 pp., illus., appendices, index ISBN 978-087969708-2

The Digital Cell: Cell Biology as a Data Science, by Stephen J Royle, Cold Spring Harbor Laboratory Press, 2019, 137 pp, Illustrated edition, ISBN 978-1621822783

Research element

Advanced laboratory techniques in microscopy, molecular biology & biochemistry to acquire data
Analysis of data, including quantitative image analysis and statistical analysis
Construction of scientific arguments based on multiple sources
Production of a scientific abstract, presentation of data, critical discussion and drawing conclusion
Keeping appropriate laboratory records

Interdisciplinary

Students will use tools from physics, mathematics and computer science to address a biological problem.

Subject specific skills

Critical appraisal of source material

Advanced laboratory techniques in microscopy, molecular biology & biochemistry to acquire data

Analysis of data, including quantitative image analysis and statistical analysis

Construction of scientific arguments based on multiple sources

Production of a scientific abstract, presentation of data, critical discussion and drawing conclusion

Keeping appropriate laboratory records

Transferable skills

Critical appraisal of source material

Self directed learning

Adult learning

Study

Study time

| Type | Required |
|---------------------|----------------------------|
| Project supervision | 20 sessions of 1 hour (7%) |
| Private study | 200 hours (67%) |
| Assessment | 80 hours (27%) |
| Total | 300 hours |

Private study description

Research project to be conducted in the supervisor's laboratory or at home (for literature reading, data analysis etc.)

Costs

| Category | Description | Funded by | Cost to student |
|-----------------------------|--------------------------------------|------------------|------------------------|
| Equipment and project costs | research consumables for the project | Department | £0.00 |

Assessment

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

Assessment group A

| | Weighting | Study time |
|---|------------------|-------------------|
| Research seminar | 20% | 20 hours |
| Students will present their project in the form of a research seminar | | |
| Thesis | 80% | 60 hours |
| Students write a 10,000 word thesis including an abstract, literature review, methodology., results, discussion and conclusions | | |

Feedback on assessment

Written feedback on thesis, verbal feedback from tutor and peers for oral presentation

Availability

Courses

This module is Core for:

- Year 3 of UMDA-CF10 Undergraduate Integrated Natural Sciences (MSci)