

Module Details	
Module Title	Research Skills for Postgraduate Students
Module Code	INC7022-C
Academic Year	2024/5
Credits	30
School	School of Pharmacy and Medical Sciences
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Lectures	4
Laboratories	20
Practical Classes or Workshops	36
Independent Study	240

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1
BDA	University of Bradford / Semester 3

Module Aims
<p>This module aims to provide students with the skills and experience needed to develop core skills for undertaking scientific research projects and understanding research outputs in the form of research articles and presentations. This includes developing student competency in basic laboratory actions (e.g., liquid handling, calculations), experiencing widely-used molecular biology and biochemical techniques, and developing the ability of students to critique the research literature via greater understanding of the strengths and weaknesses of a range of different laboratory assays. Students will also develop their scientific reading, writing, data handling, data interpretation, and critical analysis skills, as well as their communication skills as part of this module.</p>

Outline Syllabus

Practical laboratory sessions:

- Weighing and liquid handling skills session
- Aseptic technique demonstration
- Cell counting and viability session
- Quantitative PCR session
- Microscopy

Workshops

- Molarity and concentration calculations
- Scientific writing skills 1-4
- Library skills session
- How to read research papers
- Technique critique sessions 1-6
- Statistical analysis of data
- Portfolio support workshops
- Presentation skills
- Time management strategies
- Critical analysis
- Risk assessment

Lectures

- Introduction to health and safety and risk assessment
- Statistical analysis of data

Self-directed learning

- Biology and chemistry basic knowledge tests (formative)

Learning Outcomes

Outcome Number	Description
01	Demonstrate an understanding of the theory and principals of key experimental techniques and their application in pharmacological and biological sciences.
02	Demonstrate competency in laboratory calculations and statistical analysis of data.
03	Evaluate health and safety considerations required legally for experimentation
04	Demonstrate the ability to critically interpret research findings, using knowledge and information from the research literature.
05	Demonstrate effective communication of scientific research findings in written and verbal forms

Learning, Teaching and Assessment Strategy

The module will provide students with key training and skills development opportunities to prepare them for working in a research environment. Key basic laboratory skills will be introduced and developed via practical laboratory sessions and calculations workshops, and a lecture on risk assessment. Communication skills will be developed and consolidated via a series of writing workshops, data analysis, and presentation workshop sessions. These will also be supported by lectures on statistical analysis. General study skills such as time management, use of library resources, referencing, and academic misconduct training will also be covered in workshops sessions. To further develop student competency in critical analysis, there will be a series of workshops covering the key concepts of critical analysis, and specialist workshops on the strengths and weaknesses of different experimental approaches which are commonly used in biosciences research. Students will also undertake a self-directed formative quiz to understand their knowledge base in fundamental biology and chemistry to allow them to identify areas for improvement and development.

To assess these fundamental skills, students will write a short (4-pages) essay on the key background to their allocated research project, demonstrating their written communication and critical analysis skills. They will also deliver an oral presentation critiquing the experimental techniques used in a research paper they have been allocated by the teaching team (LO4, LO5), further demonstrating their critical analysis and also their verbal communication skills (LO1, LO4, LO5). Students will sit a closed book, laboratory calculations test (LO2), and submit their allocated research project COSHH and risk assessments (LO3). Finally, students will compile a portfolio where they will demonstrate their development of skills relating to risk assessment of laboratory processes (LO2), knowledge and competency in laboratory techniques (LO1), and reflection on their competency and development of the different skill sets embedded throughout the module. This activity will provide them with insights and actions to further develop their skills throughout the remainder of their studies.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Coursework - Written	Essay describing key background to their allocated research project. 4 pages max. including references and figures	20%
Summative	Presentation	15 minute presentation plus 5 of questions on validity of experimental approach of a given paper	10%
Summative	Coursework - Portfolio/e-portfolio	Laboratory portfolio including risk assessments, laboratory session write ups and reflective analysis	70%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.