



FINAL YEAR RESEARCH / CAPSTONE PROJECTS

The following guidance has been developed in collaboration with Dave Lewis (Senior Lecturer in Pharmacology & Ethics, University of Leeds) and a working group from the HUCBMS Executive Committee: Dr Sue Jones, Dr Linda Walsh, Prof Val Randall and Mr Alan Wainwright, Executive Head of Education at the Institute of Biomedical Science (IBMS) – May 2020

The current IBMS accreditation criteria state:

For BSc - *An honours level project based in biomedical science is an essential component of an Institute accredited degree programme. In accordance with the QAA Benchmarking criteria this must be an independent research-based project centred on data generation and interpretation.*

For MSc - *The research project will normally be laboratory based within a discipline of Biomedical Science. The project must have been executed successfully through independent research, centred on data generation, critical analysis and application of results.*

Pre-Covid, recognising that <10% of students go onto careers in research, the demand from students for alternative formats of final year research projects and resource constraints, many UK Bioscience Schools/Faculties were broadening their portfolio of formats of final year/capstone project offered in line with the substantially revised RSoB accreditation criteria:

https://www.rsb.org.uk/images/accreditation_home/RSB_Accreditation_Overall_Handbook.pdf

Impact of Covid- The implementation of these changes across the UK Biosciences is accelerating rapidly, with the increasing likelihood of Institutions having to deliver final year/capstone projects remotely or online in 2020-21, particularly in Semester 1.

Replacement of laboratory based opportunities with solely (critical) reviews of the literature is not acceptable for IBMS accredited programmes and is not attractive to students.

The School of Biomedical Sciences, University of Leeds currently offers 14 formats of Capstone project, developed by Dave Lewis and colleagues. Many of these project types could be delivered solely or principally online as detailed below:

A podcast describing these is available at:

<https://mymedia.leeds.ac.uk/Mediasite/Play/a3add1c5d3b34120ae9899c30bb67b6b1d>



The following Research Projects / Capstone Experiences also meet the IBMS accreditation criteria:

Laboratory-based: Currently most project students undertake a grant proposal as an extension exercise. Why not flip the concept? Lab students come up with a research question, design a study, test their hypothesis using simulations or re-analysis of existing data & when labs re-open, undertake a short proof of concept/pilot study.

Bioinformatics / Big data: Using bioinformatics tools to mine / interrogate (e.g. genomic) datasets. Analysis and interpretation of large publicly available (e.g. health, environment) or school/faculty research (e.g. neuronal recordings) data sets.

Computational modelling / Simulations: Investigate physiological, pharmacological or biochemical modulation of existing models or simulations of systems, organs or tissues (e.g. intact animals, heart, neurones). Could include the evaluation of the scientific accuracy, validity and educational benefits of simulations/models used for educational purposes or accuracy of automated data tracking/scoring systems (e.g. OptiMouse).

Systematic Reviews that must contain meta-analysis: a defined, systematic and comprehensive review of the literature, used a lot in clinical trials/health science but increasingly in animal experiments and education. Previous examples include: Pharmacotherapies for gestational diabetes; E-learning and other resources as replacements for face 2 face undergraduate practical classes in the Biosciences.

Surveys/Focus Groups: Any topic/area, of students, staff or the public. Previous topics included: public attitudes/knowledge of antimicrobial resistance; attitudes to the use of animals in education; interaction between developers, clinicians and patients in the development of Digital Health Apps (the latter was innovative in its use of twitter to engage participants in the first instance).

Educational Development: creation and evaluation of educational resources for use in undergraduate education. Ideal opportunity for student to re-purpose existing face 2 face practical into online version or create online problem solving or data handling/analysis exercise.

In addition to addressing the issue of capstone delivery during the current social distancing constraints, online or predominantly online capstones are more inclusive for students with caring or other responsibilities that prevent them from participating in long duration laboratory-based activities.



Some of the above formats can be delivered as team-based rather than individual projects, thereby providing a more real-world experience, the development of additional employability skills. Team-based projects are less resource intensive and also reduce the total number of projects required. However, each student must be able to evidence their own independent contribution to the project data generation and analysis.

A podcast describing these different types of project or capstone including the rationale is available at:

<https://mymedia.leeds.ac.uk/Mediasite/Play/a3add1c5d3b34120ae9899c30bb67b6b1d>

For more information on any of the links provided above, hints and tips for delivery, support for students or staff, email Dave Lewis (d.i.lewis@leeds.ac.uk) or Sue Jones (s.jones1@yorks.ac.uk)