



Maynooth University Department of Biology

4th Year Biotechnology
Handbook
2023-2024



Maynooth University Biology Department:

Aims of the department

To enhance students' knowledge and understanding of important concepts in the Biological Sciences and to develop their analytical, practical and communication skills and appreciation of environmental and other bioethical issues.

Our department's commitment to equality, diversity, and inclusion:



The Maynooth University Biology department is committed to equality, diversity and inclusion. We are proud to have been the first department in the University to receive an externally validated Athena Swan Bronze Department Award for our work toward promoting gender equality, diversity and inclusion within the Department of Biology.

Our goals in this area include supporting and advancing women's careers in Biology, promoting work-life balance in the department and address any gender equity or diversity issues within the department. We look forward to engaging with all members (students and staff) of the department as we implement our Gender Equality Action Plan. As part of this we will continue to seek input from the student population (through surveys and focus groups) and will endeavor to keep you informed of our progress in this area.

For more information on the Department of Biology's Gender Equality Action Plan, please see <https://www.maynoothuniversity.ie/biology/athena-swan> or contact:

Mark Robinson (Biology Athena SWAN Committee Chair): Mark.Robinson@mu.ie
Gavin Fanning (UG Committee Member)
Louis McCabe (UG Committee Member)
Kirti Achanta (UG Committee Member)

**Biology Department Athena SWAN Committee
September 2023**

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MAYNOOTH UNIVERSITY DEPARTMENT OF BIOLOGY
Information for Fourth Year Biotechnology Students 2023 - 2024

Please read this manual carefully and keep it safely so that you can refer to it during the year.

The staff extends a warm welcome back to all Fourth Years; we hope you will enjoy your final year with us and gain valuable skills and knowledge.

The fourth year programme in Biotechnology provides detailed discourse of modern biotechnological processes across a range of disciplines. In addition, a three-month industrial outplacement is incorporated both to provide the student with the skills required in the modern workplace and also to facilitate future career choice. Students will also undertake a literature review.

Assessment will be a combination of end of Semester examination of the theory component and continuous assessment of practical work. There will be 7 theory papers counting 70% of the final mark. Practical assessment (30%) will be based on literature review and industrial outplacement. The industrial outplacement will be assessed by both a written report and oral presentation. Expenses associated with the industrial outplacement will normally be the responsibility of the student.

Fourth Year Committee:

The members will be Dr Shirley O'Dea and 1 SU elected fourth year Biotechnology student. Problems and matters of interest will be discussed by the committee. If you have issues which you would like to be considered you should tell your representative.

DEPARTMENT OF BIOLOGY STAFF CONSULTATION TIMES

Teaching Staff	Phone ext*	Room	E-mail	Consultation Time
Prof. Paul Moynagh <i>Head of Department</i>	6105	B3.15	paul.moynagh@mu.ie	Monday 14.00-16.00
Dr. Özgür Bayram	6879	2.31	ozgur.bayram@mu.ie	Tuesday 11.00-13.00
Dr. Marion Butler	3856	B3.18	marion.butler@mu.ie	Monday 11.30-13.30
Dr. Jim Carolan	6367	2.29	james.carolan@mu.ie	Monday 11.00-14.00
Dr. Noreen Curran	3834	1.18	noreen.curran@mu.ie	Friday after lecture
Dr. John Devaney	7496	2.27	john.devaney@mu.ie	Wednesday 11.00 - 13.00
Dr. Tara Dirilgen	Teams	F2	tara.dirilgen@mu.ie	Thursday 14.00-16.00
Dr. Paul Dowling	6368	2.35	paul.dowling@mu.ie	Tuesday 11.00-13.00
Prof. Sean Doyle	3858	1.24**	sean.doyle@mu.ie	Tuesday 10.00-11.30
Prof. Karen English	6290	B3.17	karen.english@mu.ie	Monday 14.00-16.00
Dr. David Fitzpatrick	6844	1.26**	david.fitzpatrick@mu.ie	Monday 10.00-11.00
Dr. Emmanuelle Graciet	6255	B1.25	emmanuelle.graciet@mu.ie	Tuesday 10.00-12.00
Dr. Andy Hogan	6118	B2.16	andrew.e.hogan@mu.ie	Monday 11.00-12.00
Dr. Grace Hoysted	Teams	2.25	grace.hoysted@mu.ie	Tuesday 10.00-12.00
Prof. Kevin Kavanagh	3859	2.39	kevin.kavanagh@mu.ie	Mon & Wed 14.00-16.00
Dr. Lorna Lopez	Teams	2.36	lorna.lopez@mu.ie	Monday 10.00-11.30
Dr. Abigail Maher	6117	F6	abigail.maher@mu.ie	Tuesday 11.00-12.00
Prof. Bernard Mahon	3835	B2.15	bernard.mahon@mu.ie	Monday 09.00-11.00
Dr. Joanne Masterson	6369	B2.17	joanne.masterson@mu.ie	Monday 14.00-16.00
Dr. Eoin McNamee	6148	B2.19	eoin.n.mcnamee@mu.ie	Monday 10.00-11.30
Dr. Conor Meade	6386	2.34	conor.meade@mu.ie	Monday 12.00-13.00
Dr. Sinead Miggin	3855	B3.14	sinead.miggin@mu.ie	Tuesday 12.00-13.00
Dr. Dania Movia	Teams	F1	dania.movia@mu.ie	Friday 12.00-13.00
Dr. Jackie Nugent	3857	B1.23	jackie.nugent@mu.ie	Tuesday 10.00-12.00
Dr. Shirley O'Dea	6480	F7	shirley.odea@mu.ie	Monday 10.00-11.30
Dr. Diarmuid O'Maoileidigh	Teams	B3.08	diarmuid.s.omaileidigh@mu.ie	Monday 10.00-12.00
Prof. Kay Ohlendieck	3842	2.33	kay.ohlendieck@mu.ie	Monday 12.00-13.00
Dr. Rebecca Owens	3839	2.30	rebecca.owens@mu.ie	Wednesday 10.00-12.00
(Sem 1)				
Dr. Mark Robinson	3860	B1.21	mark.robinson@mu.ie	Wednesday 14.00-16.00
Dr. Martina Schroeder	6853	B2.18	martina.schroeder@mu.ie	Monday 10.00-11.00

*Phone prefix: (01) 708 except numbers in red which are prefixed by (01) 474...

**=Located on ground floor Callan Building; F=Located in Foyer, 1st floor Callan Building; B=Biosciences & Electronic Engineering Building

The times when staff are normally available for consultation are given above. Appointments for other times must be arranged with individual lecturers. Staff with Teams listed under Phone No. can be contacted via Microsoft Teams.

Administrative Offices 2.40, 2.41 open daily: 9.30am-12.30pm; 2.30-4.30pm e-mail: biology.department@mu.ie

Programme Coordinators:

OMNIBUS SCIENCE:

BIOTECHNOLOGY:

SCIENCE EDUCATION:

BIOLOGICAL & BIOMEDICAL SCIENCES:

BIOLOGICAL & GEOGRAPHICAL SCIENCES:

INTERNATIONAL COORDINATOR

MAP (MATURE AND ACCESS STUDENTS) ACADEMIC ADVISOR:

POSTGRADUATE COORDINATOR:

MSC IN IMMUNOLOGY & GLOBAL HEALTH:

Dr. Jackie Nugent

Dr. Shirley O'Dea

Dr. Jackie Nugent

Prof. Kevin Kavanagh

Dr. Conor Meade

Dr. Paul Dowling

Dr. Joanne Masterson

Dr. Martina Schroeder

Dr. Sinead Miggin

For urgent matters the Programme Coordinators and/or Head of Department may be contacted in their rooms at any time. Please contact biology.department@mu.ie to make an appointment.

Communication Guidelines for Students

This document is designed to clarify:

- how your lecturers and module coordinators will communicate with the class
- how your lecturers and module coordinators will communicate with individual students
- how students can best communicate with lecturing staff and with each other

1. General guidelines

- You should include your name and student number in all e-mail correspondence.
- Before emailing, you should always check that your question(s) has/have not already been answered in documents, posted on Moodle and Teams, or in a previous e-mail or module announcement.
- Regarding general questions on module content, you should seek to find module information on [Course Finder](#) first.
- Unless it is an emergency, you should seek to contact your lecturers and module coordinators during normal working hours and days.
- Staff members will do their best to answer new queries within 48 hours (during working days). Please allow at least 48 hours for a reply to your e-mail before contacting the same person or a different staff member in relation to the same query. If your query has already been answered in a previous e-mail or post, it may take longer to reply to your e-mail.

2. Class announcements by lecturers and module coordinators

Class announcements can be done using three platforms:

- E-mail communication to the class. We will **always** use your MU e-mail address.
- And/or Lecturers announcements on a specific module's Moodle page.
- And/or using the Chat function in a specific module page on Teams.

Class announcements can be used by your lecturers to send reminders, but also to answer queries received by e-mail from individual students, if the query is relevant to the whole class. In this case, you may not receive an individual reply to your original e-mail.

It is your responsibility to check e-mails regularly, Moodle and Teams as well. Each of these platforms have the option of sending notifications. We encourage you to turn on these automatic notifications.

A lecturer or module coordinator may not prioritize replying to your e-mail if the answer is already available to the class.

3. Lecturing staff communication with individual students

If a query received by e-mail does not regard the whole class, lecturing staff will do their best to answer the individual student in a timely manner (e.g. within a couple of days). While we are happy to help you study and ensure that we provide an environment that promotes learning, some queries are not acceptable and cannot be answered.

What queries are NOT acceptable?

- Asking for answers or corrections to previous exam questions. This query is not acceptable, because it is your work that is assessed and so your submissions need to reflect your own writing, ideas and thoughts.

- Asking for details of calculation, answers or corrections for lab write-ups before these are handed in. This query is not acceptable, because it is your work that needs to be assessed. Practical-related questions should be asked to demonstrators or lecturers during the lab sessions (in teaching labs or on Teams).
- Demonstrators should not be asked to provide details of calculations or to pre-correct your lab write-ups at any time. All questions to demonstrators should be asked during the lab sessions (online or in teaching labs).
- Asking for slides or lecture notes of a module that you are not registered for is not acceptable.

4. Communication among students in a class

Students in a class can use multiple 'official' platforms to communicate among themselves. We encourage these because they foster group work and mutual help. Posts and communications on different platforms (Moodle, Teams, e-mails) should be linked to the course/module and should be courteous and respectful at all times. Note that these platforms are accessible to the whole class, including lecturers.

Platforms available:

- Class discussion forum on a specific module's Moodle page
- Teams Chat on a specific module's Teams group

4th BIOTECHNOLOGY INTRODUCTORY LECTURES

Mon 25 September*	2 pm	Lab 2	Introductory Talk	(S. O'Dea)
Tues 26 September	2-3pm	JHL7	Accessing Information- Library	(A. Carey)
Fri 29 September	9am	TH1	Options with your degree (incl. introduction to career planning, postgrad study & employment)	(Eanan Strain)
Fri 29 September	10am	TH1	Plagiarism/Turnitin	(C.Meade)
Fri 06 October	9am	TH1	Postgraduate Studies	(M.Schroeder)

* After the Induction Talk on Mon 25 September you are invited (with the rest of the 4th year classes) to meet the staff at coffee/tea 3.30-5.00pm: Biosciences building foyer.

MODULE COORDINATORS 4th BIOTECHNOLOGY 2023-24

CODE	NAME	Coordinator	e-mail address
BI403	Plant Biotechnology	Noreen Curran	noreen.curran@mu.ie
BI405	Advanced Immunology	Martina Schroeder	martina.schroeder@mu.ie
BI407	Tumour Biology	Marion Butler	marion.butler@mu.ie
BI412	Bioethics & Biobusiness	Sean Doyle	sean.doyle@mu.ie
BI415	Biotechnology Processes 2	Sean Doyle	sean.doyle@mu.ie
BI416	Genomics & Proteomics	Ozgur Bayram	ozgur.bayram@mu.ie
BI417	Food Biotechnology	Karen English	karen.english@mu.ie
BI423	Literature Project 1	Sean Doyle	sean.doyle@mu.ie
BI430	Outplacement	David Fitzpatrick	david.fitzpatrick@mu.ie
BI441	Fungal & Bacterial Secondary Metabolism	Ozgur Bayram	ozgur.bayram@mu.ie
BI444	Human Nutrition & Metabolic Disease	Andrew Hogan	andrew.e.hogan@mu.ie

INDUSTRIAL OUTPLACEMENT

The Biology department will arrange an industrial outplacement of three months duration for each student in Fourth Biotechnology. This year, the outplacement will take place from **Tuesday 6th February – Friday 26th April 2024**. While the majority of placements will be in Ireland, it is possible that occasional placements abroad will be available. However, you will be notified of this well in advance. Financial costs associated with accommodation, subsistence and travel will be the responsibility of the student except in the case of placements abroad where an appropriate financial stipend will be made available.

In certain cases it may be necessary for you to attend for interview with a potential host company. To this end you have already been requested to submit a completed Curriculum Vitae (CV) to the BI430 Module Co-ordinator. You have been supplied with a template to assist you in this task. In general, host companies will come from the food, beverage, human and veterinary diagnostic and biopharmaceutical sectors. Students will be accommodated in their choice of area and geographical location as far as practicable, however the final decision with placement allocation will lie with the Biology Department.

In the majority of cases, the outplacement will be your first experience of working in a scientific or laboratory environment. In addition to fulfilling the daily tasks assigned to you during this period, you should strive to familiarise yourself with all aspects of company operation and investigate alternative career options requiring scientific knowledge in areas such as quality control, technical marketing and clinical trials.

Upon completion of your outplacement you will be required to present both a written report and a 10-minute oral presentation on your experiences, with an additional 5 minutes allowed for questions. This should cover the following aspects: Company description and organisation and a review of your work over the three-month period. You will have to be aware of company confidentiality in compilation of your report and presentation, and so you should obtain written permission from your employer for all information to be disclosed. Your audience will include the supervisor, one other member of staff, fellow fourth year students, where appropriate, and other research workers (postgraduate and post-doctoral fellows) from the Biology Department. We recommend PowerPoint presentation format, which can be emailed in advance to the Presentation organiser. Additionally, students are advised to bring a computer for the presentation, for connecting the computer to the projector and for ensuring that it works before the time when the talks are scheduled to begin. If you have any questions about these talks please contact the Placement co-ordinator. A proportion of the practical marks will be awarded for each of these presentations.

Student Grants.

The Fees and Grants Office have very kindly agreed to arrange payment of student grants, where appropriate, into student bank accounts upon provision of Bank details including address, account number and sort-code to the Fees and Grants Office. It is the responsibility of individual students to ensure that this information is made available to the relevant party.

PROJECT/REPORT DEADLINES

	Commence	Final Thesis/Report to be submitted
BI423 Literature Project	9 October 2023	19 February 2024
BI430 Industrial Outplacement	6 February 2024	10 May 2024

BI423 LITERATURE PROJECT:

- **Online submission through Moodle.**
- A sample cover sheet for your project is included on **page 43** of this manual. Cover sheets may be obtained outside the Biology Office or online at the address below. Please type in the following:
 - the title of your project,
 - your name,
 - student number,
 - the name of your project supervisor.
 - date.
- Extensions to these deadlines will not normally be granted.

BI430 OUTPLACEMENT REPORT:

- **Online submission through Moodle.**

DEPARTMENT OF BIOLOGY STAFF RESEARCH INTERESTS

Name & Qualifications	Key Words	Research Interests
Dr O. Bayram, MSc PhD	Secondary metabolism, Mycotoxins, Fungal development, Cell signalling, Epigenetics, Gene expression, Protein-protein interactions	https://www.maynoothuniversity.ie/biology/our-people/ozgur-bayram#2
Dr M.P. Butler BSc PhD	Cancer, Toll-like Receptor Signalling, sex differences in immune responses.	https://www.maynoothuniversity.ie/biology/our-people/marion-butler#2
Dr J.C. Carolan B.A (Mod) PhD	Proteomics, Mass Spectrometry, Genomics, Molecular Biology, Bumblebees, Crop-pest Interactions	https://www.maynoothuniversity.ie/biology/our-people/james-carolan#2
Dr N. Curran BSc PhD	Plant Biology	https://www.maynoothuniversity.ie/people/noreen-curran
Dr J. Devaney BSc PhD	Ecology, Forest Ecology, Climate Change, Biodiversity-Ecosystem Function, Invasive species	https://www.maynoothuniversity.ie/biology/our-people/john-devaney#2
Dr. T. Dirilgen BSc PhD	Ecology, Biodiversity (aboveground and belowground), Soil-Plant-Pollinator interactions, Soil biology and ecology, Sustainability	
Dr P. Dowling BSc PhD	Oncoproteomics, Biomarkers, Detection, Biofluids, Mass Spectrometry	https://www.maynoothuniversity.ie/biology/our-people/paul-dowling#3
Professor S. Doyle BSc PhD	Disease diagnosis, Antimicrobial resistance, <i>Aspergillus fumigatus</i> , proteomics, nonribosomal peptide synthesis, Disease diagnosis, immunoassays and enzymology.	https://www.maynoothuniversity.ie/biology/our-people/sean-doyle#2
Professor K. English MSc PhD	Cellular therapy, mesenchymal stem cells, immune modulation, pre-clinical models of inflammatory disease, organ transplantation, acute respiratory distress syndrome, asthma, gene therapy, muscular dystrophy	https://www.maynoothuniversity.ie/biology/our-people/karen-english#2
Dr D.A. Fitzpatrick BSc PhD	Computational Biology, Bioinformatics, Genome Evolution, Phylogenomics, Genomics, Transcriptomics, Proteomics, Fungi, Metabolic pathways, Genome sequencing, oomycetes.	https://www.maynoothuniversity.ie/biology/our-people/david-fitzpatrick#2
Dr E. Graciet MSc PhD	Protein degradation, biochemistry, plant molecular biology, plant-pathogen interactions, abiotic stresses, crop improvement	https://www.maynoothuniversity.ie/biology/our-people/emmanuelle-graciet#2
Dr A. Hogan BSc PhD	Immunology, obesity, cancer, metabolism, immunometabolism	https://www.maynoothuniversity.ie/biology/our-people/andrew-hogan#2
Dr. G. Hoysted BSc PhD	Fungal biology, Microbial Ecology, Mycorrhizal Interactions, Plants, Bacteria, Above-below ground interactions, Sustainability	
Professor K.A. Kavanagh BSc PhD	<i>Aspergillus</i> , <i>Candida</i> , Fungi, Innate immunology, Insect, Medical mycology, metal-cell interactions, Proteomics	https://www.maynoothuniversity.ie/biology/our-people/kevin-kavanagh#3

Dr L.M. Lopez BA PhD	Genomics, Human Health, Circadian Rhythms, Sleep, Neurodevelopmental Conditions.	https://www.maynoothuniversity.ie/biology/our-people/lorna-lopez#2
Dr A.M. Maher BSc PhD	Entomopathogenic nematode, microbes, symbiosis, biodiversity	https://www.maynoothuniversity.ie/biology/our-people/abigail-maher#2
Professor B.P. Mahon BSc PhD	Cell Biology, Immunology, microbiome/immune interaction	https://www.maynoothuniversity.ie/biology/our-people/bernard-mahon#2
Dr J. Masterson BSc PhD	Allergy, Inflammation, Epithelial Cell Biology, Stem Cells, Fibrosis, Mucosal Barrier, Cellular Metabolism	https://www.maynoothuniversity.ie/biology/our-people/joanne-masterson#2
Dr E. McNamee BSc MSc PhD	Autoimmunity, Mucosal Immunology, Translational Immunology, Chemokines, microRNAs	https://www.maynoothuniversity.ie/biology/our-people/eoin-mcnamee#2
Dr C. Meade BSc PhD	Ecology, Molecular Ecology, Sustainability, Biogeography	https://www.maynoothuniversity.ie/biology/our-people/conor-meade#1
Dr S. Miggin MSc PhD	Innate immunity, toll-like receptors, inflammation, Type-2-Diabetes, Osteoarthritis	https://www.maynoothuniversity.ie/biology/our-people/sinead-miggin#2
Dr. D. Movia BSc PhD	Alternatives to animal modes, non-animal preclinical research, lung cancer, nanomedicine	
Professor P. Moynagh BA(mod) PhD	Molecular Immunology, Inflammation, Inflammatory Diseases, Signal Transduction,	https://www.maynoothuniversity.ie/biology/our-people/paul-moynagh#3
Dr J.M. Nugent MSc PhD	Plant molecular biology, evolution and development	https://www.maynoothuniversity.ie/biology/our-people/jackie-nugent#3
Dr S. O'Dea BSc PhD	Cell therapy, cell engineering, cancer research	Shirley O'Dea Maynooth University
Dr D. O'Maoileidigh BSc PhD	Plant development, flower development, fruit development, photosynthesis, transcription factors, genomics	https://www.maynoothuniversity.ie/people/diarmuid-omaoileidigh
Professor K. Ohlndieck DipBiol PhD DSc	Skeletal muscle biology, protein biochemistry, proteomics, biomarker discovery	https://www.maynoothuniversity.ie/biology/our-people/kay-ohlndieck#3
Dr R. Owens BSc PhD	Pathogenic fungi, secondary metabolites, proteomics, antimicrobial agents, food proteins	https://www.maynoothuniversity.ie/biology/our-people/rebecca-owens#3
Dr M. Robinson BBioMedSc PhD	Natural killer cells, liver disease and cirrhosis, tissue-resident immune cells, immunosenescence	https://www.maynoothuniversity.ie/biology/our-people/mark-robinson#2
Dr M. Schroeder BSc PhD	Host-Pathogen interactions, Pattern recognition receptor signaling, Regulation of gene expression, RNA Biology	https://www.maynoothuniversity.ie/biology/our-people/martina-schroeder#2
Professor F. Walsh BSc PhD	Antibiotic resistance, microbiomes, infectious diseases, bacteriology, metagenomics	https://www.maynoothuniversity.ie/biology/our-people/fiona-walsh#2

COMPLETING YOUR 4TH YEAR WRITTEN DISSERTATION

The following section of this handbook covers information relevant for your 4th year dissertation. We encourage you to read this section thoroughly, understand clearly the responsibilities you have in relation to writing an original thesis, and use the indicated resources to help improve your written work.

GUIDELINES FOR STAFF-STUDENT INTERACTION IN UNDERGRADUATE DISSERTATION/ PROJECT MODULES

Writing a thesis while an undergraduate student at the Biology Department

A key learning objective for undergraduate thesis modules at the MU Biology Department is that you, the student, develops a sense of ownership and responsibility for your dissertations/projects. In supervisor-student relationships during the preparation of theses, responsibility is two-way. A student will have expectations in terms of support and advice from the supervisor and a supervisor will have expectations regarding independent research by the student, time-keeping, regularity of work and reporting, etc. In the end, it is the student's dissertation/project and the student is expected to take full responsibility for researching, writing and editing his/her own work.

Note: The following guidelines relate to staff-student interactions in preparation of all written theses. Additional specific guidelines for Literature and Laboratory projects, respectively, are provided in relevant sections, below.

Meetings

- In the week following the assignment of topics to students, students will contact their supervisor to arrange a first meeting. Further meetings will be arranged by agreement.

Role and Responsibilities of Supervisor

- To set the essay/ project topic and provisional title
- To provide general background information on the subject area
- To inform student of expected standard of research and citation (eg. the Harvard format)
- To brief student of the importance good essay structure, and provide feedback to the student later in the process regarding their proposed essay title, focus and structure
- To inform student of likely challenges in terms of planning and deadlines
- To make clear to the student that further reasonable contact is welcome, including additional meetings as the student progresses with their work

Role and Responsibilities of Students

- Following the first meeting with your Supervisor, to read around the broad essay topic and inform Supervisor of your chosen essay title
- With regard to the University policy on Plagiarism, present and discuss only your own work
- Consider seriously the advice and recommendations of the supervisor regarding research work, citation and time management
- Understand that the supervisor is there to assist with the task of completing a dissertation to standard and on time
- Understand that it is not within the remit of the supervisor to correct any essay or project dissertation text prior to submission

WRITING A 4TH YEAR DISSERTATION: ESSENTIAL INFORMATION

Dissertation Writing: Your Responsibilities

It is essential that you, the student, prepare all your work with due care – especially in ensuring that what you write is your own work and not a copy of someone else's work (plagiarism). To assist with this task we provide you with several important aids: (i) a central writing webpage (Thesis Online Resources, accessible on your Moodle thesis module page and the [All Biology Students 2024](#)) where you will find multiple online resources to assist with completing your dissertation, including the many services offered by MU; (ii) an online self-assessment tool 'Turnitin' (see below); and (iii) a clear guide to what is, and is not, acceptable in terms of originality: *the Maynooth University Department of Biology Plagiarism policy* (see below). Please familiarise yourself with all 3 of the above, and remember - it is mandatory to follow the guidelines for turnitin and plagiarism.

[Thesis Online Resources \(TOR\)](#)

This page is designed to allow you access multiple resources supported by MU and selected external platforms, and is accessible on your Moodle Dissertation Module Page, as well as the All Biology Students page.

Essay Preparation and Submission – the *Turnitin* facility

As you will know from BI305 last year, all Biology dissertations at NUIM must be submitted to the online *Turnitin* Facility on moodle.

Please note

- The onus is on you, the student, to validate your work using *Turnitin*.
- You should only submit your completed essay only when you have checked it on *Turnitin* and are satisfied that your written work is truly your own and not a copy of something else
- Submitted essays that are deemed to contain copying/ plagiarism will be dealt with according to the departmental policy on plagiarism (see page 16)

Using *Turnitin* on Moodle - Recap

There are two steps to using *Turnitin* on Moodle. Once you have signed up for your Literature Review/ Laboratory Project Module, you will be able to access the *Turnitin* portal via the appropriate module page on Moodle. *Turnitin self-check* will be available on your dissertation module moodle page throughout semester. In addition, each student also has an independent self-check facility supported on their personal moodle interface. Both facilities perform the same function. *Turnitin final submission*, available only on your dissertation moodle page, will be available from two weeks before the final submission date.

Step 1. During essay **preparation** – use *Turnitin self-check*

Submit your draft essay to *Turnitin self-check* to get an originality report and revise as appropriate.

Step 2. When your essay is **complete** - use *Turnitin final submission* before the submission deadline

The originality report for this submitted copy will only be available to your essay supervisor.

Submission of your Thesis

This year dissertation submission will be online only, using the Turnitin Final Submission facility on moodle. Guidance regarding the online submission process will be provided on the relevant moodle page for each module. Please note that all submitted essays must be fronted by the appropriate module cover sheet with a signed student declaration. These will be made available on the [All Biology Students 2024](#) in the folder 'Dissertation Cover Sheets', and also in the relevant module page. An example of a cover sheet from 2020-21 is provided on page 46.

For **Turnitin** self-check you should **only** upload, as a single (.doc or .pdf) document:

- Abstract
- Main Body text, including subtitles/ sections, figures, tables, legends and in-text citations. For Reserach Projects, this section includes materials and methods, results & discussion (see below)

For **Turnitin** Final Submission you should upload, as a single (.doc or .pdf) document, all of the following:

- Dissertation Cover Page
- Abstract and Essay Title
- Table of Contents
- Main Body text, including:
 - Section and subsection titles (Literature Projects)
 - Materials and methods, results & discussion (Research Projects, see below)
 - All figures & legends
 - All tables & legends
 - All in-text citations
 - Full Bibliography

At all times during the preparation of your dissertation you can access 'Turnitin Help for Students' on moodle at [Moodle Help for Students](#).

If you encounter problems using Turnitin, you can contact Moodle Support for further assistance using our email address moodlesupport@mu.ie

PLAGIARISM & THE 4TH YEAR RESEARCH THESIS

Your thesis will inevitably draw on the work of others. The effective use and evaluation of existing material are among the skills that you are expected to develop. In all cases, when you build on the work of others **you must cite the source** of the material (an idea or opinion, a quote, data, diagrams etc). It must be acknowledged in a standard form of referencing.

Details of the referencing format are given later on, but here are some practical tips to help you:

1. You must present a work of scholarship in your own words and diagrams.
2. If you state a fact or rely on data from another source, you must acknowledge that source in the form of a citation in the text. Citations must be listed in a bibliography/reference list.
3. If you use a diagram or figure from another person's work, you must cite this in the legend and the bibliography.
4. If the exact words used by someone else are important to your argument, then you may use these within quotation marks and must cite the source.
5. If you have paraphrased someone else's argument, data or conclusions, then this must be acknowledged by citation.
6. Paraphrasing that dominates your work, does not include your own intellectual input or is simply a rewrite of another person's effort is still plagiarism, even if you do use citations. You must provide an intellectual input that adds to the existing material. This point is particularly relevant to students wishing to follow postgraduate study. It should be a warning that your approach is poor if you find yourself changing words to get your Turnitin score lower.

In summary, your work will rely on the work of others. You should understand that material and think about it. **Use your own words to describe the essential point that is relevant** to your thesis, and cite your source in the text as well as the reference/bibliography section. If you are worried about what constitutes plagiarism, contact your project supervisor.

When submitting in your literature/laboratory project you will be required to sign a declaration, on your 2023 Dissertation Cover Page, stating that you have read and understand the department's Policy on Plagiarism, and that your project is your own work. Please see the sample Cover Page available for you to download from your dissertation moodle page.

This must be downloaded, signed and placed as page 1 of your final submission dissertation.

Department of Biology Policy on Plagiarism and AI.

Definition of Plagiarism

Plagiarism involves an attempt to use an element of another person's work, without appropriate acknowledgement in order to gain academic credit. It may include the unacknowledged verbatim reproduction of material, unsanctioned collusion, but is not limited to these matters; it may also include the unacknowledged adoption of an argumentative structure, or the unacknowledged use of a source or of research materials, including computer code or elements of mathematical formulae in an inappropriate manner.

The policies of the University apply within the Department of Biology, as contained on the Maynooth University website (<https://www.maynoothuniversity.ie/university-policies/rules-regulations-students>). Plagiarism is a form of academic dishonesty and will be **treated with the utmost seriousness** wherever discovered. Now that you have reached your final year you have had sufficient training to know what

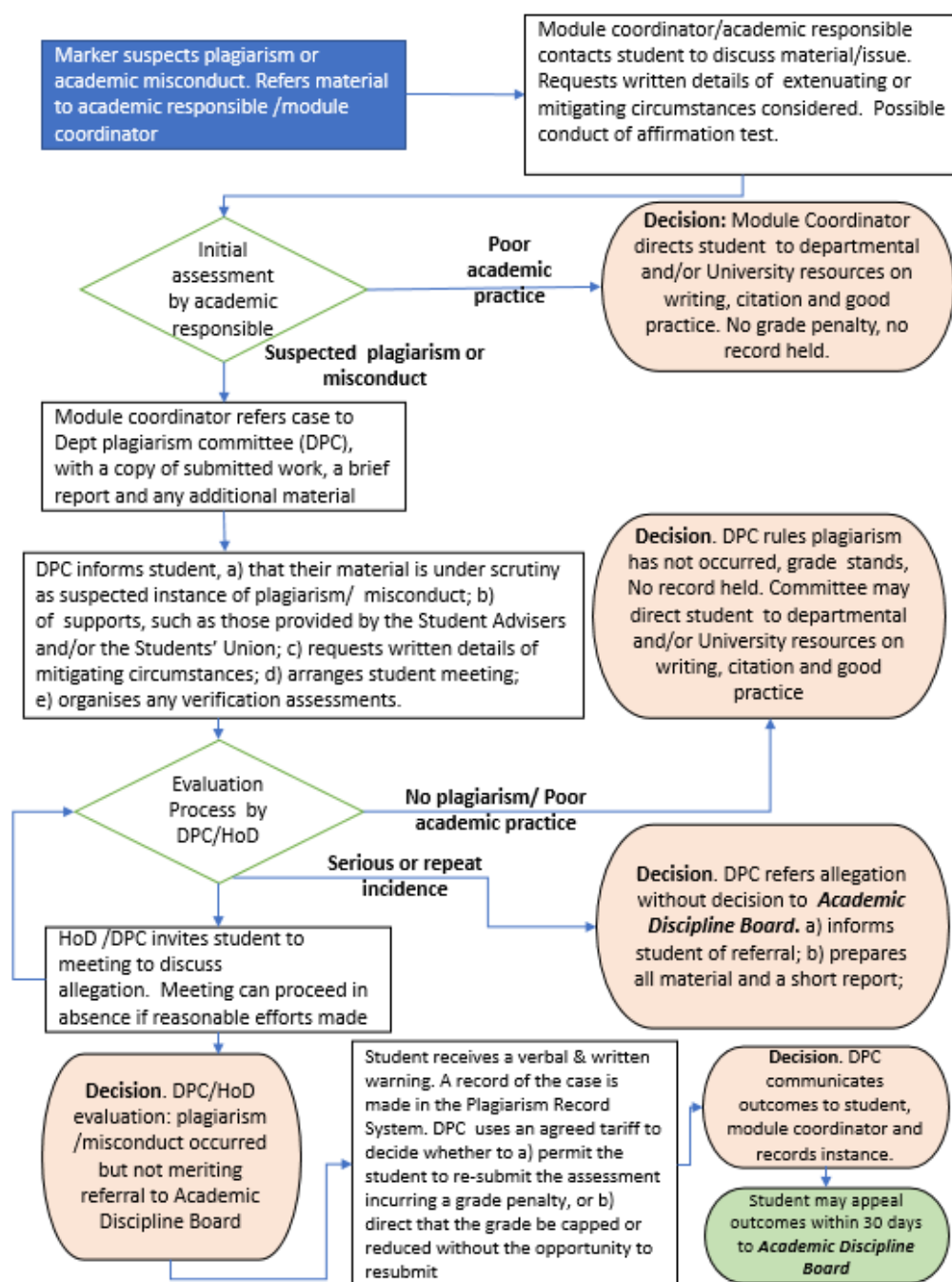
plagiarism is, there is no valid excuse for it to occur and whereas in earlier years the approach was to re-educate students when plagiarism occurred, in fourth year the consequences can be very serious.

Summary of Characteristics/Available Decisions within the Department to guide academics.

	Decision	Characteristics (not exhaustive)
A	Allow the result to stand.	This will be where the academic responsible (or other eg DPC) considers that any misconduct or plagiarism is very minor (a small number of sentences/<10% total etc) and the result remains a fair reflection of the understanding by the student. The latter may be demonstrated by a verification assessment or otherwise.
B	Adjust the result for the module to reflect the performance demonstrated by the student	This will include cases where the academic refers the case to the DPC and the DPC believes that the initial mark is not a fair reflection of the student's understanding, and is able to determine an appropriate mark. The mark adjustment should be proportionate to the extent of the plagiarism. For example, in the instances of plagiarism such as one or two paragraphs or multiple non-contiguous sentences (between 10-30% overall), then a reduction of between 10-30% might be appropriate. If a student has written a passable assignment, but then pasted in additional material which would have resulted in a higher mark the mark could be reduced to the minimum passing grade. Alternatively, an additional "make up" assignment may be requested by the DPC to achieve the adjusted mark.
C	Set a mark of zero and allow the student to resit, in line with normal resit arrangements.	In instances of major plagiarism, where a significant part (for example >30%) of an assignment is found to be plagiarised, the Department will "award a mark of zero in the assignment" but allow the student to resit in line with normal resit arrangements. There will be no possibility of submitting a 'make-up' assignment, and previous work submitted in connection with the course may be subject to further scrutiny.
D	Set a mark of zero and allow the student to resit, but with a cap on the resit mark.	As "C" but the DPC may decide to cap the resit mark where it is the norm in the Department to cap resit, or where there is a potential advantage in late submission. For example, where access to the feedback given to the rest of the class would be a significant advantage, the department may decide to cap the mark. The department may also decide to cap the mark where it believes there was limited collusion or intentional use of external assistance, or similar.
E	Refer case to the Academic Discipline Board of Maynooth University.	This should be used in the more serious cases which include: a) Students who have had multiple exam/assignment integrity issues in different sittings b) Cases where there is evidence of intent. c) Cases of impersonation or material being purchased or suspected of purchase. This will normally be used for repeat offenders, but may also be used for first offences in the most serious cases such as buying essays, or premeditated cheating.

This policy will be implemented in the following manner: As far as practical and in line with Maynooth University policy, plagiarism will be assessed in the Biology department according to set criteria (levels A-E) reflecting the severity of the issue. Levels are derived from the MU University policy ([Rules & Regulations for Students | Maynooth University](#)). Thankfully plagiarism in the final year is rare but when it occurs it is often considered at level C or above and can have severe consequences.

The following chart outlines the process:



The Academic Discipline Board of Maynooth University has powers to recommend students be suspended or expelled from the University.

All members of the Department providing a reference for a student **may be obliged to mention an instance of major plagiarism**, or two or more instances of minor plagiarism, when providing a reference for the student.

Responsible Use of Artificial intelligence tools for assignments submitted to the Biology Department.

This section lays out the Departmental advice and policies on how to use artificial intelligence (AI) ethically and responsibly to support your learning. It details when AI may or may not be used in your assignments.

ChatGPT does not “know” the material it presents is fake and if you do not understand the output, then neither do you. You must not use AI tools in your final year project

Be cautious when using AI tools for assignments.

The key to appropriate use of large language model (LLM) tools (eg ChatGPT or others) is to use these tools cautiously, critically, and reflectively to support you in your learning, research and writing in Biology. They should not be a replacement for your critical reading in a topic and should build on your understanding of Biology (not replace it). Using clear, limited, and accurate prompts when interrogating AI based tools will certainly help you. However, tools such as ChatGPT do not verify or even discover information, these tools analyse text to give a most probable pattern that approximates to an answer to your prompt. (In other words, they simply spit out the most likely next word). This is an important consideration, ChatGPT can give you a very well-structured essay which is completely false. **This is why AI tools must not be used in your 4th year thesis or dissertations.** ChatGPT does not “know” the material it presents is fake and if you do not understand the output, then neither do you.

LLM tools do not verify material scientifically but do incorporate all the biases inherent in the interpretations of the material of others. Thus, ChatGPT can deliver overtly or covertly racist, sexist or other discriminatory material as apparent fact, when in reality, these have no scientific basis. It can be trained to “support” these outputs with fabricated references or misrepresented material of others. Such outputs should not be used in your work, but *can you tell the difference between real or fake material?* Using an AI tool properly takes more effort than you might expect, as you will need to check the veracity, and sources of the returned material and evaluate it critically before use. Be aware of the implicit and explicit biases in any text produced by AI tools and take steps to mitigate this in work you submit.

What are the acceptable uses of AI tools for Biology department assignments?

- Before using an AI tool, make sure you understand the basics of your topic, then use prompts that are clear, limited/focused, and accurate;
- Spend time verifying the material returned by your query or prompt;
- Remember that LLM/AI tools generate text without understanding the output, they generate, summarise and predict text, no matter how unscientific or false.

Whilst it is unacceptable to use AI tools in your fourth year project work, it may be acceptable in other modules but only if specifically stated by your lecturer.

What are unacceptable uses of AI tools for Biology department assignments?

If you attempt to present the outputs of AI based LLM such as ChatGPT or Quillbot as your own work, then you are attempting to present material that is not the result of your academic judgement or authorship. If you use these tools in the following ways, then you have breached the department and University standards of academic integrity and will be subject to the disciplinary procedures of the department and/or University ([An Introduction to Marks and Standards, a guide for Students \(Ver 03April2020\).pdf \(maynoothuniversity.ie\)](#)).

You must not:

- Use AI tools of any kind for any aspect of your final year project work (e.g., thesis, lit review etc)

- Use AI tools to create blocks of text (including single paragraphs to complete assignments) and/or submit these as your own work
- Use AI tools to create diagrams, figures or tables and submit these as your own work. Instead learn to use BioRender or Excel to create diagrams and graphs, using your judgement.
- Use AI tools to support your preparation of an assignment without declaring which tools and/or how they were used. (You must not use AI/LLM tools for any form of 4th year thesis or dissertation in Biology)
- Use AI-generated false, or inaccurate references or submit AI-generated false, biased or discriminatory claims.

Consequences of unacceptable AI use in course material submitted to the Biology department could be large and impact you in many years' time.

Think of your future career. Future tools in the University may detect AI much more accurately than at present. **These may be deployed retrospectively and you could face loss of your degree qualification**, public embarrassment, and even loss of a job. Students presenting content that has been generated using AI are subject to the same disciplinary procedures as plagiarism. This can potentially result in denial of a reference, or a permanent notice on your student academic transcript, with career-long negative implications. Where a marker (or detection software) of submitted material suspects the inappropriate use of AI tools, the following procedure applies. If the module coordinator considers the use to be non-trivial, the issue will be referred to the departmental academic integrity committee who will assess the case and have the option to perform a **verification assessment** in the form of a face-to-face interview as detailed in the University's Marks and Standards. Where a student does not engage fully with the departmental process or in the most serious instances, the case will be referred directly to the University's Academic Discipline Board without further consideration by the department.

**Biology Dept Academic Integrity Committee
May 2023**

GUIDELINES FOR BI423 LITERATURE PROJECT

The literature project prepared you to discover scientific literature, synthesise, analyse data and to use data to make decisions and recommendations. Your aim is to research literature in an area and discuss the topic under consideration, including reference to opposing views on the subject where appropriate. The thesis should not be simply a reproduction of information from review articles or book chapters, but should include your interpretation of the subject, organised to develop the reader's understanding as you think appropriate and written with authority, by one who understands the evidence and issues. The thesis should be broken into sections which should have a *General Introduction*, *Discussion* (should be broken into subsections with appropriate subheadings for sections dealing with different topics), *Conclusions* and *References*. The Conclusions should draw together the discussion points made during the discussion.

THE LITERATURE PROJECT IS NOT TO EXCEED 5000 WORDS. The dissertation **word count** includes the main body text of the thesis, comprising headings, text and in-text citations/ references. Not included in the word count is the abstract (which has its own separate word limit of 200 words), table of contents, table legends and table text, figure legends, bibliography/ reference list, and appendices.

Quotations. In general, use direct quotations only where the wording matters to your case, and always credit the author e.g. "Rowan (1932) described the elytra 'in all cases strongly grooved and colourful' but later work (Dods, 1946; Frish, 1983) suggests that the grooving is quite variable and in some cases the elytra are more dull than Rowan thought". It is not acceptable to transcribe large tracts of text from reviews or journal articles. Write your literature survey in your own words.

Reference Material. Familiarize yourself with the background literature relating to the project. Go to the Dissertation [Thesis Online Resources](#) and you will find multiple resources to help with your initial literature review, as well as training options within MU regarding critical skills in *researching the scientific literature*, *writing*, and *referencing/citation*. You should discuss the outcome of your literature review with your supervisor approximately 3 weeks after beginning the project. Your supervisor may provide you with additional resources if you have been unable to access them.

Referencing. It must be possible to identify the source of all material which is not your own. The MU Biology Department uses the [Harvard referencing style](#), and all dissertations **must** be written in this format. All references should be given fully, and in alphabetical order, in the reference list at the end of the literature survey.

Typing. Always use a spell-checker. Recommended font is Times New Roman (size 12). The thesis should be double-spaced.

Diagrams. Should be made whenever possible. Where based in published illustrations/data these should be re-drawn by you to demonstrate the point you wish to make. The legend should contain a credit e.g. "Re-drawn from Stairs (1989)", and of course Stairs will appear in the reference list at the end. If, for instance, your point concerns a few chemical groupings on a large molecule, you might consider using lines to pick out all or part of the overall shape of the molecule and draw in more fully the few groups that are essential to your discourse.

Material beyond your competence. Where your presentation carries you into e.g. advanced mathematics or chemistry that you cannot reasonably be expected to master; deal only with the conclusions as set out by the author.

Complex original ideas. Some topics allow you to develop ideas of your own. You may like to discuss them with your Supervisor before incorporating them in your essay.

Brief guide to literature searching

Before beginning your literature review (or a review of literature associated with your lab project) go to the Dissertation [Thesis Online Resources \(TOR\)](#) page to access guidance on how to proceed with literature searches for peer-reviewed material and so forth on the internet. The most common starting point are

databases of peer-reviewed material, or scientific information search engines. Peer-reviewed material means material has been reviewed by scientists prior to publication in scientific journals

You must exercise great caution in using reference material which is not found in peer-reviewed journals as this material can be subjective in nature and, on occasion, blatantly biased to promote a particular viewpoint!

You should note that scientific articles are often presented as follows: Abstract, Introduction, Materials & Methods, Results and Discussion. The databases/search engines listed in the dissertation **Thesis Online Resources** page will enable you to access the entire article while others will only give access to abstracts and you may then have to get the entire article either in library (paper or internet access to journals) or by inter-library loan.

You will be given further direction accessing literature by your project supervisor and in the talk presented by library staff. The material presented above is for quick reference only.

See pages **16-20** for information regarding plagiarism and responsible use of AI.

When submitting your literature project you will be required to sign a declaration on the **2023 Dissertation Cover Page** stating that you have read and understand the department's Policy on Plagiarism, and that your project is your own work. Please see the sample declaration form on page **43**, which will be available for you to download from your dissertation Moodle page.

This must be downloaded, signed and placed as page 1 of your final submission dissertation.
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BI423 Biotechnology Literature Projects (23-24)

Allergy, Inflammation and Remodeling Research Laboratory (Dr. Joanne Masterson)

Gene therapies and their deliveries in skin diseases.

Applied Proteomics Laboratory (Dr. James Carolan)

Biomimetics and Biotechnology-Nature-inspired applications in biotech.

Cell Engineering Lab (Dr. Shirley O'Dea)

Tumour infiltrating lymphocytes (TILs) and their use as therapeutics.

FDA-approved gene therapy products.

Cell Signalling (Dr. Marion Butler)

Sex differences in cancer incidence and response to treatments.

Clinical Proteomics Laboratory (Dr. Paul Dowling)

Integration of Antibody Array Technology into Drug Discovery and Development.

Available to two students, if necessary.

Forest Ecology and Global Change Lab (Dr. John Devaney)

The Use of eDNA for Environmental Monitoring.

Fungal Genetics and Secondary Metabolism Laboratory (Dr. Ozgur Bayram)

Degradation of man-made polymers by microorganisms and insects.

Available to two students, if necessary.

Genome Evolution Laboratory (Dr. David Fitzpatrick)

Using OMIC technologies to discover novel enzymes in extreme environments.

The human pangenome and implications for public health.

Host-Pathogen-Interaction Lab (Dr. Martina Schroeder)

mRNA therapeutics: promises and remaining challenges.

ICB: Immunology and Cell Biology Laboratory (Prof. Bernard Mahon)

How safe are the COVID-19 mRNA vaccines?

Market regulation of Biologics/Biologicals in a post-Brexit UK.

Immune Signalling Laboratory (Dr. Sinead Miggin)

Proteomic analysis of bovine seminal plasma.

Medical Mycology Laboratory (Prof. Kevin Kavanagh)

Production, safety and efficacy of recombinant antibodies for the treatment of inflammatory disease.

Metabolic Immunobiology (Dr. Andy Hogan)

Engineering natural killer cells for cancer immunotherapy.

Molecular Biotechnology Laboratory (Prof. Sean Doyle)

New developments in vaccination strategies to overcome bacterial antimicrobial resistance.

Nucleic acid detection by lateral flow-based technologies.

Recent developments in nonribosomal peptide synthesis (NRPS) experimental strategies.

Molecular Ecology (Dr. Conor Meade)

Novel human medicinal drugs from plants.

Mucosal Immunology Research (Dr. Eoin McNamee)

Advances in the development of Mucosal Vaccines.

Muscle Biology Laboratory (Prof. Kay Ohlendieck)

Biomarker discovery for neurological disorders using mass spectrometry-based proteomics.

Plant Biochemistry Laboratory (Dr. Emmanuelle Graciet)

PROTACs in agriculture.

Plant Evolution & Genetics Lab. Dr Diarmuid O'Maoileidigh)

Genetically modified plants to combat food security threats.

Plant Molecular Biology (Dr. Jackie Nugent)

Plant chloroplasts for BioPharma.

Robinson Lab for Chronic Disease Immunology (Dr. Mark Robinson)

Senolytic Therapeutics.

MU LIBRARY: UNDERGRADUATE GUIDE

Welcome to Maynooth University! We look forward to meeting you during your studies, whether that's online or in-person. Library staff will help you with any questions you have about getting started.

MU Library will be essential to you for:

- finding the right **e-books** and **online material** to help you study & write your assignments and essays,
- borrowing physical **books**,
- short, free **online tutorials & quizzes** that will help you improve your information skills,
- approachable **library staff** who will help you find what you are looking for, and
- booking a **group study room** when you are working on projects with fellow-students.

Best thing of all? All the resources above are **FREE to use** when you are a student in MU!

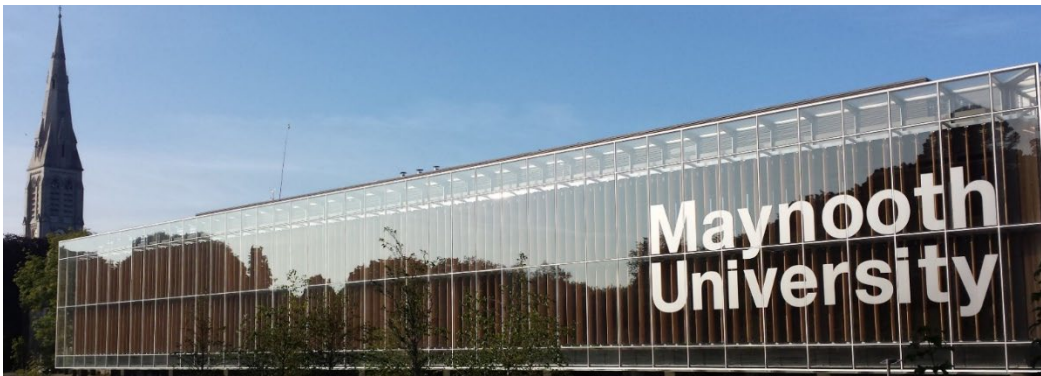


Fig. 1: Exterior of MU Library

Our library homepage is: <https://www.maynoothuniversity.ie/library>

It's a great place to start, covering:

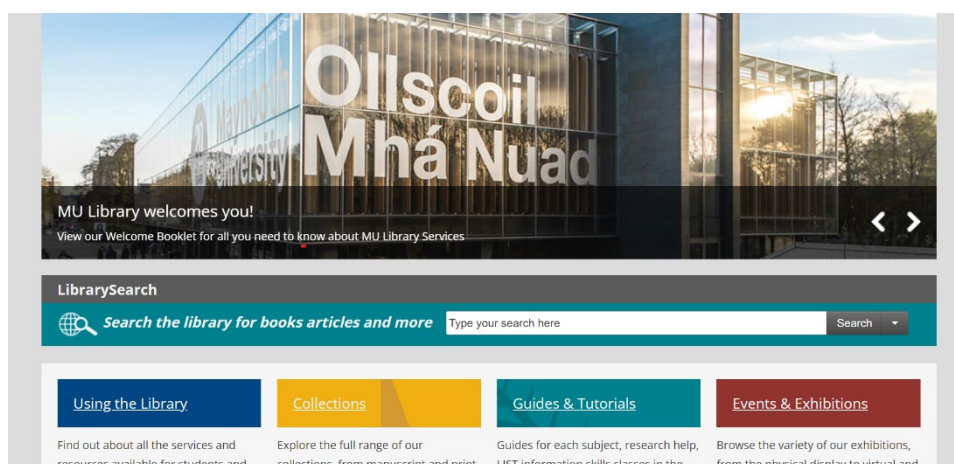
- up-to-date information about accessing the library,
- information on using all our services, including when off-campus, and accessing classes, and
- advice on connecting with us to get the support you need for your studies and assignments.

Your **MyCard** (student card) entitles you to access the library and to borrow books. Click the "*Using the Library*" tab (see Fig. 2) on the library homepage, for more information.

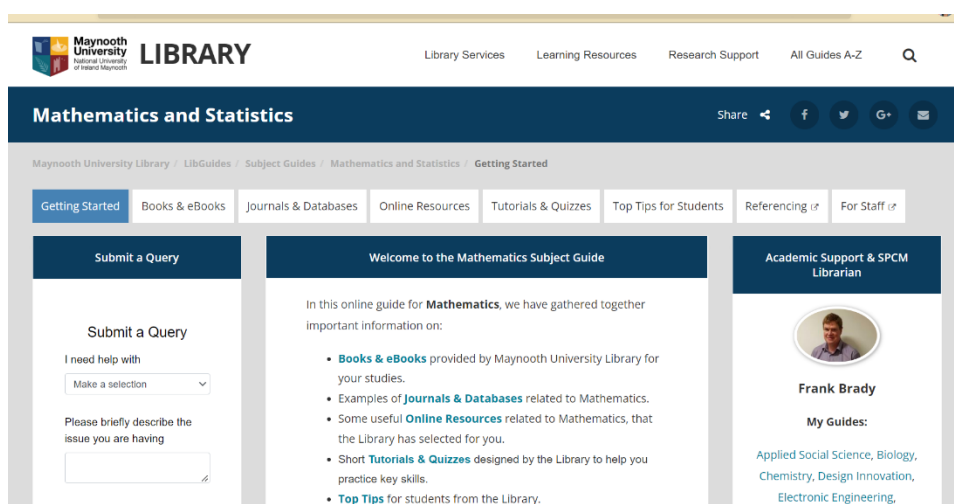
If you have any **queries about finding material**, whether it is online, or on the shelf, library staff are here to help you. If you are off-campus, use the live-chat, anonymous "*Library Chat*" box on our homepage, or email your queries to library.information@mu.ie. We love to help you find and use what you need in your studies. If you are visiting the library in person, staff are available at the desk to answer your queries and get you started with everything you need.

Fig. 2: MU Library Homepage

MU Library is on the South Campus beside the Kilcock road. You can choose different study spaces*: from the open-access area on the ground floor (where food, drink and chat are allowed) with access to over 50 laptops and print facilities*, to the quieter areas on levels 1 and 2, with training rooms and meeting



rooms*, or use the bookable group study-rooms (See links at the end of this piece) for your group and project-work*.



Using the correct information source is key to success in your studies. Every subject has a **dedicated Subject Guide** on our website (see Fig. 3) that we recommend you look at. The range of subject guides is here:

https://nuim.libguides.com/guides_tutorials and have sections on getting started, recommended books, databases, and links, as chosen by your lecturers. It also has information about reference styles, online tutorials and quizzes, a chance to email your query direct to a Teaching & Learning librarian, and lots of more useful information.

Use **LibrarySearch** (see Fig. 4) on the library homepage to search for specific books or articles, or even to see the range of material that we hold on your topic. The results give you details of e-books and e-journals you can read on your devices (on or off-campus) as well as information about where to find the print books on the library shelves.



Fig. 4: "LibrarySearch" searches the entire collection in MU Library- millions of free eBooks, articles and databases.

You can borrow a laptop from the laptop-bank (opposite the library desk) to use within the library, or you can log on to one of the library PCs to do your essays, or you can use your own laptop in the library too. We have a 3D printer available (ask us at the library desk) as well as a colour photocopier, in addition to many black and white photocopiers. You use your MyCard to load it with credit for printing. **IT Services** have a dedicated space at the main library desk where you can go if you need IT help.

Make sure to follow us on **Instagram** @library_mu, **Facebook** @MaynoothUniLibrary or on **Twitter** @mu_library.

Contact us with your **queries** about

- using the library, finding locations within it, student services,

- finding information for your studies, or
- how to use any of our online content.

We all know it can be a lot to take in when you start in university, but we are here to help you. The library wishes you *every* success in your studies.

USEFUL LINKS AND CONTACTS:

Links:

- Library homepage: <https://www.maynoothuniversity.ie/library>
- A-Z of our Subject Guides: <https://nuim.libguides.com/>
- Book a group study room*: https://nuim.libcal.com/booking/MU_GroupStudyRooms
- Online tutorials (LIST online): <http://nuim.libguides.com/list-online>

Contact:

Undergraduates' contact: library.information@mu.ie



Biochemical Calculations Website: BiochemicalTM

<http://www.biochemicalc.com>

Students in the Department of Biology now have access to BiochemicalTM. This website, developed by Professor Sean Doyle (Biology) and Mr Dermot Kelly (Computer Science), allows students to:

1. Learn the fundamental concepts of biochemical calculations such as:

What are moles, nanomoles and micrograms? Why do I need to use moles in my calculations? How do I make up laboratory solutions such as buffers? What is molarity?

2. Use online calculators to help solve biochemical problems.

The online calculators allow students to calculate the weights (in mg or g) of reagents required for making up laboratory solutions of defined molarity, calculate the volume of stock solutions required for preparation of a more dilute reagent, carry out %(w/v) dilutions, work out how to do serial dilutions etc...

3. Practice online questions to test their understanding of biochemical calculations.

BiochemicalTM offers a suite of pre-formatted questions to help students judge if they understand key concepts required for becoming proficient at undertaking laboratory calculations. These questions are of varying difficulty and style, and are designed for use in association with the online calculators on the BiochemicalTM website.

Although primarily designed for students in the 3rd and 4th years of our degree programmes, it will also be of assistance to students at earlier stages of study. Indeed it may be of use to students taking Chemistry, or any subject requiring knowledge of laboratory calculations. Postgraduates may also find aspects of BiochemicalTM beneficial to their own research projects and also find use of its functionalities a useful “double-check” for their own laboratory calculations.

We encourage you to use BiochemicalTM and please tell others if you’re happy with it. If not, please email: biochemicalc@gmail.com

BiochemicalTM was funded by the NUI Maynooth CTL Fellowship Programme 2011

FOURTH YEAR BIOTECHNOLOGY LECTURE MODULES 2023/2024

Students are required to take **ALL** courses listed below.

Module No.	Name	Semester Exam
BI403	Plant Biotechnology	Semester 1
BI412	Bioethics & Biobusiness	Semester 1
BI415	Biotechnology Processes 2	Semester 2
BI416	Genomics & Proteomics	Semester 2
BI417	Food Biotechnology	Semester 2
BI423	Literature Project 1	--
BI430	Outplacement	--

The following modules are optional [Those in brackets are timetabled against each other. You will need to pick one from the grouping.]:

Module No.	Name	Semester Exam
{ BI405	Advanced Immunology	Semester 1
{ BI441	Fungal & Bacterial Secondary Metabolism	Semester 1

The following modules are optional, however you cannot select both modules [You will need to pick one from the grouping.]:

{ BI407	Tumour Biology	Semester 1
{ BI444	Human Nutrition & Metabolic Disease	Semester 1

Each examination will be of two hours duration.

A summary of course contents and a lecture timetable is appended.

Copies of previous exam papers may be used as a guide to the types of question which might be set, but you are reminded that courses are continually evolving and the content may not remain the same from one year to the next. Past examination papers can be obtained from the The Library homepage <https://www.maynoothuniversity.ie/library> at the bottom left of the screen in Quicklinks.

4 BIOTECHNOLOGY MODULE DESCRIPTORS

For a full course description, go to [Course Finder](#)

BI423 Literature Project 1

A 12 academic week (minimum) independent literature project for 4BT. The topics will be set by the Academic staff of the Department. They will collectively cover a wide range of biological disciplines, and where possible the student will have an element of choice on the subject area. Individual topics will have a narrow enough focus to ensure a survey of the primary literature is appropriate. Projects will be assessed based on thesis write-up only for 4th Biotechnology class.

[BI423](#)

BI403 Plant Biotechnology

In the first half of the course, the commercial use of tissue culture methods for rapid clonal population of crop plants is followed by a consideration of the potential for producing valuable chemicals in cell cultures, and the potential for mutation breeding at the cell level. The remainder of the course looks at the procedures for genetic transformation of crops, examines the relative merits of nuclear vs. plastid transformation, and reviews the progress in relation to a range of traits including herbicide, pest, stress and disease resistance, improved nutritional and storage quality of foods, and the production of valuable pharmaceuticals.

The different methods for transforming crop plants are explained, including infection with modified pathogens such as *Agrobacterium tumefaciens*, and direct DNA delivery methods such as particle bombardment (the “gene gun”), and chemically or electrically induced uptake into protoplasts. The importance of regulation of gene activity, and stability of the transgene are considered, alongside ethical and safety concerns about exploiting the technology. Particular traits, which can be tackled by this approach, are evaluated as a number of case histories. Foremost among these are those which have already led to a marketed product, e.g. tomatoes with a long storage life, cotton resistant to boll weevil, and herbicide resistant soybean. A number of other characters are under development in this rapidly moving field, and new case histories will be introduced every year.

[BI403](#)

BI405 Advanced Immunology

This module will provide the students with a detailed understanding of the immune system, including the signalling pathways and effector molecules that mediate immune effector functions. Topics covered include: Innate Immunity, Pattern recognition receptor signalling, the Major Histocompatibility complex, antigen processing and –presentation, T and B cell activation, Immune effector mechanisms, Cell migration and Inflammation, Transplantation immunology, the immune response to viruses and viral immune evasion.

[BI405](#)

BI407 Tumour Biology

Topics covered: The course is lecture based with prescribed additional reading and self directed private study. The course examines the question “What is Cancer?” To answer this, the following topics are explored: Control of the Cell division cycle; Cyclins and cyclin dependent kinases; Oncogenes, Tumour suppressor genes; DNA and RNA tumour viruses; Familial cancers; a detailed study of the role of the Rb gene; P53 as the guardian of the genome; Cell death; Positive and negative induction of apoptosis; the execution phase of apoptosis; beyond the molecular biology of cancer; how the body resists neoplasia; tumour progression; Angiogenesis, how diagnosis is made; the major therapeutic interventions (existing therapies and new therapies). [BI407](#)

BI412 Bioethics & Biobusiness

Undergraduates as well as graduates are constantly faced with decisions for which they may be blamed, or for which they may blame themselves. What help has western ethical thought (in particular) to offer you for such things as

- personal justification
- management of decisions on technology and business
- public acceptance of choices
- avoiding ethically naive responses to criticism

The ethics element of this module comprises lectures and case history analysis as well as recommended reading.

The biotechnology industry comprises a broad group of organisations ranging from the production of animal feeds to speciality biopharmaceuticals. All biotechnological organisations have one common thread insofar as they are based on the commercialisation of biological organisms or products. This course will examine the diverse nature of the biotechnology industry and the commercial constraints in which it operates; particular emphasis will be paid to income generation for start-up enterprises, specific difficulties encountered and their circumvention. Introduction to, and detailed discussion of, quality management systems (ISO9000, cGMP and MDD) and the role of quality management systems in the manufacture of biopharmaceutical and *in vitro* diagnostic products. [BI412](#)

BI415 Biotechnology Processes 2

This course will comprise of a detailed examination, and examples of, the physical and chemical processes underlining bioprocess operations including fluid dynamics; heat and mass transfer in bioreactors; homogenous and heterogenous bioreactions. Specifically, we will examine fluid classification, viscosity and non-newtonian fluids. In addition, factors affecting media broth viscosity and the rheological properties of fermentation broths will be discussed. Cell growth kinetics, rate of substrate utilisation and product formation in homogenous and heterogenous systems will be examined. Finally, a detailed discussion of selected examples of large-scale prokaryotic and eukaryotic cell culture systems for recombinant protein production will be undertaken with reference to recent reviews in the area.

The use of a range of enzymes is critical to the success of many pharmaceutical, biotechnological and industrial processes. Microbial enzymes are used in a variety of foods, beverages and diagnostic procedures and, as such, their production and purification is extremely important. This course will examine factors affecting the use of micro-organisms for the production of native and recombinant enzymes. An examination of the role of thermophilic proteases in industry will be made and the ability to engineer subtilisins to withstand a variety of adverse conditions will be used as an example of enzyme engineering. Discussion will also focus on factors affecting the production of recombinant chymosin and the use of immobilisation technology for the long-term use of enzymes in industrial processes. [BI415](#)

BI416 Genomics & Proteomics

The genomics component will cover methods of genome sequencing and emerging technologies that increase throughput and reduce costs. Experimental methods for genome analysis including microarrays and functional genomics will be covered. Students will be introduced to methods for probing the molecular biology databases and the impact of the genomics revolution on biology. The proteomics section of the course will comprise brief revision of protein mass spectrometry (MS), a detailed discussion of tandem mass spectrometry and daughter ion fragmentation patterns. Close inspection of current literature to understand the application of protein MS in modern laboratories will be undertaken. [BI416](#)

BI417 Food Biotechnology

The importance of the Agri–Food industry is seen in the fact that in 1997/1998 this sector of industry accounted for 12.7% of GDP, representing 12% of total exports. There are 176,000 people employed or 11.8% of total employment (source CSO figures 1997/98). The course will commence with an introduction into the major food components such as proteins, carbohydrates, lipids, and water and the *behaviour* of these food components on subsequent processing, storage, and cooking. Foodborne disease and the microbial spoilage of food results in the failure or inability to control micro-organisms at one or more stages in the food chain from raw material production to consumption of the final product. Details of the major food spoilage micro-organisms as well as those causing foodborne illness will be discussed. The course will detail some industrial preservation methods which extend the shelf life of foods by inhibiting microbial growth or biochemical changes. The final lectures will examine the Hazard Analysis Critical Control Points (HACCP) system which is used to identify, assess, and control health hazards in food. Relevant food safety legislation will also be examined. [BI417](#)

BI430 Industrial Outplacement

The student will work in a biotechnology company (e.g., diagnostic assay manufacturer, clinical trial co-ordinator, pharmaceutical drug manufacturer etc.) in a research, manufacturing, quality or clinical trials function. The student will be required to compile a detailed report on the outplacement, upon completion of same, and also give an oral presentation based on their outplacement experience. [BI430](#)

BI441 Fungal & Bacterial Secondary Metabolism

Fungal and bacterial secondary metabolites have great potential due to their potent physiological influences on cellular functions such as antibiotics, antivirals, antifungals, antiapoptotics, cytotoxics, immunosuppressives, and deadly mycotoxins. Therefore, they are extremely important for medical, biotechnological and chemical applications. The focus of this advanced module is the fungal and bacterial secondary metabolites and the control of their production by genetic and epigenetic factors. Specific sections found in this module will be connected with chemical biology, genetics, epigenetics and fungal molecular biology. The major classes of microbial natural products and their biosynthetic pathways will be introduced. Potential impact of the bioactive metabolites in biotechnology, medicine and chemical biology will be discussed in depth. The term “gene clusters” will be introduced by analogy to prokaryotic operons. Control of gene clusters in fungi at the chromatin and epigenetic level will be examined by examples of histone modifications. Cellular signaling elements (MAPK, PKA, PKC) regulating the biosynthesis of fungal secondary metabolites will be analyzed. [BI441](#)

BI444 Human Nutrition and Metabolic Disease

Module Objective: To expose students to biochemical and cellular aspects of human nutrition and metabolic disease. This advanced module focuses on the molecular and cellular mechanisms of human metabolism, as well as the pathogenesis of selected metabolic disorders. Specific sections will be concerned with:

- The major macro and micro nutrients, and the bodies physiological response to their intake,
- The biochemical and cellular regulators of food intake and bodyweight,
- The diagnosis of metabolic disease and pathobiochemical aspects of major metabolic disease will be examined, including Obesity and Type 2 Diabetes Mellitus (T2DM).

The current therapeutic strategies for treating metabolic diseases including lifestyle modification, GLP-1 analogues and bariatric surgery. Discussing the impact each has on the biochemistry and physiology of food intake and the cellular regulators of metabolism.

Learning Outcomes:

1. Outline the major macronutrients and micronutrients.
2. Discuss the factors which regulate food intake and bodyweight.
3. Discuss the cellular players involved in the regulation of bodyweight.
4. Identify the main diagnostic methods of detecting metabolic diseases in humans.
5. Define major aspects of metabolic diseases including obesity and T2DM.
6. Define the major strategies for treating metabolic diseases in humans.
7. Examine the mode of action of defined interventions including molecular and cellular aspects.

[BI444](#)

Examination Assessment Scale

Letter Grade	Descriptive Heading	Representative %	Class
A++	Answer which could not be bettered.	100	I
A+	Exceptional answer displaying unexpected insight.	90	I
A	Undoubtedly first class, flawless answer, demonstrating originality.	80	I
A-	Almost flawless answer demonstrating some originality	70	I
B+	Extremely high competence, perhaps displaying limited originality or technical flaws or minor errors	68	II-1
B	Fundamentally correct and demonstrating overall competence.	65	II-1
B-	Competent performance, substantially correct answer but possibly containing minor flaws or omissions.	60	II-1
C+	Awarded on the basis of the answer being somewhat better than a C but below a B-.	58	II-2
C	Basically correct, answer with minor errors or one major error/omission.	55	II-2
C-	Awarded on the basis of the answer being somewhat below a C but better than a D+.	50	II-2
D+	No more than adequate answer.	48	III
D	Adequate answer with serious errors or omissions.	45	III
D-	Lowest passing grade, barely deserving to pass.	40	P
E+	The answer is inadequate and does not deserve to pass.	38	F
E	The answer fails to address the question properly but displays some knowledge of the material.	35	F
E-	Fails to address the question.	30	F
F+	Little relevant or correct material but some evidence of engagement with question.	20	F
F	Very little relevant or correct material.	10	F
F-	Totally irrelevant answer.	0	F

MARKING SCHEME FOR PRACTICAL ELEMENT OF 4TH YEAR COURSE

Practical elements of the course are as follows:

BI423 Literature Project

BI430 Industrial Placement (70% written report, 20% oral presentation, 10% feedback from Outplacement Supervisor)

Theses will be handed up as completed work, with no first drafts reviewed by the supervisors. Theses will be marked by the supervisor and one other staff member. The seminars will be marked by the supervisor and one other member of staff (one staff member will second mark all seminars from one laboratory; a different staff member will second mark the thesis). In the marking of seminars, emphasis will be placed on displaying an understanding of the subject and clarity and relevance of the material presented, rather than the quality of the overheads used for the presentation.

Students are advised that it is important to perform well in all components of the course and not to neglect either the practical or lecture elements. This is particularly relevant to students who may fall on the borderline between two grades where small numbers of marks may make a difference in the final degree class attained.

BIOLOGY LABORATORY SAFETY

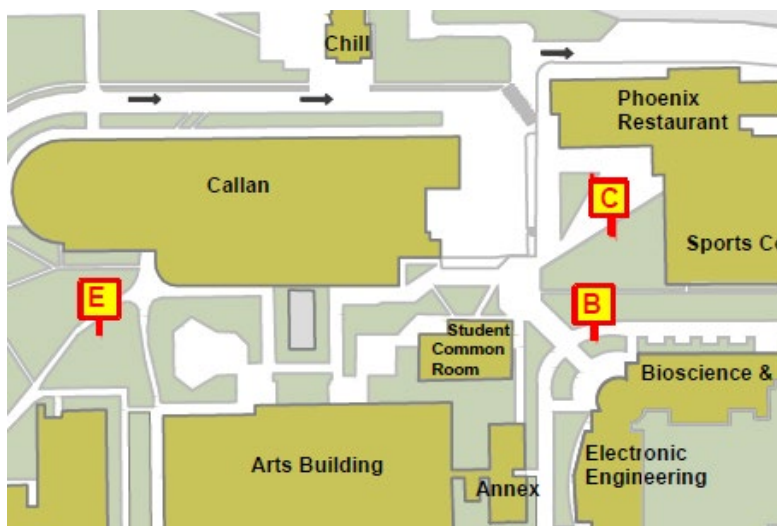
For the protection of yourself and others please read the following notes carefully and obey the instructions.

COVID-19 GUIDANCE:

If you have COVID: do not come on campus, follow the HSE guidance for self-isolation (<https://www2.hse.ie/conditions/covid19/>) and University guidance (<https://www.maynoothuniversity.ie/coronavirus/response>).

FIRE:

- On hearing the fire alarm or on discovering a fire, stop what you are doing and raise the alarm.
- If you are using a Bunsen, switch it off.
- Shut off the Bunsen gas supply to the lab.
- Leave in an orderly manner and close the door behind you. **Do not use the lift.**
- Make your way to the nearest assembly point B, C or E (see the map below).
- Remain at this location until instructed by security staff to return to the building.



PERSONAL PROTECTION:

Do not smoke, eat, drink or chew gum in the laboratory. University Policy prohibits storage of food and drink and food in all laboratories.

You are required to wear a Howie style white laboratory coat with all buttons closed and sleeves fully extended at all times. Laboratory coats may be available for hire from the Biology Department.

You must also wear safety glasses at all times. Please contact your demonstrator if you need to purchase a pair.

You will be provided with gloves for your personal protection. Unfortunately, they only protect the wearer and can easily contaminate surfaces. Remove all gloves before leaving the laboratory, even if for a brief period. Remove gloves while using laboratory equipment unless there are specific hazards present. Do not wear gloves when using Bunsen burners unless specifically instructed by the lecturer in charge.

If you need to transfer samples or equipment to another laboratory, remove one glove and use the ungloved hand to open doors etc.

Howie lab coats and safety glasses must be worn for all practicals using chemical or biological agents, gloves will be provided on the basis of a risk assessment.

Sandals, flip-flops and other open footwear are prohibited when chemical and biological agents are used. Long hair must be tied back. You must wash your hands immediately at the end of the practical.

PERSONAL INJURY:

You must cover any cuts or grazes with a plaster. Please inform your demonstrator. There are first aid cabinets in all teaching laboratories.

Report any accident or injury, however trivial, to a demonstrator.

We will explain specific hazards or disposal methods, if any. You must follow these instructions carefully.

Please inform your demonstrator if you have any concerns relating to a pre-existing medical condition, or if chemical/biological agents used in a practical session may affect any pre-existing medical condition.

GENERAL SAFETY:

In accordance with university regulations, you will be expelled from the practical session if you do not conduct yourself in an orderly manner, or if you deliberately act in an unsafe manner.

We allow students in the teaching laboratory only during timetabled laboratory sessions. You may not use the laboratory at other times unless you obtain permission from the technician in charge.

Undergraduate students should not enter the preparation laboratory, research laboratories, growth rooms, storerooms etc. without permission.

Proper regard to the correct use of equipment is required from all staff and students. Intentional interference with safety signs and safety features of any equipment is a criminal offence.

We expect you to leave your bench place, including sink, clean and tidy.

It is particularly important to put microscopes away correctly:

- Remove slides. Your demonstrator will instruct you on how to dispose of slides and coverslips
- Check that a low power lens is in the viewing position.
- Clean all lenses with lens tissue.
- Unplug the microscope and wind flexes neatly, but not tightly.
- Cover the microscope.

You should be aware that we frequently transport chemicals and biological materials around the department. Therefore, it is very important that you walk with due attention in the corridors.

N.B. Follow the instruction of your demonstrator at all times. Please check with your demonstrator if you have any doubts or questions in relation to safety. Notify your demonstrator or senior demonstrator if you are pregnant, or have any health issues which you feel may be impacted by any practical.

University safety and public health procedures must be adhered to at all times. Instruction from demonstrators, academics and technical staff must be followed at all times. Failure to do so will result in automatic expulsion from the laboratory and the forfeit of any grades associated with that practical session and an “unexplained absence” will be awarded. Repeat offenders will receive an automatic failure of continuous assessment.

Preparing for Practicals

- Complete any advance requirements for the practical before attending (e.g. Read practical manual, watch any associated videos, complete any required exercises). Details of these requirements will be provided by your lecturer in advance.
- Practical manuals will be available on Moodle in advance of your practical with a printed copy provided to you during attendance at the practical.
- If you are unable to attend a practical please refer to the instructions in your introductory handbook for completion of an absence form, along with submission of appropriate supporting documentation, as required (Notification of Absence section). Please note the list of acceptable reasons for non-attendance, outlined in the Notification of Absence text.

Preparing for Laboratory Projects

In addition to attending and passing all the safety exercises in the General Methodology module, it is your responsibility to familiarise yourself with the specific safety issues in your assigned research laboratory and to comply with the specific safety measures. You should read the safety manual and protocols in your assigned lab. Do not commence project work until you have familiarised yourself with all safety protocols. As you learn new techniques it is your responsibility to make yourself aware of the safety issues and to always ask your supervisor if you have doubts or need more safety information.

The Department of Biology would appreciate if any student with a medical condition/allergy, or who is pregnant/breastfeeding, to document the details on the form which will be provided during your first workshop class. If the medical condition changes during the year, please inform your Senior Demonstrator or your Course Coordinator.

All staff involved in this process will respect the confidentiality of the students, ensuring that this information is provided to the relevant personnel on a need-to-know basis only

NOTIFICATION OF ABSENCE

It is the responsibility of all students to be available for class throughout Semester I and Semester II between the hours of 0900-1800 Monday to Friday, in addition to occasional classes outside these hours (e.g. field trips, academic visits).

If you are unable to attend Laboratory practicals, workshops or tests for any reason you must advise the Department of Biology by submitting an on-line **Absence Form** through the **Moodle course [All Biology Students 2024](#)** either before your absence or within FIVE working days of the end of the period of absence. When submitting the absence form you will also be able to upload copies of your medical certificates or other relevant supporting documentation. Instructions on how to do this are on the Moodle page. **Failure to do so may result in the absence being counted as unacceptable and you will be given a mark of zero.**

Please note that if you are submitting a medical certificate, **the cert must be issued during the period of illness.** BACKDATED MEDICAL CERTIFICATES WILL NOT BE ACCEPTED FOR ANY REASON.

Please read and take note of your responsibilities relating to absence as, in signing a Notification of Absence Form, you agree that you have read and understood them.

It is your responsibility to:
<p>Advise the department of any absence. Submit an Absence Form to your department through the Moodle Absences course with the relevant supporting documentation either before your absence or within FIVE working days of the end of the period of absence.</p> <ul style="list-style-type: none"> • Keep in touch with your department should you be absent for a prolonged period. • Make up any work you have missed due to your absence. • Agree a revised deadline with your department for any missed assessment(s) due to your absence. <u>Note that alternative arrangements for a missed test will only be made if a medical certificate is supplied.</u> • Recognise that submission of an Absence Form does not automatically mean that the absence is acceptable and that it is at the discretion of the department as to whether any absence is deemed acceptable or unacceptable. If the absence should be deemed as unacceptable it will be recorded as such and count against the minimum attendance level. • Recognise that, although a specific individual absence may be deemed acceptable, if your overall attendance and submission of work drops below the minimum level prescribed by your department, then disciplinary procedures will still be followed. • Recognise that notification of absence, whether it is deemed acceptable or unacceptable, does not constitute grounds for appeal against a course or programme failure or failure to progress to the next stage of study.

1. Notification of Absence Forms

Reason for absence	Documentation required (<i>all to be submitted online through Moodle</i>)
Illness up to and including 5 consecutive term-time days (excluding Saturdays and Sundays)	Absence Form

Illness for more than 5 consecutive term-time days (excluding Saturdays and Sundays)	Absence Form plus formal Medical Certification <u>issued and dated during the period of illness and signed by the Medical Centre, your GP or hospital consultant</u>
Unrelated to sickness	Absence Form plus supporting evidence

2. Supporting evidence

The following table gives examples of the kind of supporting evidence that you may be required to provide as justification of absence.

Absence	Evidence
Illness of LESS THAN FIVE consecutive term time days	Self-certification– Absence Form which must be submitted to the department through Moodle within 5 working days of the end of the period of absence . Should students submit repeated self-certifications, the department will require students to produce formal Medical Certification. Note that alternative arrangements for a missed test will normally only be made if a medical certificate is supplied.
Illness of MORE THAN FIVE consecutive term time days	Formal Medical Certification issued and dated during the period of illness and signed by the Health Centre or your GP or hospital consultant
Self-isolation without illness	Self-certification – Absence Form which must be submitted to the department through Moodle. Notify in advance or within 1 day of scheduled continuous assessment component. An alternative assignment/assessment may be made available for you to do remotely and submit online. Supporting evidence can include messages relating to close contacts or instructions to self-isolate.
Outpatient's appointment	Letter from outpatients or appointment card
Doctor or dental appointment	Appointment card
Documented personal problems	Letter from someone, e.g. counsellor, who has direct knowledge of the problem and/or is involved in supporting you
Illness of dependent or family member	Medical Certification and statement explaining illness and why personal attention is necessary
Bereavement	Formal certificate or note from family member who can vouch for the situation
Severe transport problem	A copy of online or newspaper reports on the problem to be submitted to the department within 5 working days of the problem having occurred
Court attendance	Official correspondence from the Court confirming attendance requirement
Victim of crime	Statement of events, police report and crime reference number
Involvement in a significant/prestigious event	Letter of invitation from the relevant organising body
Sport commitment at national/county level	Official correspondence from the relevant sporting body confirming the requirement to be available on specified dates

The following table gives examples of the kind of circumstances where absence **may** be deemed as 'acceptable' and 'unacceptable' for non- attendance. This is for general guidance; it does not represent an exhaustive list. All absences will be reviewed on a case by case basis.

Acceptable	Unacceptable
<ul style="list-style-type: none"> • Illness • Displaying COVID-19-related symptoms • Self-isolating due to COVID-19 • Hospitalisation • Outpatients appointment (where possible you should try to make any appointment outside of your class commitments) • Doctor or dental appointment (you should try to make any appointments outside of your class commitments) • Documented personal problems • Illness of dependent or family member (until other arrangements can be made) • Bereavement • Severe transport problems (e.g. severe disruption of train travel due to signaling failure or track problems or major traffic incident on motorways, which can be verified by online or newspaper reports) • Court attendance or victim of crime • Representing College/county/ country at significant or prestigious event or sport commitment or involvement in such an event 	<ul style="list-style-type: none"> • Oversleeping • Misreading the timetable • Paid employment and voluntary work • IT and/or computer problems • Minor transport problems, e.g. being stuck in normal rush hour traffic, not permitting enough time in travel plans for minor unanticipated delays, missed public transport • Holidays • Family celebrations • Weddings • Accommodation issues, e.g. moving house • Extra-curricular sports activities • Driving test • Lack of awareness of attendance requirements and University Regulations in this regard

Multiple Choice Questionnaires and Notification of Absence

Please note that the information given below may change in response to updates in Covid-19 guidelines.

Throughout the year you will sit a number of Questionnaires, the majority of which are Multiple Choice Questionnaires (MCQs) which are generally comprised of questions that cover a significant proportion of the module.

It is important that you view the MCQs as official exams and are aware that different policies exist for missing an MCQ than for a practical. In addition, Maynooth University Exam policies and regulations will apply and be enforced during MCQs.

All MCQs are compulsory and failure to sit these exams will result in a **zero** grade.

If you foresee that you may not be able to sit an MCQ it is imperative that you contact the lecturer who is setting the exam **BEFORE** the MCQ.

Individuals who miss an MCQ may be permitted a resit if they have an acceptable reason and provide the appropriate evidence. Individuals who miss an MCQ without an acceptable reason and

who did not contact the **lecturer who has set the exam** prior to the MCQ will not be offered a resit and will consequently be awarded a zero grade.

MCQs are exams and Maynooth University Exam policies and regulations apply during both. These can be viewed at the [Maynooth University Examinations Office](#) webpage.

Late Submission of Coursework

On occasion, a student may not be able to meet a course deadline on a literature/lab project due to unforeseen exceptional circumstances. If you find yourself in this position, you may request a later submission date. The fourth year modules covered by this policy are **BI423; BI430**.

If you require a later submission date, you should complete the online *Biology Department Late Submission Request Form* available via Moodle ([All Biology Students 2024](#)). Please note that you will be required to upload your supporting documentation at the time of submission, with the exception of illnesses of 2 days duration or less, which does not require supporting documentation.

All applications must be received 5 working days prior to the original submission date or 24 hours post submission date only in order to be considered. Submission with supporting documentation does not guarantee that an extension will be granted. Approval is at the discretion of the department. Further instructions on the process are available on Moodle.

The form should **NOT** be used to request extensions in relation to Lab Practicals, Lab Write-Ups or MCQ resits. In these cases, you should follow the procedure as outlined in the handbook and contact Patricia McDonnell at patricia.mcdonnell@mu.ie

The table below gives examples of instances where late submission requests may be considered.

Reason for Application	Details Needed	Supporting Documentation Needed
Medical Circumstances	<ul style="list-style-type: none"> Specify details (e.g. Illness, injury, hospital appointment, hospitalisation) 	<ul style="list-style-type: none"> Appropriate original supporting evidence must be supplied by a registered general practitioner for illnesses of 3 days or more.
Personal Circumstances	<ul style="list-style-type: none"> Specify details (e.g., family illness) 	<ul style="list-style-type: none"> Appropriate original supporting evidence must be supplied by a registered medical practitioner or other health professional.
Bereavement	<ul style="list-style-type: none"> Specify relationship (e.g., parent/guardian, grandparent, sibling, spouse, child, friend) 	<ul style="list-style-type: none"> Appropriate supporting evidence must be supplied (e.g., RIP.ie notice).
Other	<ul style="list-style-type: none"> Specify circumstances (e.g., jury duty, wedding of a sibling or other immediate family member, victim of crime; participation in a sporting/other event for MU. 	<ul style="list-style-type: none"> Appropriate original supporting evidence must be supplied.

University Supports and Services

Academic Advisory Office

The Academic Advisory Office offers a convenient first point of contact for students who wish to seek advice or assistance with their general experience of University life. The office provides an ombudsman-like role for students who may be encountering difficulties in their programme of study.

[Academic Advisory Office](#)

Examination Office

The Examinations Office is part of the University Registry and administers the examination timetable. It is responsible for the central administration of the University written examinations. The academic year is semesterised with examinations held in Semester One (January) and Semester Two (May) with a Supplemental/Resit autumn session in August.

[Examination Office](#)

Student Health Centre

The Student Health Centre is an acute care/advisory service. The service is envisaged as an addition to the student's own family doctor or specialist medical service. It operates within resource constraints so certain service limitations apply. Students should continue to attend their own general practitioner.

[Student Health Centre](#)

Student Services

Student Services is an integral part of the University community, enabling the promotion and development of its educational mission. Using a holistic approach, we offer a range of clearly defined services to support and empower students to achieve their personal and academic potentials and so enhance their life's journey. We strive to create a community which is open and caring and where diversity is expected and respected."

[Student Services](#)

Maynooth Access Programme

The Maynooth University Access Programme (MAP) encourages under-represented groups to enter third level and provides these groups with support through their time at Maynooth. These groups include [under-represented school leavers](#), [mature students](#), [students with disabilities](#) and members of the Irish Traveller community.

[Maynooth University Access Programme](#)

Timetables 2023/24: See link [Timetables | Maynooth University](#)

Map of Campus:

[Campus Maps](#)



**Maynooth
University**
National University
of Ireland Maynooth

**Department of Biology
2020/21 Dissertation Cover Sheet**

BI423 BIOTECHNOLOGY LITERATURE PROJECT

DISSERTATION TITLE:	eg. "Covid-ByeBye": Outcome of Phase III clinical trials for new SARS-Covid-19 vaccine.
SUBMITTED BY:	Your name here
STUDENT NUMBER:	Your student number here
SUPERVISOR:	Supervisor's name here
WORD COUNT:	2999 (confirmation that count is less than limit)
<p>DECLARATION</p> <p>This thesis is submitted in fulfilment of the requirements for the BSc (Hons) Degree</p> <p>IN SUBMITTING THIS THESIS I ACKNOWLEDGE THAT:</p> <p>I have read and understood the Departmental policy on plagiarism.</p> <p>I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education.</p> <p>Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.</p>	

4th Biotechnology 2023-2024

LITERATURE REVIEW FORM

Student Name: _____

Student Number: _____

Literature Review Selection (please select your top five choices of topic):

1. _____

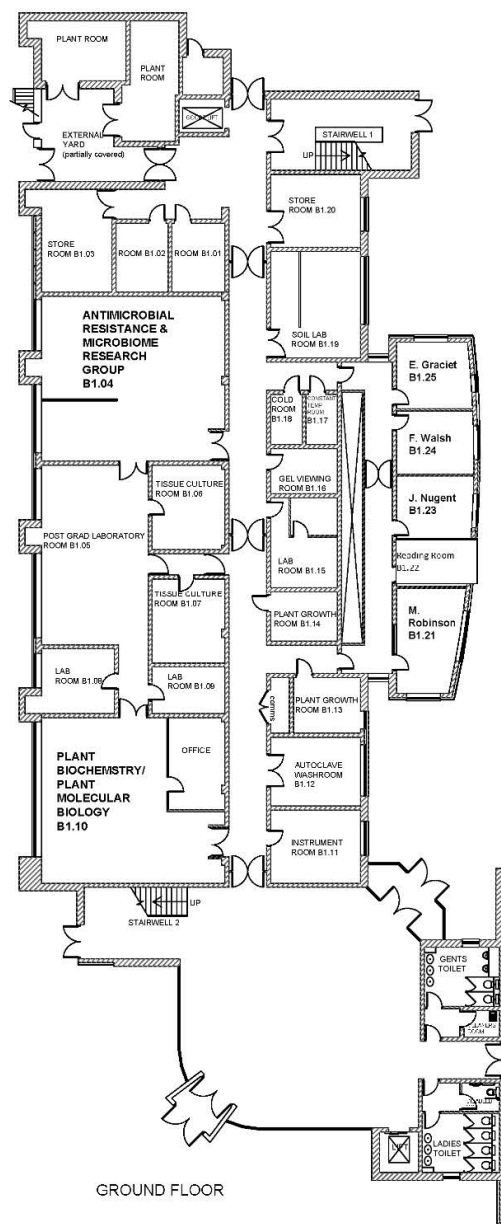
2. _____

3. _____

4. _____

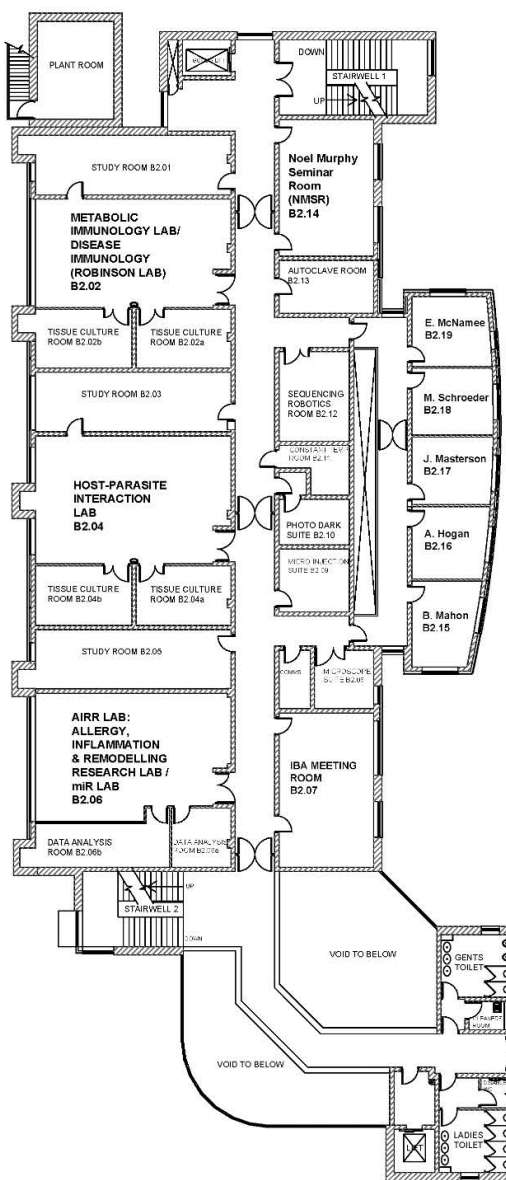
5. _____

Review topics will be allocated on first come basis. Please complete and return by email to Professor Sean Doyle (sean.doyle@mu.ie) by **5pm Thursday 28 September 2023.**



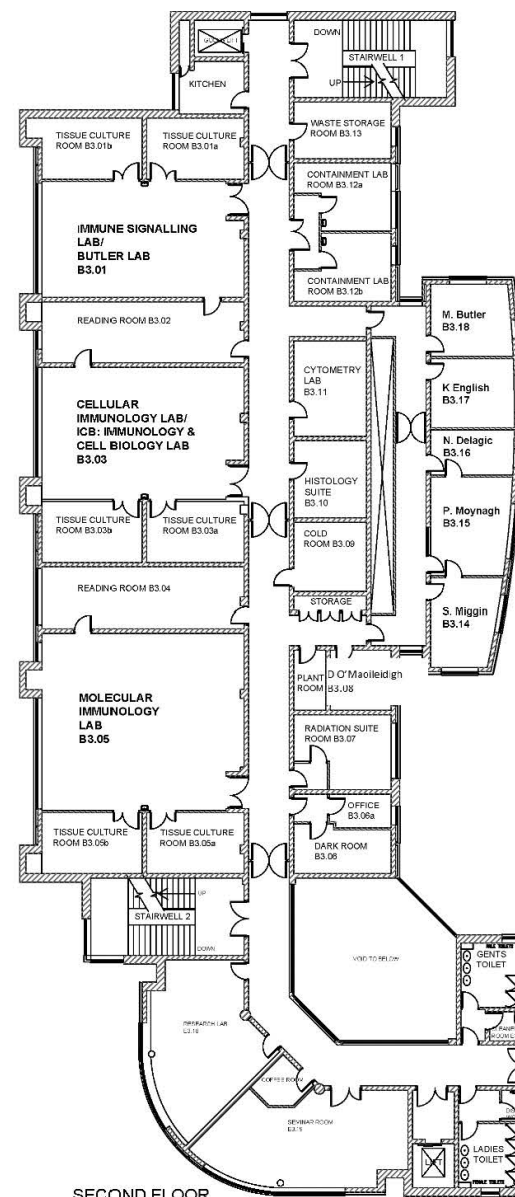
GROUND FLOOR

BIOSCIENCE BUILDING



FIRST FLOOR

BIOSCIENCE BUILDING



SECOND FLOOR

BIOSCIENCE BUILDING