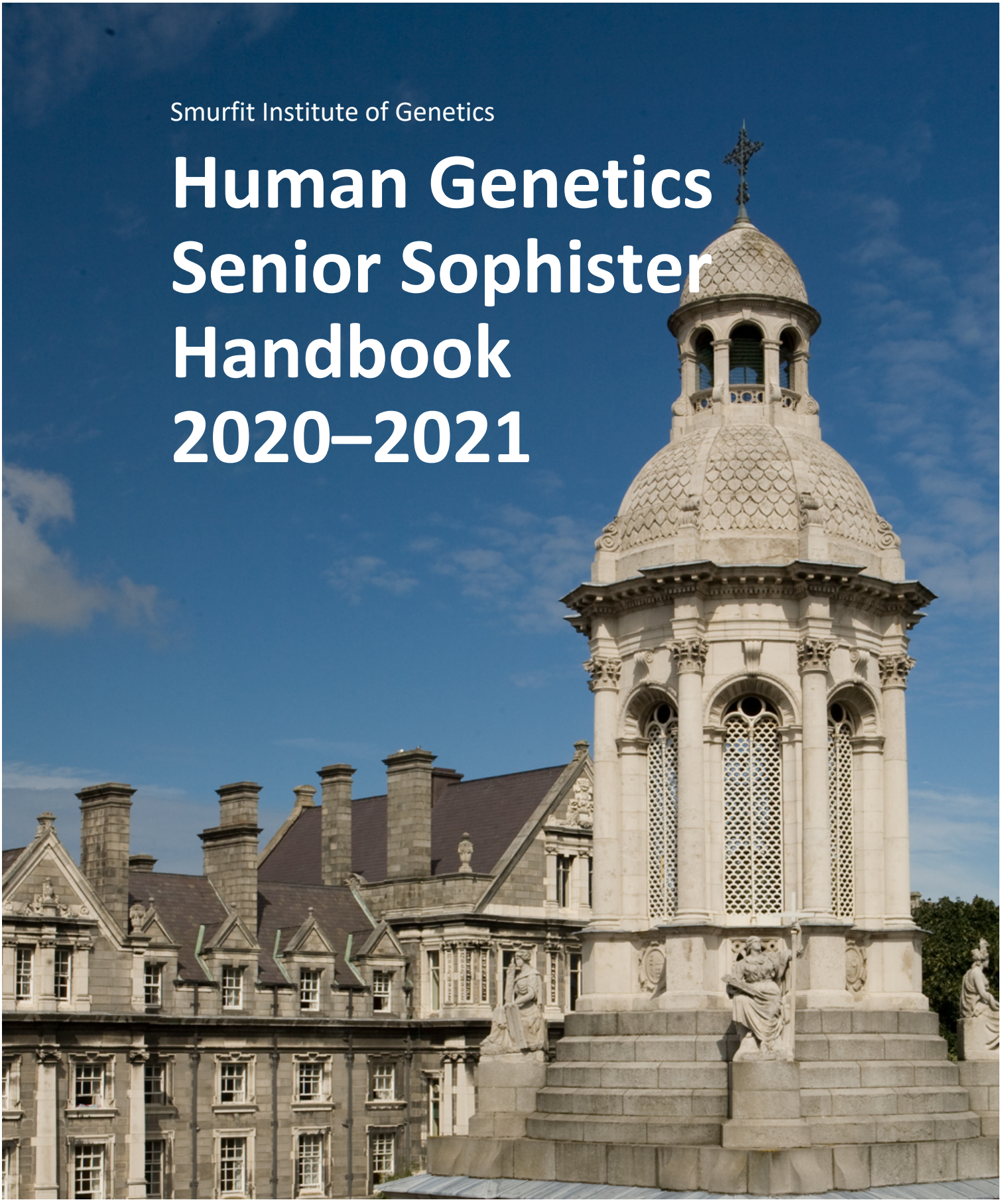
Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin



Smurfit Institute of Genetics

Human Genetics Senior Sophister Handbook 2020–2021

Contents

Contacts:

Course administration: genetics@tcd.ie

Course coordinator: aoife.mclysaght@tcd.ie

A note on adapting to COVID-19 restrictions

As we are all acutely aware, this is not going to be a normal year of College. In the Genetics Department we are determined to ensure that you receive the same high quality of education that you would have any other year. The most difficult constraint that we are facing is the reduced capacity of teaching and research spaces on campus. This has necessitated some rethinking of how we deliver lectures and how we organise research projects.

Lectures: Lectures will be delivered online through Blackboard. In the main these will be pre-recorded to avoid internet glitches etc. and they will remain available for the whole academic year. These will be supplemented with tutorial sessions delivered by the respective lecturers on each course (on average there will be a tutorial every 5 lectures). As far as possible the tutorials will be in-person on campus, but in case of health and safety concerns they may be online in specific instances. The tutorials are a wonderful opportunity to clarify points from the lectures, to engage in a class discussion, to delve deeper into the themes and to ask any questions you may have. These will work best if students come prepared (having previously watched the lectures and read some of the suggested papers), and ready to engage in discussion. If we all contribute, these could be a major asset to the course.

Research projects: Some research projects are computational in nature and do not require physical presence in the lab. Such projects are provided every year, but this year they will be greater in number. These projects will essentially be undisrupted with respect to any other year, except that most communication will be happening online and the students will be located remotely. For experimental/wet-lab projects, it may not be possible to get as much time at the bench as in another year. All labs have restrictions on the number of individuals who can be present. This will mean that students can only be present in the lab at pre-arranged times. How this is done will vary from lab to lab, but it is likely to mean that on a given week there is less time when students can be physically present in the lab. To compensate for this we are allowing the projects to start at any time in semester 1 (whereas previously the projects started after Reading Week) which will add flexibility to everyone's schedule. Many experimental projects will also have more data analysis than in previous years to ensure that the project is appropriately substantial.

In case you become unwell, or suspect that you are unwell we urge you to exercise an abundance of caution and stay at home. Similarly, some students may have a personal health concern or have a close family member who is vulnerable and therefore may need to stay at home to protect them. We will do everything in our power to ensure that there is no academic loss to any student who needs to stay at home.

Please note that the department building has been reconfigured in terms of access and circulation. This is detailed in a separate "return to work" document, which also details some guidelines that all students should read and adhere to. Most notably, **it will not be possible to congregate in previously 'social' spaces in the building,** and the atrium, for example, will not be available for use by students.

We are doing our best to anticipate what needs to be done. The situation is rapidly changing, and we may have to readjust our plans during the year. Please trust in us to always maintain your best interests at heart and to maintain the integrity of your education and your degrees. If any issues arise at any point in the year, please feel free to email me about this and we can arrange to talk.

With best wishes for the year ahead,

Aoife McLysaght, Head of Genetics.

YOU ARE ADVISED TO READ THE FOLLOWING CAREFULLY AND TO KEEP IT FOR REFERENCE THROUGHOUT YOUR MODERATORSHIP YEAR.

Programme Structure/Overview

The Senior Sophister course is divided into:

- Lectures
- A research project
- A literature review
- Problems in genetics

The Moderatorship Examination includes assessment of the Research Project, the Review, Problems in Genetics, the Papers and Viva of the final examination. The year counts for a total of 60 ECTS credits which are allocated as follows:

Paper/assessment	Credits	Module title
Review	5	Review
Project	15	Research Project
Problems in Genetics	5	Genetics Problems
Paper 1	10	Core Curriculum I
Paper 2	10	Core Curriculum II
Paper 3	10	Principles of Human Genetics and General Genetics
Essay paper 4	5	Essay

(For your information, when consulting papers from previous years, the exam structure was changed for lecture modules in 2016-17. For 2011-2016 papers 1 and 2 were similar (examining the same modules) and papers 2 and 3 were similar. Up to 2011, Papers 1 and 3 were similar, and Papers 2 and 4 were similar. What was previously paper 6 is now paper 4, having been paper 5 for a few years. Problems were formerly assessed during the summer exams as paper 5, and then as paper 4 in the last few years.).

1. Time Management

Over the course of this year you will have various ongoing assignments in addition to attending lectures and studying the material for the final exams. In particular, the Review and Project contribute significantly to your overall assessment. Generally an ECTS unit corresponds to 20-25

hours of *overall* commitment by a student. It is very important to try and balance the effort you give to all these commitments. You may also have to adjust to an irregular work schedule as demanded by the experiments you are carrying out in the course of your project.

2. Lecture Courses

We offer 15 lecture courses, presented in three 5-week blocks, with 5 or 6 courses contained in each block (page 6).

2.1 "Principles of …" Lecture Courses

GE4280 Principles of Human Genetics (20 lectures) – Semester 1

This course is mandatory for the Human Genetics moderatorship and will refer extensively to the textbook 'Genetics and Genomics in Medicine' (Strachan *et al.* 2015). The course will be examined in "section A" on paper 3. There will be four questions offered, **of which you must answer one**, and you may not answer more than two.

GE4040 Principles of Genetics (10 lectures) - Semester 1

This is strongly recommended for Human Genetics students and will be largely based on the textbook: 'Introduction to Genetic Analysis' by Griffiths *et al*. The course will be examined in Paper 2. Additionally, the course content should assist students, generally, in addressing: essay titles that appear on Paper 4; the Problems in Genetics module; and topics the external examiner might wish to explore during the Viva.

2.2 Selection of lecture courses

Remember: the more courses you study, the more choice you will have on the exam papers.

In your final examinations you will need to display not only detailed knowledge, but more importantly you need to show an understanding of the material. It is not sufficient to just remember facts. You must also know how facts are discovered and models generated. We are seeking considered, and well-constructed answers demonstrating scientific judgment, careful argument and independent original thought. In addition, we expect answers to include supporting scientific evidence with experimental detail when appropriate. In answering questions it will be to your advantage to integrate material from different courses and to show that you have read relevant material outside of the course presented. You should be able to refer to the current literature and to cite the authors of relevant papers. It is virtually impossible to do yourself justice at this level unless you select material to concentrate on. Therefore we advise you to be selective in courses you study intensively.

3. Examination papers

There will be 4 examination papers in finals. They will examine you mainly on the work of the Senior Sophister year.

Papers 1-3: Each of these papers will examine course-specific questions. There will be one either/or question per course examined on the paper (see page 6). Each paper lasts three hours and you must answer three questions

In answering questions you will sometimes find it necessary to use material from Junior Sophister and Fresher courses. While we do not expect as much detailed factual information from SF and JS courses, it is important to show (where relevant) that you are able to integrate material covered in other years into your answers, thereby demonstrating an overview of the field or perhaps an historical perspective.

Always answer 3 questions. The *most common mistake* made by students taking final exams is to answer fewer than the required number of questions. This can seriously affect your average mark, because no matter how good your answers are for the questions answered, we have to give you a *zero* mark for the missing one. If you do not study enough courses, or do not revise the whole of a given course, you may find yourself unable to answer the required 3 questions well.

Remember: you must attempt 3 questions on each paper. You should, therefore, not restrict your options by over-specializing. This is also why we recommend that you study *at least* 11 courses.

Paper 4 is an Essay Paper (3 hours). You write *one* essay from a choice of about 10 topics.

There will also be a *viva voce* examination by the External Examiner who will have seen your Reviews and Projects, and your Papers 1 to 4. External examiners often ask students about their project or review in the viva. They might also ask questions that explore your knowledge and understanding of the basic principles of (Human) Genetics.

Note: 20% of your Junior Sophister marks will be included in the calculation of your Moderatorship grade. Therefore, the 60 ECTS examined this year will contribute 80% of your Moderatorship mark.

Human Genetics moderatorship: Senior Sophister examined courses per paper

Module Title and Courses	Course Code	Lecturer
Paper 1: Human Genetics Core Curriculum I	**GEU44202**	
Genetic and Non-Genetic Mechanisms in Cancer	GE4055	AB
Transgenic Animals and Gene Therapy	GE4037	JF
Genetics & Immunology of Neural Diseases	GE4038	MC
Functions, Mechanisms and Genetics of Prion-Domain	GE4049	MR
Stem Cell Biology	GE4276	AB

Paper 2: Human Genetics Core Curriculum II	**GEU44203**	
Principles of Genetics	GE4040	Various
Human Evolutionary Genetics	GE4034	DB
Genetics of Neural Development	GE4053	JPL
Behavioural Genetics	GE4054	KM
Molecular Evolution II	GE4025	AMcL

Paper 3: Principles of Human Genetics and General Genetics	**GEU44204**	
Principles of Human Genetics	GE4280	Various
Programmed Cell Death	GE4051	SM
Developmental Genetics of *Drosophila*	GE4032	SM
Genetics of Perception	GE4045	PH
Microbial Molecular Genetics	GE4029	KD

Exam paper format - Papers 1 & 2 (each 5 questions):
Q1 – 5 will be based on lecture courses (one "either/or" question per course)
Instruction: Answer 3 questions.
Exam paper format - Paper 3:
Section A: Q1 – 4 will be based on module GE4280 "Principles of Human Genetics"
Section B: Q5 – 8 will be based on the remaining lecture courses (one "either/or" question per course)
Instruction: Answer 3 questions; **at least one from each section**.

AB - Prof Adrian Bracken
AMcL Prof Aoife McLysaght
DB - Prof Dan Bradley
LC Prof Lara Cassidy
FW - Prof Frank Wellmer
JF - Prof Jane Farrar
KD - Prof Kevin Devine
MR Prof Mani Ramaswami
MC Prof Matt Campbell
PH Prof Pete Humphries
PL Prof Pablo Labrador
RMcL Prof Russell McLaughlin
SM Prof Seamus Martin
TK Prof Tony Kavanagh
KM Prof Kevin Mitchell

4. Problems in Genetics

Problems in Genetics incorporate genetics *knowledge* alongside a *genetical approach* to thinking about biological questions. This is where you put your learning into action. The type of problems you may be faced with is broad and diverse and may include experimental design, interpretation and analysis of experimental results, and quantitative analysis of genetic data. By its very nature, this is not something where you can learn the answers, but you can train yourself to better recognise a productive approach (this is where practice on past questions is very useful).

This module is assessed by continuous assessment. Previously this was examined in the summer exams as paper 5, and then paper 4, and past exam questions will be a valuable inspiration for study. Assessment of this module will take place during week 20 (i.e., the first week of Trinity Term). The assessment will take place over 3.5 hours and you will need to answer all questions (typically about 13 problems). The problems will be of a varied nature and degree of difficulty and may be based on material or concepts from both the Fresher and Sophister years. These will test your ability to explain data, handle evidence and solve problems. You may bring notes, photocopies, the 'Genetics and Genomics in Medicine' by Strachan *et al*. textbook and a calculator to this exam. For practice, you may find useful problem sets in many genetics textbooks. Data will often be taken from published papers.

5. Review

You should arrange via e-mail to meet with your review supervisor during the first week of term to discuss the review topic and to seek their advice regarding the published literature.

5.1 Review Write-up Presentation

Your literature review *must not* exceed **6,000** words (i.e. all text, including Figure legends and Tables; but excluding the references section). It must be typed in Times New Roman 12 point font, with a line spacing of 1.5. It must be submitted on time (dates listed on page 16), with the **word count** verified and included in the submitted version.

The objective is to bring the reader up-to-date on the subject under review. You should therefore consult major texts to understand the historical aspects of the subject, and then the most recent major review articles to discover the state of the field at the time those reviews were written. You should critically review the major papers in the field during the previous ~5 years and try to define the interesting questions that remain to be answered. The emphasis of your review should be on the most recent work in the field, *i.e.,* approximately the past 5 years.

Each review topic is assigned by a member of staff, your review supervisor. You should meet with them soon after your topic is assigned, and they may give you some advice on how to start. Your supervisor will be willing to discuss the outline of your review and to advise you on its structure, but they will not read or edit draft versions of your review.

Other Review requirements:

WARNING: Your review must not contain material produced via a process of "copying" or "cutting and pasting" of text from any source: this is plagiarism. Also, the "paraphrasing" of text (i.e. changing a few words in a sentence or paragraph) constitutes plagiarism. It can be readily detected by computer-based searches of your submitted work. For more information on plagiarism please see the appendix.

***Plagiarism** is a serious offence. Any submitted work (e.g. your Review) that contains plagiarized content will be marked punitively and may even be awarded a mark of 0%.*

1. The title of your work and your name should be on the front cover.

2. All pages must be numbered and the work must be bound.

3. The work should be divided into Abstract; Introduction; Main text to be organized in subsections with headings, according to topic; Conclusion(s); References.

4. If figures and tables are included, they must be numbered. If they are not original, then the source must be cited.

5. Each Figure and Table must be accompanied by an explanatory legend (the text of all legends must be **included** in the overall document **word count).** If you have included a figure or table that you did not draw yourself, you must write your own legend and cite the source in the legend, e.g. "figure from (Jones et al 2018)".

6. References must be presented in the following way (a reference system based on numbers, rather than author names, *must not* be used). You can use software such as EndNote or Mendeley to help with reference formatting.

   In the text of the review: When citing a single author: (Behan, 2006); two authors: (Watson and Crick, 1953); three or more authors: (Lander *et al.*, 2001). Do not include author initials in the in-text citations.

   In the References section (Bibliography), *each reference* should contain the full list of author names with initials, the full article title, and the journal details, using the 'minimum punctuation' style shown in the following example. If there are more than 5 authors, you may list the first one followed by "*et al.*".

   Watson JD, Crick FHC (1953) Molecular structure of nucleic acids; a structure for deoxyribose nucleic acid. *Nature* 171: 737-738

7. References to websites should *not* be used as a substitute for the primary published literature in the field under review and therefore should be cited only in exceptional cases. If you want to refer to a website, give the address in the text, not in the references list.

8. You must include a signed statement concerning **Plagiarism**.

9. You must also include a signed statement giving the overall document **word count.**

10. **Submission is through Blackboard** using the Turnitin system to screen for possible plagiarism. The results will be made available to you.

5.2 Review Assessment

The review will be assessed taking into account the following criteria:

- Difficulty of topic
- Scientific content
- Clarity of thinking / Comprehension of the subject
- Ability to write scientifically
- Structure of the review
- Awareness of the recent literature on this subject
- Presentation

6. Project

For those of you considering a further career in research, your Project may be quite an important first step. It is a chance for you to develop your skills in the lab and demonstrate your aptitude for research to your supervisor, who will likely be an important source of letters of reference for you in your further career.

Normally, you are expected to start your research project shortly after Study Week in Semester 1 (see page 16). However, in 2020-21, given the constraints due to the SARS-CoV2 pandemic, students may start their projects any time from the start of the semester. We anticipate that different labs will accommodate students at different time and on specific restricted days. Some may get most of their lab work conducted early in the semester, and others may be later. In cases where there is reduced lab work the project will have a greater emphasis on analysis. As usual, some projects will be entirely computational/analytical. You should contact your supervisor by e-mail at the start of term and arrange to meet with them to discuss the project and background reading material. Thus, prior to arriving in the lab, you should have already become familiar with the relevant background literature on the research topic; material that should prove useful when writing the Introduction section of your report.

You must finish all experimental work and computer analysis on the date specified on page 16, and submit the write-up on or before the deadline.

Time commitment: Every project is unique and the time commitment can vary. As students, it is ultimately up to you to decide how much time to spend on your project, but it is wise to consider this in the context of the ECTS weighting and the other demands on your time. The project is worth 15 ECTS. A rough rule-of-thumb is that you should expect about 20-25 hours of effort by the student per ECTS. So that works out as 300-375 hours for your project. Note, this includes all your reading, writing-up, and actual lab work.

If for argument's sake we assume 300 hours overall, and then presume that 1/3 of the time is spent on the write up, then that leaves 200 hours. Over the course of 10 weeks that equates to 20 hours per week working on the project: primarily lab work, analysis, and literature research.

Supervision: A member of the lecturing staff will be the supervisor of your project. In many cases this member of staff will assign a postdoctoral fellow or PhD student in their lab to assist you. However, the member of staff is your primary supervisor. They are responsible for the scientific direction of your project, and it is important that you discuss the progress of your project with them regularly. Your project will be marked by your supervisor and a second member of the academic staff.

Research seminar: You must give a 10-minute seminar on your research project to a group including the members of your lab and at least one other lab. **This will count for 5% of your project grade**.

The intention is that you produce 8-10 slides, but not more than this. This is not intended as a comprehensive run-through of everything you have done in the lab (it is possible that you will do a longer presentation with your supervisor as a normal part of being in the lab). The purpose of this is to get you thinking about the overall picture of your project without getting lost in the nitty gritty.

For your presentation you should try to address the following points: (1) What is my question and why is it interesting?; (2) What have others done?; (3) What have I done?; (4) What does it mean?

You should email a copy of your presentation to your supervisor and cc genetics@tcd.ie (Rowena) at any time during week 26. This will be made available to the external examiners as part of their evaluation of your project.

Drafts: You should discuss the overall structure of your project report with your supervisor, before you start writing it in detail, and certainly at least 1 month before the submission deadline. Your supervisor will be willing to discuss the outline of your report and to advise you on its structure. They will also be willing to discuss the details of specific Figures or Tables that you want to include in the Results. However, your supervisor will not read or edit draft versions of your report.

6.1 Project Report presentation

Your Project Report *must not* exceed **6,000** words (i.e. all text excluding the Figure legends, Tables and the references section – N.B. this differs from the instruction for reviews). It must be typed in Times New Roman, 12 point font, with a line spacing of 1.5. It must be submitted on time, with the **word count** verified and included in the submitted version.

The report should be written following the structure of a scientific paper. It should be composed of an Abstract (250 words maximum), Introduction, a section on Materials and Methods, a section on Results, and a Discussion. It should have a Reference list with full references (use the referencing system and style specified above for the Review). It must be typed, paginated and bound. In summary a competent scientist should be able to repeat your experiments or your analysis having read your report. Your report will be marked down if it is not presented well.

In summary:

WARNING: Plagiarism *is a serious offence. Any submitted work (e.g. your Project Report) that contains plagiarized content will be marked punitively and may even be awarded a mark of 0%.*

1. The title of your work and your name should be on the front cover.
2. The following page should be a Table of Contents.
3. All pages must be numbered and the work must be bound.
4. The work should be subdivided into the following sections:
   Abstract; Introduction; Materials and Methods; Results; Discussion; References
   [Results and Discussion may be combined where appropriate]
5. Figures and tables must be numbered.
6. Each figure and table must be accompanied by an explanatory legend.
7. References **must** be presented using the same style indicated above for your Review.
8. **Submission is through Blackboard** using the Turnitin system to screen for possible plagiarism. The results will be made available to you.
9. You must include a signed statement concerning **Plagiarism**.
10. You must also include a signed statement giving the overall document **word count.**

You should write your project report with the non-expert geneticist in mind, *i.e.,* don't assume intimate knowledge of either the general field or the specifics of your project on the part of the reader. **Remember that your report won't just be read by your project supervisor, but also by a second member of staff and by the external examiner** – and they will not know anything about the project except what you tell them in your report. They won't know what you were trying to do, unless your report explains it.

In writing up your project you must use the scientific literature as your model. The Abstract is very important because it should summarize (in not more than 250 words) the rationale for doing the experiments, what your main results were, and what you conclude from them. Your Introduction (which should not exceed 3,000 words), should introduce the research area, but it should also introduce your specific project. What was the aim of the project? What questions were you trying to answer? Were you testing an hypothesis? Why was your particular experimental strategy chosen over alternative ways of answering the same question? The Introduction should end with a formal declaration of the specific aim(s) of the research that was undertaken. Your Materials and Methods should resemble those of a journal article, with perhaps a little more detail. You should not, however, devote 10 pages with explicit details of every solution you made up; reference to standard manuals will suffice. Your Results section should be written as in a scientific paper, describing the rationale and design of experiments as you go along and not merely presenting data. **The Results section should not just be a collection of Figures or Tables with no text.** It should talk the reader through the experiments you did, why you did them, and what these experiments show. Figures and Tables should be referred to in the text. The Discussion section is where you discuss what your results mean, and how they fit into the field. Do they support previous work? Contradict it? Did you answer the questions you set out in the Introduction?

In your writing you should try to display yourself as a scientist. Show your knowledge of the field and the place of your project in the field. Describe the design of the project showing how you expected it to produce useful results. If there is an hypothesis be sure to state it clearly. If there are puzzling conflicts in the published literature that you set out to resolve, make sure you explain these. Describe your experimental results adequately and clearly. Do not include trivial data. Accuracy, clarity and orderliness are essential. Interpret and explain your data. Give your own ideas. Make your own judgments. Be thoughtful, critical, original and constructive. Avoid pedantry. None of these hints is easy to realize - one good idea is worth a thousand pages. Make sure you emphasize what you believe to be the most important discoveries and ideas.

6.2 Assessment of the Project:

The project will be assessed taking the following criteria into account:

- Difficulty of project
- Understanding of literature/project
- Clarity of thinking
- Ability to design experiments
- Ability to analyse and discuss experiments
- Commitment, effort and behaviour in the laboratory
- Ability to work independently
- Presentation and content of write-up

It is important to emphasize that marks are not allocated solely on the basis of the experimental results obtained – *i.e*. there is NOT a direct relationship between the quantity of results obtained and marks awarded. Instead it must be evident, during your stay in the laboratory and in the write-up of your project, that you have read the literature, formulated a hypothesis, designed appropriate experiments to test this hypothesis (to include all appropriate controls), written all experimental details in you laboratory notebook, interpreted the results and evaluated them to decide if they are consistent with your hypothesis and that you were capable of bringing a "problem-solving" approach to bear on difficulties encountered with experiments. The assessment will include an evaluation of how well you performed ALL these tasks.

Please note: we won't be able to disclose any marks in advance of main exams because all marks are subject to approval by the External Examiner and cannot be made available in advance of the final examiners' meeting.

7. Safety

You must understand that safety is an issue of paramount importance in the department – we take it very seriously – you are REQUIRED to take it seriously also.

You should already have a copy of the Science Faculty Safety Manual and a statement on safety issues within the department is appended to this document. You are required to read these documents before you start laboratory work. The department will give you a short course on aspects of general safety, safety in handling biological, chemical and radioactive materials and on the extent to which you as undergraduates can handle such materials. You must act at all times in a manner that protects your own safety and the safety of all others in the department. You must **NEVER do experiments ALONE** in a laboratory! The laboratory PI is responsible for all aspects of safety within the laboratory. If you are in any doubt about equipment usage or procedures, please consult a more senior person or one of the technicians. Prof. Tony Kavanagh is the departmental safety officer. Prof. Tony Kavanagh is the GMO safety officer. Ms. Brenda Campbell is the Fire Safety officer. You must consult them on matters of safety and report any incident immediately.

Obviously be guided by your supervisor, the technical staff and experienced researchers. Take care of the equipment and only use it if you know how! Laboratories are by their nature potentially dangerous, so please act thoughtfully and defensively. Please remember you are responsible not only for your own safety but the safety of other i.e. other researchers, our technical staff and the cleaning staff who keep the Smurfit Institute so well – do not endanger others by your actions.

As a matter of general safety, it is important that you do not wear laboratory gloves when touching door handles, bannisters etc.. If it is necessary for you to go between two rooms wearing gloves, then either keep one hand ungloved, or ask someone to come with you to open the doors.

8. Reading the literature

There is a huge literature in genetics. You will be given references to important recent papers in your lectures, which are an authoritative selection. You are expected to read as many of these as possible – if you have problems with them talk about them with your lecturers and you will also find that the research fellows and graduate students will be helpful. Reading and talking about original research papers is an important way of learning how to do science. You should also read reviews, for example the papers in *Nature Reviews Genetics*. Make a point of looking at *Nature* and *Science* each week.

You should aim to be familiar with any major discoveries in genetics reported in the literature during the year (which we may not have had the chance to include in our lectures). Examiners are often impressed by students who are familiar with the recent literature on a topic and incorporate references to it into exam answers, provided that it is relevant.

9. Deadlines and dates to remember

Please note that due to uncertainty regarding the impact of the SARS-CoV2 pandemic, all dates are provisional

Review submission deadline:	**Semester 2**	Monday **1st February 2021**
Project lab work to start:	**Semester 1**	Beginning of semester 1
Project research seminar	**Semester 2**	Between **1st-12th March 2021**
Problems in Genetics assessment	**Semester 2**	Week beginning **11th Jan 2021**
Project lab work to end:	**Semester 2**	Friday **5th March 2021**
Project submission deadline:	**Semester 2**	Monday **22nd Mar 2021**

- **All work should be submitted to Blackboard by the dates above**
- **Work submitted LATE WILL BE PENALISED by a 5% reduction in mark per day, or part thereof, that the assignment is late**

Provisional dates for Moderatorship exams 2021

Paper 1	Mon 10 May	09.30-12.30
Paper 2	Wed 12 May	09.30-12.30
Paper 3	Fri 14 May	09.30-12.30
Paper 4	Mon 17 May	09.30-12.30

Reception to meet externs:	Wed 26 May (evening)
Vivas	Thu 27 May
Results posted	Fri 28 May

10. External examiner

The External Examiner for the Human Genetics degree is Professor Alison Hardcastle, University College London

11. Your career ahead

You should start thinking now about what you want to do after Moderatorship. There are many openings for geneticists. If you are aiming to do postgraduate research (MSc or PhD), you should aim for a 1st or a II.1 to have the best choice of a place to study, and to qualify for certain scholarships (e.g. Irish Research Council scholarships). Students with II.2s have also been accepted in recent years for research degrees here and abroad. If you are planning to apply for postgraduate courses in the USA you must prepare for and sit the GRE (Graduate Record Examination) during the Michaelmas term, and you may also need to submit a Visa application several months in advance of travel.

Mr Seán Gannon from TCD's Careers Office staff will talk to your class on a date to be arranged. Information on the careers advisory service are provided on the last page of this booklet

If you require written references: you should obtain these from your Research Project supervisor in the first instance. If you worked in a laboratory during the summer, the head of that lab would be a good second referee. If an additional reference is required, ask your Review supervisor.

Your referees will also be happy to give you **advice on how to present your CV** and how to write cover letters.

And finally …

You will have a challenging year ahead. Others have found it really worthwhile. All the staff wish you the best of luck.

Professor Aoife McLysaght

Head of Department

APPENDICES

Guidelines on Awarding Grades for Examinations and Essays Answers in the Sophister Years

Note that these guidelines are for use as a general reference. Differences may occur between disciplines.

	Mark Range	Criteria
I	90-100	IDEAL ANSWER; showing insight and originality and wide knowledge. Logical, accurate and concise presentation. Evidence of reading and thought beyond course content. Contains particularly apt examples. Links materials from lectures, practicals and seminars where appropriate.
	80-89	OUTSTANDING ANSWER; falls short of the 'ideal' answer either on aspects of presentation or on evidence of reading and thought beyond the course. Examples, layout and details are all sound.
	70-79	MAINLY OUTSTANDING ANSWER; falls short on presentation and reading or thought beyond the course, but retains insight and originality typical of first class work.
II-1	65-69	VERY COMPREHENSIVE ANSWER; good understanding of concepts supported by broad knowledge of subject. Notable for synthesis of information rather than originality. Sometimes with evidence of outside reading. Mostly accurate and logical with appropriate examples. Occasionally a lapse in detail.
	60-64	LESS COMPREHENSIVE ANSWER; mostly confined to good recall of coursework. Some synthesis of information or ideas. Accurate and logical within a limited scope. Some lapses in detail tolerated.
II-2	55-59	SOUND BUT INCOMPLETE ANSWER; based on coursework alone but suffers from a significant omission, error or misunderstanding. Usually lacks synthesis of information or ideas. Mainly logical and accurate within its limited scope and with lapses in detail.
	50-54	INCOMPLETE ANSWER; suffers from significant omissions, errors and misunderstandings, but still with understanding of main concepts and showing sound knowledge. Several lapses in detail.
III	45-49	WEAK ANSWER; limited understanding and knowledge of subject. Serious omissions, errors and misunderstandings, so that answer is no more than adequate.
	40-44	VERY WEAK ANSWER; a poor answer, lacking substance but giving some relevant information. Information given may not be in context or well explained, but will contain passages and words, which indicate a marginally adequate understanding.
F-1	35-39	MARGINAL FAIL; inadequate answer, with no substance or understanding, but with a vague knowledge relevant to the question.
	30-34	CLEAR FAILURE; some attempt made to write something relevant to the question. Errors serious but not absurd. Could also be a sound answer to the misinterpretation of a question.
F-2	0-29	UTTER FAILURE; with little hint of knowledge. Errors serious and absurd. Could also be a trivial response to the misinterpretation of a question.
U.G		Ungraded

Faculty of Engineering, Mathematics and Science - Guidelines on Marking, last modified 2007.

Plagiarism (from the College Calendar)

82 General

It is clearly understood that all members of the academic community use and build on the work and ideas of others. It is commonly accepted also, however, that we build on the work and ideas of others in an open and explicit manner, and with due acknowledgement.

Plagiarism is the act of presenting the work or ideas of others as one's own, without due acknowledgement.

Plagiarism can arise from deliberate actions and also through careless thinking and/or methodology. The offence lies not in the attitude or intention of the perpetrator, but in the action and in its consequences.

It is the responsibility of the author of any work to ensure that he/she does not commit plagiarism.

Plagiarism is considered to be academically fraudulent, and an offence against academic integrity that is subject to the disciplinary procedures of the University.

83 Examples of Plagiarism

Plagiarism can arise from actions such as:

(a) copying another student's work;

(b) enlisting another person or persons to complete an assignment on the student's behalf;

(c) procuring, whether with payment or otherwise, the work or ideas of another;

(d) quoting directly, without acknowledgement, from books, articles or other sources, either in printed, recorded or electronic format, including websites and social media;

(e) paraphrasing, without acknowledgement, the writings of other authors.

Examples (d) and (e) in particular can arise through careless thinking and/or methodology where students:

(i) fail to distinguish between their own ideas and those of others;

(ii) fail to take proper notes during preliminary research and therefore lose track of the sources from which the notes were drawn;

(iii) fail to distinguish between information which needs no acknowledgement because it is firmly in the public domain, and information which might be widely known, but which nevertheless requires some sort of acknowledgement;

(iv) come across a distinctive methodology or idea and fail to record its source.

All the above serve only as examples and are not exhaustive.

84 Plagiarism in the context of group work

Students should normally submit work done in co-operation with other students only when it is done with the full knowledge and permission of the lecturer concerned. Without this, submitting work which is the product of collusion with other students may be considered to be plagiarism.

When work is submitted as the result of a group project, it is the responsibility of all students in the group to ensure, so far as is possible, that no work submitted by the group is plagiarised.

85 Self plagiarism

No work can normally be submitted for more than one assessment for credit. Resubmitting the same work for more than one assessment for credit is normally considered self-plagiarism.

86 Avoiding plagiarism

Students should ensure the integrity of their work by seeking advice from their lecturers, tutor or supervisor on avoiding plagiarism. All schools and departments must include, in their handbooks or other literature given to students, guidelines on the appropriate methodology for the kind of work that students will be expected to undertake. In addition, a general set of guidelines for students on avoiding plagiarism is available on http://tcd-ie.libguides.com/plagiarism.

87 If plagiarism as referred to in §82 above is suspected, in the first instance, the Director of Teaching and Learning (Undergraduate), or their designate, will write to the student, and the student's tutor advising them of the concerns raised. The student and tutor (as an alternative to the tutor, students may nominate a representative from the Students' Union) will be invited to attend an informal meeting with the Director of Teaching and Learning (Undergraduate), or their designate, and the lecturer concerned, in order to put their suspicions to the student and give the student the opportunity to respond. The student will be requested to respond in writing stating their agreement to attend such a meeting and confirming on which of the suggested dates and times it will be possible for them to

attend. If the student does not in this manner agree to attend such a meeting, the Director of Teaching and Learning (Undergraduate), or designate, may refer the case directly to the Junior Dean, who will interview the student and may implement the procedures as referred to under conduct and college regulations §2.

88 If the Director of Teaching and Learning (Undergraduate), or designate, forms the view that plagiarism has taken place, he/she must decide if the offence can be dealt with under the summary procedure set out below. In order for this summary procedure to be followed, all parties attending the informal meeting as noted in §87 above must state their agreement in writing to the Director of Teaching and Learning (Undergraduate), or designate. If the facts of the case are in dispute, or if the Director of Teaching and Learning (Undergraduate), or designate, feels that the penalties provided for under the summary procedure below are inappropriate given the circumstances of the case, he/she will refer the case directly to the Junior Dean, who will interview the student and may implement the procedures as referred to under conduct and college regulations §2.

89 If the offence can be dealt with under the summary procedure, the Director of Teaching and Learning (Undergraduate), or designate, will recommend one of the following penalties:

(a) Level 1: Student receives an informal verbal warning. The piece of work in question is inadmissible. The student is required to rephrase and correctly reference all plagiarised elements. Other content should not be altered. The resubmitted work will be assessed and marked without penalty;

(b) Level 2: Student receives a formal written warning. The piece of work in question is inadmissable. The student is required to rephrase and correctly reference all plagiarised elements. Other content should not be altered. The resubmitted work will receive a reduced or capped mark depending on the seriousness/extent of plagiarism;

(c) Level 3: Student receives a formal written warning. The piece of work in question is inadmissible. There is no opportunity for resubmission.

90 Provided that the appropriate procedure has been followed and all parties in §87 above are in agreement with the proposed penalty, the Director of Teaching and Learning (Undergraduate) should in the case of a Level 1 offence, inform the course director and where appropriate the course office. In the case of a Level 2 or Level 3 offence, the Senior Lecturer must be notified and requested to approve the recommended penalty. The Senior Lecturer will inform the Junior Dean accordingly. The Junior Dean may nevertheless implement the procedures as referred to under conduct and college regulations §2.

91 If the case cannot normally be dealt with under the summary procedures, it is deemed to be a Level 4 offence and will be referred directly to the Junior Dean. Nothing provided for under the summary procedure diminishes or prejudices the disciplinary powers of the Junior Dean under the 2010 Consolidated Statutes.

UNIVERSITY OF DUBLIN

TRINITY COLLEGE

SCHOOL OF GENETICS AND MICROBIOLOGY

SMURFIT INSTITUTE OF GENETICS

DECLARATION FOR REVIEW
(to be bound into your Review)

I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at http://www.tcd.ie/calendar.

I have also completed the Online Tutorial on avoiding plagiarism 'Ready Steady Write', located at http://tcd-ie.libguides.com/plagiarism/ready-steady-write.

I declare that this Review does not contain material which has been **PLAGIARISED**.

Signed.....

Dated .....

The **word count** of this document (excluding the References section) is: [ ]

Signed.....

Dated .....

UNIVERSITY OF DUBLIN

TRINITY COLLEGE

SCHOOL OF GENETICS AND MICROBIOLOGY

SMURFIT INSTITUTE OF GENETICS

DECLARATION FOR PROJECT
(to be bound into your Project)

I have read and I understand the plagiarism provisions in the General Regulations of the University Calendar for the current year, found at http://www.tcd.ie/calendar.

I have also completed the Online Tutorial on avoiding plagiarism 'Ready Steady Write', located at http://tcd-ie.libguides.com/plagiarism/ready-steady-write.

I declare that this Project does not contain material which has been **PLAGIARISED**.

Signed.....

Dated .....

The **word count** of this document (excluding the References section and figure legends) is: [ ]

Signed.....

Dated .....

Safety statement

Location	Hazard	Risk Assessment	Control Measures	Person Responsible
			The Head of Department has overall responsibility for Health and Safety within his area as stated in the College Safety Statement. Day to day duties are delegated to those individuals as listed.	Prof A. McLysaght
			The Genetics Department areas consist of: (1) The Smurfit Institute of Genetics (EE5 building); (2) Floors 1-3 of houses 29-30 Westland Row and floors 1-2 of houses 30-31 Westland Row.**	
All Genetics Department areas	Lack of safety management	High	The Head of Department has appointed Prof Tony Kavanagh as Departmental Safety Officer and Ms Brenda Owens as Fire Warden.	Prof A. McLysaght
			A copy of this document is to be given to each member of staff.	Prof Tony Kavanagh
			All accidents and dangerous occurrences are to be reported to the Safety Officer, who is to forward the information to the College Safety Officer or Jennifer Gill in West Chapel.	Prof Tony Kavanagh
			As a preventative welfare measure, all staff are encouraged to attend the Occupational Health Clinic at the Student Health Centre.	Prof Tony Kavanagh
			The Safety Officer is to inform the Head of any problems implementing their respective Health and Safety duties.	Prof Tony Kavanagh,
All Genetics Department areas	Fire	High	The Fire Warden is to carry out a weekly check of all Departmental areas to final exits to ensure escape routes are: not obstructed, openable from the inside in the direction of escape and free from combustible materials.	Ms Brenda Owens
All Genetics Department areas			The Fire Warden is to periodically ensure that all Departmental offices and store rooms in the are, as far as reasonably practical, kept in a tidy manner, free of excess combustible items, and that fire doors are not left constantly wedged open.	Ms Brenda Owens
			During fire alarm activations the Safety Officer is to assist in the evacuation of the building as far as possible, and without putting himself in any danger.	Prof Tony Kavanagh
All Genetics Department areas			The Fire Warden is to periodically check all relevant fire extinguishers, fire panels and that break glass unit keys are in place. Any defects or faults found are to be reported to the Buildings Office.	Ms Brenda Owens
			The Fire Warden is to attend a basic fire safety training course, run by the College Safety Officer. Staff are reminded that the assembly point in the event of an evacuation is the Parade Ground.	Ms Brenda Owens
All Genetics Department areas			On hearing the fire alarm (a continuous ringing bell) staff are instructed to: 1- Leave the building, closing doors behind you. 2- Go to the assembly point (Parade Ground). 3- Re-enter only when alarm is turned off.	Building Users
All Genetics Department areas			On discovery of a fire staff are instructed 1- Raise the fire alarm. 2- Leave the building, closing doors behind you. 3- Inform security centre on ext 1999. 4- Go to the assembly point. 5- Re-enter only when alarm is turned off.	Building Users
All Genetics Department areas			No alterations or repairs to any electrical items fixtures or fittings. The Buildings Office or appointed contractors are to carry out any alterations or repairs.	Building Users

All Genetics Department areas	Fire & electrical shock	High	All electrical items are to be periodically inspected as far as possible for any signs of damage or wear to cords, flexes, cables, mouldings etc. Any defects are to be reported to the Buildings Office.	Heads of Laboratories, Ms. Brenda Owens
All Genetics Department areas			The use of extension leads, adaptors is to be minimised as far as possible. Electrical sockets are not to be overloaded.	Building Users
All Genetics Department areas			All second hand electrical items introduced into the Department are to be tested for electrical integrity by the Buildings Office prior to use.	Prof Tony Kavanagh
All Genetics Department areas			Open bar electrical fires or other portable electric heaters are not to be used.	Prof Tony Kavanagh
All Genetics Department areas			All non-essential electrical items to be turned off last thing at night, as far as possible.	Building Users
All Genetics Department areas	Fire & passive smoking	High	Smoking is prohibited in all Genetics Department areas	Ms Brenda Owens
All Genetics Department areas	Arson and bomb threats	High	All staff to report suspicious packages or persons to the security centre ext 1999 as soon as possible.	Building Users
All Genetics Department areas			All staff are requested to challenge as far as is reasonably practical, any person unknown to staff or not in building on official business.	Building Users
All Genetics Department areas			All staff to keep their offices locked when not in use. Last person out at night, to ensure the building is adequately secured and locked.	Building Users
All Genetics Department areas	Slips trips & falls	Medium	Trailing cables are not to be left in any circulation routes as far as possible. Cables in circulation routes must be kept as short as possible and covered with a cable guard mat.	Prof Tony Kavanagh
All Genetics Department areas			All desks, office equipment, and furniture to be arranged so that safe access egress and clear circulation routes are provided.	Prof Tony Kavanagh
All Genetics Department areas			All items of disrepair to fixtures, fittings, flooring, stairs or fabric of the building are to be reported to the Buildings Office as soon as possible.	Building Users
All Genetics Department areas	Lack of First Aid personnel & facilities	High	At least one person within each building to be trained in First Aid.	Prof Tony Kavanagh
All Genetics Department areas			The first aid cabinets are kept fully stocked.	Prof Tony Kavanagh
All Genetics Department areas	Work related upper limb disorder &...	Medium	All VDU work stations to have a suitable fully adjustable chair for any user. The College Safety Officer will define a "user", assess suitability and adjust the chair as necessary.	Heads of Laboratories
All Genetics Department areas	...repetitive strain injury		The VDU to be positioned in accordance with good ergonomic principles. The College Safety Officer will advise as necessary.	Heads of Laboratories
All Genetics Department areas	Eye strain	Low	Anti glare screens to be removed in favour of arranging screens away from window reflections and direct light. The College Safety Officer will advise as necessary.	Heads of Laboratories
All Genetics Department areas			All staff are encouraged to attend the Occupational Health clinic at the student health centre to receive an eye screen test.	Building Users

All Genetics Department areas	Plant equipment & machinery	High	No alterations, repairs, interference, or misuse of any plant, equipment or machinery. Routine photocopier and printer manipulations are exempt. All alterations and repairs are to be carried out by the Buildings Office or qualified technicians.	Building Users
All Genetics Department areas			All staff are to be familiar with and follow instructions in the correct use of any plant, equipment or machinery. This includes paper jams in photocopiers and printers.	Heads of laboratories
All Genetics Department areas	Ventilation for equipment	Low	Photocopiers and printers should be located as close to sources of ventilation (e.g. windows) as far as possible. This does not apply if the area is supplied with mechanical ventilation.	Prof Tony Kavanagh
All Genetics Department areas	Use of office chemicals	Medium	Staff are not to interfere with any hygiene products used by housekeeping staff. Instructions supplied with all other chemicals used, e.g. toner cartridges, household cleaners, computer cleaning fluids etc. to be followed at all times.	Building Users
All Genetics Department areas	Incorrect lifting & handling		All staff as far as possible to be trained in manual handling techniques by the College Safety Officer.	Prof Tony Kavanagh
All Genetics Department areas	Visitors to the building	Low	All visitors who are present in the building for more than a brief period, are to become the responsibility of the invitee. The invitee is to take charge of the visitor(s) in the event of an evacuation or if any specific procedures apply.	The Invitee
All Genetics Department areas	Late night & lone working	High	Staff and students are to have access to a telephone in the event of an emergency. Students working late are to use only buildings supervised by College Security staff.	Prof Tony Kavanagh
Lecture theatres	Over-crowding	Medium	Purpose built lecture theatres become overcrowded when the number of students exceed the number of seats. This should be avoided as far as possible. In multi purpose rooms the number of desks available will limit the number of persons within the room.	Prof Tony Kavanagh
	Lack of supervision for students	High	Students should be supervised at all times by staff or use a supervised building. When students are granted leisure or study facilities within an unsupervised building, the College Safety Officer is to assess suitability.	Prof Tony Kavanagh
	Changes in office practice	High	Any substantial changes involving the introduction of potentially hazardous materials, equipment or situations is to be risk assessed and control measures adopted prior to use. The College Safety Officer will advise as to risk assessments.	Prof Tony Kavanagh
Research laboratories	Researcher registration		All individuals engaged in research must fill out a Departmental Personnel Details Record and must be responsible for updating this.	Heads of Laboratories
Research laboratories	Under-graduate projects	High	All undergraduate research work must be supervised by a graduate researcher at all times. All undergraduates must attend the departmental safety course prior to starting research.	Heads of Laboratories
Research laboratories	Ionising Radiation	High	All users of radioactive materials must be adequately trained and have attended the TCD course on radiation safety. All users are to wear film badges. Where research starts before it is practical to attend the yearly course, the departmental safety course must	Prof Tony Kavanagh
Research laboratories	Ultra-violet Radiation	High	All users of UV light sources must be adequately trained and wear appropriate eye and skin protection.	Heads of Laboratories
Research laboratories	Use of research chemicals	High	Standard Safety Procedures as described in Faculty of Science Safety Manual to be followed at all times. Hazardous chemicals are to be manipulated in fume cupboards only. Any new experimental procedures are to be risk assessed by the	Heads of Laboratories
Research laboratories	Use of Photographic chemicals		Specific procedures to be followed are supplied to personnel working with photographic chemicals. These procedures are as a result of risk assessments and manufacturers instructions.	Heads of Laboratories
	Changes in work practice	High	Any substantial changes involving the introduction of potentially hazardous materials, equipment or situations is to be risk assessed and control measures adopted prior to use.	Prof Tony Kavanagh

Careers Advisory Service

What do you want to do? How will you get there? We are here to support you in answering these and other questions about your career.

Finalists and Senior Sophisters

Meet Employers and/or Explore Further Study: You may have decided to seek employment directly after graduation and many employers visit Dublin to actively seek out talented graduates. For others, further study may be their preferred option. Your MyCareer dashboard will keep you informed.

Find Jobs: Personalise your MyCareer profile to receive email alerts tailored to your interests.

Attend class seminar: Typically this takes place in Michaelmas term and includes information on applying for postgraduate study and jobs.

GradLink Mentoring: An opportunity to get advice and support from a Trinity graduate.

Drop-In CV/ LinkedIn Clinics: We also provide support at a practical level, helping you to improve your applications, which will benefit you in securing your future, whether in employment or further study.

Practice Interviews: A practice interview tailored to the job/ course of your choice with practical feedback.

MyCareer: Log in to MyCareer to keep abreast of jobs, study and careers events of interest to you.

MyCareer

An online service that you can use to:

- Apply for opportunities which match your preferences - vacancies including research options
- Search opportunities- postgraduate courses and funding
- View and book onto employer and CAS events
- Submit your career queries to the CAS team
- Book an appointment with your Careers Consultant

Simply login to MyCareer using your Trinity username and password and personalise your profile.

Careers Advisory Service

Trinity College Dublin, 7-9 South Leinster Street, Dublin 2

01 896 1705/1721 | Submit a career query through MyCareer

MyCareer: mycareerconnect.tcd.ie

TCD.Careers.Service

TCDCareers

www.tcd.ie/ Careers/students/postgraduate/

@TCDCareers

tinyurl.com/LinkedIn-TCD-Connecting

Opening Hours

During term: 9.30am - 5.00pm, Monday - Friday

Out of Term: 9.30am - 12.30pm & 2.15 - 5.00pm, Monday - Friday

Academic Year Structure 2020/21

Key Dates:

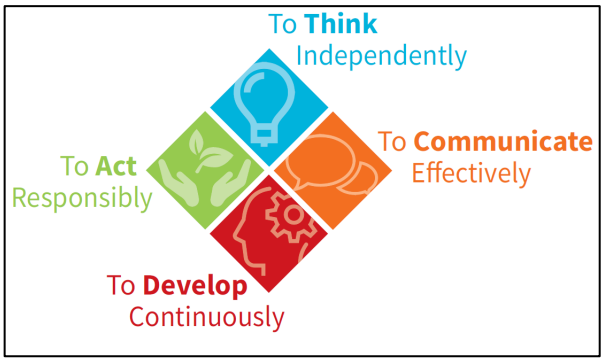
Orientation Week:	Monday 28 September to Friday 2 October 2020
Study/Review Week:	Monday 9 November to Friday 13 November 2020
Revision Week Semester 1:	Monday 4 January to Friday 8 January 2021
Study/Review Week:	Monday 15 March to Friday 19 March 2021
Revision Week Semester 2:	Monday 3 May to Friday 7 May 2021
Trinity week:	Monday 26 April to Friday 30 April 2020á

Progression and Awards

Refer to Calendar General Regulations.

Graduate Attributes

The Trinity Graduate Attributes represent the qualities, skills and behaviours that you will have the opportunity to develop as a Trinity student over your entire university experience, in other words, not only in the classroom, but also through engagement in co- and extra-curricular activities (such as summer work placements, internships, or volunteering).



The four Trinity Graduate Attributes are:

- To Think Independently
- To Act Responsibly
- To Develop Continuously
- To Communicate Effectively

Why are the Graduate Attributes important?

The Trinity Graduate Attributes will enhance your personal, professional and intellectual development. They will also help to prepare you for lifelong learning and for the challenges of living and working in an increasingly complex and changing world.

The Graduate Attributes will enhance your employability. Whilst your degree remains fundamental, also being able to demonstrate these Graduate Attributes will help you to differentiate yourself as they encapsulate the kinds of transversal skills and abilities, which employers are looking for.

How will I develop these Graduate Attributes?

Many of the Graduate Attributes are 'slow learned', in other words, you will develop them over the four or five years of your programme of study.

They are embedded in the curriculum and in assessments, for example, through undertaking independent research for your final year project, giving presentations and engaging in group work.
You will also develop them through the co-curricular and extra-curricular activities. If you help to run a club or society you will be improving your leadership skills, or if you play a sport you are building your communication and team-work skills.