

# **SMURFIT INSTITUTE OF GENETICS**

**TRINITY COLLEGE DUBLIN**

**MODERATORSHIP IN GENETICS**

**SENIOR SOPHISTER HANDBOOK**

**2017/2018**

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

The Senior Sophister course is divided into:

- Lectures
- A research project
- A written review

The Moderatorship Examination includes assessment of the Research Project, the Review, 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                      |
| Paper 1          | 10      | Medical and Cellular Genetics         |
| Paper 2          | 10      | Analytical and Developmental Genetics |
| Paper 3          | 10      | General and Molecular Genetics        |
| Problems paper 4 | 5       | Genetics Problems                     |
| Essay paper 5    | 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 5 is now paper 4, and former paper 6 is now paper 5).

## **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 NEW LECTURE COURSES (since 2015-16)***

#### **GE4040 Principles of Genetics (10 lectures) - Semester 1**

This is a mandatory course for the Genetics moderatorship and will be largely based on the textbook: 'Introduction to Genetic Analysis' by Griffiths *et al.* 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. Additionally, the course content should assist students,

generally, in addressing: essay titles that appear on Paper 5; questions on Paper 4 (Problems paper); and topics the external examiner might wish to explore during the Viva.

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

This course is mandatory for the Human Genetics moderatorship. Genetics students may attend the lectures but the course will not be examined on Genetics moderatorship papers.

## **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 judgement, 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 strongly advise you to be selective in the lectures you attend and in the courses you study intensively.

## **3. EXAMINATION PAPERS**

There will be 5 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 Freshman 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** (3.5 hours) will be a Problem Paper with about 13 questions. The problems will be of a varied nature and degree of difficulty and may be based on material or concepts from both the Freshman and Sophister years. These will test your ability to explain data, handle evidence and solve problems. You may bring notes, textbooks, photocopies and a calculator to this Paper. Textbooks of Genetics such as Griffiths *et al.*, and Klug & Cummings have good problem sets for practice. Data will often be taken from published papers.

**Paper 5** 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 5. 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.

## Genetics moderatorship: Senior Sophister Courses 2017-18

| Module Title and Courses                                    | Course Code   | Lecturer |
|---|---------------|----------|
| <b>Paper 1: Medical and Cellular Genetics</b>               | <b>GE4110</b> |          |
| Genetics & Epigenetics of Cancer                            | GE4055        | AB       |
| Transgenic Animals and Gene Therapy                         | GE4037        | JF       |
| Programmed cell death                                       | GE4051        | SM       |
| Functions, mechanisms and genetics of prion-domain proteins | GE4049        | MR       |
| Genetics & Immunol of Neural Diseases                       | GE4038        | MC       |
|   |               |          |
| <b>Paper 2: Analytical and Developmental Genetics</b>       | <b>GE4120</b> |          |
| Plant Developmental Genetics                                | GE4057        | FW       |
| Human Evolutionary Genetics                                 | GE4034        | DB       |
| Genetics of Neural Development                              | GE4053        | JPL      |
| Behavioural Genetics  | GE4054        | KM       |
| Developmental Genetics of Drosophila                        | GE4032        | SM       |
|   |               |          |
| <b>Paper 3: General and Molecular Genetics</b>              | <b>GE4130</b> |          |
| Principles of Genetics                                      | GE4040        | Various  |
| Molecular Evolution II                                      | GE4025        | AMcL     |
| Stem Cell Biology   | GE4276        | AB       |
| Plant Molecular Genetics II                                 | GE4031        | TK       |
| 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 - Papers 3:

Section A: Q1 – 4 will be based on module GE4040 “Principles of 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.**

During **Hilary Term**, members of the lecturing staff will give tutorials on solving problems questions that have appeared on past versions of Paper 4 (prior to 2017, this was known as Paper 5).

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

#### 4. REVIEW

You should arrange via e-mail to meet with your review supervisor during the first week of term (**Mon 26<sup>th</sup> September, 2017**) to discuss the review topic and to seek his/her advice re the published literature.

##### 4.1 *Review Presentation*

Your literature review *must not* exceed **8,000** 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 not later than **Monday 13<sup>th</sup> November** 2017, 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.*

***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 and the source 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**).
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. Prior to final submission: you must upload an electronic copy of the Review, **but without the References section**, as a Microsoft Word file into the **Turnitin** system (see separate instructions) to screen for possible plagiarism. The results will be made available to you.
11. THREE printed copies of the review must be submitted. You should also print a fourth identical copy for yourself, so that you can re-read it before your *viva*.

#### **4.2 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



## 5. ***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.

You are expected to start your research project during the week after Study Week in Semester 1 i.e. the week beginning **Monday 13<sup>th</sup> November, 2017**. However, you should contact your supervisor by e-mail at the start of term and arrange to meet with him/her 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 during the week preceding Study Week in Semester 2 i.e. by Friday **23<sup>th</sup> February, 2018**. You must hand in your Report on / before **Monday 12<sup>th</sup> March, 2018**.

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.

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.

### 5.1 ***Project Report presentation***

Your Project Report *must not* exceed **10,000** 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 not later than **Monday 12<sup>th</sup> March, 2018**, 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 (the text of all legends must be included in the overall document **word count**).
7. References **must** be presented using the same style indicated above for your Review.
8. Prior to final submission: you *must* upload an electronic copy of the Report, **but without the References section**, as a Microsoft Word file into the **Turnitin** system (see separate instructions) 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**.
11. THREE printed copies of the project report must be submitted. You should also print a fourth identical copy for yourself, so that you can re-read it before your *viva*.

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.

## 5.2 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 your 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.**

## 6. 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. Dr. Paul McDermott 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.

## 7. 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.

8. **DEADLINES and DATES TO REMEMBER**

|                                     |                   |  |
|-------------------------------------|-------------------|--|
| <u>Review submission deadline:</u>  | <b>Semester 1</b> | Monday <b>13<sup>th</sup> Nov 2017</b>               |
| <u>Project lab work to start:</u>   | <b>Semester 1</b> | <u>Week beginning:</u> Mon 13 <sup>th</sup> Nov 2017 |
| <u>Project lab work to end:</u>     | <b>Semester 2</b> | Friday <b>23<sup>th</sup> Feb 2018</b>               |
| <u>Project submission deadline:</u> | <b>Semester 2</b> | Monday <b>12<sup>th</sup> Mar 2018</b>               |

- **All work should be handed in to Sue in the Genetics Office ON THE DATES SPECIFIED ABOVE, between 9:30am - 1:00pm or 2:00pm - 5:30pm**
- **You will be given a receipt**
- **Work must also be uploaded to Turnitin by the same deadlines**
- **Work handed in or uploaded 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 2018

|         |            |                     |
|---------|------------|---------------------|
| Paper 1 | Tues 8 May | 09.30-12.30         |
| Paper 2 | Fri 11 May | 09.30-12.30         |
| Paper 3 | Mon 14 May | 09.30-12.30         |
| Paper 4 | Wed 16 May | 09.30- <b>13.00</b> |
| Paper 5 | Fri 18 May | 09.30-12.30         |

Reception to meet externs: Weds 23 May (evening)

Vivas                      Thurs 24 May  
Results posted        Fri 25 May

## 9. EXTERNAL EXAMINER

The External Examiner for the Genetics degree is Professor Robin Allshire, Edinburgh University.

## 10. 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 1<sup>st</sup> 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 Friday 13<sup>th</sup> October, 3-4 p.m., Dawson Room. 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.

## 11. CONCLUSION

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

## 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

## 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 his/her 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 inadmissible. 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 (with the exception of 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 (with the exception of the References section is:

Signed.....

Dated .....

| 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 Kavanahj 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. In case of absence, Professor Kavanagh will deputise for Dr McDermott  | 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 | 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           | 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.  | Dr. Paul McDermott    |
| 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        | 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 | 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             | 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.

## Junior and Senior Fresh Students

**Get Involved:** Remember that your course of study, extra-curricular activities, voluntary and part-time work all provide opportunities for developing skills and gaining an insight into your career preferences. In your Senior Fresh year, look out for short-term internship opportunities.

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

## Junior Sophisters

**Attend class seminar:** Typically this takes place in Hilary term and includes information on applying for work experience and internships and postgraduate study.

**Get work experience:** The programme of summer work experience and internships is particularly relevant to Junior Sophisters. Personalise your MyCareer profile to receive email alerts tailored to your preferences.

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

## 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](http://mycareerconnect.tcd.ie)



TCD.Careers.Service



TCDCareers



[www.tcd.ie/Careers/students/pc](http://www.tcd.ie/Careers/students/pc)



@TCDCareers



[tinyurl.com/LinkedIn-TCD-Conne](http://tinyurl.com/LinkedIn-TCD-Conne)

## Opening Hours

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

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