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The Graduate School
Welcome from Professor Sue Gibson, Director of the Graduate School

The Graduate School has several roles but our main functions are to provide a broad, effective and innovative range of professional skills development courses and to facilitate interdisciplinary interactions by providing opportunity for students to meet at academic and social events. Whether you wish to pursue a career in academia, industry or something else, professional skills development training will improve your personal impact and will help you to become a productive and successful researcher.

Professional skills courses for Master’s students are called “Masterclasses” and they cover a range of themes, for example, presentation skills, academic writing and leadership skills [link](http://www3.imperial.ac.uk/graduateschool/currentstudents/professionalskillsmasters/masterclassprogramme). All Masterclasses are free of charge to Imperial Master’s students and I would encourage you to take as many as you can to supplement your academic training. The Graduate School works closely with the Graduate Students’ Union (GSU) and is keen to respond to student needs so if there is an area of skills training, or an activity that you would like us to offer, but which is not currently provided, please do get in touch ([graduate.school@imperial.ac.uk](mailto:graduate.school@imperial.ac.uk)).

The Graduate School also runs a number of exciting social events throughout the year which are an opportunity to broaden your knowledge as well as to meet other students and have fun. Particular highlights include the Ig Nobel Awards Tour Show, the Chemistry Show and the 3 minute thesis competition. You should regularly check the Graduate School’s website and e-Newsletters to keep up to date with all the events and training courses available to you.

Finally, I hope that you enjoy your studies here at Imperial, and I wish you well.

Sue Gibson
Welcome from Dr Janet De Wilde, Head of Postgraduate Professional Development

I would like to welcome you to the graduate school courses for postgraduate professional development. The team of tutors here come from a wide variety of experiences and we understand just how important it is to develop professional skills whilst undertaking postgraduate studies and research. Not only will this development improve success during your time at Imperial College, but it will also prepare you for your future careers. We are continually working to develop and innovate the courses we offer and over this year you will see many new offerings both face to face and online. I encourage you to explore and engage with the diverse range of opportunities on offer from the team at the graduate school and I wish you well in your studies.

Janet De Wilde

Welcome from the Graduate Students’ Union
Hello and welcome to Imperial. I’m Liucheng, the President of the Graduate Students’ Union for the 2015/16 academic year.

The Graduate Students' Union (GSU) is the representative body within the Imperial College Union for the postgraduate community across all Imperial campuses. The GSU works alongside the Imperial College Union President to ensure that the requirements of postgraduate students are catered for. The GSU also ensures that postgraduates' social and recreational needs are met and holds a number of events during the year.

Postgraduate students at Imperial are at the forefront of the research done and the experience they have as a student should be the best. Therefore, at the GSU we ensure that this happens. The work we do focuses on the academic, welfare and social needs of postgraduates.

Whether you are a MSc, MRes or Doctoral Research student, you are automatically a member of the GSU. If you have any questions or would like to find out more please do not hesitate in getting in touch with me at: gsu.president@imperial.ac.uk, or visiting our website: https://union.ic.ac.uk/gsu.

Liucheng Guo
Chapter 1: Introduction to the MSc in Bioinformatics and Systems Biology

1.1 Aims

The aims of the MSc in Bioinformatics degree are:

- to provide an introduction to the disciplines underlying modern bioinformatics and systems biology
  - Mathematics and Statistics
  - Biology
  - Computing
- to give a comprehensive overview over modern methods and tools in bioinformatics and systems biology.
- enable students to develop tools and software for bioinformatics and systems biology research.
- to introduce students to active research groups in bioinformatics, systems biology and related disciplines at the interface between the biomedical and mathematical/physical and engineering sciences.
- to encourage an analytical approach to a wide range of topics relevant to industry and research.
- to provide training in communication of scientific results.

1.2 Objectives

At the end of the MSc degree students should have gained an overview of bioinformatics and systems biology, as well as a proper foundation to develop these fields further. Bioinformatics and systems biology are highly active and quickly changing research areas and there is no substitute for a sound understanding of basic concepts of biology, mathematics/statistics and computing. These will be provided in this course.

Students should also have developed their abilities in software design and statistical analysis, including the critical discussion of scientific results. Finally they should have improved their skills in presenting scientific work verbally and in written form.

1.3 Course Organisation

The MSc course consists of three elements which (with % contribution to the final grade) are:

- **Element 1** – Taught component (30%)
- **Element 2** – Project 1 and Project 2 (40%)
- **Element 3** – Project 3 (30%)

To pass, the work reported in the three projects comprising Elements 2 and 3 must demonstrate a level of mathematical, statistical or computational skill that extends beyond just the use of existing programs.

**Element 1** (see section 3 for details) consists of two components. The total mark for this element is 45 which is converted to a percentage.

**Component 1** -
- Bioinformatics and Systems Biology I (5 marks out of the 45)
- Bioinformatics and Systems Biology II (25 marks out of 45)

**Component 2**
Mathematics, Statistics and Probability (10 marks out of 45)
Computing (5 marks out of 45)

**Element 2** (see Section 4 for details) consist of two components.
The total mark for this element is 100.

**Component 1** – Computing (group) project (50 marks out of 100)
**Component 2** – Data analysis project (50 marks out of 100)

**Element 3** (see Section 4 for details) consist of one component:
Bioinformatics and Theoretical Systems Biology project (100 marks out of 100)

Course contents may vary slightly between years in order to reflect the students' needs as well as the fast pace at which these fields are progressing. The taught components are assessed partly through course work and through written exams. The three projects are in computing data analysis and bioinformatics/systems biology, respectively. They all last for approximately 12 weeks and aim to deepen the students understanding of advanced concepts and methods in bioinformatics. The overall degree is assessed in a viva with the external examiners.

1.4 Grades from the course

There are four outcomes from your MSc course: distinction, merit, pass and fail.

**Distinction** – You obtain at least 70% in each of the three elements.
**Merit** – You obtain at least 60% in each of the three elements
**Pass** – You obtain at least 50% in each of the three elements.
**Fail** – You obtain less than 50% in any of the three elements, irrespective of the aggregate mark for the entire course. In addition, if you obtain less than 40% in any component of an element, this is a fail irrespective of the aggregate mark for the element.

Note that the aggregate grade for your course from the three elements does not define your outcome.

**Chapter 2: Administration**

2.1 Dates in the academic year 2015-16

The MSc course is full time one year course, which will end no later than 27 September 2016. The College calendar can be accessed here [http://www3.imperial.ac.uk/registry/currentstudents/termdates](http://www3.imperial.ac.uk/registry/currentstudents/termdates) but please see below for closure dates and note that the course does not follow the undergraduate teaching calendar.

The college will be closed on the following dates:

College will reopen Monday 4 January 2016.
College will reopen Thursday 31 March 2016.
Early May Bank Holiday – Monday 2 May 2016.
2.1.2 Courses and Exams

Teaching is loosely based on term dates but projects continue throughout the academic year.

**Exams** will be over the period Thursday 7 January to Friday 15 January 2016 inclusive.

- **Thursday 7 January 2016 1.00-4.00** Bioinformatics II
- **Monday 11 January 2016 1.00-4.00** Bioinformatics I
- **Wednesday 13 January 2016 1.00-3.00** Maths

The **computing project** will run for 10 weeks from Monday 11 January to Tuesday 22 March 2016.

The **timed computing assessment** will be held in the week commencing 11 April 2016.

The **data analysis project** will run for 11 weeks (including Easter closure) from Tuesday 22 March to Tuesday 8 June 2016.

The **bioinformatics and systems biology project** will run for c.13 weeks from Tuesday 8 June to Monday 5 September 2016.

Vivas for the **bioinformatics and systems biology project** will be held from Tuesday 6 September to Wednesday 21 September 2016.

**Final Vivas** with external examiners: Provisional Date: Friday 23 September (subject to final confirmation) but no later than 28 September 2016.
2.2 Contacts

Course Director
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Director of Postgraduate Studies
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Postgraduate Tutor / Disability Liaison Officer
Professor Neil Fairweather,
Department of Life Sciences
Tel: 020 759 45247; email: n.fairweather@imperial.ac.uk

2.3 Support and Guidance

Every MSc student will be allocated a member of staff as a mentor for the whole year. The mentor is the student’s first point of contact should a problem arise and will be available to the student on request. Independently, the course director will meet all students during the same period at specified times when guidance and feedback on progress will be provided.

The supervisors of the research projects will also act as points of contact and will report on the student’s performance to the course director. In cases where a project is done outside of Imperial College, the course director identifies a member of the MSc teaching committee to act as a point of contact for the student.

2.4 Student Involvement

2.4.1 Student representative

The MSc students elect a representative who liaises with the course director, deputy director and other members of the teaching committee. The student representative can also act as a representative for individual students and raise potential problems with the course director and deputy director.

2.4.2 Staff-Student Committee

There will be regular staff-student committee meetings where the course director and course convenors will be present and provide additional administrative information. Students may also be able to raise issues.
2.4.3 Student feedback

Your feedback is important to your department, the College and Imperial College Union. Whilst, there are a variety of means to give your feedback on your Imperial experience, the following College-wide surveys give you regular opportunities to make your voice heard:

- PG SOLE lecturer/module
- Student Experience Survey (SES)

The PG SOLE lecturer/module survey runs at the end of the Autumn and Spring Terms. This survey is your chance to tell us about the modules you have attended and the lecturers who taught them. Run at the same time as the Autumn Term PG SOLE is the Union’s Student Experience Survey (SES). This survey will cover your induction, welfare, pastoral and support services experience. During December you will receive an email in your Imperial College account with a link to the surveys.

All these surveys are anonymous and the more students that take part the more representative the results so please take a few minutes to give your views

As a result of feedback to previous surveys, we have increased the contribution of Mathematics to the total for Bioinformatics II

The course director may distribute feedback forms at various stages of the course. These forms can be used to provide anonymous feedback on the performance of individual lectures and the organization of the course. Student feedback is taken very seriously and enables us to improve the course.

During the final viva with the external examiners students will also have an opportunity to give feedback on the course.

2.5 Academic Conduct

2.5.1 Attendance

During the first half of the course students are assessed by course work. This is an integral part of the degree and contributes to the final mark. It is expected that students attend courses and hand in the completed course work in time. Should personal and/or health problems require the student to take some time off, then this should be immediately brought to the attention of the Course Director.

Students are permitted to take sound recordings of a lecture if they have obtained consent from the lecturer. Video recording are not permitted. If a student arrives more than 10 minutes late for a lecture, the lecturer has the right to refuse admission to prevent disruption to the detriment of other students.

The research projects aim to introduce students to an active research environment. Performance during the project is part of the formal assessment and students should try to arrange working hours together with their supervisor. As the time on each project is limited to approximately 12 weeks the students also have to agree leave of absence with their project supervisors and the course director. Failure to do so may be reflected in the mark for lab-performance.

Students are expect to work at Imperial and cannot expect their supervisor to provide detailed scientific guidance by e-mail rather than by face-to-face meetings.

Any assessments or project reports that are handed in late will be downgraded. Every day (or part of day) late will result in a 10% reduction from the final mark.

2.5.2 Plagiarism

You are reminded that all work submitted as part of the requirements for any examination (including coursework) of Imperial College must be expressed in your own words and
incorporate your own ideas and judgements. All Master’s students will be required to self-enrol onto the course which is available via Blackboard. Instructions on how to enrol onto the course can be found on the Graduate School’s Plagiarism Awareness Online Course webpage http://www3.imperial.ac.uk/graduateschool/plagiarismawarenesscourse. The course will take approximately 1.5 hours to complete but can be saved and returned to at a later date. There is no limit to the amount of times students can take the course – it can be accessed anytime, so there will always be an opportunity to refresh understanding.

Plagiarism, that is, the presentation of another person’s thoughts or words as though they were your own, must be avoided, with particular care in coursework, essays and reports written in your own time. Note that you are encouraged to read and criticise the work of others as much as possible. You are expected to incorporate this in your thinking and in your coursework and assessments. But you must acknowledge and label your sources.

Direct quotations from the published or unpublished work of others, from the internet or from any other source, must always be clearly identified as such. A full reference to their source must be provided in the proper form and quotation marks used. Remember that a series of short quotations from several different sources, if not clearly identified as such, constitutes plagiarism just as much as a single unacknowledged long quotation from a single source. Equally, if you summarise another person’s ideas, judgements, figures, diagrams or software, you must refer to that person in your text and include the work referred to in your bibliography. Departments are able to give advice about the appropriate use and correct acknowledgement of other sources in your own work. Please note that a general reference at the end of your report to sources other than your own is not sufficient.

The direct and unacknowledged repetition of your own work which has already been submitted for assessment can constitute self-plagiarism. Where group work is submitted, this should be presented in a way approved by your department. You should therefore consult your tutor or course director if you are in any doubt about what is permissible. You should be aware that you have a collective responsibility for the integrity of group work submitted for assessment.

The use of the work of another student, past or present, constitutes plagiarism. Where work is used without the consent of that student, this will normally be regarded as a major offence of plagiarism.

In your report you must explicitly identify any results obtained by others. If you worked jointly with a member of the group to obtain a particular result, this should be stated.

Occasionally a paper describing your project work will have been submitted to a conference or a journal prior to you submitting your report. You cannot use the text from this paper – you must rewrite this for your report - even if you wrote the original paper. You should discuss this with the course Director or Deputy Director.

Failure to observe any of these rules may result in an allegation of cheating. Cases of suspected plagiarism will be dealt with under the College’s Procedure for Dealing with Examination Offences and may result in a penalty being taken against any student found guilty of plagiarism.

You will be required to submit any group work in electronic form by the allotted deadline. Teaching staff may use this to check for evidence for plagiarism using the College’s plagiarism detection software system. Failure to submit electronic copies of your work by the allotted deadline may also result in downgrading of the final project mark.
2.5.3 Illness and other problems affecting performance

We understand that illness and other major problems can affect your performance during the course. In addition, during the projects problems might arise such as the illness of your supervisor. We will of course treat any such issues sympathetically and, if appropriate, make appropriate adjustments.

It is essential that you let us know as soon as any such problem arises.

2.5.4 Illness at exams

If you are unwell and unable to attend an exam it is essential that you let us know as soon as possible and no later than the day of the exam. You must obtain a doctor's note on the day of non attendance. If there are several days of non attendance, then you need a separate note for each day. The Imperial College Health Centre can help to give these notes but you are strongly advised to register with a local GP who could then provide this note.

2.5.5 Late hand in of work

Course work and reports must be handed in by the deadline. If there is a problem due to illness that prevents you meeting this deadline you must let us know as soon as the problem arises. We require medical notes to document illness.

Please note that not having sufficient results is never accepted as a reason for late hand in. Your report is assessed in terms of the quality of the presentation and can detail the problems you encountered.

A penalty of 10% of your original mark will be deducted from the mark for your coursework or report for each day (or part of a day) you are late.

If you fail to hand in Project 3 without good reason, then you will not be vivaed and will obtain a zero mark for the report and the viva.

2.5.6 Data management

It is your responsibility to ensure that all data including reports and research are kept securely and are backed up. During your research project you should discuss with your supervisor how data is backed up. Any data just stored on a PC should not be considered as secure. Loss of your report due to computing problems is not considered a valid reason not to have submitted on time. We advise you to avoid updating any PC software just prior to a hand in date as this can cause problems.
Chapter 3: Taught Element

The first term of the year will be spent on taught courses. These courses reflect the background of the students as much as the requirements of the working research bioinformatician and systems biologist. We aim to provide an introduction to computing, mathematics/statistics and biology as well as a survey over recent developments in bioinformatics and systems biology. Depending on your background you may find parts of the course familiar while other parts will introduce novel material and concepts. Students with a background in biology will have to become familiar with a range of mathematical and numerical techniques, while those from the mathematical and physical sciences will have to learn genetics and genomics at the level of final year undergraduate biologists. The amount of time spent on learning the material covered in the different courses will necessarily have to reflect this. Ample time for revision is built into the time-table.

3.1 Course Outlines

3.1.1 Bioinformatics and Systems Biology I
This course covers genetics and genomics as well as experimental and mathematical foundations of systems biology. After a brief review of basic concepts this course proceeds quickly and covers functional as well as medical genomics. You will receive detailed overviews over several ongoing genome projects.

Lectures include:
- a. Genes and Genomes
- b. Proteins
- c. Gene Expression
- d. Cell Biology
- e. Cellular Biochemistry and Metabolism
- f. Functional and Structural Genomics
- g. Population and Evolutionary Biology
- h. Integrative Systems Biology

There will be one or more question and answer sessions which are targeted at those who have had no previous exposure to biology.

Recommended reading for this course includes:
1. Mount, Bioinformatics
2. Strachan and Read, Human Molecular Genetics
3. Passarge, Colour Atlas of Genetics

3.1.2 Statistical Learning

The main objective of this course is to introduce the theory of probability and techniques for carrying out probability calculations, as well as to introduce the theory of statistical inference and statistical learning techniques. Fundamental topics will be selected with emphasis on important issues arising in bioinformatics applications, such as hypothesis testing and the problem of multiple comparisons. Essential techniques for statistical modelling and data analysis will be introduced and various computational methods with particular relevance to systems biology will be illustrated.
You will receive lectures on:

- Probability and discrete random variables
- Independence, joint and conditional probabilities
- Discrete distributions and generation of random numbers
- Continuous random variables and distributions
- Population vs sample statistics and descriptive statistics
- Likelihood
- Bayesian methods and inference
- Statistical tests
- Bootstrap and randomization
- Markov processes and HMMs
- Statistical learning theory
- Classification and Clustering
- Regression models
- Stochastic processes
- Dynamical systems, difference equations and differential equations
- Analysis of differential equations
- Partial and stochastic differential equations
- Parameter estimation and optimization
- Graphical models
- Model selection

These lectures will be supplemented by an Introduction to the R statistical environment and R tutorials.

**Recommended Reading:**

1. Stirzaker, Elementary probability
2. Stirzaker, Probability and random variables: a beginner’s guide
3. Ewens and Grant, Statistical methods in bioinformatics
4. Rice, Mathematical Statistics and Data Analysis
6. Durbin, Eddy, Krogh and Mitchison, Biological Sequence Analysis: Probabilistic models of proteins and nucleic acids
7. Lange, Mathematical and statistical methods for genetic analysis
8. D.W. Mount, Bioinformatics: sequence and genome analysis

**3.1.3 Computing**

This course provides an introduction to the important computational methods and languages in bioinformatics and systems biology. It aims to provide highly transferable skills. Students who have taken this course should be able to learn new methods and languages independently if the need arises.

**Python/Java** These courses provide an introduction to scripting programming with Python and object-oriented programming using Java. These courses are assessed by programming assignments and also a Python practical exam.

**Python** This is one of the main programming languages used in bioinformatics and is taught using bioinformatics related examples. Topics covered include:

- Writing a simple script
- File handling including parsing and extracting data
• Lists/arrays
• Dictionaries/associative arrays
• Regular expressions
• Functions
• Modules
• PyCogent, a Python software library for genomic biology

Java
The Java course builds on the programming and implementation techniques previously learnt. Topics covered include:

• Overview of Java
• Primitive Data types
• Writing a simple Java program
• Class methods and access privileges
• OO programme design
• Packages
• Interfaces
• Threads of execution
• Exception handling
• Event handling
• File handling, input and output
• GUI design and implementation
• Layout managers
• Abstract classes
• Analysing images in Java
• Database connectivity using JDBC
• Building Java applications

Introduction to Databases
The course is a general introduction to relational databases. Topics covered include database design and an overview of normalisation. This will be followed by a presentation of MySQL with a presentation of how to create, populate and access information in a database.

Web development.
The course is a general introduction to website development. Topics covered include HTML, Javascript and the use of a Python framework to develop dynamical websites.

There will be weekly lectures and lab sessions for the programming that will run every week of the first term. The course is assessed with three assignments covering Python and Java programming. Databases are covered in lectures by Dr Huntley.

3.1.4 Bioinformatics and Systems Biology II
Aims:
• To provide students with a state-of-the-art understanding of the principles, algorithms and programs in bioinformatics and systems biology methodologies across a broad range of application areas.
• To provide practical experience of the most important bioinformatics tools in core areas and experience of systems biology analysis
To introduce key computational methods that impinge directly on contemporary bioinformatics and systems biology

To provide an understanding of the limitations of contemporary bioinformatics and systems biology

Objectives:

The lectures in the course will be divided into the following components:

- The protein component: Principles of protein structure and function. Annotation and prediction of protein structure and function.
- The DNA component: DNA sequence analysis; prokaryotic and eukaryotic genome annotation; expression arrays.
- Statistical component: statistical genetics
- Systems Biology Component: networks; mathematical modelling; machine learning

Course timetable There will be approximately 40 hours of lectures running through the autumn term. There will be three practical exercises which will occupy the student for 10 -15 hours and will be phased throughout the course.

The exercises will be given out in parallel with the lectures and will cover: protein annotation (term 1); genome annotation (term 1) and networks (term 2). Recommended reading will be announced during the lectures. A good introductory book is A Lesk Introduction to Bioinformatics 4th ed Oxford University Press

3.2 Taught Assessment

The taught components will be assessed partly through written exams and partly through small practicals. There may be some minor changes to the course content which will be announced well ahead of the actual exams. Assessment of the taught components will follow along these lines:

Component 1

Bioinformatics and Systems Biology I

This will be assessed through a written exam. Students will have the choice of 4 out 8 questions covering the material of the lectures. Two questions out of four related to genes and genomics, and two out of four questions related to systems biology have to answered. Each question carries the same mark.

Bioinformatics and Systems Biology II

There are three practical assignments and a three hour written exam which contribute to the overall mark. All practicals together contribute 25% with the remaining 75% of the exam results. The examination will be split into two parts. For the first part (Part A), which lasts one hour, students have to answer six short compulsory questions. After a short break, the second part (Part B), lasting two hours, will require the students to answer three questions from five. The first three of set questions will be primarily focussed on bioinformatics (Part B1) and the remaining two of systems biology (Part B2). The student must answer one question from Part B1, one from Part B2, and one from either Part B1 or B2. Each short question provides 5% of the exam mark, while the three long questions provide 70% in total.
Component 2

Mathematics, Probability and Statistics

This course is assessed through a two hour written exam, where students have to answer three out of six short questions and two out of for long questions. Each short question contributes 10% to the final examination mark and each long question 35%. In addition there is a project on computational statistics. Separate marks are given for content, coding and project presentation. The assignments contribute 25% to the final mark of this part.

Computing

There will two marked assignment in Python (each contribution 20%) and one timed exam style test (contributing 50%). There will be sufficient time in this test to allow students who have learnt computing for the first time and are competent to finish the questions. There will also be a JAVA assignment (contributing 10%). The timed exam style test will be held shortly after the Easter break in the week commencing 11 April 2016.

The relative weightings of the above to Element 1 are:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioinformatics and Theoretical Systems Biology I</td>
<td>5 out of 45</td>
</tr>
<tr>
<td>Bioinformatics and Theoretical Systems Biology II</td>
<td>25 out of 45</td>
</tr>
<tr>
<td>Mathematics, Probability and Statistics</td>
<td>10 out of 45</td>
</tr>
<tr>
<td>Computing</td>
<td>5 out of 45</td>
</tr>
</tbody>
</table>
Chapter 4 : Projects

4.1 Computing Project

The aim of this project is to further develop students’ computational expertise in a bioinformatics and/or systems biology setting and to apply the newly acquired skills in the development of a substantial piece of software. The development of a functional genomics data-base with a web-based user-interface is an example of a previous project. Depending on the nature of the project students may have to learn new computational techniques.

By default this is a group project, where 3-4 students will implement a large software project under the supervision of a member of the Department of Computing or the Centre for Integrative Systems Biology and Bioinformatics (CISBIO). The supervisor will, however, only give minimal guidance and leave planning, development, implementation and tuning of the software to the students. Each group has approximately 11 weeks to complete the project. It is assessed through:

- A group report in the form of user documentation
- An individual report
- A presentation of the project to the course
- Performance during the project.

The group report should provide an overview over the software product and information on how to use it. In the joint report clearly indicate in each section by use of initials who wrote that section and if different who undertook the work. Joint authorship is allowed.

The individual reports should contain a detailed description of the work each student contributed to the overall project. This can include a log-book of the progress made during the course of the project and explain the choices made during the design and implementation phase. Individual reports should not be longer than 3,000 words.

The final presentation of the project should introduce the other students on the course to the software and each student should present their contribution to the overall project. This presentation forms part of the assessment of the project. The examiners may call individual students for an in-depth viva voce examination.

In cases where a student can prove proficiency and experience in computer science they may also be given the opportunity to do an individual software project. In this case it is assessed by:

- An individual report
- A presentation
- Performance during the project.

Two copies of the individual and group reports have to be submitted for assessment; in addition an electronic copy has to be submitted. Late submission can lead to a deduction of 10% of the final mark per day.

For group as well as for the individual projects the performance during the course of the project is also assessed by the supervisor of the project. It is, however, left to the members of each group how to divide the necessary work among themselves.
The mark for this project accounts for 50% of Element 2 and thus 20% of the total mark of the degree.

To pass, the work reported in these three projects must demonstrate a level of mathematical, statistical or computational skill that extends beyond just the use of existing programs.

4.2 Data Analysis Project
For the second project, the students work on the statistical and computational analysis of biological or biomedical datasets in collaboration with experimental/clinical groups within Imperial College London. This should be related to ongoing research projects. Assessment will be through a webpage detailing the results of the research. The supervisor will mark lab performance and scientific aspect of the report at a ratio of 2:1. The examiners will mark the webpage report and scientific aspect at a ratio of 2:1. Late submission will lead to a deduction of 10% of the final mark for the report per day.

The mark for this project accounts for 50% of Element 2 and thus 20% of the total mark of the degree.

4.3 Bioinformatics and Systems Biology Project
This forms Element 3 of the course. The third project can be hosted by any suitably qualified bioinformatics and systems biology group within Imperial College London, including all associated hospital and Silwood Park campuses. The project must not be purely computational, mathematical or statistical but must serve to introduce the student to a high quality bioinformatics and systems biology research environment. Topics can range from applied bioinformatics all the way through to mathematical biology. Students cannot perform their bioinformatics project outside of Imperial College.

During the project each student will become part of their host laboratory and work alongside PhD students and postdocs on a topic agreed with the supervisor. The project has to involve substantial use of bioinformatics tools and/or development of bioinformatics and systems biology methods. It must not include any experimental work. The project scope can range from developing or integrating software tools to working on mathematical models of biological systems.

Students are expected to submit three copies of their work, as well as an electronic copy. Late submission of the report can result in a 10% deduction from the final mark per day (or part of a day) from the report grade.

The project is assessed by the supervisor who gives marks for the lab performance and the report which contribute at a ratio 2:1 and, in total, make up 50% of the overall project grade. The project is also assessed by two examiners in a viva. The examiners mark the report as well as the viva which contributes at a ratio of 1:2, and which make up the remaining 50%.

If no report is submitted without good reason approved by the course organiser(s), no viva is held. Thus the mark for the report and the viva will be zero and you will fail the degree.

Overall the bioinformatics project contributes 30% to the overall degree.
Chapter 5: Useful Resources

5.1 The Graduate School: Professional Skills Courses for Research Students 2015/16

The Graduate School offers a comprehensive training programme for MRes and doctoral students to enhance your research, professional and personal development skills. Our workshops run throughout the year and are designed to support you throughout your studies. They can also show you how to communicate your work to a variety of audiences and consider the wider application of your work. The courses are also a social opportunity to interact with students from other parts of the College.

The A & B categories

The programme is divided into “A” (core) and “B” (later-stage or specialist) courses.

A List courses give you the key transferable skills to help you in your research and beyond. They are relevant at any time during your studies, but are particularly suitable for students during the first 18-24 months of their research programmes. They provide the fundamental skills to help you in your research and development.

B List courses cover a range of topics, many of which are suited to later stage researchers (post-18 months) or are courses which are of a specialised nature so are not considered essential for all research students.

There are also some general interest, not for credit, courses available, including a suite of online courses.

The courses we offer:

Our courses are divided into skill categories, grouping related courses together and making it easier for you to find courses relevant to your skill-base. Early stage researchers are encouraged to select A list courses from the following categories as these cover the fundamental skills needed to help you become an effective researcher:

- Residential Courses – including the Research Skills Development (RSD) course
- Personal Effectiveness
- Presentation Skills
- Writing Skills
- Research Effectiveness
- Information Skills
- Ethics
- Statistics
- Business, Enterprise & Commercialisation
- Completing the Research Degree
- Careers

The full programme can be viewed at http://www3.imperial.ac.uk/graduateschool/currentstudents/professionalskillsmasters

To best plan your development, we recommend that you discuss your choice of workshops with your supervisor. When choosing courses, always read the full course description on the Graduate School website as this will tell you the course content and guide you to the most appropriate time to attend the course. You should apply only for the workshops recommended for your current stage of study.
Your attendance requirement

The transferable skills programme is an integral part of your research degree and you should use it to support your development. It exists in order to ensure that you receive generic transferable skills training whilst at Imperial, enhancing your employability.

All students who register on PhD or MD(Res) programmes on or after 1 January 2011 are required to attend four A list courses OR the Research Skills Development course (above) plus one further course by the 18-24 month milestone (pro-rata for part-time students). If attending 4 A list courses, you are strongly encouraged to take at least one course from three of the different skills categories.

The attendance requirement is deliberately kept low to give you the freedom to take responsibility for your own training and development. Once you have completed your attendance requirement you are welcome, and encouraged, to attend any further workshops that interest you.

The Transferable Skills Programme is also designed for those students following Master of Research (MRes) degree programmes. Students on these programmes are free to select courses they feel would enhance and develop their skills. As this is different to studying for a PhD, there is no Graduate School attendance requirement for MRes students although your academic department will normally require you to attend some workshops. Please remember that you should discuss your timetable with your course director and also please note that priority for places will be given to first year doctoral (research) students.

Where to find information on the courses

Course information can be found on the Graduate School website at http://www3.imperial.ac.uk/graduateschool/currentstudents/professionalskillsmasters

You should follow the “Humanities, Life Sciences and Medicine” [HLSM] route for appropriate courses. Dates of workshops are given on each of the course description pages. The majority of courses will run on the South Kensington (SK) and the Hammersmith (HH) Campuses.

How to book
In order to book your place on a course, please complete the appropriate on-line booking form. Details can be found on the Graduate School website as above. Places are allocated on a first come first served basis and the course venue will be sent in a confirmation email.

Cancellation charges

There is a charge for late cancellations and non-attendance of courses. For our short courses, we ask for at least three working days’ notice of cancellation. Cancellation periods for residential and longer courses can vary. Please see the Graduate School website for full details of the cancellation policy and charges.

Credit for prior learning

We acknowledge the diversity of experience amongst our students and this is why we offer a mechanism for recognising external training or experience. If you have attended a course you think may be equivalent to a Graduate School workshop, or if you have significant work experience, we recommend that you discuss this with your Director of Postgraduate Studies.
They can make an application to the Graduate School on your behalf, to recognise your previous training.

Normally a maximum of two courses can be claimed as equivalent, to encourage all students to engage with the programme during their time at Imperial.

There are also a number of courses offered in Departments that are already recognised as equivalent to the Graduate School programme.

Full details of equivalent courses and how to apply for exemption can be found at http://www3.imperial.ac.uk/graduateschool/currentstudents/professionalskillsmasters

Other Resources

Help sheets
We have a number of help sheets which provide guidance and tips. These include advice on literature reviews, poster presentations and career planning. All of these can be found on the Graduate School website as above.

Mathematics Advisory Service
The Mathematics Advisory Service, funded by the Graduate School, is free for all research students and offers technical help to overcome mathematical problems you may encounter in your research. The Service is informal, friendly and effective. For details, follow the link to the Mathematics Advisory Service from: http://www3.imperial.ac.uk/graduateschool/currentstudents/professionalskillsmasters

Online Courses
The Graduate School provides a number of online courses and resources. The following courses are available to all research students:

- Attending Conferences, Presenting and Networking
- Career Planning in the Arts, Humanities and Social Sciences
- Career Planning in the Sciences
- Getting Published in the Arts
- Getting Published in the Sciences
- Intellectual Property in the Research Context
- IT and Statistics Basics
- Project Management in the Research Context
- Research Ethics: Good Ethics Practice
- Research Ethics: Working with Human Subjects

Online courses are hosted on the Graduate School Blackboard VLE: http://learn.imperial.ac.uk

Graduate School Events

All postgraduate students at Imperial, whether following taught or research programmes, belong to the Graduate School. Membership means you immediately become part of a wider postgraduate community, broadening and enriching your academic and social experience whilst at Imperial. The Graduate School provides a focus for opportunities to meet each other and exchange ideas across disciplines through attendance at guest lectures and other similar academic (combined with social) activities.

Attending the different activities and events will give you the opportunity to meet other postgraduates in your field and from other parts of the College, and have the chance to share
knowledge and experience. An important part of these events are the receptions afterwards, which provide an opportunity for you to meet with the speaker(s) and presenter(s) and with each other. This enables you to make rewarding contacts outside of your laboratory or department, bringing you into contact with graduates from different backgrounds to your own.

There are a number of social and academic events throughout the year, including distinguished guest lectures, at which you will be able to hear top national and international speakers. Other regular events include the extremely popular Ig Nobel Awards Tour Show in March and the exhibition chemistry show in May. The Graduate School Research Symposium in July includes the opportunity to view posters presented by research students across the College, a keynote lecture and reception.

In addition to the many events which are now well established in the Graduate School calendar, you are encouraged to contact the Graduate School with your suggestions for popular speakers, issues for debates and ideas for other interdisciplinary events.

See the website for our events programme [www.imperial.ac.uk/graduateschool/events](http://www.imperial.ac.uk/graduateschool/events)

**Contact Us**

By email at graduate.school@imperial.ac.uk

Follow us on Twitter – follow @ImperialGradSch for news, events and highlights

Find us on Facebook at Imperial College Graduate School

Visit the Graduate School website: [www3.imperial.ac.uk/graduateschool](http://www3.imperial.ac.uk/graduateschool)

We are based in the Registry, Level 3, Sherfield Building, South Kensington Campus – accessible via the Student Hub.

5.2 Web resources

5.2.1 Imperial Study Guide / Imperial Study Guide for Masters Students:

[http://www3.imperial.ac.uk/students/studyguide](http://www3.imperial.ac.uk/students/studyguide)

5.2.1 Assessment

Policy on employment during studies:

[https://workspace.imperial.ac.uk/registry/Public/Procedures%20and%20Regulations/Policies%20and%20Procedures/Student%20Employment%20During%20Studies.pdf](https://workspace.imperial.ac.uk/registry/Public/Procedures%20and%20Regulations/Policies%20and%20Procedures/Student%20Employment%20During%20Studies.pdf)

Academic and Examination regulations:

[http://www3.imperial.ac.uk/registry/proceduresandregulations/regulations](http://www3.imperial.ac.uk/registry/proceduresandregulations/regulations)

Religious obligations in assessments:

[https://workspace.imperial.ac.uk/registry/Public/Exams/Exams%20and%20religious%20obligations.pdf](https://workspace.imperial.ac.uk/registry/Public/Exams/Exams%20and%20religious%20obligations.pdf)

5.2.3 Procedures

- The College’s Regulations for Students:

[http://www3.imperial.ac.uk/registry/proceduresandregulations](http://www3.imperial.ac.uk/registry/proceduresandregulations)
• Mitigation / extenuating circumstances policy and procedures:
  http://www3.imperial.ac.uk/registry/proceduresandregulations/policiesandprocedures/examinationassessment

• Complaints and Appeals procedures:
  http://www3.imperial.ac.uk/registry/proceduresandregulations/policiesandprocedures/complaintsappeals

• Academic integrity:
  https://workspace.imperial.ac.uk/registry/Public/Procedures%20and%20Regulations/Policies%20and%20Procedures/Examination%20and%20Assessment%20Academic%20Integrity.pdf

• Cheating offences policy and procedures:
  http://www3.imperial.ac.uk/registry/proceduresandregulations/policiesandprocedures/disciplinary

5.2.4 Welfare and Support
Personal Tutor system, links to Roles and Responsibilities of Personal Tutors:
http://www3.imperial.ac.uk/registry/proceduresandregulations/qualityassurance/goodpractice

• PDRP / iplan:
  http://www3.imperial.ac.uk/careers/staff/staff/pdp

Other welfare and pastoral care /support resources both Departmental and College-wide (e.g. College Tutors, Dean of Students, Counselling Service, Health Centre, NHS Dentist, Student Hub, Chaplaincy, support for International Students inc. ELSP):
http://www3.imperial.ac.uk/humanities/englishlanguagesupport
http://www3.imperial.ac.uk/students/welfareandadvice
http://www3.imperial.ac.uk/students/international

• Information about the Library:
  http://www3.imperial.ac.uk/library

• ICU:
  http://www.imperialcollegeunion.org/

  Student representation – how to become a student representative:
  https://www.imperialcollegeunion.org/representation

• Details of departmental/College Committees, including Staff-Student Committees. (The College’s Staff-Student Committee Good Practice Guidelines are available at:
  http://www3.imperial.ac.uk/registry/proceduresandregulations/qualityassurance/goodpractice)

• Other support services (e.g. Registry, Careers Advisory Service):
  http://www3.imperial.ac.uk/registry
  http://www3.imperial.ac.uk/careers

Additional Information for Master’s Courses
• MRes Code of Practice – can be used as a guideline where applicable:
http://www3.imperial.ac.uk/registry/proceduresandregulations/qualityassurance/codesofpractice/codeofpracticeformresprogrammes

5.2.5 CISBIO websites
Centre for Integrative Systems Biology and Bioinformatics at Imperial College (CISBIO) :
http://www3.imperial.ac.uk/CISBIO
Bioinformatics Support Service : http://www3.imperial.ac.uk/bioinfsupport

5.3 Information for Students with disabilities, specific learning difficulties or long-term health issues
At Imperial College we recognise that studying at university can be a challenge, especially if you have a disability. We are keen that you have every opportunity to fulfil your potential and graduate with the degree you deserve. It is therefore important that you let us know about any disability, specific learning difficulty or health problem as soon as possible so that we can give expert advice and support to enable you to do this.

Some people never think of themselves as having a disability, but students who have experienced any of the issues listed below have found that a little extra help and support has made all the difference to their study experience.
- Specific learning difficulties (such as dyslexia, dyspraxia, AD[H]D)
- Autistic spectrum disorder (such as Asperger’s)
- Deafness or hearing difficulties
- Long term mental health difficulties (such as chronic anxiety, bipolar disorder, depression)
- Medical conditions (such as epilepsy, arthritis, diabetes, Crohn’s disease)
- Physical disabilities or mobility impairments
- Visual difficulties

Where to find help:
1. Your Disability Liaison Officer: Professor Neil Fairweather,
n.fairweather@imperial.ac.uk ext 45247

Professor Neil Fairweather is your first point of contact within your department and is there to help you with arranging any support within the department that you need. Neil is also the person who will apply for Special Examination arrangements on your behalf. You need to contact him without delay if you think that you may need extra time or other adjustments for your examinations. http://www3.imperial.ac.uk/registry/exams/specialexamarrangements

2. Disability Advisory Service:
http://www3.imperial.ac.uk/disabilityadvisoryservice

The Disability Advisory Service works with individual students no matter what their disability to ensure that they have the support they need. We can also help if you think that you may have an unrecognised study problem such as dyslexia. Our service is both confidential (information about you is only passed on to other people in the university with your agreement) and individual in that any support is tailored to what you need.

Some of the sorts of things we can help with are:
- Being an advocate on your behalf with others in the College such as your departmental liaison officer senior tutor or exams officer, the accommodation office or the estates department
- Checking that your evidence of disability is appropriate and up-to-date
- Arranging a diagnostic assessment for specific learning difficulties
• Help with applying to the College for the cost of an assessment
• Help with your application for the Disabled Students Allowance (DSA) see below
• Helping students not eligible for the Disabled Students Allowance in obtaining support from other sources
• Help with arranging extra Library support
• Supporting applications for continuing accommodation for your second or later years

3. **Disabled Students Allowance:**
   [http://www3.imperial.ac.uk/disabilityadvisoryservice/supportatimperial](http://www3.imperial.ac.uk/disabilityadvisoryservice/supportatimperial)

Students who are home for fees and who have a disability can apply for a grant called the Disabled Students Allowance which can pay any extra costs that are a direct result of disability. This fund is not means-tested and is also a grant not a loan so any home student with a disability can apply and will not be expected to pay it back. Remember students with unseen disabilities such as mental health difficulties, dyslexic type difficulties or long term health problems are also eligible for this fund.

Students who have been awarded a Research Council scholarship (such as MRC or BBSRC) may also be eligible for a disability allowance – for more information please see the relevant websites for each of student handbooks below:


MRC  [http://www.mrc.ac.uk/funding/](http://www.mrc.ac.uk/funding/)

5.4 **English Classes for Overseas Students and Staff**

English classes are offered free of charge to students and staff of Imperial College London. Separate classes are also offered at a small charge to the partners of members of the College from overseas (ask for a separate sheet about this).

The classes starting mid-October and most run until the end of the Spring term. Some classes also run into the Summer term. Most classes are for 2 hours a week, Monday to Thursday, 6.00 to 8.00pm, and also on Wednesday afternoons. We try to hold all classes in the Humanities Programme.

Most classes come under three headings:

- **General classes** - offering speaking and listening practice & grammar and vocabulary
- **Pronunciation classes**
- **Writing**

We also have a permanent Writing Clinic to give students individual help with written work. There are other types of classes available and you should visit our website for more information: [http://www3.imperial.ac.uk/humanities/englishlanguagesupport/](http://www3.imperial.ac.uk/humanities/englishlanguagesupport/)

If you wish to do the Writing classes you should read the ELSP information sheet available from the Humanities General office or from the website, as there are different types offered.
Chapter 6: Assessment Criteria and Project Guidelines

6.1: Criteria for Assessment of Written work – long questions

These criteria are used to assess the essay questions. Note that account is taken of the teaching of the subject, the instructions provided for the work (e.g. level of presentation for dissertations) and the type of question set. For examination answers, allowance is made for what is reasonably achievable under examination conditions.

<table>
<thead>
<tr>
<th>Literal Grade</th>
<th>Percentage Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>A*</td>
<td>85-100</td>
<td>Distinction+. Answer is an exceptionally well presented exposition of the subject showing: (i) complete command of the relevant concepts and facts, (ii) a high critical or analytical ability**, (iii) originality, and (iv) evidence of substantial outside reading.</td>
</tr>
<tr>
<td>A+</td>
<td>80</td>
<td>Distinction. Answer is a very well presented exposition of the subject, showing the above features, but not fully achieving one of them.</td>
</tr>
<tr>
<td>A</td>
<td>76</td>
<td>Merit. Answer has the following features, but without fully achieving one of them: (i) shows a clear grasp of the relevant concepts and facts, (ii) gives an accurate account of the relevant taught material, and (iii) shows evidence of some outside reading, or of critical or analytical ability**.</td>
</tr>
<tr>
<td>A-</td>
<td>72</td>
<td>Pass. Answer: (i) shows a grasp of the basic concepts and facts, (ii) gives a mainly accurate account of at least half of the relevant taught material, but (iii) does not go beyond that, or goes beyond that but is then marred by significant errors.</td>
</tr>
<tr>
<td>B+</td>
<td>68</td>
<td>Pass mark</td>
</tr>
<tr>
<td>B</td>
<td>65</td>
<td>Fail. Answer: (i) shows only a basic grasp of the fundamental concepts and facts, but is marred by major errors or omissions and (ii) presents accurately at least a third of the material expected.</td>
</tr>
<tr>
<td>B-</td>
<td>62</td>
<td>Answer: (i) shows a confused understanding of the question, and (ii) presents less than a third of a material expected.</td>
</tr>
<tr>
<td>C+</td>
<td>58</td>
<td>Answer presents only two or three sentences or facts that are correct and relevant.</td>
</tr>
<tr>
<td>C</td>
<td>55</td>
<td>Answer presents only two or three sentences or facts that are correct and relevant.</td>
</tr>
<tr>
<td>C-</td>
<td>52</td>
<td>Answer contains nothing correct that is relevant to question. Mark to be given where the work is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism</td>
</tr>
<tr>
<td>D+</td>
<td>48</td>
<td>** Analytical = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. Critical = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.</td>
</tr>
<tr>
<td>D</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>D-</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>40</td>
<td></td>
</tr>
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<td>30</td>
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<tr>
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<td>15</td>
<td></td>
</tr>
<tr>
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<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
6.2 : Criteria for Assessment of Written work –short questions

These criteria are used to assess the short questions in the MSc in Bioinformatics module Bioinformatics II. For examination answers, allowance is made for what is reasonably achievable under examination conditions.

<table>
<thead>
<tr>
<th>Grade out of 5</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td><strong>Distinction+.</strong> Answer <em>(i)</em> shows a very clear grasp of the relevant concepts and facts, <em>(ii)</em> gives an accurate account of the relevant taught material, and <em>(iii)</em> is well presented.</td>
</tr>
<tr>
<td>4</td>
<td><strong>Distinction.</strong> Answer <em>(i)</em> shows a clear grasp of the relevant concepts and facts, <em>(ii)</em> gives an accurate account of most of the relevant taught material.</td>
</tr>
<tr>
<td>3</td>
<td><strong>Merit/Pass</strong> Answer: <em>(i)</em> shows a grasp of the basic concepts and facts, <em>(ii)</em> gives a mainly accurate account of at least half of the relevant taught material.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Fail.</strong> Answer: <em>(i)</em> shows only a basic grasp of the fundamental concepts and facts, but is marred by major errors or omissions and <em>(ii)</em> presents accurately at least a third of the material expected.</td>
</tr>
<tr>
<td>1</td>
<td>Answer: <em>(i)</em> shows a confused understanding of the question, and <em>(ii)</em> presents less than a third of a material expected.</td>
</tr>
<tr>
<td>0</td>
<td>Answer contains nothing correct that is relevant to question. Mark to be given where the work is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism.</td>
</tr>
</tbody>
</table>
6.3: Criteria for Assessment of Laboratory Work

These criteria are used to assess all laboratory work during the MSc. Due allowance is made for what is reasonably achievable under laboratory conditions and in the time available.

<table>
<thead>
<tr>
<th>Literal Grade</th>
<th>Percentage Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>A*</td>
<td>85-100</td>
<td><strong>Distinction+:</strong> Quality and quantity of data comparable to that in research articles published in the best journals. Outstanding presentation of results showing: (i) complete command of the background and context of the work, (ii) a high critical and analytical ability** including an appreciation of the limits of the experimental procedures, possible sources of errors and significance of results, and (iii) originality and evidence of substantial outside reading in discussion. These features also to be shown during oral examination where relevant (e.g. for research projects).</td>
</tr>
<tr>
<td>A+</td>
<td>80</td>
<td><strong>Distinction.</strong> Work successfully completed and well presented, showing the above features, but not fully achieving one of them. No significant deficiencies.</td>
</tr>
<tr>
<td>A</td>
<td>76</td>
<td><strong>Merit.</strong> Work shows the following features, without fully achieving one of them: (i) shows a clear grasp of background and context of the work, (ii) gives a complete and fully accurate account of the experimental procedures and results, and (iii) shows evidence of some outside reading or of critical or analytical ability** including an understanding of the limits of the experimental procedures and possible sources of errors.</td>
</tr>
<tr>
<td>A-</td>
<td>72</td>
<td><strong>Pass.</strong> Work (i) shows a grasp of the background and context of the work, (ii) gives an accurate account of most of the experimental procedures and results, but (iii) does not go beyond that, or goes beyond that but has significant errors of interpretation.</td>
</tr>
<tr>
<td>B+</td>
<td>68</td>
<td><strong>Pass mark</strong></td>
</tr>
<tr>
<td>B</td>
<td>65</td>
<td><strong>Fail.</strong> Work (i) shows only a basic grasp of the background and context of the work, and has major errors or omissions, but (ii) presents a mainly accurate account of at least a third of the experimental procedures and results.</td>
</tr>
<tr>
<td>B-</td>
<td>62</td>
<td>Work (i) shows a confused understanding of the experiment, and (ii) presents less than a third of the experimental procedures and results.</td>
</tr>
<tr>
<td>C+</td>
<td>58</td>
<td>Work (i) is too inaccurate, too irrelevant, or too brief to indicate more than a vague understanding of the experiment, and (ii) presents only about a quarter of the experimental procedures and results.</td>
</tr>
<tr>
<td>C</td>
<td>55</td>
<td>Work presents only two or three sentences or facts that are correct and relevant to the experiment.</td>
</tr>
<tr>
<td>C-</td>
<td>52</td>
<td>Work attempted, but no relevant experimental procedures, results or discussion.</td>
</tr>
<tr>
<td>D+</td>
<td>48</td>
<td>Experiment not attempted, work not handed in or contains nothing correct that is relevant. Mark given where the work presented is discovered not to be that of the candidate (plagiarised). Further disciplinary action is usually taken in cases of plagiarism.</td>
</tr>
<tr>
<td>D</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>D-</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

26
6.4: Criteria for Assessment of Work Presented Orally

These criteria are used to assess all oral presentations during your MSc course. Allowance is made for what is reasonably achievable under the conditions of the presentation and viva (resources available, time allowed, etc.).

<table>
<thead>
<tr>
<th>Literal Grade</th>
<th>Percentage Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>A*</td>
<td>85-100</td>
<td>Distinction+. Presentation demonstrates: (i) complete understanding of the material to be presented showing high critical or analytical ability as relevant, (ii) clear and logical organisation of the material, (iii) excellent use of appropriate resources and teaching aids, (iv) preparatory work including substantial background reading, and (v) ability to instruct with clarity of exposition and productive engagement with the audience resulting in a very positive learning experience.</td>
</tr>
<tr>
<td>A+</td>
<td>80</td>
<td>Distinction. A very well presented exposition of the subject, showing all the above features, but not fully achieving one of them.</td>
</tr>
<tr>
<td>A-</td>
<td>76</td>
<td>Merit. Presentation has the following features, but without fully achieving one of them: (i) shows a clear understanding of the material with an accurate account that demonstrates good critical or analytical ability, (ii) good use of resources, (iii) evidence of appropriate background reading, and (iv) succeeds in delivering all the relevant material clearly to the audience so that they appreciate its significance.</td>
</tr>
<tr>
<td>B+</td>
<td>68</td>
<td>Merit. Presentation has the following features, but without fully achieving one of them: (i) shows a clear understanding of the material with an accurate account that demonstrates good critical or analytical ability**, (ii) good use of resources, (iii) evidence of appropriate background reading, and (iv) succeeds in delivering all the relevant material clearly to the audience so that they appreciate its significance.</td>
</tr>
<tr>
<td>B</td>
<td>65</td>
<td>Merit. Presentation has the following features, but without fully achieving one of them: (i) shows a clear understanding of the material with an accurate account that demonstrates good critical or analytical ability**, (ii) good use of resources, (iii) evidence of appropriate background reading, and (iv) succeeds in delivering all the relevant material clearly to the audience so that they appreciate its significance.</td>
</tr>
<tr>
<td>B-</td>
<td>62</td>
<td>Merit. Presentation has the following features, but without fully achieving one of them: (i) shows a clear understanding of the material with an accurate account that demonstrates good critical or analytical ability**, (ii) good use of resources, (iii) evidence of appropriate background reading, and (iv) succeeds in delivering all the relevant material clearly to the audience so that they appreciate its significance.</td>
</tr>
<tr>
<td>C+</td>
<td>58</td>
<td>Pass. Presentation: (i) shows a solid grasp of the material, (ii) gives a mainly accurate account of most of the relevant material, (iii) shows evidence of some background reading, and (iv) successfully delivers most of the material to the audience in a way that they can understand it, but does not go beyond that.</td>
</tr>
<tr>
<td>C</td>
<td>55</td>
<td>Pass mark</td>
</tr>
<tr>
<td>C-</td>
<td>52</td>
<td>Fail. Presentation: (i) shows only a basic grasp of the material, (ii) shows evidence of little background reading or preparation, (iii) delivers most of the material accurately but makes errors or omissions resulting in a poor learning experience for the audience.</td>
</tr>
<tr>
<td>D+</td>
<td>48</td>
<td>Fail. Presentation: (i) shows only a basic grasp of the material, (ii) shows evidence of little background reading or preparation, (iii) delivers most of the material accurately but makes errors or omissions resulting in a poor learning experience for the audience.</td>
</tr>
<tr>
<td>D</td>
<td>45</td>
<td>Fail. Presentation: (i) shows only a basic grasp of the material, (ii) shows evidence of little background reading or preparation, (iii) delivers most of the material accurately but makes errors or omissions resulting in a poor learning experience for the audience.</td>
</tr>
<tr>
<td>D-</td>
<td>42</td>
<td>Fail. Presentation: (i) shows only a basic grasp of the material, (ii) shows evidence of little background reading or preparation, (iii) delivers most of the material accurately but makes errors or omissions resulting in a poor learning experience for the audience.</td>
</tr>
<tr>
<td>F</td>
<td>40</td>
<td>Fail. Presentation: (i) shows only a basic grasp of the material, (ii) shows evidence of little background reading or preparation, (iii) delivers most of the material accurately but makes errors or omissions resulting in a poor learning experience for the audience.</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>Fail. Presentation: (i) is too inaccurate, too irrelevant, or too brief to indicate more than a vague understanding of the material, and (ii) only succeeds in misinforming and confusing the audience.</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Fail. Presentation includes very little that is correct and relevant.</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>Failure to make a presentation at all.</td>
</tr>
</tbody>
</table>

** Analytical = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. Critical = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.
6.5: Criteria for Assessment of Work Presented in Reports

These criteria are used to assess all oral presentations during your MSc course. Allowance is made for what is reasonably achievable under the conditions of the research project report (resources available, time and space allowed, etc.).

<table>
<thead>
<tr>
<th>Literal Grade</th>
<th>Percentage Grade</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>A*</td>
<td>85-100</td>
<td>Distinction+. Report demonstrates: (i) complete understanding of the material to be presented showing high critical or analytical ability**, as relevant, (ii) clear and logical organisation of the material, (iii) excellent use of appropriate resources and teaching aids and (iv) preparatory work including substantial background reading.</td>
</tr>
<tr>
<td>A+</td>
<td>80</td>
<td>Distinction. A very well presented report of the subject, showing all the above features, but not fully achieving one of them.</td>
</tr>
<tr>
<td>A</td>
<td>76</td>
<td>Merit. Report has the following features, but without fully achieving one of them: (i) shows a clear understanding of the material with an accurate account that demonstrates good critical or analytical ability**, (ii) good use of resources, (iii) evidence of appropriate background reading, and (iv) succeeds in delivering all the relevant material clearly to the audience so that they appreciate its significance.</td>
</tr>
<tr>
<td>A-</td>
<td>72</td>
<td>Pass. Report (i) shows a solid grasp of the material, (ii) gives a mainly accurate account of most of the relevant material, (iii) shows evidence of some background reading, and (iv) successfully delivers most of the material to the audience in a way that they can understand it, but does not go beyond that.</td>
</tr>
<tr>
<td>B+</td>
<td>68</td>
<td>Pass mark</td>
</tr>
<tr>
<td>B</td>
<td>65</td>
<td>Fail. Report (i) shows only a basic grasp of the material (ii) shows evidence of little background reading or preparation, (iii) delivers most of the material accurately but makes errors or omissions resulting in a poor learning experience for the audience.</td>
</tr>
<tr>
<td>B-</td>
<td>62</td>
<td>Report: (i) shows that the material has not been understood, (ii) shows no evidence for background reading or preparation, and (iii) presents the material inaccurately and does not increase the audience’s understanding.</td>
</tr>
<tr>
<td>C+</td>
<td>58</td>
<td>Report (i) is too inaccurate, too irrelevant, or too brief to indicate more than a vague understanding of the material, and (ii) only succeeds in misinforming and confusing the audience.</td>
</tr>
<tr>
<td>C</td>
<td>55</td>
<td>10 Report includes very little that is correct and relevant.</td>
</tr>
<tr>
<td>C-</td>
<td>52</td>
<td>0 Failure to make a presentation at all.</td>
</tr>
<tr>
<td>D+</td>
<td>48</td>
<td>25 <strong>Analytical</strong> = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. <strong>Critical</strong> = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.</td>
</tr>
<tr>
<td>D</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>D-</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

** Analytical = assessing a hypothesis or statement by breaking it down into its elements and examining their inter-relationships and contribution to the whole; cf. Critical = judging a hypothesis or conclusion by examining the validity of the evidence adduced for it.
6.6: Structure of Examination Questions

Where a question provides a breakdown of the weighting attached to parts of a question, the final grade is based on the evaluation of the question as a whole against the above criteria. The breakdown only provides a guidance as to the suggested emphasis in your answer for each part of the question.

6.7: Guidelines for Reports

The following are draft guidelines for the project reports. These may be modified to reflect the developments of the project and staff/student discussions.

General guidelines for all reports

1. Students are expected to discuss their reports with their supervisors before starting to write up. At least two weeks before submission students should concentrate on completing the report. It is more important to produce a quality report than obtain all the results. You are permitted to show your supervisor your report for general feedback before submission, but please allow sufficient time for your supervisor to provide feedback.

2. The report should be in the format of a paper in a bioinformatics or systems biology journal. Your report should be aimed at readers who work in these areas but who is not a specialist in the precise area of your project. In contrast to a scientific paper, your report should clearly and extensively identify in the text what was your contribution to the project. You can use “I” to show your work.

3. Students are advised to make frequent back-up copies of their work. Disk failure can occur, must be planned for, and are not a valid excuse for late submission. Projects must be submitted by the deadline. The penalty for late submission is 10% of the mark per day or part of day.

4. With the exception of the data analysis web-based report: the font size must be no smaller than 11 point and the report must be double spaced. Only one side of the paper should be used. Each major new section (e.g. Methods) should start on a new page. Pages must be numbered.

5. It is important to ensure that the report is concise, well laid-out and in scientific style English. Avoid slang and abbreviations such as “won’t”. Remember that “it’s” is an abbreviation for “it is” and “its” is used for the possessive.

6. The project report must include the word count on the title page (the number of words will be checked and failure to comply with the word limit will incur penalties).

7. As this is an MSc project undertaken in a limited time period, we appreciate that positive results (such as an improvement in an algorithm or a statistically significant observation) might not be obtained. Negative results are not penalised. In your report you need to show that you have undertaken a rigorous scientific study and critically evaluated your results.

8. The format should follow that of a scientific paper and must include the following sections: Title page, Abstract, Contents page, Abbreviations, Introduction, Conclusion, References, and if required an Appendix. The main part of the report can either follow the standard three sections of Methods, Results and Discussion or can be modified to best present the information. You are advised to discuss such a modification with your supervisor. For example, if there is a series of studies, you are free to report each study in turn as a main section and then under subsections detail the Methods, Results and Discussions.
9. **The Abstract** should be structured (i.e. aims, methods, results, conclusion), be no more than one side of paper (in written reports). Ideally the Abstract should cite some key numerical results rather than just generalities. Making a point in an abstract does not remove the requirement for it to be made elsewhere in the report. The report must be comprehensible even if the abstract is removed.

10. **The Introduction** should provide the necessary background to understand the relevance and topicality of the aims and objectives and your contribution of the research. In particular, how has this project advanced the field.

11. **The Methods** should be sufficiently (but not excessively) detailed, such that the reader can fully understand how the study was performed. It is important to provide an overview of the methodology, for example by a flow chart.

12. **The Results** should provide the necessary data, including negative results, to justify the conclusions drawn. It is important to summarise the results (for example in tables and/or graphs) and not just put in the output of the program. The results should describe testing where appropriate and an assessment of possible errors. Results should also discuss the conclusions drawn from the specific results.

13. **The Discussion** section should place the results into the context of published knowledge and understanding and provide details of future work and more general applications of the knowledge gained from the project. Avoid simply repeating the Results section.

14. **The Conclusion** can provide a brief summary of the key results and provide a brief statement of the impact of the work. Do not repeat previous sections. It is best to have a separate discussion and conclusion.

15. **All mathematical expressions** must have all the symbols defined and used consistently throughout the report.

16. **All Figures** must be clearly labelled with a full explanation of the different information (e.g. colours) presented. Graphs must have the axes labels and the lines in an easy to read presentation without tiny fonts and faint lines. Units are required on the axes. Figures must be referred to in the text i.e. see Figure X.

17. **All Tables** should be clearly explained with units and numbers given to the appropriate degree of accuracy. Use a sensible number of significant figures. Tables must be referred to in the text i.e. see Table X.

18. **Full reference** citations must be given: authors, year of publication, journal title, volume and page numbers are all needed. Two reference styles are acceptable. The first is author and date in the text with the references arranged alphabetically by first author’s surname. The second is numbering in the text and in the reference list in order of citation of the reference in the text. Authors’ first names must consistently be by initial only, even if you know the first name. The reference style must be consistent throughout.

19. **Abbreviations.** You should list on a separate page all the abbreviations that you have used in your thesis. Many of these are standard, such as DNA, and do not need to be defined. Try not to invent too many abbreviations of your own, as it can make it hard work for your examiner to read. In addition, the first time that you use an abbreviation in the main text, you must define it, e.g: We analysed the number of non-synonymous single nucleotide polymorphisms (nsSNPs). The next time you can simply use the abbreviation, e.g. Table 3 details the number of nsSNPs. You must be consistent. Once you have defined an abbreviation, always use the same abbreviation and do not revert to the original.

20. It is vital that any information including a mathematical derivation taken from another source is duly acknowledged otherwise you are plagiarising. Note many figures in books and papers are subject to copyright and cannot be reduced without copyright permission.
The Library can advise but it is probable simplest not to use any published figure directly. You can of course redraw a figure and acknowledge the source upon which it is based.

21. The project report must be written in your own words. Imperial has software that will detect plagiarism – automatic zero mark if plagiarism is detected, with the burden of proof is on the student.

22. Occasionally a paper describing your project work will have been produced for submission to a conference or a journal prior to you writing your report. You cannot use the text from this paper – you must rewrite this for your report - even if you wrote the original paper. If this occurs you are strongly advised to discuss this with the Course Director or Deputy Director at the writing up stage.

23. Details of the submission mechanism of your report will be provided later.

Additional Requirements for Computing Project reports

1. The project consists of a group and an individual report.

Group report:

2. The report should be in the format of a manual/documentation including technical and user oriented information. The group report should be aimed at readers who work in bioinformatics or affiliated areas but who are not specialists in the subject cover in the project. Users should be able to read the group report and from it be able to use and continue to develop the work.

3. If needed, especially in the case of new algorithm, the manual can contain portion of code with explanation but it should not be a simple catalogue of the code. You should present the concepts and not just the features. Where relevant, provide examples describing the use of the software/code.

4. The group report should include a description of the problem motivating the project and discuss the parts that still need to be improved or developed.

5. The group report can be as long as it needs to be but should not exceed 40 pages. In the group report you must use initials at the start of each section to indicate which student undertook the work and who wrote the section. We understand some sections are joint work and this should be indicated.

Individual report:

6. Individual Reports should be between 2,000 and 3,000 words. The maximum is 3,000 words plus diagrams, graphs, figure and table legends, references and appendix (if present). (Note: References are not included in the word count). There is a maximum of 12 display items (Figures or Tables).
Additional guidelines for web-based report of data analysis

1. The aim is to present a web page describing the results of your data analysis project.

2. We are looking for use of web tools to enhance the information provided to the viewer of the page. Please use links to other web pages can be used where appropriate. You are free to make use of the multi-media capabilities of web sites; but remember that clarity and statistical soundness are important criteria for marking this project. Choose your colours and font sizes carefully to be attractive.

3. Websites will need to be Firefox compatible and will be hosted on our MSc server. Please check that all your links work under Firefox on this server. Web pages with links that fail will be heavily penalised.

4. Content and presentation will be important. You will need to justify the statistical methods used, explain where the data came from, the objective of the overall project. When presenting statistical information provide an assessment of variability of your results. If this is not possible then outline the reasons for why you have not done this.

5. The web page should be 2,500 words max (excluding references and data in tables). Supplementary material as a plain text file can be provided detailing the method (but is not required). This cannot be more than 1,000 words. Our assessment will focus on the main web.

6. The web page must have a scientific abstract of about 250 words

7. In addition there should be a lay summary of about 250 words explaining the project aimed at a first year science undergraduate.

8. The marking for the project are laboratory work (1/3); scientific report (1/3) and how web resources were effectively used (1/3).

Additional guidelines for Project 3 report

1. The reports should be a maximum of 5,000 words plus diagrams, graphs, figure legends and references. There is a maximum of 12 display items (Figures or Tables). Please indicate on the front the number of words.

2. As this is the report on your final project, we are looking for a demonstration of critical and analytical ability. The best projects would be in a suitable for submission to a journal or a conference with only the most minor of modification (excluding any consideration of whether the report presents positive or negative results).
Chapter 7: Safety

All students at the College have specific health and safety responsibilities. These are listed below:

Students responsibilities (taken from College Health and Safety Policy)
Each student is responsible for looking after their own health and safety and that of others affected by their College-related work and leisure activities. To this end, each student must:
Comply with all local and College policies, procedures and codes of practice and with the arrangements which the College has in place to control health and safety risks.
Ensure that their activities do not present unnecessary or uncontrolled risks to themselves or to others.
Attend appropriate induction and training.
Report any accidents, unsafe circumstances or work-related ill health of which they become aware to the appropriate person.
Not interfere with any equipment provided for Health and Safety.
Where a student is not confident that he or she is competent to carry out a work or leisure activity safely, inform his or her supervisor or the person in charge of the activity rather than compromise his or her own safety or the safety of others.

Department of Life Sciences safety contacts and advice
(taken from https://workspace.imperial.ac.uk/lifesciences/Public/Safety/DoLS%20safety%20contacts%20and%20advice.pdf)

The Dept of Life Sciences receives professional safety advice from Faculty Safety Managers (FSMs). FSMs are assisted in their role by trained personnel within the buildings and environs that the Dept of Life Sciences operates.

The Dept has a Health and Safety committee that meets each term. The committee has a Post graduate (PG) representative who attends the meetings and ensures that PG views and concerns are discussed and where appropriate action taken.

PG safety representative contact details:
to be appointed)

A list of contacts (020 759 xt) for safety advice within the Dept is shown below:

Faculty Safety Manager
Mr Stefan Hoyle (s.hoyle@imperial.ac.uk) xt45020

Flowers building:
Ms. Heather Combe (h.combe@imperial.ac.uk) xt43070

Biochemistry building:
Ms. Fiona May (f.holt@imperial.ac.uk) xt45410
Mr. Samuel Bamigbade (s.bamigbade@imperial.ac.uk) xt43173

SAF building and plant growth facilities:
Ms. Fiona May (f.holt@imperial.ac.uk) xt45410
Mr Ian Morris (i.w.morris@imperial.ac.uk) xt45352
RCS1:
Mr. Dave Featherbe (d.featherbe@imperial.ac.uk) xt45273

Bioreactor and X-ray Facility:
Dr. Jeremy Moore (jeremy.moore@imperial.ac.uk) xt43204

Cross Faculty NMR suite:
Dr. Pete Simpson (p.simpson@imperial.ac.uk) xt45336

Electron Microscopy centre:
To be appointed

Biophysics (Huxley Building)
Mr Matt Stansfield (m.stansfield@imperial.ac.uk) xt47618

Silwood
Mr Anthony Fitzgerald (a.jfitzgerald@imperial.ac.uk) xt42346
Mr Paul Nicholas (p.nicholas@imperial.ac.uk) xt42217

Useful websites for safety information, guidance, and training:
Dept of Life Sciences safety information:
http://www3.imperial.ac.uk/lifesciences/safety

Faculty of Natural Sciences Safety webpage:
http://www3.imperial.ac.uk/naturalsciences/safety

Imperial College Safety webpage
http://www3.imperial.ac.uk/safety

Imperial College Occupational Health website:
http://www3.imperial.ac.uk/occhealth

Imperial College Security, Fire and Post webpage:
http://www3.imperial.ac.uk/facilitiesmanagement/security

Dept Life Sciences PG primary induction  Safety induction
Tuesday Oct 7th - 12:30 - 1:30 Life Sciences PG primary induction  Safety induction, Read Lecture Theatre, Sherfield

Risk Assessment Foundation Training (RAFT)*
A new online version of RAFT needs to be completed by all students. The course is based in Blackboard and provides training on the basic principles of risk assessment, significant risk and College forms, procedures and guidance. The learning objectives for the course are tested in an online test. All research students will be enrolled and receive links and information at beginning of October.

*MSc students will be enrolled before projects start in 2015.

If you have any questions on these courses please contact Stef (s.hoyle@imperial.ac.uk),

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Appendix

On the following pages:
  1. Timetable
  2. Important dates
  3. Writing Resources
  4. Reference disclaimer form
  5. Acceptance of handbook terms form
<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Time Slot</th>
<th>Room</th>
<th>Lecturer</th>
<th>Topic/Title</th>
<th>N o Course work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Monday</td>
<td>05/10/2015</td>
<td>11:00-12:00</td>
<td>Link Lecture Theatre, 290 Sir Ernst Chain Building</td>
<td>Michael Stumpf</td>
<td>MSc Bioinformatics Induction and Welcome Talk</td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>Monday</td>
<td>05/10/2015</td>
<td>14.30-16.00</td>
<td>Sir Ernst Chain Building (SEC) 310-311</td>
<td>Suhail Islam</td>
<td>IT Induction and Introduction to Linux (Suhail Islam)</td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>Monday</td>
<td>05/10/2015</td>
<td>16.15</td>
<td>Great Hall, Sherfield Building</td>
<td>Welcome talk by Provost,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>Tuesday</td>
<td>06/10/2015</td>
<td>15.30-16.30</td>
<td>G34, SAF</td>
<td>Safety Induction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>Tuesday</td>
<td>06/10/2015</td>
<td>16.30-18.00</td>
<td>Flowers G47A G47B</td>
<td>Welcome Drinks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>Tuesday</td>
<td>06/10/2015</td>
<td>11.00-16.00</td>
<td>Flowers G47A G47B</td>
<td>Freshers’ Fair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>Wednesday</td>
<td>07/10/2015</td>
<td>14.00-17.00</td>
<td>310-311</td>
<td>Suhail Islam</td>
<td>IT Induction and Introduction to Linux (Suhail Islam)</td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td>Thursday</td>
<td>08/10/2015</td>
<td>13.00-17.00</td>
<td>310-311</td>
<td>Suhail Islam</td>
<td>IT Induction and Introduction to Linux (Suhail Islam)</td>
<td></td>
</tr>
<tr>
<td>Week 2</td>
<td>Monday</td>
<td>12/10/2014</td>
<td>12.00-14.00</td>
<td>LINK</td>
<td>Neil Fairweather</td>
<td>BI Lecture 1 - Biomolecules and Cells</td>
<td>1</td>
</tr>
<tr>
<td>Week 2</td>
<td>Tuesday</td>
<td>13/10/2014</td>
<td>10.00-12.00</td>
<td>310</td>
<td>Michael Stumpf</td>
<td>Maths</td>
<td>1</td>
</tr>
<tr>
<td>Week 2</td>
<td>Tuesday</td>
<td>13/10/2014</td>
<td>13.00-15.00</td>
<td>G47A</td>
<td>Neil Fairweather</td>
<td>BI Lecture 2 - Genes and Proteins</td>
<td>2</td>
</tr>
<tr>
<td>Week 2</td>
<td>Tuesday</td>
<td>13/10/2014</td>
<td>16.00-17.00</td>
<td>G47A</td>
<td>Derek Huntley</td>
<td>Computing Seminar Python</td>
<td>1</td>
</tr>
<tr>
<td>Week 2</td>
<td>Wednesday</td>
<td>14/10/2014</td>
<td>09.30-11.30</td>
<td>310/311</td>
<td>Derek Huntley</td>
<td>Computing Practical Python</td>
<td>1</td>
</tr>
<tr>
<td>Week 2</td>
<td>Thursday</td>
<td>15/10/2014</td>
<td>10.00-12.00</td>
<td>310</td>
<td>Michael Stumpf</td>
<td>Maths</td>
<td>2</td>
</tr>
<tr>
<td>Week 2</td>
<td>Thursday</td>
<td>15/10/2014</td>
<td>14.00-16.00</td>
<td>G47A</td>
<td>Neil Fairweather</td>
<td>BI Lecture 3 - DNA Sequence</td>
<td>3</td>
</tr>
<tr>
<td>Week 2</td>
<td>Thursday</td>
<td>15/10/2014</td>
<td>17:00-18:30</td>
<td>SEC 7th Floor Common Room</td>
<td>Social and Welcome Drinks</td>
<td></td>
<td></td>
</tr>
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**Important Dates**

**Deadlines for Term 1 assignments** as per timetable.

**Examinations**
- Thursday 7 January 2016 1.00-4.00 Bioinformatics II
- Monday 11 January 2016 1.00-4.00 Bioinformatics I
- Wednesday 13 January 2016 1.00-3.00 Maths

The **computing project** will run for 10 weeks from.
The **data analysis project** will run for 11 weeks (including Easter closure)
The **bioinformatics and systems biology project** will run for c.13 weeks from Vivas for the
**bioinformatics and systems biology project will be held from**
**Final Vivas** with external examiners: Provisional Date: Friday 23 September (subject to final confirmation) but no later than 28 September 2016

**MSc staff student meetings (to be confirmed):**
- 1st week December
- 3rd week March
- 3rd week May
Writing Resources

There are many guides on the internet about writing styles. Here are a few suggestions. It is worth reading these guides.

A) Structure of a Scientific Report

- Principles of Scientific Writing from Scitext (general guidelines about a paper or report)
- Penn State Writing Guidelines for Engineering and Science Students (general guidelines about a paper or report)
  - [http://www.writing.engr.psu.edu/](http://www.writing.engr.psu.edu/)
- The Science of Scientific Writing by Gopen & Swan (some helpful worked examples)
- Cambridge Biomedical Writing Course (general guidelines about a paper or report)

B) Useful guides to correct usage – well worth reading bit by bit on the tube!

- Writing a better scientific paper (note some comments about chatty style not appropriate for Biology, but good hits especially about mistakes non-native English scientists often make)
- ACS writing style guide (many useful examples)
- Guide to Grammar and Style by Jack Lynch (a useful guide to A to Z, can be read through slowly and very sensible)
  - [http://andromeda.rutgers.edu/~jlynch/Writing/](http://andromeda.rutgers.edu/~jlynch/Writing/)
- The Elements of Style - William Strunk’s classic on writing style (This is the definitive American guide; the concepts are very good but American and sometimes out of date)

B) Internet resource to check

- The Internet Grammar of English from UCL (useful to check a detail))
Disclaimer for Provision of Confidential References by Staff

A student is required to sign this form if a member of staff is to provide confidential references to prospective employers.

Please complete the details and sign below to give your consent to the provision of references which are confidential and therefore not shown to you.

Name (please print clearly)

Signature

Date

Reference Disclaimer.doc
Faculty of Natural Sciences
Imperial College

Acceptance of terms of Handbook

A student is required to sign this form to acknowledge that they have read and understood the handbook, especially the following:

1) Penalties for late hand in of coursework
2) Plagiarism

Please complete the details and sign below.

Name (please print clearly)

Signature

Date