Welcome to the University of Sussex.

You should already have received information about registration, and general talks about postgraduate life at the University of Sussex. This handbook contains information specific to your degree course.

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Introduction.

These notes are to introduce you to the way in which the MSc course is organised, and to tell you to whom you are responsible, and what action you should take if you have problems. Please keep these notes for future reference. The course runs from the third week of September until early September next year.

Aims and Objectives of the MSc Course.

The aim of the GMMCB course is to provide an in depth understanding of molecular cell biology and how this discipline is used to solve scientific problems. It will also illustrate how genetic manipulation provides new ways of creating biological products. For the students the objectives will be:

to appreciate the role of molecular genetics in modern science
to understand how molecular cell biology can be applied to biological problems
to gain experience in the practical techniques used in molecular genetics and cell biology

Postgraduate Student Handbook

The University produces a handbook that details all the rules and regulations concerned with postgraduate degrees. The handbook can be found online at:
http://www.sussex.ac.uk/academicoffice/1-3-2.html

Transferable Skills.

Successful completion of this course will require students to analyse material, including raw experimental data, and to critically evaluate it. The students will acquire laboratory skills associated with scientific research and will be able to present experimental data to others in both written and oral forms.
Structure and Organisation of the Course.

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<th>Module</th>
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<th>Items of coursework</th>
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<td>Taught Component:</td>
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<tr>
<td>Practical Techniques in Cell, Molecular and</td>
<td>Dr N. Crickmore</td>
<td>2</td>
<td>0</td>
<td>30</td>
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<tr>
<td>Developmental Biology</td>
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<tr>
<td>Advanced Methods in Molecular Research</td>
<td>Dr A. Sinclair</td>
<td>1</td>
<td>1</td>
<td>15</td>
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<tr>
<td>Options Modules</td>
<td>Various</td>
<td>0-2</td>
<td>2x1</td>
<td>2x15</td>
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<tr>
<td>Topics in Genetic Manipulation and Molecular</td>
<td>Dr M. West</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Cell Biology</td>
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<td>Skills for Research Bioscientists</td>
<td>Dr N. Crickmore</td>
<td>1</td>
<td>0</td>
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<tr>
<td>Research proposal</td>
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<td>1</td>
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<td>Project Component:</td>
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<tr>
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<td>Dr N. Crickmore</td>
<td>2</td>
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Note that one credit relates to a nominal 10 hours of student effort – this includes attending timetabled sessions, background reading and preparing for assessments and seminars.

There are two main components to the course; taught modules and project work.

**Taught modules**

In this course you take five course-specific modules (Practical Techniques in Cell, Molecular and Developmental Biology, Advanced Methods in Molecular Research, Skills for Research Bioscientists, Research Proposal and Topics in Genetic Manipulation and Molecular Cell Biology) along with one of a choice of research-orientated modules, many of which are also taken by final year undergraduate biochemists and biologists. The lecturers who teach these courses deal with their own field(s) of expertise and interest. The options from which to choose are:

- Introduction to Genes and Biochemistry
  - Autumn term
  - 15 credits
- Regulating the Transcriptome
  - Autumn term
  - 15 credits
- Molecular Genetics
  - Autumn term
  - 15 credits
- Genomics
  - Spring term
  - 15 credits
- Post-transcriptional control of Gene Expression
  - Spring term
  - 15 credits
- Genome Stability, Genetic Diseases and Cancer
  - Spring term
  - 15 credits
- Protein Form and Function
  - Spring term
  - 15 credits

You need to take two of these modules. Your workload will increase significantly during the Spring term when you start your project so you are not advised to choose two Spring term modules.

It may be necessary to advise students who have not previously studied in this country that the emphasis in lectures is on describing how experimental data are obtained and used to form models, theories or hypotheses, through objective interpretation. As a result, lecture course material tends to go beyond the contents of standard textbooks, which at the level of our third year undergraduate courses are used simply as sources of fundamental
information that is on the whole accepted without reasonable doubt. In addition to using conventional visual aids, lecturers usually provide students with reading lists containing references, for example, to background material or original work that is relevant to the content of their lectures. Students are expected to consult a proportion of such references to aid their understanding of the subject matter. Although in general our approach to teaching and supervision is a relatively informal one, lectures are by necessity a means of one-way information transfer. Students are strongly advised to be present at all lectures.

Projects.
A list of project areas will be available from the course organiser Dr Neil Crickmore. Students should discuss projects with potential supervisors before indicating their preferred choices on the form provided. Every effort will be made to provide each student with one of their preferred projects. Please do not make firm arrangements with individual supervisors without first checking with the course organiser. The projects will be allocated in November or December, you are then encouraged (in consultation with your supervisor) to do some background reading in preparation for starting laboratory work in January.

The purpose of a research project is several fold. Not only should you gain experience in a number of techniques and learn how to use various instruments, but you should also see how these are applied to a particular piece of scientific work through the use of well-designed experiments. Thereafter, you will be expected to record your results accurately and interpret them objectively. In the course of your laboratory work you will probably find yourself doing numerous tasks that are new to you. These will include preparing many of your own solutions and reagents.

During your project the role of your supervisor is crucial. It is the supervisor's responsibility, in consultation with the student, to define the research project. Supervisors differ considerably in the way in which they guide their postgraduate students, as, for example, in the extent to which they help with the detailed design of experiments. Some supervisors often work alongside their students at the bench, while others leave students to acquire techniques from other research workers in their laboratories or elsewhere. However, your supervisor will normally expect to talk to you at frequent intervals about the progress of your project. Even if he/she is busy he/she will probably wish you to see him/her at regular intervals each week.

All supervisors have their own research laboratories in which MSc students are allocated space, and so for the duration of your project you will become part of an active research group. Although many of the supervisors who offer MSc projects have their laboratories within the JMS building others are in the Genome Damage and Stability Centre or the Medical School.

Students are expected to organise and carry out their project work at the same time as attending lectures, seminars, tutorials and writing course essays (see below) and during both the teaching terms and vacations. Obviously some of these pressures will be less during the vacations, but it is necessary to advise you to strike a proper balance amongst these commitments so that sufficient time is made available for laboratory work. Normally students leave the lab for a week or two prior to the May examination period to revise. Experimental work should be completed by the end of July at the latest. MSc students should have started to prepare material for their dissertation by the beginning of August for submission in late August. At the start of your project you will have to prepare a short review of the literature relevant to your project and at the end you will give a short oral presentation on your project to the rest of the MSc group.

Additional Lectures and Seminars.
Attendance at special lectures and seminars is an important part of postgraduate training. All postgraduate (including MSc) students are required to attend seminars on safety and techniques during the Autumn term. Various groups within the school (eg the Genome Centre) run regular seminars given by both external and internal speakers in term-time and on a wide range of research topics which all postgraduates are encouraged to attend. In addition, many other seminars in the University may be of interest to you, and you are encouraged to attend these where appropriate. Some of these will also form part of the “Skills for Research Bioscientists” module. Finally, some of the larger research groups have their own regular meetings, of which your supervisor will inform you.
**Tutorials.**
At the start of the course you will be split into small tutorial groups and allocated a member of teaching faculty as an academic advisor. As a group you will meet with your tutor several times a term. In some of these tutorials you will cover specific items, usually connected with the “Skills for Research Bioscientists” module, whereas in others you will be free to discuss any course related matters. Your tutor will follow your academic progress and will also be able to provide a reference for you when you start to apply for jobs or PhD places.

**Assessments.**
The responsibility for the assessment of the MSc course rests with the School’s postgraduate Examination Board. The members of the Board may vary from year to year but will include the course organiser. The assessment of the MSc course is monitored by a separate External Examiner (a senior academic from another university) appointed by the University.

**Mitigating Circumstances eg Illness**
Instances of mitigating circumstances, e.g. illness, which could affect performance during the course (including preparation for examinations) must be communicated to the School via a form available from your Sussex Direct site and, where appropriate, a medical certificate.

**Taught Module Work.**
Several forms of assessment are involved.

a) **Written examinations.** Each student is required to take a number of unseen examinations in the options courses and in the Advanced Methods in Molecular Research and the Topics in Genetic Manipulation and Molecular Cell Biology modules. Details of the time and examination room are supplied to MSc students by the Postgraduate Office and copies of previous years' papers are usually available online, or from individual module organisers.

b) **Essays.** All students are required to submit essays or other coursework on topics relating to lecture or seminar material. These essays are organised by the individual module organisers and contribute towards assessment of modules. Coursework must be submitted by the date required otherwise reduced or no marks are awarded unless there are mitigating circumstances. Two copies of each piece of coursework must be submitted.

c) **Portfolio.** For the Skills for Research Bioscientists course you will need to prepare a portfolio of work. Although no mark will be awarded for this it must be completed for you to pass the course.

**Module Assessment Weighting.**
Each component of the programme is given a certain weighting as shown in the table earlier. The pass mark for each module is generally set at 50%. The results of these assessments (other than the project) are communicated to students by the course convenor (usually in early July).

**Project Dissertation and Oral Presentation.**
Dissertations (up to 20,000 words) must be submitted in late August. In early September you will be required to give a short oral presentation, describing your project, to the rest of your MSc group and other interested members of the School.

The mark awarded for your project will be based mainly on your dissertation but will also take account of your performance in the laboratory. Note that you do not need to achieve good results to get a high project mark. A series of failed experiments can lead to a good mark if you can demonstrate an understanding of why an experiment may have failed and how to deal with this.

**Resit Examinations.**
In order to be awarded a degree students must achieve 180 credits worth of modules. Those students who fail any module will be offered a resit opportunity for each failed module (including the project). If the student fails the resit then they will not be offered the opportunity to take a second resit. It is possible though to pass the MSc with a failed module (other than the project) so long as your other marks are high enough.
Oral Examinations
Oral examinations ("vivas") may be held after the student presentations in mid-September. These examinations are only held for students who are in danger of failing the course either because their aggregate mark is not high enough or because they have narrowly failed too many modules. During the examination each student will most likely be interviewed by an external and internal examiner. Although the oral examination would normally concentrate on the module(s) failed students should be prepared to be asked about any part of their work. The oral examination will not affect the mark awarded for your project or coursework, although students who failed to achieve the required standard for a pass may be awarded these based on their performance in the oral examination.

Final Result
The MSc Examination Board meets immediately after the oral examinations to consider all the assessments of each student, including reports on dissertations by the examiners, and a list of those recommended for the award of the degree is posted on the MSc Notice Board on level 3 of the School. A number of awards can be made:

- MSc with distinction – for students with an overall mark of >70% plus a project mark of >70%
- MSc with merit - for students with an overall mark of >60% plus a project mark of >60%
- MSc - for students with an overall mark of >50% plus a project mark of >50%
- Diploma - for students who have failed the project but passed all other modules, or otherwise achieved 120 credits.

Plagiarism, Collusion and Misconduct
It is an offence for any student to be guilty of, or party to, attempting to commit or committing collusion, plagiarism, or any other misconduct in an examination or in the preparation of work which is submitted for assessment. Misconduct in assessment exercises, examinations or in the presentation of marks achieved elsewhere is conduct likely to be prejudicial to the integrity and fairness of the examination process. The submission of a dissertation, essay or any other assessment exercise will be considered by the examiners to be a declaration that it is the candidate's own work.

Collusion is the preparation or production of work for assessment jointly with another person or persons unless explicitly permitted by the examiners. An act of collusion is understood to encompass those who actively assist others as well as those who derive benefit from others’ work. Where joint preparation is permitted by the examiners but joint production is not, the submitted work must be produced solely by the candidate making the submission. Where joint production or joint preparation and production of work for assessment is specifically permitted, this will be stated explicitly in the relevant course documentation.

Plagiarism is the use, without acknowledgement, of the intellectual work of other people, and the act of representing the ideas or discoveries of another as one’s own in written work submitted for assessment. To copy sentences, phrases or even striking expressions without acknowledgement of the source (either by inadequate citation or failure to indicate verbatim quotations), is plagiarism; to paraphrase without acknowledgement is likewise plagiarism. Where such copying or paraphrase has occurred the mere mention of the source in the bibliography shall not be deemed sufficient acknowledgement; each such instance must be referred specifically to its source. Verbatim quotations must be either in inverted commas, or indented, and directly acknowledged.

For further information see the University’s web site on plagiarism at the follow URL: http://www.sussex.ac.uk/academicoffice/resources/misconduct

Problems. The MSc course is fairly intensive in nature and, although the majority of students experience little difficulty, a few will be faced with either academic or non-academic problems. It is best to know to whom to turn for help or advice or simply to talk to. The first person you should talk to is is your academic advisor although both your project supervisor and the course organiser may also be able to help. Finally for more serious matters (eg health or financial) you should contact the student support services http://www.sussex.ac.uk/students/support/
Options Modules. You are required to choose two of the following modules. Once you have made your choice could you please inform Nicola Davies (nvm20@sussex.ac.uk) which modules you intend to take.

INTRODUCTION TO GENES AND BIOCHEMISTRY - Module organiser: Dr John Armstrong
This course will provide background knowledge of basic biochemistry, and the relationship of genes and proteins within the cell for those students with a non-biological first degree. The course will cover aspects of large molecules, including lipids, sugars, proteins and nucleic acids. It will cover gene expression including DNA replication, transcription and translation. It will introduce enzymes and catalysis, and provide grounding in energy metabolism.

REGULATING THE TRANSCRIPTOME - Module organiser: Dr Michelle West
This course takes an in-depth look at the molecular mechanisms controlling RNA expression in prokaryotes and eukaryotes focussing largely on gene transcription but also examining RNA processing events. The mechanism of action of RNA polymerase, transcription factors and RNA processing factors will be examined in detail.

MOLECULAR GENETICS - Module organiser: Dr Felicity Watts
The course will cover the application of molecular genetics to the study of processes in model systems and higher eukaryotes. Particular topics will include cell cycle and checkpoint control, recombination and mating type switching in lower eukaryotes, gene mapping and cloning disease genes in higher eukaryotes and the production of transgenic animals.

GENOMICS - Module organiser: Dr Frances Pearl
This course will survey the common types of genomic and proteomic data including DNA and protein sequences, motifs, gene structure, protein interactions and expression data. The methods used to generate each type of data will be explained. The aims and methods of DNA and protein sequence analysis will be covered in depth including analysis of homology, identification of motifs and domains, pairwise and multiple alignments and prediction of gene structure. The distribution of data through public databases will be surveyed including data formats and end-user applications for manipulation and analysis. Students will learn to access, manipulate and analyse data available on the internet, and gain an understanding of the structure and limits of these services.

POST-TRANSCRIPTIONAL CONTROL OF GENE EXPRESSION - Module organiser: Prof Simon Morley
This course makes an in-depth trip into the molecular mechanisms controlling RNA export, translation and decay in eukaryotes. It is focused largely on how these processes are carried out, regulated by hormones and growth factors, miRNAs, viral infection, ischaemia, hypoxia and stress and what goes wrong in the diseased state.

GENOME STABILITY, GENETIC DISEASES AND CANCER- Module organiser: Dr Jessica Downs
The design of new therapies for cancer depends on first understanding the molecular events that cause the disease. Genomic DNA is damaged spontaneously, by chemical carcinogens and by radiation. If unrepaired, this damage leads to mutations, cancer and other developmental disorders. All cells have evolved a sophisticated array of repair and response mechanisms to deal with DNA damage. The aim of this course is to understand the molecular mechanisms that control DNA repair and to appreciate how defects in genes involved in these repair processes are associated with different, in many cases cancer-prone, genetic disorders. Throughout the course, emphasis will be placed on the review and critical evaluation of recently published experimental evidence; advances in this area rely on a combination of biochemical analysis, genetic approaches and bioinformatics. Lectures will be complemented by discussion groups.

PROTEIN FORM AND FUNCTION - Module organizer: Prof Louise Serpell
Protein Form and Function will provide a sense of how protein structures are related to each other and of how these structures relate to protein function. It also equips the student with the necessary knowledge and skills to allow them to learn about and appreciate this class of molecule. This course covers aspects of protein structure in detail and introduces computational and experimental techniques that are essential for studying proteins and provides the basis for the in depth discussion of more topical issues such as protein engineering and design, protein folding, chaperones and protein folding diseases.