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Key contacts in the department for assistance with any of the above

Dr. Sarah Matthews, programme tutor. Email: sarah.matthews@ucl.ac.uk, Tel.: 01483 204208

UCL Library Services

UCL Information Services Division (ISD)

UCL Centre for Languages & International Education (CLIE)

Student representation

Informal resolution

Formal complaints

Student feedback

ChangeMakers

Employability and Careers

Opportunities available, where and how to get advice, career planning tips

The department’s careers advisors are: Dr. Sarah Matthews (sarah.matthews@ucl.ac.uk) and Prof. Andrew Fazakerley (a.fazakereley@ucl.ac.uk).

Global Citizenship

Data Protection

Health, Safety and Security

Health and Safety information concerning the department

After study

Notes and References
Introduction

This is the Student Handbook for the UCL MSc/Postgraduate Diploma/Postgraduate Certificate Programme in *Space Science and Engineering*, which has two Pathways:

- Space Technology
- Space Science

The Programme runs over a full calendar year. This Handbook is intended to give students joining the Programme the basic information they will need about it, information about the facilities and the host departments, the main procedures to be followed, and references to further sources of information.

The MSc/Postgraduate Diploma/Postgraduate Certificate Programme in *Space Science and Engineering* is run jointly by the Department of Space and Climate Physics and the Department of Electronic and Electrical Engineering.

The Department of Space and Climate Physics is the Admitting Department for the Programme.

The following abbreviations are used in this Handbook:

- **SSE** (MSc/Postgraduate Diploma/Postgraduate Certificate) *Space Science and Engineering* (Programme code TMSSPSAENG10)
- **ST** (Pathway) *Space Technology* (Route code TMSSPSSTEC12)
- **SS** (Pathway) *Space Science* (Route code TMSSPSSING11)
- **S&CP** Department of *Space and Climate Physics*
- **E&EE** Department of *Electronic and Electrical Engineering*

**Key staff members**

Dean of MAPS: Prof. Ivan Parkin

Faculty Tutor: TBC

Head of Department of Space & Climate Physics: Prof. Andrew Fazakerley

MSc Programme team:

- **Mr Matthew Whyndham** – Departmental Graduate Tutor, S&CP. Based in Room B3, 3 Taviton Street. Tel: 24522 (020 7679 4522), m.whyndham@ucl.ac.uk
- **Dr. Sarah Matthews** – Programme Tutor (SSE), S&CP. Based at MSSL. Tel: 01483 204208, sarah.matthews@ucl.ac.uk
- **Dr Christos Masouros** – Programme Tutor (SSE, ST Pathway only), E&EE
  Based in Room 917, Roberts Building, UCL. Tel 37965 (0207 679 7965), c.masouros@ucl.ac.uk
- **Ms Natasha Magennis** – Assistant Programme Administrator (UCL campus), S&CP. Based in Room B2, 3 Taviton Street. Tel 24519 (0207 679 4519), n.magennis@ucl.ac.uk
- **Ms Vilma Dzewu** – Assistant Programme Administrator (UCL campus), S&CP
  Based at MSSL. Tel #6129 (01483 204110), v.dzewu@ucl.ac.uk
- **Ms Libby Daghorn** – Assistant Programme Administrator (MSSL), S&CP
  Based at MSSL. Tel #6129 (01483 204110), l.daghorn@ucl.ac.uk
  Note: Ms Daghorn works part-time, currently on Mondays, Wednesdays and Fridays only.
UCL’s Academic Regulations for Students apply to this MSc /Postgraduate Diploma/Postgraduate Certificate Programme.

The information in this Handbook is believed to be correct at the time of printing, but may be subject to change during the year. Further information can be obtained from the Programmes Website http://www.ucl.ac.uk/mssl/taught-programme/msc-space-sci-eng. Students will be informed of any changes to this Handbook, or any further information regarding the Programme, by email or by notices in the relevant department (see below for locations).

Sarah Matthews, MSc (Space) Programme Tutor

Image on front cover: Artist's impression of Juno arriving at Jupiter on 4th July 2016 (Credit NASA/JPL)
Programme Information

Aims and Objectives

The Programme aims to enable successful students to put the skills and knowledge gained to good use, in either employment or in further study such as PhD research.

The ST Pathway is focussed on the application of space technology in industrial settings, and therefore has this main objective:

- To provide students with a sound knowledge of the underlying principles which form a thorough basis for careers in space technology, satellite communications and related fields.

The SS Pathway is focussed on scientific research applications of space technology, and has the objective:

- To provide students with a sound knowledge of the underlying principles which form a thorough basis for careers in space science and related fields.

The two Pathways share a number of common aims and objectives:

- To enable students to develop insights into the techniques used in current space missions.
- To allow students to have an in-depth experience of a particular specialised area, through project work, as a member of a research team.
- To develop students’ professional skills which are necessary to play a meaningful role in industrial or academic life and satisfy the need, both nationally and internationally, for well-qualified postgraduates who will be able to respond to the challenges that arise from future developments.
- To give students the experience of teamwork, to develop students’ report-writing and presentation skills, and to train students to work to deadlines.

The two Pathways share a great deal, but there are important differences, especially in the course options structure. Refer to page 8.
Programme Details

Both ST and SS Pathways of the MSc/Diploma/Certificate Programme in ‘Space Science and Engineering’ comprise taught Core and Advanced modules, the Individual Project and the Group Project.

The two Pathways differ in one of their Core modules and in the options available for the advanced modules, so these notes should be studied carefully.

Course Codes

Lecture modules and the projects that make up the MSc/Diploma/Certificate Programme have UCL codes (SPCE…., ELEC…., etc.) which you will need for accessing information on them via PORTICO (see later). We also have historical Departmental codes (beginning with the letters SS or ST) for some of the modules, but they are not used in this Handbook.

Structure of the MSc/Diploma/Certificate Programme

Students gain ‘credits’ when they complete each one of the components of the MSc/Diploma/Certificate Programme (taught Core and Advanced modules, the Individual Project and the Group Project); the total number of credits required to obtain the MSc degree is 180, while a Postgraduate Diploma and a Certificate require 120 and 60 credits, respectively. The structure of the MSc/Diploma/Certificate Programme is summarised in the table on page 16.

The overall average MSc/Diploma/Certificate mark is the average of the marks obtained in all components (taught Core and Advanced modules, the Individual Project and the Group Project), weighted according to the number of credits attributed to each. To obtain an award, students must obtain an overall average mark of at least 50%, and a mark of at least 50% in all individual components, i.e. each Core and Advanced module, the Individual Project and the Group Project. If these criteria are met, the Examination Board will normally condone a failure to achieve the MSc/Diploma/Certificate pass mark of 50% in two of the taught (15 credit) modules, provided that the mark for that module is at least 40%.

Otherwise, failure of any taught module examination requires a re-sit of that component to be completed successfully in a subsequent year in order to obtain the MSc/Diploma/Certificate. Failure in the Individual or Group Project component requires a re-submission in a subsequent year.

In order to gain an award of MSc with Distinction, a student must obtain an overall average mark of at least 70%, and obtain a mark of at least 70% for the Individual Project and a mark of at least 50% for each other component (all marks being based on first attempts).

An award of MSc with Merit will be made when the overall average mark is at least 60%, the mark for the Individual Project is at least 60%, there are no marks below 50% and no condoned marks (all marks being based on first attempts).

The following diagram summarises the mark classification adopted in all taught and project components of the Programme:

<table>
<thead>
<tr>
<th>Mark Range</th>
<th>Mark Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 39%</td>
<td>Fail</td>
</tr>
<tr>
<td>40 - 49%</td>
<td>Condonable Fail</td>
</tr>
<tr>
<td>50 - 59%</td>
<td>Pass</td>
</tr>
<tr>
<td>60 - 69%</td>
<td>Merit</td>
</tr>
<tr>
<td>70 - 100%</td>
<td>Distinction</td>
</tr>
</tbody>
</table>

At the discretion of the Examination Board, considering all students together on both SS and ST Pathways of the Programme, prizes are sometimes awarded for Best Individual Project and Best Overall Achievement.

The main formal meeting of the Examination Board takes place on the last day of the Programme and it is at this meeting that the MSc results are decided - not before!
You will be invited to a Progress Meeting with the Programme Team early in the second term to review your performance in the first term, to give a short presentation on work carried out and future plans for your Individual Project, and to discuss your Initial Project Report.

*It is important that you heed the advice offered during this meeting, otherwise you may not be successful later in the year.*

**Postgraduate Diploma and Postgraduate Certificate Exit Points**

MSc/Diploma/Certificate Programme elements are operated concurrently, with the Postgraduate Diploma and Postgraduate Certificate as exit points for students who do not attain the 180 credits required for an MSc award. As such, Postgraduate Diploma and Certificate can be offered as an alternative to re-sitting failed modules in the attempt to gain enough credits for an MSc award.

The **Diploma** is obtained by gaining 120 credits: these must be achieved by passing all seven taught modules and the Group Project.

The **Certificate** is obtained by gaining 60 credits: these are achieved by passing four taught modules, of which at least one has to be a Core Module.

In order to be eligible for a Postgraduate Diploma/Certificate award, a student must complete all required components of the Programme satisfactorily. The overall mark for the Diploma/Certificate is the average of the marks for all these components, weighted according to the number of credits attributed to each.

If a student fails to achieve the marks required for a Postgraduate Diploma/Certificate (i.e. at least 50% for each component) he/she can re-sit the relevant exams for the Diploma/Certificate in a subsequent year.

**Learning Agreements**

Some overseas students are required to submit ‘Learning Agreements’ forms for College approval. Please note that the forms should be handed in to the Programme Team by 10th November at the latest.

**Programme Timetable/Calendar**

The Programme Timetable/Calendar is distributed at the introductory meeting (a draft version), and is published on the Programme Moodle Website; the Moodle version will always be kept up-to-date, so students should use it in preference to other versions and check it often for updates.

**Personal Tutor**

**Academic and Personal Tutoring**

UCL is committed to providing all students with the academic guidance and personal support that they need to flourish as members of our active learning and research community. As part of the wider support infrastructure provided by a programme, every undergraduate or taught postgraduate student will be assigned a member of staff who can provide constructive academic and personal development guidance and support. At the start of the year, students will be provided with the name and identity of their personal tutor, the date of their first meeting, and where and when the personal tutor can be found in term time. Students are encouraged to be proactive in engaging with their Personal Tutor, as it is the responsibility of the student to keep in touch.

You will be assigned a personal tutor at the beginning of the programme.

**Format of Modules**

There are two different formats for the lecture modules and their exams.

- **‘SHORT FAT’ MODULES (SPCEGC03, ELECGT02, ELECGC01, ELECGC16)**

  These modules are ‘short and fat’, i.e. running with many lectures condensed into a short period. All are run with 6 lecture-hours per day over 4 or 5 consecutive days, followed by tutorial(s) and an exam in the following few weeks. The Core Modules that are ‘short and fat’ are SPCEGC03 and ELECGT02; the Advanced Modules are ELECGC01 and ELECGC16.
‘LONG THIN’ MODULES (all others)

These modules are ‘long and thin’, i.e. running with a few lectures per week over a whole term, with an exam in the summer.

MSc/Postgraduate Diploma/Certificate Programme in 'Space Science and Engineering'

<table>
<thead>
<tr>
<th>Core Modules - Term 1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection</td>
<td>UCL code</td>
<td>credits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45 total</td>
</tr>
<tr>
<td>Space Science (SS) pathway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take all three CORE courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CORE</td>
<td>SPCEG001</td>
<td>15</td>
</tr>
<tr>
<td>CORE</td>
<td>SPCEG002</td>
<td>15</td>
</tr>
<tr>
<td>CORE</td>
<td>SPCEG003</td>
<td>15</td>
</tr>
<tr>
<td>Space Technology (ST) pathway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take all three CORE courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CORE</td>
<td>SPCEG001</td>
<td>15</td>
</tr>
<tr>
<td>CORE</td>
<td>SPCEG002</td>
<td>15</td>
</tr>
<tr>
<td>CORE (OPTION)</td>
<td>ELECG102</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Advanced Modules - Term 2 (see exceptions under Notes)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection</td>
<td>UCL code</td>
<td>credits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60 total</td>
</tr>
<tr>
<td>Take COMPulsory module, and three OPTIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Space Science (SS) pathway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP</td>
<td>SPCEG001</td>
<td>15</td>
</tr>
<tr>
<td>OPTION</td>
<td>SPCEG001</td>
<td>15</td>
</tr>
<tr>
<td>OPTION</td>
<td>SPCEG002</td>
<td>15</td>
</tr>
<tr>
<td>OPTION</td>
<td>SPCEG003</td>
<td>15</td>
</tr>
<tr>
<td>OPTION</td>
<td>SPCEG004</td>
<td>15</td>
</tr>
<tr>
<td>OPTION</td>
<td>GEGG141</td>
<td>15</td>
</tr>
<tr>
<td>OPTION</td>
<td>GEGG142</td>
<td>15</td>
</tr>
<tr>
<td>Space Technology (ST) pathway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take four OPTIONAL modules, at least one each from group A (Systems Modules) and group B (Applications Modules)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: OPTION</td>
<td>SPCEG007</td>
<td>15</td>
</tr>
<tr>
<td>B: OPTION</td>
<td>SPCEG008</td>
<td>15</td>
</tr>
<tr>
<td>A: OPTION</td>
<td>SPCEG009</td>
<td>15</td>
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<tr>
<td>A: OPTION</td>
<td>ELECG001</td>
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</tr>
<tr>
<td>A: OPTION</td>
<td>ELECG101</td>
<td>15</td>
</tr>
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<td>B: OPTION</td>
<td>SPCEG003</td>
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</tr>
<tr>
<td>B: OPTION</td>
<td>GEGG141</td>
<td>15</td>
</tr>
<tr>
<td>B: OPTION</td>
<td>GEGG142</td>
<td>15</td>
</tr>
</tbody>
</table>

Exit Point: Postgraduate Certificate, if passed four taught modules, of which at least one must be a Core Module (i.e. 60 credits total)

Problem based learning and career training: Group Project

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>credits</td>
<td>15 total</td>
<td></td>
</tr>
<tr>
<td>SPCEG008</td>
<td>15 Group Project (6 weeks in summer)</td>
<td></td>
</tr>
</tbody>
</table>

Exit Point: Postgraduate Diploma, if passed all seven taught modules and the Group Project (i.e. 120 credits total)

Research Programme: Individual Project

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>credits</td>
<td>60 total</td>
<td></td>
</tr>
<tr>
<td>No difference between SS and ST pathways, except choice of Individual Project subject</td>
<td>SPCEG009</td>
<td>15 Intern Report (over Terms 1 and 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>45 Final Report (Term 3)</td>
</tr>
</tbody>
</table>

MSc award if successful in all four components (described in the four boxes, i.e. 180 credits total)

S&C&P, Space and Climate Physics Department
E&EE, Electronic & Electrical Engineering Department
Core Modules

During the First Term (September - December) students attend the following Core Modules. Lecture dates and times are given in the Programme Timetable/Calendar. Examinations for Core Modules SPCEGC03 and ELECGT02 normally take place during the First Term or early in the Second Term, as shown in the Programme Timetable/Calendar. These modules aim to give all students, with their diverse academic backgrounds, a thorough, basic understanding of the major aspects of the field, and they form an essential background to the Advanced Modules. They also provide an introduction to the UK examination style for non-UK students.

ST Core Modules

SPCEGC01  Space Science, Environment and Satellite Missions – Dr S. Matthews, Prof. G. Branduardi-Raymont, Dr. T. Kitching
SPCEGC02  Space Systems Engineering – Prof. I. Hepburn, Mr M.Whyndham
ELECGT02  Communication Systems Modelling – Dr K. K. Wong, Dr Y. Andreopoulos, Dr R. Clegg

During the initial weeks of the Programme it will be very useful for students to read up on basic electromagnetism (up to Maxwell’s equations) & basic electronics (including AC circuits and transmission lines). This is particularly important for those with a physics-based degree rather than an electronic engineering degree. Students can ask the Tutors for suggested textbook chapters to use for revision.

Please note that ELECGT02 requires a strong background in communication techniques that e.g. Physics graduates do not normally possess, and this has hampered the performance of some past students in this module. For this reason students lacking the appropriate background knowledge are permitted to substitute ELECGT02 with SPCEGC03 as their Core Module.

SS Core Modules

SPCEGC01  Space Science, Environment and Satellite Missions – Dr S. Matthews, Prof. G. Branduardi-Raymont, Dr. T. Kitching
SPCEGC02  Space Systems Engineering – Prof. I. Hepburn, Mr M.Whyndham
SPCEGC03  Space Data Systems and Processing – Prof. L. Harra, Dr P. Groves, Prof. M. Ziebart, Prof. A. Smith, Dr T. Huang, Dr I. Ferreras

Advanced Modules

Modules are the individual units of study that lead to the award of credit. Many programmes offer students the opportunity to choose between different modules that they are interested in. However some new students will find they do not need to make selections as all their modules are compulsory. If students need to choose modules, their department will advise them of how and when to do this, usually during departmental introductions. There may be a deadline by which students should make their choices, so students should keep an eye out for information from their department. The deadline for module selection for both pathways to be entered into Portico is [FIXME].

Further information:

- Selecting Modules

Contact details for staff who can give advice:

Dr. Sarah Matthews – sarah.matthews@ucl.ac.uk, Tel: 01483 204208

The details here are different for the two Pathways, so please read carefully. You are welcome to attend more than four of the Advanced Modules, but you can only be examined in four of them.

Module Confirmation

The deadline for confirming your Term 1 module choices on PORTICO is Friday 13 October 2017.

In response to feedback from students, Student and Registry Services are putting processes in place to release the timetable of centrally organised examinations earlier in 2017/18. As a result, it is necessary to bring the deadline for
the confirmation of module choice forward. **All modules you intend to take in 2017/18, including modules for Term 2, must be confirmed on Portico by 6 December 2017.**

You will not be able to change your Term 2 module selection after 6 December. It is therefore essential that you make sure you research your module choices thoroughly before selecting them. If you want to make a change after you have confirmed your module choice, please consult your tutor. Changes can be made by your teaching administrator and you will need to request any changes to your Term 2 module registrations in good time before the deadline.

**Please note that some optional Advanced Modules are taught in the First Term (GEOGG141 – Principles and Practice of Remote Sensing, SPCEG013 – High Energy Astrophysics, and SPCEGC03 – Space Data Systems and Processing, this last being an option for the ST Pathway), with exams in the First or early in the Second Term (except for SPCEG013, which is examined in the Third Term).**

**ST Advanced Modules**

During the second term (January - March) students take four Advanced Module options including at least 1 Systems module and 1 Applications module (see below). Each module lasts for approximately 27-30 hours (including tutorials, if given). Dates and times of all modules, and of the examinations for the short fat courses, are given in the Programme Timetable/Calendar. The examinations for the long thin courses (except for GEOGG141, see later) take place between the end of April and the beginning of June, and students will be notified in March of the times/dates/locations for these.

**SYSTEMS MODULES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPCEG007</td>
<td>Space-based Communication Systems – Dr. T. Huang, Prof. A. Smith</td>
<td></td>
</tr>
<tr>
<td>SPCEG008</td>
<td>Spacecraft Design: Electronic Sub-systems – Prof. I. Hepburn</td>
<td></td>
</tr>
<tr>
<td>SPCEG009</td>
<td>Mechanical Design of Spacecraft – Dr B. Shaughnessy, Dr. Matt Hills</td>
<td></td>
</tr>
<tr>
<td>ELECGC01</td>
<td>Antennas and Propagation – Prof. K. Tong, Dr P. Brennan</td>
<td></td>
</tr>
<tr>
<td>ELECGC16</td>
<td>Radar Systems – Prof. H. Griffiths</td>
<td></td>
</tr>
</tbody>
</table>

**APPLICATIONS MODULES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOGG141</td>
<td>Principles and Practice of Remote Sensing – Dr M. Disney <em>(note: this module is taught in the First Term and the exam normally takes place in January.)</em></td>
<td></td>
</tr>
<tr>
<td>GEOGG142</td>
<td>Global Monitoring and Security – Prof. J.-P. Muller, Dr M. Disney</td>
<td></td>
</tr>
<tr>
<td>SPCEG001</td>
<td>Space Instrumentation and Applications – Prof. M. Cropper, Dr. C. Forsyth, Dr K. al-Janabi, Prof. I. Hepburn, Dr D. Kataria, Prof. J.-P. Muller, Prof. L. Harra</td>
<td></td>
</tr>
<tr>
<td>SPCEG002</td>
<td>Space Plasma and Magnetospheric Physics – Prof. C. Owen, Dr J. Rae</td>
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</tbody>
</table>


**SS Advanced Modules**

During the Second Term (January - March), all students take the Space Instrumentation & Applications module SPCEG001. Students also take 3 other space science Advanced Modules from those listed below. Each module lasts for approximately 30 hrs and examinations are in the Third Term (except for GEOGG141). Dates and times of these modules are given in the Programme Timetable/Calendar. Students will be notified in March of the times/dates/locations for the summer exams, which take place between the end of April and the beginning of June.

**COMPULSORY MODULE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPCEG001</td>
<td>Space Instrumentation and Applications – Prof. M. Cropper, Dr. C. Forsyth, Dr K. al-Janabi, Prof. I. Hepburn, Dr D. Kataria, Prof. J.-P. Muller, Prof. L. Harra</td>
<td></td>
</tr>
</tbody>
</table>
SPACE SCIENCE MODULES

SPCEG011   Planetary Atmospheres – Dr G. Jones
SPCEG012   Solar Physics – Prof. L. van Driel-Gesztelyi, Prof. L. Green
SPCEG013   High Energy Astrophysics – Prof S. Zane (note: this module is taught in the First Term)
SPCEG002   Space Plasma and Magnetospheric Physics – Dr J. Rae, Prof. C. Owen
GEOGG141   Principles and Practice of Remote Sensing – Dr M. Disney (note: this module is taught in the First Term and the exam normally takes place in January)
GEOGG142   Global Monitoring and Security – Prof. J.-P. Muller, Dr M. Disney

Note: SPCEG012 and GEOG142 are timetabled for the same slots, and so may not be taken together.

Lecturers will recommend suitable textbooks during their courses. One book that gives a good general introduction to the whole field is Space Science, edited by L. Harra and K. Mason, published by Imperial College Press (2004). This book has 14 chapters on different aspects of Space Science, each written by a member of staff at MSSL.
Project Work

Individual Project (SPCEG099)

Students start work on an Individual Project during the first term. This may involve attachment to any of the relevant Departmental Research Groups:

- **ST:** S&CP or E&EE
- **SS:** S&CP, Physics and Astronomy, or Earth Sciences (by special arrangement).

**General Notes**

- Some set topics for Individual Projects have been selected by potential supervisors, and a list will be available during the first term. Alternatively students can suggest areas in which they are interested. It is, however, essential that the subject of the chosen project is relevant to the Programme, and a willing supervisor is also required. Discussions with the Programme Team and potential supervisors start in October and a **project title must be defined, and a supervisor appointed, by mid-November at the latest** (see the exact deadline on the Programme Timetable/Calendar). Work begins in the First Term, usually with a literature survey or other background work. Progress, plans and difficulties are outlined in an **Initial Report** and a second, **Interim Report**, due at the end of the First and Second Terms respectively (see the Programme Timetable/Calendar for the exact dates). Part of the Individual Project are also: a) **presentation**, given to an audience of staff and students of the S&CP and E&EE Departments (as appropriate) about one month before the Final Report submission deadline, and b) The **Final Report**.

**ALL COMPONENTS OF THE INDIVIDUAL PROJECT HAVE TO BE SUBMITTED IN ORDER FOR THE PROJECT TO BE DEEMED COMPLETE.**

- Assessment of the Individual Project is based on the **Final Report** (70% of available marks), the **Interim Report** (20%) and the **presentation** (10% of the assessment).

- The Individual Project is a piece of research related to your MSc subject, and as such, students are expected to demonstrate **initiative, originality of approach and deduction**, although at a level, and within a timescale, appropriate to an MSc (rather than a PhD).

- **THE AVAILABLE TIME IS SHORTER THAN IN MOST OTHER MSc PROGRAMMES** (this is because of the 7 weeks taken up afterwards by the Group Project). Therefore you will start your project work much earlier than on most other MSc programmes.

- The Individual Project counts for one third of the assessment of the whole MSc (see page 8). As part of the pass criteria, the Individual Project must be passed with a mark of at least 50% to obtain an MSc (60% for a Merit and 70% for a Distinction).

- **DO NOT LEAVE NEARLY ALL THE WORK TO THE LAST FEW WEEKS.** Spread your project work between the three terms as suggested below.

- **MAINTAIN REGULAR CONTACT WITH YOUR SUPERVISOR** to ensure that the project remains “on course”, i.e. with the correct work being done, on schedule.

**Summary of Deadlines and Deliverables**

- **Early in First Term** (17 November) ➔ Identify supervisor and project title
- **End of First Term** (15 December) ➔ Project Initial Report submission
- **End of Second Term** (22 March) ➔ Project Interim Report submission
- **21 June** ➔ Mid-Term Presentation
- **14 July** ➔ Project Final Report submission

**Work in the First Term**

- By the “project definition” deadline (see the Programme Timetable/Calendar for the exact date), define your project, in consultation with a potential supervisor, using the information and list that will be provided. Try to choose something that interests you – it may be useful to look at previous years’ reports (some may be
available upon request from the Programme Administrators). If you need more help, ask one of the Programme Tutors.

• Email the title of the project, and your supervisor’s name and Department, to the Individual Project Tutor, Dr Sarah Matthews (sarah.matthews@ucl.ac.uk) and to the Programme Administrator, Ms Libby Daghorn (l.daghorn@ucl.ac.uk) by the “project definition” deadline (see the Programme Timetable/Calendar for the exact date). Ask your Project supervisor to confirm this by emailing both sarah.matthews@ucl.ac.uk and l.daghorn@ucl.ac.uk.

• Try to complete the literature review and any other preliminary tasks in the First Term. Start the main project work if possible.

• Email (in Word or pdf format) a 2 to 4 page (not including space taken by graphics and tables) PROJECT INITIAL REPORT to Libby Daghorn (l.daghorn@ucl.ac.uk) by the deadline, at the end of the First Term (the actual date will be listed in the Programme Timetable/Calendar). This should give: your name, supervisor’s name, project title, objectives, summary of work programme, work done so far, outline project schedule (including writing up time). YOU MUST AGREE THE CONTENTS OF THIS REPORT WITH YOUR SUPERVISOR BEFORE SUBMITTING IT.

THIS INITIAL REPORT IS IMPORTANT BECAUSE WILL FORM THE BASIS OF THE ASSESSMENT AND FEEDBACK PROVIDED BY THE PROGRAMME TEAM AT THE PROGRESS MEETING EARLY IN THE SECOND TERM.

• Students will also be required to give a 5 MINUTE PRESENTATION about progress in their Individual Project at the Progress Meeting with the Programme Team early in the Second Term.

Work in the Second Term

• Aim to work at least 1 day per week on the project during the Second Term.

• Aim to have completed about 25% of the project work by the end of the Second Term.

• Submit one file (a Word document or pdf, via Moodle) containing your PROJECT INTERIM REPORT (a maximum of 3,000 words long, not including Figures, Tables and Reference list – Include the total number of words in the Report on the front page) by the deadline, at the end of the Second Term (see the Programme Timetable/Calendar).

THIS IS A REAL DEADLINE - STUDENTS WILL BE PENALISED (MARKS SUBTRACTED) FOR LATE SUBMISSION OF THE REPORT.

• Note the following:
  
  o The report should have 3 sections (section 2 being the largest):
    1. A brief introduction to the project, including a brief outline of the envisaged work;
    2. A description of the work completed to date, with any conclusions;
    3. A summary of the work still to do, with a provisional contents list for the Final Report, and an updated project schedule.
  
  o You should discuss the contents and style of this report with your supervisor before writing it and at the draft stage, but it will be assessed, so it must be your own work.

THE LENGTH OF THE REPORT IS IMPORTANT: 3,000 WORDS IS A HARD MAXIMUM AND STUDENTS WILL BE PENALISED FOR EXCEEDING IT (see page 24).

THE INTERIM REPORT ACCOUNTS FOR 20% OF THE AVAILABLE PROJECT MARKS.
NOTE: It can make the difference between Pass and failure, or Pass and Distinction!

Work in the Third Term & the Summer Period

• Work full time on the Individual Project, and complete it, after the summer exams. Discuss any difficulties with your supervisor WELL IN ADVANCE OF THE FINAL REPORT DEADLINE.

• Prepare, in consultation with your supervisor, a PRESENTATION on your project work, to be delivered about a month before the Final Report submission deadline (the date will be posted in the Programme Timetable/Calendar), to an audience of academics, scientists, engineers and postgraduate students. It is
expected that following the presentation students will receive feedback on their project work that can be incorporated into their Final Report.

**THE MARK ON THE PRESENTATION ACCOUNTS FOR 10% OF THE OVERALL PROJECT MARK.**

- Discuss the structure of your **FINAL REPORT** (i.e. its sections and subsections) with your supervisor at an early stage. The detailed structure may vary depending on the subject, but should always include:
  - An **Abstract**, which is a concise summary of your Report and its results (in no more than 300 words), at the beginning of the Report.
  - An **introductory section** which states the aims and objectives of the project, discusses the rationale for the project (including how it relates to previous work) and outlines what is covered by each main section in the Report.
  - A **concluding section** which discusses the extent to which the main results and discussion meet the aims and objectives of the project, and discusses any possible future research that could follow on from the project.

- Complete a draft of the Report well before the deadline to allow for proof reading and alterations.

- A template will be issued for the front cover. All Reports should have a cover conforming to this.

- The Final Report should be produced in a font such as Times New Roman (font size 12) or Arial (font size 10), with 1.0 or 1.5 line spacing. **Any Figures or Tables should be labelled and numbered, and each of these must be referred to in the text by number. References should be referred to in the text and in the reference list at the end of the Report in a conventional way** (as in scientific papers – if in doubt, ask your supervisor for advice). Pages must be numbered.

- Your Final Report must be **between 10,000 and 12,000 words** long, excluding table of contents, list of figures, figures and tables, and their captions, reference/bibliography lists and appendices. Include the **total number of words** in the Report on the front page.

**AGAIN, THE LENGTH OF THE REPORT IS IMPORTANT: 12,000 WORDS IS A HARD MAXIMUM AND STUDENTS WILL BE PENALISED FOR EXCEEDING IT** (see page 24).

**THE FINAL REPORT ACCOUNTS FOR 70% OF THE OVERALL PROJECT MARK.**

### Submission of the Final Report

- Provide 3 bound copies of your project **FINAL REPORT** by the deadline date (usually around mid-July – see the Programme Timetable/Calendar), handing them in at the offices at 3 Taviton St.

- An electronic copy of the Final Report should also be submitted via Moodle by the same deadline (file type and size restrictions may apply).

**THIS IS A REAL DEADLINE – STUDENTS WILL BE PENALISED (MARKS SUBTRACTED) FOR LATE SUBMISSION OF THE FINAL REPORT**

- You should be aware that the Department uses a sophisticated detection system (Turnitin® [xix]) to scan work for evidence of plagiarism (see later section about ‘Plagiarism’). This system has access to billions of sources worldwide (Websites, journals, etc.) as well as work previously submitted to this Department and other Departments.

- The Final Report will be assessed (independently by 2 markers) for its main content (including **originality, analysis and discussion of results**), for its introductory content (including introduction, problem definition and references), and for its style (including structure, literary style and presentation). The assessment of the first marker (your supervisor) will also take into account the **effort and initiative** that you put into your project.

**To summarise, assessment of the Individual Project is based on three components:**

1. **The Interim Report** (providing 20% of the overall Individual Project mark)
2. **The Mid-Term Presentation** (10%)
3. **The Final Report** (70%)
Group Project (SPCEG089)

Supervisor: TBC

For the final 7 weeks of the MSc Programme, students on the ST Pathway combine with those on the SS Pathway to carry out a Group Project, generally an industrial-style space mission design study (similar to a “Phase A” feasibility study), at which they all work together as part of a team. Weekly meetings are held with the supervisor to monitor progress and help to solve the problems that may be encountered.

STUDENTS MUST MAKE SURE TO BE PRESENT IN LONDON OVER THIS PERIOD (19 JULY TO MID SEPTEMBER).

A Report (60,000 words maximum – Include the total number of words in the Report on the front page) is written and the study is presented and assessed by a panel of experts, including some from outside UCL, during a formal Design Review. Each student is expected to give part of the presentation. The presentation and Review are held just at the end of the Programme’s year. By way of an introduction to the Programme, students about to join the Programme the following year are invited to attend the current year’s Group Project Presentation.

More details about the organization of the Group Project, including its key dates, will be provided later in the year.

Assessment of the Group Project is based on four components:

1. The Final Report (60%),
2. The Presentation (15% - each student is marked individually on their performance),
3. Team work (10% - each student is assessed individually by the supervisor on their performance during the weekly meetings)
4. Peer assessment (15% - more details will be provided closer to the time)

Lecture Module syllabus details

Refer to the table on page 8 summarising the MSc/Diploma/Certificate Programme structure for details of which modules apply to the two Pathways. Some modules are present in both Pathways: in such cases, the descriptions below appear only once. This syllabus is for guidance only: lecturers may on occasion make minor changes.

Core Modules syllabus summaries

SPCEGC01: SPACE SCIENCE, ENVIRONMENT AND SATELLITE MISSIONS

Lecturers: Dr S. Matthews, Prof. G. Branduardi-Raymont, Dr. T. Kitching

Credits: 15       Teaching Term: 1

Assessment method and timing: 20% coursework, 80% examination in Term 3

This module will give students an appreciation of the history of early spaceflight and examples of early space science satellites; will lead students to understand different space science fields, and will equip them with basic knowledge of the spacecraft environment, of spacecraft dynamics, rocket propulsion, spacecraft design and the essential spacecraft sub-systems; will inform them about space mission planning and space project management. This knowledge is the necessary pre-requisite to develop a good understanding of the advanced topics taught in Term 2 of the MSc Programme.

Topics covered by the module:

Space science and other space applications. Brief history of early spaceflight to 1961. Examples of early space science satellites: Ariel 1, Orbiting Observatories, European programme. Brief outline descriptions of the following space science fields, with major related space science missions and discoveries: solar physics, space plasmas (solar wind and Earth’s magnetosphere), solar system exploration (moons, planets, asteroids and comets), astrophysics from space, Earth observation from space (remote sensing).
The spacecraft environment - Earth's atmosphere, equation of hydrostatic equilibrium, measurements of density, atmospheric drag. The ionosphere and solar radiation, the trapped particle zone (radiation belts). The magnetosphere, the Sun and the solar wind.

Spacecraft dynamics - Orbits, trajectories and launching. The nature of satellite orbits and elementary orbit theory, perturbations. Rocket propulsion - the rocket equation, propellants and specific impulse, nozzle design, staging.


Project management - organogramme, work packages, schedule. PERT network, milestones, critical path, progress meetings, expenditure profiles and financial control.

Mission planning and operations, science planning, timelining, ground support

SPCEGC02: SPACE SYSTEMS ENGINEERING

Lecturers: Mr M. Whyndham, Prof. I. Hepburn

Credits: 15  
Teaching Term: 1

Assessment method and timing: 20% coursework, 80% examination in Term 3

The aim of this module is to provide an understanding of how a spacecraft operates from a technological perspective. This will necessitate exploring the physical, mathematical and engineering principles used in the operation of the major subsystems of a modern spacecraft. On completion of the module the student will be able to describe in some detail the major subsystems of a spacecraft, calculate the basis of operation of these, develop simple models of their functional scope and relate these to simple scientific or operational goals of space missions.

Topics covered by the module:

Systems engineering lifecycle, structure and management of systems development projects and programmes, management of requirements and interfaces. Technology selection, development, insertion and trade-off.

Review of scientific spacecraft subsystems, with examples from modern space vehicles. Spacecraft and instrument design constraints and evolution - size, mass, geometry, power, apertures, thermal control, surface requirements, booms, e-m properties, command capability, data rate.

Mechanical sub-systems: the mechanical environment and design.

Electrical sub-systems: power sub-system and other electronic sub-systems, including analogue signal amplification and processing.

The spacecraft thermal environment and design considerations and methods. Cooling methods and refrigeration.

Attitude control and station keeping, and the basic technology of attitude sensors.

Quality management in the space domain, qualification and integration activities. Component, sub-assembly, instrument and spacecraft level tests. Vibration, temperature, vacuum, solar simulation tests. Configuration management.

Product assurance: approved parts and materials lists, cleanliness, testing, protection during shipping, documentation.

Commanding and data acquisition. Data relay satellites, ground stations, control centre requirements.

Digitised signal data, On-Board Data Handling (OBDH), telemetry and telecommanding, including encoding and command decoding, error detection and correction, RF satellite communications links and link budgets.

SPCEGC03: SPACE DATA SYSTEMS AND PROCESSING

Lecturers: Prof. L. Harra, Dr P. Groves, Prof. M. Zebart, Prof. A. Smith, Dr I. Ferreras, Dr T. Huang

Credits: 15  
Teaching Term: 1

Assessment method and timing: 20% coursework, 80% examination in Term 1

2017-18
On successful completion of this module, students should have competence in understanding current applications of downstream data (in the areas specified below), finding and using space data, processing data products to acquire further scientific knowledge or make statements about the natural and human-made environments (mostly Earth’s, but not exclusively), combining data from many sources in support of such processes, stating limitations of given datasets, defining basic requirements for data systems (current and future).

This is a short, intensive module, run over five days, with 6 hours of lectures on a specific topic, and delivered by a different lecturer, each day. The five topics are:

1) **Positioning**
Principles of positioning systems and practicalities. Applications (methods and uses): vehicles, ground transport in general, personal, navigation, metrology, asset management, security, defence services. Future developments and enhancements.

2) **Solar-Terrestrial Relationships**
Terrestrial applications, Earth magnetosphere and space weather, solar cycle and activity in general (e.g. CMEs), NOAA reports, end users (e.g. aircraft and spacecraft operators, power lines on the ground). Science of space weather and solar-terrestrial relationships, possible connection between solar activity and Earth’s climate.

3) **Telecommunications**
Communications and broadcast services and applications, an introduction; basic principles of space communications; data formatting and encryption; data security; orbits and coverage; communication bands, their application and allocation; radio-amateur satellites; National Space Technology Roadmap for telecoms; an anatomy of a telecoms satellite; partnerships and collaborators in a satellite TV broadcast.

4) **Earth Observations (EO) and Global Change**
Different purposes of EO, of which climate is one; weather monitoring and forecasting, defense, agriculture, natural resource exploitation, geographical science, disaster monitoring and predicting, urban and territory planning, climate and global change, importance of remote sensing.

5) **Astronomy**

**ELECGT02: COMMUNICATION SYSTEMS MODELLING**

**Lecturers:** Prof. K. K. Wong, Dr Y. Andreopoulos, Dr R. Clegg

**Credits:** 15

**Teaching Term:** 1

**Assessment method and timing:** 50% coursework, 50% examination early in Term 2

This module introduces students to the techniques and tools used to model and simulate today’s communications systems and networks. Consideration is given to both the Physical Layer and the Network Layer and the module looks at the theory of modelling and practical applications using standard simulation packages. This module provides in-depth exposure to analytic and simulation techniques appropriate for the representation, analysis and performance evaluation of communications systems and networks (e.g. using MATLAB simulation tools).

**Topics covered by the module:**
Equations, Measurement Technique for Nonlinear Components, Modelling with MATLAB, Simulating the internet.

Advanced Modules syllabus summaries

ST Systems Modules (OPTIONS A)

SPCEG007: SPACE-BASED COMMUNICATION SYSTEMS

Lecturers: Dr. T. Huang, Prof. A. Smith

Credits: 15  Teaching Term: 2

Assessment method and timing: 20% coursework, 80% examination in Term 3


SPCEG008: SPACECRAFT DESIGN - ELECTRONIC SUB-SYSTEMS

Lecturer: Prof. I. Hepburn

Credits: 15  Teaching Term: 2

Assessment method and timing: 20% coursework, 80% examination in Term 3

Introduction - Comparison of spacecraft electronic systems to an equivalent ground based unit.

Power Systems - Solar cells, solar arrays; storage cells; regulation dissipative and non-dissipative, regulators linear and switched mode, noise reduction, filters, supply monitoring, decentralised regulation.

Attitude sensing and control - Earth and Sun sensors, charge coupled devices, wedge and strip, crossed anode, magnetic sensors, search coil and fluxgate, magnetic torquers.

Mechanisms & Housekeeping - Control monitoring; optical and magnetic, pyrotechnic actuators, bridge techniques.

Harnesses - EMC magnetic and electric coupling, shielding efficiencies for near and far field, EMC outgassing ports, connector types, low and high voltage, printed circuit board types.

Reliability - Design techniques, heat dissipation, latch-up, interface and single point failures, housekeeping requirements, components specification, failure rates, fabrication, radiation testing, effect of radiation, displacement and ionisation damage, transients effects, designing for radiation protection.

Analogue design - Charge sensitive amplifiers, noise considerations, practical circuits, pulse shaping circuits, unipolar and bipolar pulses, base line depression, pulse pile-up, low frequency measurements.

Example sessions - Electrical hardware circuits for past and present space missions will be described and demonstrated utilizing the project's development circuit boards.

SPCEG009: MECHANICAL DESIGN OF SPACECRAFT

Lecturers: Dr B. Shaughnessy, Dr. Matt Hills

Credits: 15  Teaching Term: 2
**Assessment method and timing:** 20% coursework, 80% examination in Term 3

Spacecraft configurations - interplay of mission goals, power requirements, attitude system and launch vehicle; mechanical interfaces and sub-systems.

Mechanical design - introduction to the mechanical design procedure and its application to spacecraft design.

Foundations of stress analysis and mechanics of materials - examples of application to spacecraft structures: beam analysis; frame structure analysis; strut buckling and optimisation; shell structure and analysis; sandwich panels theory and practice.

Introduction to Finite Element Analysis (FEA) - basics of finite element method and application to simple structures; using FEA software.

Launch loads - accelerations, acoustic fields, vibrations; calculating load cases and margins of safety.

Materials for lightness, space vacuum and the radiation environment - metals, polymers, ceramics and composites.

Introduction to vibration theory for space systems - analysis of single degree-of-freedom systems; natural frequency, damping, transmissibility; analysis of multi degree-of-freedom systems; random vibration excitation and response.

Testing of space hardware - thermal and mechanical, including vibration and shock. Typical test specifications; derivation from measurements; modes of failure.

Mechanisms - types of space mechanisms - actuators, stepper motors, pyrotechnics, gear transmissions; kinematics and kinematic design; bearings - sliding, rolling and flexing; lubrication and tribology for space applications; mechanism life.

Introduction to cryogenics for space and cryocooler technologies.


**ELECGC01: ANTENNAS AND PROPAGATION**

**Lecturers:** Prof. K. Tong, Prof. P. Brennan

**Credits:** 15  
**Teaching Term:** 2

**Assessment method and timing:** 25% coursework, 75% examination in Term 2

Definitions: Gain, directivity, efficiency, effective area & length; directional patterns; polarisation; Hertzian dipole reactive and far field patterns; types of radiating element; Fourier transforms in antennas, displacement theorem, amplitude tapers & sidelobe levels; orthogonality, pattern synthesis; near and far field patterns, focussed apertures. Arrays and Electronic Beam Control: Interferometers, linear arrays, product theorem; frequency-scanned array, phase & time delay compensation, null steering; switched-line phase shifter & sidelobe levels, vector modulator; multiple beamforming arrays. Digital beamforming; smart antenna systems in mobile applications. Reflector and Lens Antennas: Reflector antennas, feed systems; lens antennas. Antenna Measurements: Anechoic chambers, far-field definition; gain, three-antenna measurement; impedance & polarisation. Other Antenna Topics: Pyramidal & corrugated horns; printed and helical antennas; slot antennas. Propagation Principles: Friis transmission formula; atmospheric effects; fading types and statistics; line-of sight microwave transmission; edge effects; application of propagation models in mobile communications to model urban, suburban and rural environments.
ELECGC16: RADAR SYSTEMS

Lecturer: Prof. H. Griffiths

Credits: 15  Teaching Term: 2

Assessment method and timing: 100% examination in Term 2

Introduction: historical background, radar terminology, radar band designations
The radar equation: point targets, radar cross section, distributed targets, propagation, coverage diagrams
Noise, clutter and detection: theory of detection, sea and land clutter models, CFAR Processing.
Displays: A-scope, B-scope, PPI, modern displays
Doppler radar and MTI: Doppler effect, delay-line cancellers, blind speeds, staggered PRFs, Adaptive Doppler filtering
Pulse Doppler processing and STAP: airborne radar, high, low and medium PRF operation, Space-Time Adaptive Processing
Pulse compression: principles, the ambiguity function, the matched filter, chirp waveforms, SAW technology
Waveform design: nonlinear FM, phase codes, waveform generation and compression
FM radar: principles, radar equation, effect of phase and amplitude errors
Synthetic Aperture Radar: principles, SAR processing, autofocus, spotlight mode, airborne and spaceborne systems and applications, interferometry, ISAR
Tracking radar: conical scan, monopulse, - tracker, track-while-scan, Kalman filters
Avionics and radionavigation: Air Traffic Control, primary and secondary radar, GPS
Phased array radar: phased array principles, array signal processing, multifunction radar, scheduling
Electronic Warfare: ESM, ECM, ECCM; superresolution, IFM, types of jammers, calculation of performance, adaptive arrays, LPI radar
Stealth and counter-stealth: stealth techniques for aircraft and other target types, low frequency and UWB radar
Bistatic radar: bistatic geometry, bistatic radar equation, synchronisation, illuminators of opportunity System design examples

ST Applications Modules (OPTIONS B)

SPCEGC03: SPACE DATA SYSTEMS AND PROCESSING

See page 16 for details and syllabus.

SPCEG001: SPACE INSTRUMENTATION AND APPLICATIONS

See page 21 for details and syllabus.

SPCEG002: SPACE PLASMA AND MAGNETOSPHERIC PHYSICS

This Space Science module is very relevant to Space Technology, with regard to the spacecraft environment and potential detrimental effects on spacecraft (e.g. spacecraft charging, space weather). The main physics background required is electromagnetism, including Maxwell’s Equations.

See page 24 for details and syllabus.

GEOGG141: PRINCIPLES AND PRACTICE OF REMOTE SENSING

Lecturer: Dr M. Disney

Credits: 15  Teaching Term: 1

Assessment method and timing: 100% examination in early January

This module provides an introduction to the basic concepts and principles of remote sensing. It includes three components:

i) The geometric principles of remote sensing: geodetic principles and datums, reference systems, mapping projections distortions and transformations; data acquisition methods.
ii) The radiometric principles of remote sensing: electromagnetic radiation; basic laws of electromagnetic radiation; absorption, reflection and emission; atmospheric effects; radiation interactions with the surface; orbits; spatial, spectral, temporal, angular and radiometric resolution; data pre-processing; scanners. Introduction to radiative transfer, with focus on models of vegetation and terrestrial surface.

iii) Active remote sensing and time-resolved signals (Lidar and RADAR): Lidar: lidar principles; types of lidar system; advantages of lidar observations; information content; discrete return v waveform; current and future systems; ground-based lidar. RADAR: RADAR principles; time-resolved signals; the RADAR equation; RADAR resolution; phase information and SAR interferometry; microwave applications.

**GEOGG142: GLOBAL MONITORING AND SECURITY**

**Lecturers:** Prof. J.-P. Muller, Dr M. Disney

**Credits:** 15  
**Teaching Term:** 2

**Assessment method and timing:** 50% coursework, 50% examination in Term 3

The module provides an introduction to the current state-of-the-art in Global Monitoring of Environment and Security (which is the EU/ESA name for the Group on Earth Observations, GEO).

**Aims of the module:**

To define the objectives of a GMES system within the context of the GEOSS (Global Earth Observation System of Systems) and its nine societal benefit areas. To describe the scientific underpinning for many of these societal benefit areas, including improved weather forecasting, the monitoring of climate change and the monitoring and prediction of natural hazards. To investigate the needs for EO monitoring of human security concerned with transmigration of people, diseases and animals and what remote sensing tools and techniques exist to address these needs. To study the requirements for accurate calibration and validation of instruments to be able to address the needs of GMES, especially related to long-term monitoring. To describe the fundamental principles of data and system inter-operability and to explore the role of OGC protocols within GMES. To assess the progress of the GEOSS 10 year Implementation Plan in the context of international programmes.

**SS Compulsory Module**

**SPCEG001: SPACE INSTRUMENTATION AND APPLICATIONS**

**Lecturers:** Prof. M. Cropper, Prof. A. Fazakerley, Dr K. al-Janabi, Prof. I. Hepburn, Dr D. Kataria, Prof. J.-P. Muller, Prof. L. Harra

**Credits:** 15  
**Teaching Term:** 2

**Assessment method and timing:** 20% coursework, 80% examination in Term 3

1. Spacecraft as observation platforms  
Why go into space, space environment, space effects from Earth's surface, in situ measurements, remote sensing, space as a laboratory, impact of space studies.  
Systems approach to measurements: analysis, detection, signal processing, data encoding, control.  
Spacecraft interface and subsystems: accommodation, attitude control, power conditioning.  
Examples from solar system exploration.

2. Spacecraft-environment interactions  
Spacecraft charging in low Earth orbit and geostationary orbit. Radiation damage effects. Background effects and their minimisation. Plasma influx, penetrating radiation, sunlight.

3. In-situ plasma measurements  
Requirements; Energy and mass analysis for charged species from 1eV to 1MeV. Neutral mass spectrometers.

4. Detectors and sensors for in-situ measurements  
Channeltrons, microchannel plates, solid state detectors, charge coupled devices, current collectors, antennas and probes, magnetometers and electric field sensors.

5. Planetary analysis
Nuclear remote and in-situ measurement techniques. Introduction to planetary analysis, spectroscopy: \( \gamma \)-ray, X-ray, \( \alpha \)-particle, neutron, Mossbauer. Visible light & dust particle measurement techniques. Imagers, experimental platforms, future missions, dust detectors. Radar instrumentation and chemical analysis.

6. Atmospheric measurements
Basic physics and chemistry, spectroscopy, practical instrument examples, applications of fundamental principles to measurements

7. Detectors and sensors for astrophysics
Radiometry, solid state physics, cooling, intrinsic and extrinsic photoconductors, radiation effects, stressed photoconductors, photodiodes, photomission detectors, photomultipliers, image intensifiers, bolometers, coherent detectors, amplifiers; Attitude and position sensing: sun sensors, earth sensors, star sensors, magnetometers, attitude control

8. Astronomical observations (astrophysics, UV/optical/IR)
Radio, Microwave and Sub-millimeter, Far Infra-red and Infra-red, Visible and UV, X-ray, Gamma-ray, Formation Flying, Cryogenics

9. Solar measurements
Remote sensing instrumentation for studying the Sun. Motivation for observing the Sun, detectors used, telescope designs, instrumentation from the optical to gamma-ray wavelength ranges, future solar instrumentation.

10. Onboard and ground data processing
System overview, onboard data processing, data compression techniques, on-board data handling (OBDH) and telemetry systems, spacewire, ground systems

11. Case studies I: Case studies of missions
12. Case studies II: Student presentations of case study missions

SS OPTION Modules

SPCEG011: PLANETARY ATMOSPHERES

Lecturers: Dr G. Jones

Credits: 15 Teaching Term: 2

Assessment method and timing: 10% coursework, 90% examination in Term 3

Comparison of planetary atmospheres - competition between gravitational attraction and thermal escape processes; factors which differentiate between planetary atmospheres; energy and momentum sources; accretion and generation of gases; loss processes; dynamics; composition.

Atmospheric structure - hydrostatic equilibrium; adiabatic lapse rate; stability; radiative transfer; the greenhouse effect and the terrestrial planets.

Oxygen chemistry - ozone production by Chapman theory; comparison with observations; ozone depletion and the Antarctic ozone hole.

Atmospheric temperature profiles - troposphere, stratosphere, mesosphere and thermosphere described; techniques of measurement for remote planets; use of temperature profiles to deduce physical processes.

Origin of planetary atmospheres and their subsequent evolution - formation of the planets; primeval atmospheres; generation of volatile material; evolutionary processes; consideration of terrestrial and outer planets.

Atmospheric dynamics - equations of motion; atmospheric circulation and storms; dynamics of the atmospheres of the outer planets; comparison of the behaviour of wet and dry air; formation of clouds and rain; orographic effects.

Ionospheres and magnetospheres - ionisation and recombination processes; formation of a Chapman layer; interaction of the solar wind with planets and atmospheres.

Atmospheric loss mechanisms - exosphere and Jeans escape; non-thermal processes.

Extrasolar planetary atmospheres.

Observational techniques - occultation methods from UV to radiofrequencies; limb observation techniques in the UV, visible, IR and microwave spectrum.
Global warming - recent trends and the influence of human activity; carbon budget of the Earth; role of the oceans in climate moderation; positive and negative feedback effects; climate history; the Gaia hypothesis; terraforming Mars.

**SPCEG012: SOLAR PHYSICS**

**Lecturers:** Prof. L. van Driel-Gesztelyi, Prof. L. Green

**Credits:** 15  
**Teaching Term:** 2

**Assessment method and timing:** 10% coursework, 90% examination in Term 3

Introduction to solar physics: basics and properties of the Sun.


Reflection of acoustic waves in the interior, oscillations, helioseismology. The structure of the solar interior as deduced from helioseismology. Improving the Standard Solar Model with input from helioseismology.


Coronal mass ejections - observations and models. Association with flares. Energetics. Travel into the heliosphere and interaction with the Earth. Space weather.


**SPCEG013: HIGH ENERGY ASTROPHYSICS**

**Lecturer:** Prof. S. Zane

**Credits:** 15  
**Teaching Term:** 1

**Assessment method and timing:** 10% coursework, 90% examination in Term 3

**Prerequisites**
The student needs to be familiar with vector calculus, tensor calculus, differentiation, integration, basic formalism of general relativity, special functions and Fourier transforms, Lagrangian formalism, electromagnetism, basic knowledge of mechanics, radiative transfer, basic astrophysical concepts (e.g. spectra).

This course aims to:

• provide a practical rather than mathematical introduction to General Relativity and the properties of black holes
• derive a simple mathematical formulation of the mechanisms which lead to the production of high energy photons in the Universe, and of the absorption processes which they undergo on their path to Earth
• provide a quantitative account of cosmic sources and phenomena involving the generation of high energy photons and particles
• train students to apply the mathematical formulations derived in the course to realistic astrophysical situations, to derive parameters and properties of cosmic sources of high energy radiation, in a fashion similar to that commonly applied in research projects

Syllabus (The approximate allocation of lectures to topics is shown in brackets below)

1. The scope of High Energy Astrophysics; Pre-requisites, units [1]
2. Blackbody radiation.[1]
4. Special relativity and four momentum, aberration and doppler effects. [5]
7. Interaction of radiation with matter: Absorption, scattering, pair production.[2]

SPCEG002: SPACE PLASMA AND MAGNETOSPHERIC PHYSICS

Lecturers: Dr J. Rae, Prof. C. Owen

Credits: 15  Teaching Term: 2

Assessment method and timing: 10% coursework, 90% examination in Term 3

Available as an Applications Module option in the ST Pathway.

Introduction - Plasmas in the solar system, solar effects on Earth, historical context of the development of this rapidly developing field

Plasmas - What is a plasma, and what is special about space plasmas; Debye shielding, introduction to different theoretical methods of describing plasmas

Single Particle Theory - Particle motion in various electric and magnetic field configurations; magnetic mirrors; adiabatic invariants; particle energisation

Earth’s Radiation Belts - Observed particle populations; bounce motion, drift motion; South Atlantic Anomaly; drift shell splitting; source and acceleration of radiation belt particles; transport and loss of radiation belt particles

Introduction to Magnetohydrodynamics - Limits of applicability; governing equations; convective derivative; pressure tensor; field aligned currents; frozen-in flow; magnetic diffusion; fluid drifts; magnetic pressure and tension; MHD waves

The Solar Wind - Introduction, including concept of heliosphere; fluid model of the solar wind (Parker); interplanetary magnetic field and sector structure; fast and slow solar wind; solar wind at Earth; coronal mass ejections

Collisionless shocks – Shock jump conditions, shock structure, shock examples
The Earth's magnetosphere and its dynamics – Magnetospheric convection, magnetospheric currents, the magnetopause, open magnetosphere formation, magnetosphere-ionosphere coupling, non-steady magnetosphere

The Solar Wind Interaction with Unmagnetised Bodies - The Moon; Venus, Comets

GEOGG141: PRINCIPLES AND PRACTICE OF REMOTE SENSING
See page 20 for details and syllabus.

GEOGG142: GLOBAL MONITORING AND SECURITY
See page 21 for details and syllabus.

Module Assessment and Examinations
Assessment of work will take two forms: assignments set during each module, marked and returned to the student with feedback, and "closed-book" examinations consisting of unseen questions based on the syllabus.

The in-module assignments allow tutors to give constructive feedback about each student's progress.

Feedback is also given in a specific individual tutorial, the Progress Meeting with the Programme Team early in the Second Term, which is held to review the student's performance in the First Term and to discuss their project Initial Report. Modules "closed-book" examinations follow standard UCL practice: detailed feedback is not given.

The main opportunities to receive feedback about the Individual Project are the comments and suggestions given on the Interim Report and at the Mid-Term Presentation. This feedback should be noted carefully.

UCL Feedback Turnaround Policy
Regular feedback is an essential part of every student's learning. It is UCL policy that all students receive feedback on summative assessments within one calendar month of the submission deadline. This feedback may take the form of written feedback, individual discussions, group discussions, marker's answers, model answers or other solutions (although students should note that UCL is generally unable to return examination scripts or comments on the same). Students writing dissertations or research projects should also expect to receive feedback on a draft on at least one occasion.

If, for whatever reason, a department/division cannot ensure that the one calendar month deadline is met then they will tell students when the feedback will be provided - it is expected that the extra time needed should not exceed one week. Where feedback is not provided within the timescale, students should bring the matter to the attention of their Departmental Tutor or Head of Department.

Further information:
- UCL Feedback Turnaround Policy

Marking, Second-Marking and Moderation
All work that is submitted for summative assessment is marked by a UCL Internal Examiner or Assistant Internal Examiner. All UCL programmes also include rigorous second-marking and internal moderation processes to ensure that marking is consistent and fair. Second-marking can take a number of different forms depending on the type of assessment, but the overall aim is to ensure that marking is as accurate as possible. Internal moderation also helps UCL to ensure that marking is equitable across different modules, pathways, options and electives.

Examination Irregularities and Plagiarism
UCL students are expected to be aware of and adhere to UCL's referencing and examination requirements as a condition of their enrolment:
- For examinations, the UCL Examination Guide for Candidates is published annually on the Examinations and Awards website. All candidates for written examinations must
ensure they are familiar with the requirements for conduct in examinations set out in this guide.

- **For coursework submissions**, students must ensure that they are familiar with the UCL Library Guide to References, Citations and Avoiding Plagiarism, which provides detailed guidance about UCL’s referencing and citation requirements. Students should also ensure that they are familiar with the specific referencing requirements of their discipline.

UCL will use plagiarism detection software to scan coursework for evidence of plagiarism against billions of sources worldwide (websites, journals etc. as well as work previously submitted to UCL and other universities). Most departments will require students to submit work electronically via these systems and ask students to declare that submissions are the work of the student alone.

Any student suspected of examination misconduct, plagiarism, self-plagiarism, collusion, falsification or any other form of academic misconduct which is likely to give an unfair advantage to the candidate and/or affect the security of assessment and/or compromise the academic integrity of UCL will be investigated under the Examination Irregularities and Plagiarism procedures. If misconduct is found, students are likely to be failed for that assignment and/or module. Serious or repeated offences may lead to failure of the whole year, suspension or even expulsion. A breach of copyright or intellectual property laws may also lead to legal action.

**Further information:**
- UCL Examination Guide for Candidates
- Library Guide to References, Citations and Avoiding Plagiarism
- Examination Irregularities and Plagiarism procedures
- Students can also seek advice from the UCLU Rights & Advice Centre

**Plagiarism is taken extremely seriously by the Department and by UCL,** as well as in the academic and publishing world at large. It should be noted that “presenting of others’ work as your own work” is a very wide-ranging concept. It includes, for example, the copying of text or figures from Websites, articles or books as part of a review or methodology description in a Project Report. **Such copying is completely unacceptable, even if there is no intention to deceive the reader as to its origin.** Any such material must be referenced in the Report and, if text, either presented in quotation marks, or not directly quoted at all. If in doubt, consult your supervisor or the Programme Team about what is acceptable and normal practice; do not jeopardise your future through ignorance or uncertainty.

For this MSc/Diploma/Certificate Programme Turnitin® is used for essays and project Reports, and means that you may have to submit electronic copies of work in addition to paper copies. You will be told during each relevant module how this will be organised and what file formats will be acceptable.

**Penalties**

**Penalties for late submission of coursework**

Planning, time-management and the meeting of deadlines are part of the personal and professional skills expected of all graduates. For this reason, UCL expects students to submit all coursework by the published deadline date and time, after which penalties will be applied.

If a student experiences something that prevents them from meeting a deadline that is sudden, unexpected, significantly disruptive and beyond their control, they should submit an Extenuating Circumstances (EC) Form. If the request is accepted, the student may be granted an extension. If the deadline has already passed, the late submission may be condoned i.e. there will be no penalty for submitting late.

**Further information:**
Late Submission Penalties
Extenuating Circumstances

Extract from UCL regulations:

The full allocated mark should be reduced by five percentage marks for the first calendar day after the deadline for the submission of the coursework. The mark will be reduced by a further ten percentage marks if the coursework is submitted during the following six days. In the case of coursework submitted more than seven days late, the mark will be recorded as zero, but the assessment would be considered to be complete, providing that the coursework contains material that can be assessed.

Penalties for exceeding and being under the prescribed word count

Extract from UCL regulations:

For work that exceeds or is under the word limit by 10% or more, a mark of zero will be recorded.

For work that exceeds or is under the word limit by less than 10% the mark will be reduced by ten percentage marks; however, the penalised mark will not be reduced below the pass mark, assuming the work merited a pass.

Attendance Requirements, Penalties for Poor Attendance, Absence

UCL expects students to aim for 100% attendance, and has a minimum attendance requirement of 70% of scheduled learning, teaching and assessment activities. If a student does not meet this requirement they may be barred from summative assessment.

Further information:

- Attendance Requirements
- Barring Students from Assessment

Tier 4 students: Absence from teaching and learning activities

In line with UCL’s obligations under UK immigration laws, students who hold a Tier 4 visa must obtain authorisation for any absence from teaching or assessment activities.

Further information:

- Authorised Absence
- UCL Visa and Immigration pages

Extenuating Circumstances

Reasonable Adjustments

UCL will make Reasonable Adjustments to learning, teaching and assessment to ensure that students with a disability are not put at a disadvantage. UCL also provides Reasonable Adjustments for students who might not consider themselves to have a ‘disability’ but who nevertheless would benefit from additional support due to an ongoing medical or mental health condition. It is the responsibility of the student to request Reasonable Adjustments, and students are encouraged to make a request as early as possible.

Further information:

- Reasonable Adjustments
- Student Disability Services
Student Code of Conduct

UCL enjoys a reputation as a world-class university. It was founded on the basis of equal opportunity, being the first English university to admit students irrespective of their faith and cultural background and the first to admit women. UCL expects its members to conduct themselves at all times in a manner that does not bring UCL into disrepute. Students should ensure they read and familiarise themselves with UCL’s Student Code of Conduct and be aware that any inappropriate behaviour may lead to actions under UCL’s Student Disciplinary Procedures.

Further information:
• UCL Student Code of Conduct
• Student Disciplinary Code and Procedure

If a student needs to be absent from UCL for any reason, he/she must inform the Programme Team, and explain the reason. Absence during the Group Project is only permitted in very exceptional circumstances

Examinations

Students must ensure that they are aware of the regulations governing written examinations detailed in the UCL Examination Guide for Candidates on the Examinations and Awards website. Students should pay particular attention to the regulations around examination irregularities. Students who are suspected of any form of cheating or of breaching the Examination Regulations will be investigated under UCL’s Examination Irregularities and Plagiarism procedures.

Further information:
• Examinations and Awards website
• Examination Regulations
• Examination Irregularities and Plagiarism procedures

UCL Examination Periods 2017-18

Examination Period: 25 April 2018 – 08 June 2018

Late Summer Exam Period: Monday 20th August – Friday 7th September 2018

Candidate Codes

For the purposes of anonymity during standard UCL examinations, students are issued with alphanumeric codes that are written on papers. In this way, the markers will not know who has written each script. The Programme tutors and administrators will however have access to the names and candidate codes.

Calculators in Examinations

Only certain specific electronic calculators may be used during examinations at UCL, namely the Casio FX83WA, FX83MS or FX83GT+ (battery powered) and Casio FX85WA, FX85MS or FX85GT+ (solar powered). All students on the MSc/Diploma/Certificate Programme should use one of these calculators in the exams. Mobile phones, personal organisers, etc. are not permitted as substitutes, nor is any programmable calculator.

The mandated models are economically priced and are available from various outlets in UCL, including the UCL shop in South Junction [i] and in the basement of the Bloomsbury Theatre.

• Please make sure you buy one of these before your first exam.
Absence from Assessment
Any student who is absent from an assessment will receive a mark of zero unless they obtain authorisation for the absence and formally defer their assessment to a later date by submitting a request for Extenuating Circumstances. Absences from assessment need to meet the criteria for Extenuating Circumstances and be supported by appropriate evidence. If Extenuating Circumstances are not approved, the mark of zero will stand.

In line with UCL’s obligations for students studying under a visa, Tier 4 students must also obtain authorisation for any absence from teaching or assessment activities under the Authorised Absence procedures.

Further information:
- Extenuating Circumstances
- Authorised Absence Policy

Deferral of Examinations or Interruption of Study

Reassessment
The Programme Scheme of Award describes the modules which students must complete and pass in order to achieve their degree. Where a student fails to meet these requirements at the first attempt, and there are no Extenuating Circumstances material to that failure, they may be reassessed on one more occasion only, unless they have been awarded a degree, are eligible for the award of a degree, or have been excluded from UCL on the grounds of academic insufficiency or as a result of misconduct. Students who have passed a module are not permitted to resit or repeat that module.

In response to student feedback, UCL will be implementing a new Late Summer Assessment Period at the end of 2017-18 for students who need to undertake a Resit or Deferral. The following page explains the regulations which will accompany the new sitting - more information will be published over the coming months.

https://www.ucl.ac.uk/srs/academic-manual/c0/students/changes

Masters/ MRes Dissertation/ Research Project
The Programme Board of Examiners will determine whether the student should either:

a) Resubmit the dissertation in the same academic session, or
b) Interrupt and re-register in the following academic session in order to resubmit at the end of the first term and be considered for the award of a degree in January, or
c) Interrupt and re-register in the following academic session in order to resubmit at the next scheduled occasion and be considered for the award of a degree at the end of that academic session.

Where a student must be reassessed in a significant proportion of the taught modules, and this might affect performance in the dissertation or research project, the Programme Board of Examiners may recommend that the student undertakes the reassessment for the taught modules in the current academic session, and re-registers in the following academic session in order to resubmit their dissertation.
Special Examination Arrangements

Special Examination Arrangements (SEAs) are adjustments to central or departmental written examinations that can be made as a Reasonable Adjustment for students with a disability or longer-term condition or as a form of mitigation for students with shorter-term medical Extenuating Circumstances. This may include, but is not limited to extra time, a separate room, rest breaks and specialist equipment. Students must make an application to use the special examination facilities.

Further information:
- Special Examination Arrangements – guidance and forms
- Special Examination Arrangements – regulations
- Student Disability Services
- Reasonable Adjustments regulations

Illness and other Extenuating Circumstances

UCL recognises that some students can experience serious difficulties and personal problems which affect their ability to complete an assessment such as a sudden, serious illness or the death of a close relative. Students need to make sure that they notify UCL of any circumstances that are unexpected, significantly disruptive, and beyond their control, and which might have a significant impact on their performance at assessment. UCL can then put in place alternative arrangements, such as an extension or a deferral of assessment to a later date.

Longer-term conditions

The Extenuating Circumstances regulations are designed to cover unexpected emergencies; they are not always the best way to help students who might have a longer-term medical or mental health condition or a disability. Although there may be times when it is necessary for such students to use the EC regulations, students should make sure they are aware of, and take advantage of, all the other support mechanisms provided by UCL such as:

- Reasonable Adjustments
- Special Examination Arrangements
Any circumstances likely to affect your examination performance should be notified in writing, on a form that can be obtained from the Programme Team, with appropriate supporting documentation, to the Programme Team no later than one week after the end of the examination in question. These circumstances will be considered in strict confidence.

Circumstances which have already been brought to the attention of the Board of Examiners and for which allowance has already been made (e.g. extra time allowed because of dyslexia, extension of deadline for coursework) should not be notified in this way. The examiners will be aware of these circumstances, but any circumstances which might affect your examination performance can be taken into account only once for each annual cycle of examinations.

Organisational Details

Term Dates

UCL Term Dates: 2017/18

<table>
<thead>
<tr>
<th>Term</th>
<th>Dates</th>
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<tbody>
<tr>
<td>First Term</td>
<td>25 September 2017 – 15 December 2017</td>
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<tr>
<td>Second Term</td>
<td>08 January 2018 – 23 March 2018</td>
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<tr>
<td>Third Term</td>
<td>23 April 2018 – 08 June 2018</td>
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</tbody>
</table>

For those departments that operate them, Reading Weeks are the weeks beginning Monday 7 November 2016 (Week 7), and Monday 13 February 2017 (Week 6).

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
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<tbody>
<tr>
<td>Christmas College Closure</td>
<td>Close 5.30pm Friday 22 December 2017</td>
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<tr>
<td></td>
<td>Open 9.00am Tuesday 2 January 2018</td>
</tr>
<tr>
<td>Easter College Closure</td>
<td>Close 5.30pm Wednesday 28 March 2018</td>
</tr>
<tr>
<td></td>
<td>Open 9.00am Thursday 25 April 2018</td>
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<tr>
<td>Bank Holidays</td>
<td>Closed - Monday 07 May 2018</td>
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<tr>
<td></td>
<td>Closed - Monday 28 May 2018</td>
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<td></td>
<td>Closed - Monday 27 August 2018</td>
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</tbody>
</table>

Further information:

- Term dates: 2017-2018

The Programme starts at the beginning of UCL’s First Term, and continues until two weeks before the commencement of the First Term in the following year. This includes the period after the end of
the Third Term, known to most people as the “summer holiday”. Please note that the last 7 weeks of the Programme, i.e. the second half of July, all the month of August and early September, are taken up by the “Group Project” during which students on both Pathways work together as a team. Presence in London throughout this period is mandatory (see page 15, Group Project).

Introductory Meeting
An introductory (or ‘induction’) meeting for all students newly enrolled on the Programme is held at the beginning of the first term. In 2017, this is on FIXME.

Enrolment (Registration)

Procedure
Once you have completed pre-enrolment you will be sent an email telling you when and where to enrol. If you fail to complete pre-enrolment or don't receive any communication about these arrangements before you are due to arrive, please contact the New Students Team. All students are required to enrol within the two weeks from their official programme start date.

See http://www.ucl.ac.uk/new-students/enrolment for details (for a map of the campus see http://www.ucl.ac.uk/maps/downloads/ucl-bloomsbury-campus-map). It is very important that all students attend to complete the various formalities. If you have not already verified your qualifications, you should take the appropriate documentation (Certificates, Transcripts, etc.) with you. Further information on this and other issues relevant to students new to UCL can be found at http://www.ucl.ac.uk/new-students/

Checking your enrolment: PORTICO

UCL has a Web-accessible data system known as PORTICO – The UCL Student Information Service. As a student you can take ownership of your own personal data by logging on to PORTICO.

Access to PORTICO is available at http://www.ucl.ac.uk/portico. You will need to log on using your main UCL userid and password; see Computer facilities and email, page 7.

In PORTICO you may:
- edit your own personal data, e.g. update your home and term addresses, contact numbers and other elements of your personal details
- view data about courses/modules
- enter and view your own choice of optional modules for your degree programme.

Note that the deadline for entering your module selections in PORTICO is Friday 13 October 2017.

Communication with the Departments

UCL will communicate with students via:

2) **UCL student email** – Students should check their UCL email regularly.

3) **UCL Moodle** – UCL’s online learning space, used by module organisers, programme leaders, departments and faculties to provide essential information in addition to learning resources.

4) **myUCL** – A weekly term-time e-newsletter to all students (undergraduate and postgraduate) at UCL, which covers key internal announcements, events and opportunities.

5) **UCL Instagram** – UCL’s official Instagram channel, featuring news, events, competitions and images from across the UCL community.

6) **@ucl Twitter channel** – Sharing highlights of life at UCL from across UCL’s diverse community.
Departments and Programme Team

The ST Pathway is taught jointly by the Department of Space & Climate Physics (S&CP) and the Department of Electronic & Electrical Engineering (E&EE).

The SS Pathway is taught by S&CP. Some of the lectures are held jointly with the ST MSc Pathway.

All lectures take place on or near the UCL main site in London. Some of the lectures of both Pathways are held jointly with other Masters-level programmes. Two of the optional Advanced Modules (GEOGG141 and GEOGG142) are taught by the Department of Geography.

S&CP has offices in 3 Taviton St., London, WC1H 0BT (see http://www.ucl.ac.uk/maps/downloads/ucl-bloomsbury-campus-map).

The Department’s main premises are near Guildford in Surrey at the Mullard Space Science Laboratory (MSSL), Holmbury St. Mary, Dorking, Surrey RH5 6NT, Tel: #6129 (01483 204100).

E&EE is based in the Roberts Building, Malet Place (see http://www.ucl.ac.uk/maps/downloads/ucl-bloomsbury-campus-map) on the main UCL site.

The MSc/Diploma/Certificate Programme is run by the Programme Team. It is very important that you contact the Programme Team if you have any problems or difficulties. You should also keep them informed of changes of address, phone number etc. The Programme Team contact details are as follows:

- **Mr Matthew Whyndham – Departmental Graduate Tutor, S&CP**  
  Based in Room B3, 3 Taviton Street. Tel: 24522 (020 7679 4522), m.whyndham@ucl.ac.uk

- **Dr. Sarah Matthews – Programme Tutor (SSE), S&CP**  
  Based at MSSL. Tel: 01483 204208, sarah.matthews@ucl.ac.uk

- **Dr Christos Masouros – Programme Tutor (SSE, ST Pathway only), E&EE**  
  Based in Room 917, Roberts Building, UCL. Tel 37965 (0207 679 7965), c.masouros@ucl.ac.uk

- **Ms Natasha Magennis – Assistant Programme Administrator (UCL campus), S&CP**  
  Based in Room B2, 3 Taviton Street. Tel 24909 (0207 679 4909), n.magennis@ucl.ac.uk

- **Ms Vilam Dzewu – Assistant Programme Administrator (UCL campus), S&CP**  
  Based in Room B2, 3 Taviton Street. Tel 24519 (0207 679 4519), v.dzewu@ucl.ac.uk

- **Ms Libby Daghorn – Assistant Programme Administrator (MSSL), S&CP**  
  Based at MSSL. Tel #6129 (01483 204110), l.daghorn@ucl.ac.uk  
  Note: Ms Daghorn works part-time, currently on Mondays, Wednesdays and Fridays only.

All above telephone numbers are given as internal UCL extensions with full (external) numbers in brackets. The dialling code for central London is 0207, and the UK country code, if required, is +44.

For example, the following telephone numbers are the same:  
Internal 24522 = Local 679 4522 = National/UK-Mobile 0207 679 4522 = International +44 207 679 4522

Other UCL Staff

Email addresses and phone numbers for all staff and students at UCL (including S&CP) are listed on the UCL web site [ii]. Individual Department websites (click ‘Faculties and departments’ under ‘Explore UCL’ and then ‘UCL Departments A-Z’ in the left hand side menu) generally have information on staff roles and research interests. The Registry (click ‘UCL Student and Registry Services’ under ‘UCL Departments A-Z’) is responsible for all administrative matters concerning students.
Computer facilities and email

UCL accounts
You will be assigned a UCL computer account and a UCL email address. Once you have pre-enrolled you are eligible to gain access to UCL’s central student IT facilities. To do this you need your UCL userid and password, which you will be given at pre-enrolment online. From the UCL Information Services Division (ISD, http://www.ucl.ac.uk/isd/) you can obtain information on student IT services, using your own computer, connections in halls, etc.

Please remember that passwords automatically expire after 4 months, unless they have been changed. Warnings are sent to your UCL email address during a 30 day period, prior to your password being reset. You can change your password on the Web, at any time [iii]. Procedures also exist for management of passwords over the phone or in person, by visiting the IDS Service Desk.

Information on the UCL email system is given elsewhere [iv]. It is possible to use UCL email from other locations and with various email programs, or through a Web interface. It is also possible for UCL email to be forwarded to other accounts.

Please check your email very frequently (every day if possible), as it is the main method for the Programme Team to get in touch with you, and for you to receive any general UCL messages. However, please note that the Programme Team will only send new emails to your UCL email address, i.e. not to personal email addresses.

S&CP MSSL computer accounts
Computing at MSSL is run separately from UCL. Should any student need to access the MSSL computers for their project, they will later be given a relevant account.

EEE computer accounts
(ST students only)

Students will also be given an account on the Department of Electronic and Electrical Engineering computing system. This entails attending the appropriate registration and induction sessions in the Roberts Building during the first week of term. Details of these sessions are given in your Programme Timetable/Calendar. You will receive an additional email address, which might be used by staff members in the Electronic and Electrical Engineering Department, but which will not be used by staff in the Department of Space and Climate Physics, who will use your UCL account only. It may therefore be easier to route your email to a single account.

eduroam
The UCL “eduroam” WiFi system [v] allows you to connect a personal laptop computer to the UCL network through a wireless connection. To this end there are a large number of wireless connection points around the UCL site, including in our offices at 3 Taviton Street. Some, though not all, of the lecture theatres have the necessary access points, as do many of the public spaces in the campus.

Please make sure that the software on your own computers is updated with relevant security patches, and that it has functioning, updated anti-virus measures. Students’ computers are only entitled to use WiFi, i.e. UCL “eduroam”.

Moodle: the Programme Website
The Programme Website is accessed through the UCL Moodle service. This is a Web-based service that allows students to access material relevant to their programmes, and to interact with lecturers and with each other. You will be informed when this is available. You will then see relevant programmes and modules when you log in to the Moodle server. The address will be http://moodle.ucl.ac.uk/
Postal service

Mail (post) addressed to students will initially go to Room B2 and students will be asked to come and collect it from the office. It is important that you check for mail regularly – at least twice each week. Correct addressing of mail is important. The correct addresses for incoming mail are:

<table>
<thead>
<tr>
<th>EXTERNAL MAIL</th>
<th>INTERNAL MAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>(name of student)</td>
<td>(name of student)</td>
</tr>
<tr>
<td>Dept. of Space &amp; Climate Physics</td>
<td>Dept. of Space &amp; Climate Physics</td>
</tr>
<tr>
<td>University College London</td>
<td>3 Taviton Street</td>
</tr>
<tr>
<td>3 Taviton Street</td>
<td>UCL</td>
</tr>
<tr>
<td>London WC1E 6BT</td>
<td></td>
</tr>
<tr>
<td>Outgoing external mail: please ensure that the</td>
<td>Outgoing internal mail should be placed in</td>
</tr>
<tr>
<td>correct postage has been paid and the mail is</td>
<td>reusable UCL mailing envelopes and placed in</td>
</tr>
<tr>
<td>placed in the appropriate tray in the lobby on</td>
<td>the appropriate tray in the lobby on the Ground</td>
</tr>
<tr>
<td>the Ground Floor of 3 Taviton Street.</td>
<td>Floor of 3 Taviton Street.</td>
</tr>
</tbody>
</table>

Staff-student consultative committee and Student academic representatives

A staff-student consultative committee (SSCC) that covers both ST and SS MSc Pathways is set up each year. It normally meets twice per year, once early in the new year and once after the individual projects are completed (around July). The staff representatives are the Tutors for the MSc/Diploma/Certificate Programme; student academic representatives (StARs) from the two Pathways are chosen by the students themselves during the first term, following an email request from the Programme Team. Students should contact their representatives before the meetings with any issues that they would like to be discussed by the SSCC. Details of the STAR scheme can be found at [http://uclu.org/representation/student-academic-representatives-stars](http://uclu.org/representation/student-academic-representatives-stars)

Health and Safety

Students must be aware of the rules and correct procedures to be followed in matters of health and safety whilst on the College premises. At the start of term, you will be issued with a copy of the S&CP Department Health and Safety Policy which, in the interest of your own safety and that of others, you are required to read carefully. An accompanying form is supplied for you to sign and return, confirming that you have read the document and will comply with the rules laid down.

- Read and retain the safety rules, and obey the procedures given.

Visit to MSSL

There will be a one-day visit to the Mullard Space Science Laboratory (MSSL) in Surrey, the home of the Department of Space & Climate Physics. This usually takes place during the first term. Students will be informed of the details in due course.

Other UCL services

Information on general issues relevant to UCL students can be found at [http://www.ucl.ac.uk/current-students/](http://www.ucl.ac.uk/current-students/)

Libraries

The UCL Science Library (DMS Watson) is available to students for study, consulting journals and borrowing books. Library registration for UCL students is completed automatically; UCL ID cards come complete with a library barcode on the reverse. There is an on-line library catalogue and user information available at [http://www.ucl.ac.uk/library](http://www.ucl.ac.uk/library). Many journals are also available on-line (often restricted to computers on the UCL networks).
A particularly useful facility for project work is the ‘Web of Knowledge’ (WOK), hosted at Manchester University. This facility, free of charge to UCL students, gives the user access to the Science Citation Index, allowing the user to browse millions of journal articles from 1945 to the present, with abstracts and links to all the articles that they have cited, or which have cited them. (This allows you to do a complete literature search backwards or forwards in time.) See http://wok.mimas.ac.uk/

The nearby library of the University of London, on the 4th floor of Senate House, Malet Street (phone 020 7862 8500), is also available free of charge to UCL students. Its on-line catalogue is at http://www.ull.ac.uk/.

The Faculties

Departments at UCL are organised into Faculties. The Department of Space and Climate Physics is in the Faculty of Mathematical and Physical Sciences; the Department of Electronic and Electrical Engineering is in the Faculty of Engineering Sciences.

Each Faculty has an appointed Faculty Tutor and he/she is responsible for exercising the general academic and pastoral oversight of all students (undergraduate, postgraduate taught and postgraduate research students) in their Faculty. Their remit also includes the following:

- To advise students who are academically insufficient or who have failed major examinations as to their possible future actions, and to suspend or exclude them from further registration at UCL, in conjunction with the Dean of Students (Academic), as appropriate.
- To monitor and co-ordinate all aspects of student progress, liaising with Faculty staff, departmental tutors, graduate tutors and teaching staff on issues concerning the general pastoral and academic welfare of students in the Faculty.
- To advise students who have difficulty in paying their fees, or who are experiencing any other difficulties (personal, financial, medical or academic) affecting their studies.
- To handle complaints and grievances in liaison with the Dean of Students (Academic) and the Student Mediator.

MAPS: Dr Caroline Essex
Engineering: Dr Simon Banks

Careers Service

The Programme Tutors play a role in the professional development of students in the Programme. They can advise on fruitful career options, or the possibility of further study. They will be pleased to consult with students in this area. They will often refer students to other sources of information, such as the UCL Careers Service [vi].

Facilities in Detail: 3 Taviton Street

General

The Department of Space and Climate Physics facilities at 3 Taviton Street are part of UCL, and are governed by applicable UCL regulations. The basement of the building is occupied by the Department of S&CP, whilst other UCL functions occupy the rest of the building. In particular, rooms B5 and B7 are used by S&CP staff for meetings and tutorials, and can be used by students only occasionally, on request to the Programme Administrators.

Students should not be in these areas except on business (e.g. if meeting a lecturer). Please respect the other users of the building, and in particular do not make excessive noise in or around the building.
Location and Transport

UCL’s Website has full details of public transport options to the UCL area, as well as the full selection of maps. Euston is the nearest tube and mainline rail station to Taviton St. You should have been given a complete UCL map at the introductory meeting. Further copies can be obtained from:

- Student Centre on the ground floor of the Chadwick Building
- Front Lodge at the entrance to the Main Quadrangle on Gower Street

Access, safety and security

*Note that no smoking is permitted in any part of UCL.*

Students must read the safety instruction booklet for information about safety in the building. As 3 Taviton Street is located a short distance away from the main Gower Street site, security is particularly important. *It is the responsibility of all users of the building to ensure that the building and its rooms remain secure.* Any breach of security will be treated very seriously by the Department and by UCL.

Access to the building is via the front door of number 3 Taviton Street, by using your UCL ID card. The front door must be kept locked at all times. On the inside you need to use the green button on the left hand side to exit the building.

Access to the basement is by a door under the stairs on the ground floor of 3 Taviton St. For security reasons it is important that the door to the basement is kept locked at all times. The access code is changed annually. You must not, under any circumstances, reveal the access code to someone who is not on this MSc/Diploma/ Certificate Programme.

Parts of the building, and the garden, have restricted access and are separated off by doors fitted with alarms; *do not attempt to open these doors except in an emergency.*

There are two emergency fire exits, also alarmed, directly from the basement area at the front of the building; *these exits are for emergency use only.* If using them in an emergency, you must take with you the key (pinned on the exit door) that unlocks the padlocked gate onto the street.

- Respect the environment of other staff in the building
- Keep the building secure, and do not leave personal valuables unattended
- Do not give keys or codes to unauthorised persons
- Be familiar with fire exits and use them only in an emergency
- No Smoking anywhere

The basement facilities

Please note that the photocopier is not for student use.

Copies of previous students’ project reports and other books are available upon request by contacting the Programme Administrators.

There is a toilet near to room B5 for use by staff and students. *For the benefit of all, please keep these areas clean and tidy.*

UCL computer clusters

The UCL Information Services Division (ISD) provides a number of computer rooms (“Cluster Rooms”) around the UCL site for use by all students. Details of these are available from the ISD.
website [viii]. Most of these run the Windows-based service "Desktop@UCL" (UCL’s Cluster Rooms), and "Desktop@UCL Anywhere" (e.g. on own machine – see http://www.ucl.ac.uk/isd/common/ucldesktop), with a wide selection of software available. The ISD website also provides information on other ISD services.

Finally, your attention is drawn to UCL’s Computing Regulations. These regulations apply to all users of computers and networks owned by UCL ISD, and those provided by UCL Departments (see http://www.ucl.ac.uk/isd/regulations).

Support and Welfare

**UCL Student Support and Wellbeing**

UCL is committed to the wellbeing and safety of its students and tries to give assistance wherever possible to ensure that studying at UCL is a fulfilling, healthy and enjoyable experience. There is a wide range of support services for student - the Current Students Support website provides more information. Students should be aware that, while there are many services on offer, it is their responsibility to seek out support and they need to be proactive in engaging with the available services.

**The Student Centre**

The Student Centre provides front-line administrative services to UCL students and is an excellent source of information about the services provided by Student Support and Wellbeing. They can also provide advice about a range of Student Records enquiries and fulfil requests for proof of student status.

**Further information:**

- Student Centre website

**Student Disability Services**

Student Disability Services provide a comprehensive range of support services for students who have a disability which impacts upon their studies at UCL. They support students with physical and sensory impairments, specific learning difficulties, autistic spectrum disorders, mental health difficulties, and long-term health conditions. As well as arranging for adjustments to learning environments, the team loan out specialist equipment and provide one-to-one tutoring and support for students with specific learning difficulties.

**Further information:**

- Student Disability Services

**Student Psychological Services**

Student Psychological Services is dedicated to helping UCL students with personal, emotional and psychological concerns. The Student Psychological Services Team is diverse and consists of a variety of highly trained and experienced professionals, who offer short-term CBT and psychodynamic support. There are currently two psychiatrists and ten therapists on staff with varying kinds of psychological training and expertise.

**Further information:**

- Student Psychological Services

**International Student Support and Welfare**

The International Student Support and Welfare Team provide specialist support and advice for all non-UK students at UCL. As well as immigration information, they help to support students through the transition to university in the UK by organising the International Student Orientation
Programme (ISOP) at the start of each term, and arranging regular workshops for international students which tackle particular issues.

Further information:
- International Student Support and Welfare

Accommodation

UCL Residences provides a range of accommodation options including three Halls of Residence, self-catered student houses and intercollegiate halls shared with other colleges of the University of London. Each Hall has a Warden and Vice-Warden to support students and foster a positive environment within the accommodation.

Further information:
- Wardens and Vice Wardens at UCL Residences

Financial support

At UCL we understand students can face a range of financial issues. We aim to help and advise students as much as possible, so that they have more control over their own financial situation. The Student Funding Team offer online information and one-to-one support through appointments as well as a drop-in service. Students with a more complex or sensitive circumstances can make an appointment with the Student Funding Welfare Adviser.

Further information:
- UCL Financial Support

Student of Concern

There are many sources of support for students who are having difficulties, but sometimes it is hard to know how to help a student who appears to be struggling, particularly if they seem unwilling or unable to seek the help they need. Anyone concerned about the behaviour of a student, who believes the problem may be related to health and wellbeing issues, is encouraged to complete the online UCL Student of Concern Form. Depending on the concerns raised, Student and Registry Service may respond by offering support or advice to the student or the person who submitted the form, liaise with support services or, if necessary, work with the relevant authorities to ensure the student is safe.

Further information:
- Student of Concern

Registering with a Doctor

Students are strongly encouraged to register with a doctor as soon as possible after they arrive in London so that they can access healthcare as quickly as possible if they become ill or injured. When attending a university in the UK students are also advised to be vaccinated against Meningitis C.

The Ridgmount Practice is a National Health Service (NHS) practice providing healthcare and dental services for students living within its catchment area (i.e. near the main UCL campus). Students can also choose to register with a practice closer to where they live if they prefer. The Ridgmount Practice also runs a Walk-in Surgery which any UCL student can attend, even if they are not registered with the practice.

Further information:
- Register with a Doctor
- Ridgmount Practice website
Out-of-hours support and information helpline

UCL works in partnership with Care First to provide an out-of-hours support and information helpline. The helpline is free of charge and includes access to information specialists who are trained by Citizens Advice and to professionally-qualified and BACP-accredited counsellors who can help students with a range of emotional and psychological difficulties.

Further information:

- Care First

Crisis support - immediate help

If a student is in crisis there are a range of UCL and external sources of help such as Nightline, Ridgmount Medical Practice, Hall Wardens, Student Psychological Services and the Samaritans.

Further information:

- Crisis Support – immediate help

Equality and Diversity

UCL fosters a positive cultural climate where all staff and students can flourish, where no-one will feel compelled to conceal or play down elements of their identity for fear of stigma. UCL is a place where people can be authentic and their unique perspective, experiences and skills seen as a valuable asset to the institution. The Equalities and Diversity website brings together a range of information on issues relating to race, gender, religion and belief, sexual orientation, and disability amongst other equalities initiatives at UCL.

Further information:

- Equalities and Diversity
- Support for Pregnant Students
- Religion and Belief Equality Policy for Students
- UCL LGBT Student Support Pages
- UCL Chaplain and Inter-Faith Adviser
- DEOLOs (Departmental Equal Opportunity Liaison Officers)

Departmental Equal Opportunity Liaison Officers

Departmental Equal Opportunity Liaison Officers (DEOLOs) provide support and assistance for students and staff about issues relating to equalities and diversity. The S&CP DEOLO is Mrs Sue Chick, based at MSSL. (s.chick@ucl.ac.uk, tel: 01483 204100).

Harassment and bullying

Every student and member of staff has a right to work and study in a harmonious environment. UCL will not tolerate harassment or bullying of one member of its community by another or others and promotes an environment in which harassment and bullying are known to be unacceptable and where individuals have the confidence to raise concerns in the knowledge that they will be dealt with appropriately and fairly.

Further information:

- UCL Policy on Harassment and Bullying
- UCLA Rights & Advice Centre

Sexual harassment

It is unacceptable for any person at UCL, whether staff or student, to be subjected to any unwanted and persistent behaviour of a sexual nature. UCL is working with UCLU to implement a
two-year action plan to tackle issues of sexual harassment and make sure that staff and students have access to relevant training. Any UCL student experiencing sexual harassment may access confidential support from a range of sources including their personal tutor or any other member of staff in their department or faculty who they trust, their Hall Warden, a UCLU student officer, the trained staff in the UCLU Rights & Advice Centre, or the UCL Student Mediator.

Further information:
- UCLU Zero Tolerance to Sexual Harassment

Support for students who have been affected by sexual violence

UCL will do its utmost to support anyone who has been, or is being, affected by sexual violence. If a student would like to talk to somebody at UCL, the Student Support and Wellbeing Team can offer advice on the support available both internally and externally.

Further information:
- Support for Students Who Have Been Affected by Sexual Violence

The UCL Students' Union, located at 25 Gordon Street, also aims to represent the interests of all students, and is 'run by students for students' (see http://uclu.org/).

Further information and sources of assistance may be found on the Student Support website [ix] and at http://www.ucl.ac.uk/current-students/support.

Departmental Support

If any student has any problem or difficulty (academic or personal) whilst attending UCL, the Programme Tutors are always available for guidance and advice. Often the Programme Tutors will refer a student elsewhere rather than deal with the problem directly, as they will know of other sources of assistance in UCL and elsewhere. The Programme Tutors will respect the sensitivity and confidentiality of students who may have problems.

In addition, UCL’s confidential Student Counselling Service, see below, is also available to all.

Examination Arrangements

If you have a disability or specific learning difficulty, UCL recognises that the usual format of exams may not be suitable.

Students are advised to contact the Student Disability Services as early as possible in the academic year to discuss examination arrangements; for example it may be possible to arrange for you to take your examinations in a separate room designated for this purpose (known as the Special Facility) and/or use special equipment. The deadlines for making such arrangements are 1 March if you have dyslexia or at least six weeks before your first examination if you have another disability. If you wish to enquire about such arrangements you should contact the Student Disability Services (see above for contact information).

Student Grievances

If you feel that you have been unfairly treated, in any way, by a member of staff or another student, you should raise it first with that member of staff or student. If this proves inappropriate or problematical, you should arrange to see the Programme Tutor. This can include sexual, racial or religious harassment, perceived deficiency in teaching/supervision or the decision not to permit you to continue on your programme of study on grounds of unsatisfactory academic performance, for example. In cases where you wish to talk to a member of staff outside the Department you should make an appointment to see the Faculty Tutor (see section “The Faculties” on page 9) or the Student Mediator.
Note that there is the possibility for a student to submit a **claim of Extenuating Circumstances** in cases of serious grievances, and this will be taken into consideration when assessing the student performance. Submission of a claim should be made **as soon as possible** after the grievance has taken place. Ask the Programme Tutor for assistance.

**UCL Union Nightline**

Nightline [x] is a confidential listening, support and information helpline provided by the Students’ Unions in London for students requiring advice, information or just someone to talk to between 6 pm and 8 am (during term-time) or via e-mail at any time during the term. Telephone: 020 7631 0101, or for e-mail advice, contact them on: listening@nightline.org.uk.

**UCL Union Rights and Advice Centre**

This Centre [xi] is located on the 1st floor of the Bloomsbury Building, 15 Gordon Street. It offers comprehensive information and an advice service on a wide range of issues including grants, loans, social security benefits, alternative sources of funding, immigration, housing, academic appeals and other practical problems. Free appointments with local solicitors can also be arranged during term time. Telephone: 020 7679 2998 or complete a contact form on the Web.
Changes to Registration

Students wishing to make changes to their registration status should first discuss their plans with their Personal Tutor or Supervisor who can explain the options available and help students to make the right decision. Students should also ensure that they read the relevant sections of the UCL Academic Manual before making any requests to change their academic record.

Applications must be made in advance of the effective date of change.

Changing modules

If a student wishes to make changes to their individual modules, an application must be made by the Departmental Tutor to the Examinations Office, via the Faculty Office. The deadline for changes to modules during the session is 27 January each year. Any student wishing to make a change after this date must be referred to the relevant Faculty Tutor.

Further information:
- Change of Course Unit/ Module Selection
- Changes to Registration Status

Changing programme

If a student wishes to transfer from one UCL degree programme to another, they must make a formal application. The deadline for change of degree programme during the academic session is 31 October each year. Students should log in to their Portico account and complete the online application under the 'C2RS Home' menu. Students are strongly advised to discuss their plan with the departments involved before requesting a change of programme on Portico.

Further information:
- Programme Transfers
- Changes to Registration Status

Interruption of studies

If a student requires a temporary break from their studies and plans to resume their programme at a future date, they must apply for a formal Interruption of Study.

Further information:
- Interruption of Study
- Changes to Registration Status
**Withdrawing from a programme**

If a student wishes to leave their degree programme prior to completing their final examinations they must apply for a formal withdrawal from their studies. Once withdrawn, the student cannot return to the programme at a later date. Applications must be made in advance of the effective date of change. Students should log in to their Portico account and complete the online application under the 'C2RS Home' menu.

**Further information:**
- [Changes to Registration Status](#)

**Key contacts in the department for assistance with any of the above**

Dr. Sarah Matthews, programme tutor. Email: sarah.matthews@ucl.ac.uk, Tel.: 01483 204208
UCL Library and Learning Resources

UCL Library Services
UCL has 19 libraries and a mixture of quiet study spaces, bookable study rooms and group work areas. Each library has staff that students can ask for help. The UCL Library Services page has information for students about using the library, services available, electronic resources and training and support.

Further information:
- Library information for students

UCL Information Services Division (ISD)
The UCL Information Services Division (ISD), the primary provider of IT services to UCL, offers IT learning opportunities for students and staff in the form of ‘How to’ guides which provide step-by-step guidance to all of ISD’s key services, including email and calendar services, user IDs and passwords, print, copy and scanning, wifi and networks. There are also opportunities for digital skills development through face-to-face training in areas such as data analysis, programming, desktop applications and more, along with individual support through drop-ins and via the ISD Service Desk. UCL also has a licence for Lynda.com which provides thousands of high quality video-based courses from programming to presentation skills.

E-learning services available to students include Moodle, Turnitin and Lecturecast and allow students to access online course materials or take part in online activities such as group work, discussions and assessment. Students can re-watch some lectures using the Lecturecast service and may also use interactive tools in the classroom.

ISD provides desktop computers and laptops for loan in a number of learning spaces. A map of computer workrooms is available on the ISD website. Computers at UCL run a Desktop@UCL service which provides access to hundreds of software applications to support students. It is also possible to access a large range of applications remotely, from any computer, using the Desktop@UCL Anywhere service.

All students are encouraged to download the UCL-Go app, available for iOS and Android devices. The app gives access to Moodle and timetabling and shows where desktop computers are available on campus.

UCL Centre for Languages & International Education (CLIE)
The UCL Centre for Languages & International Education (CLIE) offers courses in over 17 foreign languages (including English), along with teacher training courses, across a range of academic levels to support UCL students and staff and London’s wider academic and professional community. CLIE provides degree preparation courses for international students, courses satisfying UCL’s Modern Foreign Language requirements and a range of UCL summer school courses. Students can also access a database of language-learning resources online through the CLIE Self-Access Centre, including film and documentary recommendations and books for self-study.

Further information:
- CLIE website
- CLIE Self-Access Centre
Student representation

University College London Union (UCLU)

UCLU is the students’ union at UCL. As the student representative body, it is run by students for students. UCLU is independent of UCL and a registered charity, providing a range of services to support UCL students and help them develop skills and interests while at UCL. UCL students are automatically members of UCLU (but can opt out), and the Union is run by seven full-time student sabbatical officers who are elected by cross-campus ballot each year and take a year out of their studies in order to work for the Union. These officers represent students on various UCL committees and campaign on the issues that matter to students.

Further information:
- UCLU website
- Membership information (including how to opt out)
- Elections information (including how to run for office)

Student Societies

UCL students currently run over 250 different clubs and societies through UCLU, providing a wide range of extra-curricular activities for students to get involved with during their time at UCL.

Further information:
- UCLU Clubs & Societies

Add information about department-specific societies where applicable.

Student Academic Representatives (StARs)

The principal function of UCLU is to represent the needs and interests of all UCL students at the university, regional and national level. Central to this mission are elected Student Academic Representatives (StARs).

StARs are elected to represent students’ views and interests. They sit on various departmental, faculty and University level committees and act as the voice of students, ensuring that UCL takes the needs of students into account in its decision-making. StARs also liaise with UCLU and UCL staff to resolve issues.

Being a StAR is an opportunity not to be missed. Participants can gain a StARs certificate and, if applicable, Higher Education Achievement Report (HEAR) accreditation in recognition of their contribution to students and UCL. StARs receive training for their role and additional skill building sessions such as public speaking, assertiveness and negotiation. They work on real issues and make changes to teaching, assessment and local facilities.
Further information:
- StARs website
- Find your StAR
- Become a StAR

Staff-Student Consultative Committee
Every department at UCL has a Staff-Student Consultative Committee (SSCC) that meets at least twice a year. The SSCC provides a forum for discussion between staff and student representatives (StARs). This is an important opportunity for students to give feedback on their learning experience and is central to maintaining and improving the quality of education at UCL.
UCLU Rights & Advice Centre

The UCLU Rights & Advice Centre is a service available to UCL students to help with any difficulties that might occur while at UCL. The Rights & Advice Centre’s trained and experienced caseworkers can give advice about:

- **Immigration** - including applying for a Tier 4 visa
- **Academic issues** - including examination irregularities and student complaints
- **Housing** - including contract checking and housemate disputes
- **Employment** - including unpaid wages and part time employment contracts
- Many other legal and university matters

Students can make an appointment or attend a drop-in session for free, confidential and independent advice and support.

Further information:
- UCLU Rights & Advice Centre

Student Complaints

UCL aims to ensure that every student is satisfied with their experience of UCL. However we recognise that from time to time problems do arise and students may wish to express concern or dissatisfaction with aspects of UCL or the quality of services provided.

Informal resolution

Many complaints can be resolved at an informal or local level without needing to submit a formal complaint. Students can speak to their Personal Tutor, Programme Leader, Departmental or Faculty Tutor, or Student Academic Representative (StAR) if they have any concerns about their programme. They can also speak to the UCL Student Mediator or the UCLU Rights and Advice Service. UCL strongly encourages this kind of resolution and does expect students to have attempted some form of informal resolution before making a formal complaint.

Formal complaints

If an issue cannot be resolved at a local level, students may feel they need to submit a formal complaint using UCL’s Student Complaints Procedure. UCL aims to ensure that all complaints are treated fairly, impartially, effectively and in a timely manner, without fear of victimisation. The Complaints Procedure applies across all Schools, Faculties, Academic Departments and Professional Service Divisions.

Further information:
- Student Complaints Procedure
- UCL Student Mediator
- UCLU Rights & Advice Centre
Student feedback

Student Feedback

UCL’s goal is to put students’ feedback, insights and contributions at the heart of our decision-making. We value students’ feedback and work with students as partners in the process of shaping education at UCL. In recent years, as a direct result of student feedback, we extended library opening hours, opened new study spaces and scrapped graduation ticket fees for students.

Student Surveys

One of the principal ways in which UCL gathers and responds to student feedback is via online student experience surveys such as the National Student Survey, The Postgraduate Taught Experience Survey and the Student Barometer. Whether it’s about teaching, accommodation, or facilities, surveys are a chance for students to have their say about what works and what needs improving, to help us make sure that UCL is as good as it can be for current and future students. Each survey usually takes just a few minutes to complete, all responses are anonymous and some include a generous prize draw. Every piece of feedback is read and the results of each survey are then shared with staff right across UCL – including President & Provost Michael Arthur.

Further information:

- UCL Student Surveys

Student Evaluation Questionnaires

Departments also run Student Evaluation Questionnaires on individual modules throughout the year. This gives students the opportunity to feedback about the teaching on their specific modules, helping departments to continuously improve learning, teaching and assessment. Feedback from SEQs feeds into the Annual Student Experience Review process.

Due to the different module formats SEQs will not always be handed out in the same week of term, but where appropriate they will be distributed during the week following Reading Week. Lecturers will allocate time during the lecture for students to complete these, and for a collator to collate the overall responses.

The Annual Student Experience Review (ASER)

UCL’s Annual Student Experience Review (ASER) process requires all departments to undertake an annual self-evaluation and produce a development plan for how they plan to improve in the coming year. The self-evaluation involves looking at student feedback from surveys and student evaluation questionnaires as well as other data about student performance and academic standards, such as the feedback provided by the External Examiner, which helps departments to understand what is working well and what might need improving. Student Academic Representatives (StARs) are active participants in the evaluation process and creation of the development plan through discussions at departmental and faculty committees, giving students an important role in identifying and planning improvements within their department. Students can view the completed reports and action plans on the faculty/departmental intranet.
Further information:
  • Annual Student Experience Review

ChangeMakers

**UCL ChangeMakers**

UCL ChangeMakers encourages students and staff to work in partnership with each other on educational enhancement projects to improve the experiences of students across UCL. **UCL ChangeMakers Projects** supports students and staff in running projects to improve the learning experience at UCL. Anyone with an idea, or who wants to get involved, can submit a proposal for funding and support. **UCL ChangeMakers ASER facilitators** are students who work with Student Academic Representatives and staff in selected departments to formulate the departmental educational enhancement action plan.

Further information:
  • UCL ChangeMakers

Employability and Careers

**Opportunities available, where and how to get advice, career planning tips**

The department’s careers advisors are: Dr. Sarah Matthews (sarah.matthews@ucl.ac.uk) and Prof. Andrew Fazakerley (a.fazakereley@ucl.ac.uk).

**UCL Careers**

UCL Careers provides a wide variety of careers information, one-to-one guidance and events for UCL students and recent graduates, and assists them through the entire job hunting process, including exploring options, searching for vacancies, preparing CVs and applications, practicing for interviews, aptitude tests or assessment centres, and providing access to recruitment fairs and other employment-related events. They can also advise on exploring options for further study and funding. These specialised services and events are available to graduates, international students and Master’s students for up to two years following course completion.

UCL Careers also supports work-related learning, including internships and placements. UCL students who are required to complete a placement or internship as part of certain courses are supported in their search, application, and work by UCL Careers. Students can also sign up for UCL Talent Bank, a shortlisting service connecting students to small and medium sized organisations.

Further information:
  • UCL Careers

UCL has a long and successful track record of supporting spin-outs and start-ups developed by its academic and student communities. Many of the student and staff entrepreneurs have won external awards and achieved substantial investment allowing their enterprises to grow and reach their full
potential. UCL offers a wide range of support to students ranging from training programmes, advice on whether an idea has commercial potential, one-to-one sessions with business advisers, funding, competitions and incubator space to help them start or grow their business.

Further information:
- UCL Enterprise

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**Global Citizenship**

**UCL Global Citizenship Programme**

The UCL Global Citizenship Programme is a two-week programme for UCL undergraduates and taught postgraduates offering the chance to put their studies in a global context, learn new skills and see the world differently. The Programme runs for two weeks after summer exams have finished, providing a range of opportunities to help students boost their studies, enhance their future and make an impact on the world. Participation is free and open to all UCL undergraduate and taught postgraduate students on a first come, first served basis.

Further information:
- UCL Global Citizenship Programme

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**Data Protection**

**How UCL uses student data**

UCL uses student information for a range of purposes connected with their studies, health and safety. UCL takes the protection of student information very seriously and complies with the Data Protection Act (DPA) 1988. Information about students will only be shared within UCL when necessary. UCL may also be required by law to share information with some external agencies for a variety of purposes, such as UCLU, the Higher Education Statistics Agency and UK Visas and Immigration. After students leave UCL their data is retained in the permanent archives.

Further information:
- UCL General Student Privacy Notice
- UCL Confidential Information Statement
- UCL Information Security Policies
- data-protection@ucl.ac.uk
Health, Safety and Security

Health, Safety and Security at UCL

UCL’s overall objective is to provide and maintain a safe and healthy environment for staff, students, people who work with UCL and those who visit. Health and safety is an integral part of the way in which UCL’s activities are managed and conducted. The UCL Safety Services webpage includes further information about health and safety policies and useful guidance and tools for risk assessment. The UCL Security Services webpage includes information regarding security operations, emergency contacts and tips for staying safe at UCL.

Further information:
- UCL Health and Safety Policy
- UCL A-Z Safety Guidance
- General Fire Safety for UCL Students
- UCL Security Services
- Staying Safe at UCL

Health and Safety information concerning the department

Department to add details about labs, field trips etc., if applicable.

After study

Transcripts

All graduating students will receive an official transcript, detailing examinations taken and results achieved. Transcripts are issued automatically and sent to the contact address held on Portico. Additional transcripts are available via the UCL Transcript Shop.

Further information:
- Transcripts

UCL Alumni Community

The UCL Alumni Online Community is a global network of more than 200,000 former students of UCL. Alumni can take advantage of a wide range of benefits, services and discounts – on campus, across the UK and globally – including the Alumni Card, access to thousands of e-journals and library services and a free UCL-branded email service. The UCL Alumni Online Community also posts information about events and reunions happening around the world and other ways to get involved, including the UCL Connect professional development series.

Further information:
- UCL Alumni
Notes and References

i  UCL shop: http://www.ucl.ac.uk/estates/ucl-shop/

ii The main UCL web site is at http://www.ucl.ac.uk/. To find the staff and student directory, select “Staff” in the top bar.

iii For information about UCL Information Systems passwords, including procedures for changing them, see http://myaccount.ucl.ac.uk/

iv Full information on UCL email and calendar is given at: http://www.ucl.ac.uk/isd/services/email-calendar

v UCL ‘eduroam’ is a free service which allows UCL students and staff to connect a PC (e.g. laptop) to the UCL Network and gain access to the Internet and Network resources (e.g. email) from hot-spots located throughout the campus. For instructions and driver downloads: http://www.ucl.ac.uk/isd/services/get-connected/wireless/eduroam/

vi UCL Careers Service: http://www.ucl.ac.uk/careers/

vii UCL Location and Maps: http://www.ucl.ac.uk/maps/

viii Information Systems: http://www.ucl.ac.uk/isd/

ix Student Support: http://ucl.ac.uk/support-pages/

x Nightline: http://www.nightline.org.uk/

xi UCL Union Rights and Advice Centre: http://uclu.org/services/advice-welfare