SCHOOL OF PHYSICAL AND GEOGRAPHICAL SCIENCES

PHYSICS and ASTROPHYSICS

FHEQ Level 5 Handbook

2015-2016
Semester Dates 2015-2016
(FHEQ Level 5)

AUTUMN SEMESTER

Monday 28th September 2015 – Friday 22nd January 2016

Teaching Weeks (1 – 12):
Monday 28th September 2015 – Friday 18th December 2015

Christmas Vacation:
Saturday 19th December 2015 – Sunday 10th January 2016

Examinations and Assessment:
Monday 11th January 2016 – Friday 22nd January 2016

Re-examination period Monday 6th June 2016 – Friday 10th June 2016

SPRING SEMESTER

Monday 25th January 2016 – Friday 10th June 2016

Teaching Weeks (1 – 8):
Monday 25th January 2016 – Friday 18th March 2016

Easter Vacation:
Saturday 19th March 2016 – Sunday 10th April 2016

Teaching Weeks (9 – 12)
Monday 11th April 2016 – Friday 6th May 2016

Examinations and Assessment:
Monday 16th May 2016 – Friday 27th May 2016

Academic Year ends on Friday 10th June 2016

Re-examination period Monday 15th August 2016 – Friday 19th August 2016

For details on the undergraduate academic year see:
http://www.keele.ac.uk/keydates/
CONTENTS

SECTION 1:

1.1 INTRODUCTION

1.2 Physics Department Academic Mission
   1.2.1 Departmental Aims
   1.2.2 Objectives of Degree Courses
   1.2.3 Details of professional, statutory and regulatory body (PSRB)

1.3 Disclaimer

1.4 Location

1.5 Physics Academic and Support staff

1.6 Communication with students
   1.6.1 e-mail
   1.6.2 eVision
   1.6.3 KLE
   1.6.4 Higher Education Achievement Report (HEAR)
   1.6.5 Timetabling

1.7 Sources of help and advice
   1.7.1 Personal Tutor
   1.7.2 FHEQ Level 4 Tutor
   1.7.3 Director of Undergraduate Studies
   1.7.4 Student Support
   1.7.5 Provision of References
   1.7.6 Progress Interviews
   1.7.7 Student Records
   1.7.8 School Complaints Procedure
   1.7.9 University Complaints Procedure
   1.7.10 Academic Appeals Procedure

1.8 Organisation of the School
   1.8.1 Staff-Student Liaison Committee
   1.8.2 Physics and Astrophysics Teaching Committee
   1.8.3 Lennard-Jones Workplace Safety Committee
   1.8.4 Safety Policy and Regulations

1.9 General Information
   1.9.1 Student Resource Rooms
   1.9.2 The University Library (Information Services Building)
   1.9.3 IT Services
   1.9.4 The Keele Physics Website
   1.9.5 The Teaching Laboratories
   1.9.6 Physics Students’ Notice-boards
   1.9.7 Handbook on Mathematics, Physics and Astronomy Data
   1.9.8 Disability and Dyslexia Support
   1.9.9 The Academic Year
   1.9.10 Personal Development Planning (PDP)
   1.9.11 Distinctive Keele Curriculum (DKC)
1.10 Absence from classes for medical reasons

1.11 Academic misconduct
1.11.1 Plagiarism, Collusion and Academic Dishonesty
1.11.2 Academic Warnings

SECTION 2

2.1 Course Structures

2.2 Principal Physics and Principal Astrophysics Course Structures

2.3 Laboratory Work and Mathematics at FHEQ Level 5

2.4 Teaching Methods and Timetables
2.4.1 Lectures and Laboratories
2.4.2 Discipline and Conduct

2.5 Assessment
2.5.1 Examinations
2.5.2 Problems Sheets
2.5.3 Laboratory Assessment
2.5.4 Problem Classes
2.5.5 External Examiners

2.6 Submission of Assessed Coursework
2.6.1 General Instructions
2.6.2 Problems Sheets and Laboratory Reports
2.6.3 Submission Deadlines
2.6.4 Granting of Extensions for Assessed Coursework
2.6.5 Return of Marked Coursework
2.6.6 Publication of Results
2.6.7 Progression

2.7 Evaluation of Teaching
2.7.1 Module Questionnaire Forms
2.7.2 Peer Observation of Teaching

APPENDICES

Appendix 1: Complaint Form
Appendix 2: Assessed Coursework Submission (ACS) Form
Appendix 3: Guidance on Plagiarism
Appendix 4: Guidance on Proofreading
Appendix 5: Student Sickness Self-Certification Form (from School Office)
Appendix 6: Module Tutors and Staffing

4
MODULE OUTLINES available on the Physics web-site:

http://www.keele.ac.uk/physics/

and module resources at:

http://students.keele.ac.uk

Online version of School of Physical and Geographical Science Student Handbook can be found at:

http://www.keele.ac.uk/physics/forcurrentstudents/

MAILING ADDRESS FOR PHYSICS/ASTROPHYSICS

School of Physical and Geographical Sciences
Lennard-Jones Laboratories
Keele University
Keele
Staffordshire
ST5 5BG
United Kingdom

Telephone Number: 01782 733527
Fax Number: 01782 733750
1.1 INTRODUCTION

This Handbook provides you with all the necessary information you require that relates to your study programme in Physics or in Astrophysics at Keele University with particular reference to the teaching and assessment of FHEQ Level 5. In addition, the Handbook provides general information about the School of Physical and Geographical Sciences and the Physics teaching staff. It should be read in conjunction with the University Regulations, available on:

http://www.keele.ac.uk/regulations/

For the sake of clarity the term department will be used to refer to the activities and work of the physics part of the School.

1.2 PHYSICS DEPARTMENT ACADEMIC MISSION

1.2.1 DEPARTMENTAL AIMS

1. To prepare graduates, with appropriate Principal subject combinations (i) to operate effectively as professional physicists in industrial, commercial or research organisations, or (ii) for progression to academic research and academic careers in Physics, Astrophysics and cognate disciplines.

2. To prepare graduates to use the analytical skills and the knowledge gained from scientific training in Physics/Astrophysics alongside those gained from their other discipline(s) in a wide variety of employment roles.

3. To contribute to the University’s multidisciplinary mission by offering Elective modules for undergraduate programmes across the University.

4. To raise awareness of Physics and Astrophysics in the local community by taking part in, and organizing, Public Understanding of Science and similar events, and to offer support to local schools and sixth form colleges in teaching Physics and Astrophysics.

5. To monitor and improve our performance in teaching and research, and in the management of these activities.

6. To carry out high quality research that gives the Department and the University a reputation for excellence at an international level, and to use this research to inform the undergraduate programme through projects and specialist modules.

7. To train postgraduate research students in the planning, execution and dissemination of research within an internationally competitive environment.
1.2.2 OBJECTIVES OF DEGREE COURSES IN PHYSICS AND ASTROPHYSICS

On completion of your degree course within the department, graduates in physics or in astrophysics will have achieved the following:

- Through participation in formal classes, directed and private study, you will achieve knowledge and understanding, commensurate with your degree award, of the fundamentals of Physics/Astrophysics, and will be able to apply this to problems in these disciplines.

- You will have developed competence in the application of mathematics, IT and, where appropriate, computer simulation and analysis, to physical/astrophysical problems. Through laboratory work at FHEQ Levels 4 and 5, and project work at FHEQ Level 6, you will achieve competence in practical skills, data analysis and reporting skills with in physics.

- You will acquire a range of generic, transferable skills including independent learning, management of your own work, communication - whether written or oral, team working and other interpersonal skills.

1.2.3 DETAILS OF PROFESSIONAL, STATUTORY AND REGULATORY BODY (PSRB)

All Physics and Astrophysics programmes (except minor routes) at Keele have been accredited by the Institute of Physics (IoP). Students who successfully complete an accredited degree course will normally qualify for admission to Membership/Fellowship of the Institute and for the award of Chartered Physicist status after a specified period of professional development and relevant experience following graduation.

1.3 DISCLAIMER

The information in this Handbook is accurate at the time of going to press. It does not, however, replace the entries in the University Prospectus and Calendar, which are authoritative statements. In the case of conflict, the Prospectus and Calendar take priority. The statements of School policy in this Handbook are made in good faith. It may, however, be necessary from time to time to vary courses, procedures and other arrangements.

The University’s Codes of Practice can be found at:

http://www.keele.ac.uk/ps/governance/actcharterstatutesordinancesandregulations/universityregulations/student-relatedregulations/

1.4 LOCATION

All the staff and all the teaching laboratories are located in the Lennard-Jones Building.
1.5 PHYSICS ACADEMIC AND SUPPORT STAFF

The Physics academic staff exhibits a research profile with two main areas of expertise; namely astrophysics and condensed matter physics. Most also undertake administrative roles, either within our teaching or research activities. Staff telephone numbers and email addresses are provided below, for those teaching on undergraduate courses, together with brief descriptions of their research interests.

Professor Nye Evans  
LJ2.03 (73)3342 a.evans@keele.ac.uk
Professor of Astrophysics with research interests in laboratory astrophysics, the circumstellar environments and evolution of highly evolved stars and novae.

Professor Coel Hellier  
LJ2.04 (73)4243 c.hellier@keele.ac.uk
Library Liaison
Professor of Astrophysics with research interests in exoplanets.

Dr Raphael Hirschi  
LJ2.09 (73)3324 r.hirschi@keele.ac.uk
Postgraduate Admissions Tutor
Reader in Astrophysics with research interests in massive stars and supernova progenitors.

Professor Rob Jeffries  
LJ2.08 (73)3892 r.d.jeffries@keele.ac.uk
Head of Physics/Astrophysics
Professor of Astrophysics, researching the formation and evolution of sun-like and lower mass stars.

Dr A Mahendrasingam  
LJ1.04 (73)3312 a.mahendrasingam@keele.ac.uk
Physics/Astrophysics Course Director, Physics Projects
Reader in Physics with research interests in the application of x-ray and neutron diffraction techniques to study the structural and morphological changes in organic and biological polymers due to mechanical and thermal stress.

Dr Pierre Maxted  
LJ2.06 (73)3457 p.maxted@keele.ac.uk
Year 6 Tutor, Astrophysics Projects Tutor, Careers Tutor
Reader in Astrophysics with research interests in testing models of stellar structure and evolution by measuring the properties of binary stars.

Dr Dean McLaughlin  
LJ1.49 (73)4113 d.e.mclaughlin@keele.ac.uk
Physics/Astrophysics Admissions Tutor
Lecturer in Physics and Astrophysics with research interests in globular clusters and stellar populations in galaxies.

Dr Joana Oliveira  
LJ1.48 (73)3493 j.oliveira@keele.ac.uk
Year 5 Tutor, Study Abroad Tutor
Lecturer in Astrophysics studying star formation and early stages of stellar evolution and their dependence on environments.

Dr James Reeves  
LJ2.10 (73)3329 j.n.reeves@keele.ac.uk
Reader in Astrophysics with research interests in x-ray observations of Active Galactic Nuclei and gamma ray.

Dr Barry Smalley  
LJ2.05 (73)4229 b.smalley@keele.ac.uk
Astrophysics Computer Manager, Exams Officer
Senior Lecturer in Physics and Astrophysics with research interests in stellar atmospheres and the fundamental parameters of stars.
Dr John Taylor  LJ 1.42     (73)3494     j.k.taylor@keele.ac.uk
Lecturer in Astrophysics working on measuring the physical properties of transiting extrasolar planets and eclipsing binary star systems.

Dr Jacco van Loon  LJ2.07     (73)3331     j.t.van.loon@keele.ac.uk
Year 4 Tutor, Observatory Director
Reader in Astrophysics, studying mass-loss from evolved stars and its implications for stellar evolution and chemical enrichment of galaxies and the structure and evolution of galaxies.

Patricia Pointon  LJ0.16     (73)3527     p.pointon@keele.ac.uk
Physics/Astrophysics Undergraduate Administrator

Phil Callaghan  LJ1.09     (73)3853     p.l.callaghan@keele.ac.uk
Technician, Disability Officer

Dr Steven Wye  LJ1.09     (73)3852     s.m.wye@keele.ac.uk
Physics Teaching Fellow

1.6 COMMUNICATION WITH STUDENTS

1.6.1 E-MAIL

Please do not hesitate to contact a member of staff, for whatever reason. You can often find staff in their offices during working hours, though you should make an appointment by email if possible. Important notices are posted on the notice boards in the foyer or outside the Teaching Laboratory.

You will be assigned a computer username when you arrive at Keele that provides access to the free email and the Internet. Keele Information Services will also give you a printing allocation. The School and other University services circulate important information by email regularly. It is therefore essential that you check your Keele email account regularly. You can access your email from any networked computer, many of which are sited in halls of residence.

1.6.2 eVISION

You will also need to make yourself familiar with eVision.

eVision provides an opportunity to:
  ● View your current and previous module marks
  ● View and update your personal information and contact details
  ● Request a course change
  ● View your credit requirements
  ● View your absence record
  ● Re-register for your course each year

You can access eVision through the student login on the Keele homepage. eVision is then accessible through ‘The Office’ tab.
1.6.3 KEELE LEARNING ENVIRONMENT (KLE)

The KLE is used by Keele to provide every student and member of staff with a personal teaching and learning workspace that can be accessed through the Internet.

The KLE gives you access to information, activities and resources associated with the modules you are studying. These might include, for example, lecture notes and slides, pictures and other material together with interactive features such as discussion groups.

You should regularly access the KLE, ideally on a daily basis, since it provides the most accurate and up-to-date information with regard to your modules. Online help for the KLE can be found here: http://www.keele.ac.uk/klehelp/

1.6.4 HIGHER EDUCATION ACHIEVEMENT REPORT (HEAR)

At the end of your studies, the HEAR will provide you with a comprehensive record of all your university achievements, including some of your co-curricular activities, both during and upon completion of your academic studies at Keele. It is an extended academic transcript and will contain detailed information about your learning and achievements and, along with your degree certificate, will support applications for employment and further study.

HEARs will be issued to all undergraduate degree students studying at Keele. You will receive a registration email from Gradintel during your studies at Keele and must complete your registration with them so you can access your HEAR. Your HEAR is a digitally signed document and when logged into Gradintel you can share your HEAR with employers, employment agencies or other universities.

For more information on what will appear in the HEAR, and the benefits of having one, please visit: http://www.keele.ac.uk/hear/

1.6.5 TIMETABLING

Information on how to access your timetable and where to go to resolve any timetabling issues can be found at http://www.keele.ac.uk/timetabling/
1.7 SOURCES OF HELP AND ADVICE

You will find the Physics staff friendly and approachable and you should not feel worried or inhibited about going to see them at any time. There are several key personnel who have a primary contact role for undergraduates:

1.7.1 YOUR PERSONAL TUTOR

Your Personal Tutor is a first point of contact for general guidance on academic and career development and, in consultation with yourself, may refer you to specialist academic support services within the University. Your Personal Tutor can also provide advice, support and general guidance on non-academic issues or, again, in consultation with yourself refer you to pastoral support services within the University, where necessary.

Every student is allocated a Personal Tutor at the very beginning of their studies and he or she will normally meet with you on a one-to-one basis to discuss your academic development throughout your time at Keele. Where possible, you will have the same Personal Tutor throughout your studies. Arrangements will be made for you to meet your Personal tutor during your first few days at Keele. You must attend scheduled meetings with your Personal Tutor as required.

You must ensure that you notify your Personal Tutor promptly if you are having academic, health or personal problems that are affecting your academic work and must be an active participant in finding a solution to the problem. Your Personal Tutor's contact details are available through eVision. If you wish to meet up with your Personal Tutor outside their scheduled meetings, you should make an appointment with them directly or consult them during their office hours. Students are entitled to change their personal tutor, with good reason. Contact the School Office for information.

You can find the University’s Code of Practice for Personal Tutoring at: http://www.keele.ac.uk/policyzone/viewbyowner/planningandacademicadministration/name,80500,en.php

1.7.2 LEVEL 2 TUTOR

Dr Joana Oliveira

Dr Jacco van Loon is responsible for the pastoral care of all FHEQ Level 5 Physics and Astrophysics undergraduates and it is important that she is informed of any circumstances (medical or otherwise) that affect your academic work. In addition, Joana monitors general problems that affect the FHEQ Level 5 Physics and Astrophysics undergraduates and reports these matters to the Director of Undergraduate Studies.
1.7.3 DIRECTOR OF UNDERGRADUATE STUDIES

Dr A Mahendrasingam

Dr Mahendrasingam is responsible for overseeing the operation of the Physics and Astrophysics undergraduate programmes. He is Chair of the Learning and Teaching Committee and reports directly to the main School Committee. The Year Tutors inform him in confidence of any issues relating to undergraduate teaching and student progression.

If you wish to speak to Dr Stuart Egan (Head of School) then it is best to make an appointment through the School Office.

Additional information relating to student welfare and support, including the Counselling Service, Student Finance and Health, may be found at:

http://www.keele.ac.uk/ssds/

1.7.4 STUDENT SUPPORT AND DEVELOPMENT SERVICES

Student Support and Wellbeing:
Whilst we know that you will have a great experience at Keele, there are likely to be times when you need support, advice or just somebody to talk to. At Keele there are specialist and professional student support and wellbeing services and staff who are in place to offer such support when and if you need it.

Take the time now, to familiarise yourself with these services, and if at any point you feel like you need some help or want somebody to talk to then don’t hesitate to ask, that's what we are here for.

Student Services Centre - The Student Services Centre should be your first stop for Academic advice, Exams Information, timetabling queries, Electives information, Money Support, Support in Accommodation, Disability and Dyslexia Support, International Student Support, Critical Incident Support, and Personal Issues, i.e. Bullying, Homesickness etc.. Staff in the Centre are experienced in dealing with a wide range of issues and will work with you to resolve any issues or concerns that you have at any point during your time here at Keele. Visit: http://www.keele.ac.uk/studentservices

Student Wellbeing - Your wellbeing is of paramount importance to us. As such we ask that should you need to, that you talk to us but also engage with the Counselling and Mental Health Support service. The team of trained and specialist professionals are all committed to providing effective, sensitive support and specifically understand the challenging experiences that students and young people often face. http://www.keele.ac.uk/studentcounselling/

Careers and Employability - Whilst starting a career may seem a long way into the future, the Careers and Employability Service offers an excellent source of information and support for students throughout their Keele experience (and beyond). If at any stage you want to get your CV looking great or are uncertain of what to do after you graduate then get in touch with them and talk things through. Visit: http://www.keele.ac.uk/careers/ or pay them a visit in the Library, where they are based.

To find out more about all of the services above go to www.keele.ac.uk/studentservices
Keele Mentors Scheme
Staff within Student Support also co-ordinate the Keele Mentors Scheme, which is open to all new students. For more information about Keele Mentors and to sign up online go to: http://www.keele.ac.uk/keelementors/.

Advice and Support at Keele (ASK)
Located on the ground floor of KeeleSU (the Students’ Union), ASK delivers independent advice on a whole range of issues, including academic, health, family, wellbeing, accommodation, finance, legal, international and employment. The advice and support that ASK offers is free, confidential, non-judgemental and impartial. Our trained Education and Welfare Advisors are here to help, just ASK. For more information, please visit www.keelesu.com/advice or come and see us between Mon-Fri 10.00am to 12.30pm and 1.00pm to 4.00pm.

Student Finance Service
http://www.keele.ac.uk/studentfunding/

International Students’ Support
http://www.keele.ac.uk/iss/

SAM – Virtual Student Advisor
isam.keele.ac.uk

Visas and Immigration

Any student who requires a visa to be in the UK or who has been granted a Tier 4 Student Visa is bound by the Immigration rules. These rules also apply to students who need to extend their visa to complete their course with Keele University. The rules and requirements regarding your visa to study at Keele are very strict and you must make sure that you do not accidentally break them. The University is duty bound to report to the Home Office - UK Visas and Immigration on students who do not adhere to the rules, which will result in their Visa being cancelled.

Examples on what is reported include (note: this is not an inclusive list):

- students who do not attend their classes, supervisory meetings and checkpoints;
- students who do not pay their Fees on time;
- students who do not make satisfactory progress in their course;
- students who do not provide documentation when requested by the University;
- students who do not keep their UK contact address up-to-date;
- students that take a leave of absence or intermit from their studies;
- students who leave Keele University during their course;
- students that exceed the working limits as stated in their visa;
- students that withdraw or are withdrawn from their studies.

To note, these requirements are subject to change in line with the Immigration Law and the requirements on sponsors by the Home Office - UK Visas and Immigration, formally the UKBA. For more information please refer to the immigration pages on the Keele University web site.

http://www.keele.ac.uk/visa.
1.7.5 PROVISION OF REFERENCES

You may ask your Level 5 Tutor, the Director of Undergraduate Studies or any other member of the academic staff to write a letter of reference for you. The reference will be given in good faith but the University accepts no liability in negligence or otherwise, for the statements or information contained in the reference.

1.7.6 PROGRESS INTERVIEWS

You will have two progress interviews with your Level 5 Tutor during the academic year. The purpose of these interviews is to give feedback on your academic progress and to give you the opportunity to raise any matters of concern. The interviews are treated as confidential between you and your Level 5 Tutor.

The interviews will take place at the following approximate times:

<table>
<thead>
<tr>
<th>Individual Progress Interview 1</th>
<th>Autumn Semester, Weeks 6-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Progress Interview 2</td>
<td>Spring Semester, Weeks 6-8</td>
</tr>
</tbody>
</table>

1.7.7 STUDENT RECORDS

Individual records are kept for each Physics or Astrophysics student. These records are usually only accessible to the Head of School, the Director of Undergraduate Studies and the Year Tutors and are maintained by the Physics/Astrophysics Undergraduate Administrator Secretary. The record comprises your registration form, information concerning examination results and academic progress and any other relevant documents, e.g. medical certificates. Please make an appointment with your Year Tutor if you wish to see your personal record.

1.7.8 SCHOOL COMPLAINTS PROCEDURE

If you wish to complain about any aspect of the service provided by the School of Physical and Geographical Sciences, you should ask your student representative to bring the problem to the attention of the next meeting of the Staff-Student Liaison Committee. Alternatively, you may be more appropriate to discuss the issue directly with the member of staff concerned, with your Year Tutor or with the Director of Undergraduate Studies.

In any case, if you wish to put your complaint in writing; you should obtain a Complaint Form (Appendix 1) from the Physics Administrator and hand the completed form to your Year Tutor. Any interview that you have with the staff listed above will be documented and may be referred to the Head of School.

1.7.9 UNIVERSITY COMPLAINTS PROCEDURE

A statement of the university complaints procedure can be found in the University Regulations 26: Complaints Procedures, [http://www.keele.ac.uk/regulations/regulation26/](http://www.keele.ac.uk/regulations/regulation26/)

[http://www.keele.ac.uk/studentcomplaints/](http://www.keele.ac.uk/studentcomplaints/)
1.7.10 ACADEMIC APPEALS PROCEDURE

Your final module marks, and your eventual degree classification, are confirmed by a Board of Examiners. It may be possible, in exceptional circumstances, to appeal against the outcome using the Academic Appeals process. The reason for your appeal must be based on one of the following:

- A procedural irregularity in the conduct of the assessment
- Extenuating circumstances (providing that the Board of Examiners were not already aware of them, that evidence can be provided to support them, and that there is a valid reason for not notifying the Board at an earlier stage)

For more information, please visit http://www.keele.ac.uk/appeals/

1.8 ORGANISATION OF THE SCHOOL

There is a committee structure within the School of Physical and Geographical Sciences within which several groups are of particular relevance to undergraduates.

1.8.1 PHYSICS/ASTROPHYSICS STAFF-STUDENT LIAISON COMMITTEE

The Staff-Student Liaison Committee (SSLC) provides a forum for discussion between student representatives (StARS) and staff about issues relating to teaching and assessment as well as the provision of facilities to Physics and Astrophysics undergraduates. You will have representatives on this committee from your year, elected early in the Autumn Semester. The committee meets at least once per semester and you should ensure that you inform your student representatives of any issues you wish to be raised. The student representatives should inform the class of forthcoming meetings and invite you to contribute items for discussion. Minutes of the SSLC are posted on the physics/astrophysics web page.

StARs (Student Academic Representatives)

All students have the opportunity to stand for election as a StAR, representing the views of other students on their programme. StARs gather feedback and attend Staff-Student Liaison Committees (SSLCs) to discuss items raised by students and developments to the programme. It is an important role, which is recognised by being HEAR-recordable. There are even StARs awards each year to celebrate the achievements of those who have gone above and beyond the standard duties of a StAR. Look out for further information publicised by KeeleSU, including details of elections, which are held online at the start of the year. More information can be found here: http://keelesu.com/yourunion/stars/.

1.8.2 PHYSICS/ASTROPHYSICS TEACHING COMMITTEE

The minutes of the SSLC are fed to the Teaching Committee (TC), which reports back to the SSLC on actions taken in response to student complaints or concerns. The TC meets fortnightly and its responses are notified to the SSLC meeting.
1.8.3 LENNARD-JONES SAFETY COMMITTEE

The Committee normally meets four times a year to discuss any safety matters brought before it and to advise the Head of School on action to be taken. A list of the current members of the Committee is posted on most notice boards around the building. You should notify your undergraduate representative on the Committee or Mr David Evans (School Safety Advisor: phone 734213 or e-mail d.l.evans@ Keele.ac.uk) of any concerns you may have about safety within the School or the chair of the committee.

1.8.4 SAFETY POLICY AND REGULATIONS

The School of Physical and Geographical Sciences has a responsibility to provide a safe working environment and to provide instruction for the safe operation of all procedures. The School has a commitment to safety and produces an Undergraduate Safety Handbook in addition to the main University Safety Handbook.

Mr David Evans is the School Safety Advisor. Every student is provided with the Safety Handbook and the module leaders also provide further safety advice relevant to each laboratory class. Every student is asked to sign a declaration stating that they have received the Undergraduate Safety Handbook together with the relevant safety information before beginning a laboratory module.

An undergraduate representative from physics or astrophysics will sit on the Lennard-Jones Workplace Safety Committee.

1.9 GENERAL INFORMATION

1.9.1 STUDENT RESOURCE ROOMS IN THE LENNARD-JONES BUILDING

Students may use the Resource Rooms for writing laboratory reports, completing lecture notes and for general reading. A number of PCs, each networked to the main University Computer, are also located in some rooms; you can access the Internet and email using these PCs, but please show consideration for other users and don’t spend excessive periods writing email. You must not eat or drink in these rooms, failure to comply with this rule will result in access being refused in the future. The resource rooms are sometimes used for staff meetings and tutorials which take precedence. In addition, Pool Rooms can be used when they are not allocated for teaching. If you wish to book a room for group learning activities please contact the School Office.
1.9.2 THE UNIVERSITY LIBRARY (INFORMATION SERVICES BUILDING)

The University Library retains copies of all recommended texts and many others, as well as research journals. The Nuffield Library has a short-term loan system. You should endeavour to attend one of the introductory tours of the Main Library provided at the beginning of the Autumn Semester. Copies of past examination papers are kept in the University Library and may be copied. (Past examination papers are also available on the physics web pages).

Find out more about our services from our website: http://www.keele.ac.uk/library/.

The Library Liaison Officer for Physics and for Astrophysics is Professor Coel Hellier. However, if you have any comments concerning the provision of materials in the University Library for your courses then you should direct these to your representative on the Staff-Student Liaison Committee so that the matter can be raised at a subsequent meeting.

1.9.3 IT SERVICES

IT Services are responsible for your IT systems and networks throughout the University. Their services include the wireless network, printing service, IT Suite and Labs, Laptop Loan and Laptop repair service. They provide help and advice using Keele systems such as the KLE, eVision, office software or Google Mail and Apps and advice when connecting to the wireless network (eduroam).

Remember when using Keele University IT systems that you are bound by the IT Conditions of Use, a link to which can be found on http://www.keele.ac.uk/it/. It is important that you familiarise yourself with these to ensure that you use the systems within the terms of the Acceptable Use Policy.

Keep yourself safe whilst online:-

- Make sure that before connecting to the network your antivirus, web browser and operating system are all up to date.
- Protect your personal information; secure your account by changing your password to something that is memorable but secure, a combination of capital and lowercase letters.
- Ensure that your online presence, particularly in social media, has the security set to a level you are comfortable with.
- If you receive an email or message that sounds too good to be true you are probably best deleting it. Do not give out personal information to a non-accredited website or link.

If in doubt about staying safe whilst online check with someone you can trust like IT Services.

The IT Service Desk is the first point of call for anything IT related. It is based in the campus Library and IT Services building and is open 7 days per week throughout the Semester. For further information regarding IT Services, or to report a problem or seek advice, please visit: http://www.keele.ac.uk/it/.
1.9.4 KEELE PHYSICS WEBSITE

http://www.keele.ac.uk/physics/

The website contains news and information regarding teaching and research within the School, including the Student Handbook, the Safety Handbook and module outlines.

1.9.5 THE TEACHING LABORATORIES

The main teaching laboratory (LJ1.17) is primarily used for level 1 and level 2 practical classes, together with some subsidiary and other teaching. It also incorporates a set of dark room facilities for optics work (LJ 1.72/73) and a computer laboratory (LJ 1.27), specifically for physics and astrophysics students to use in support of their laboratory work and other discipline specific computer-based learning activities. The projects laboratory is located in LJ0.35. General IT work and internet access should be undertaken in the Natural Sciences Faculty IT suite located on the ground floor (north) of the Lennard-Jones Building or in the central IT facilities within the library.

You will be given detailed instructions on how to work in the laboratories, including health and safety issues, at the start of your first session.

You should direct any problems you have in using the laboratories, including computer issues, to the technician responsible or the appropriate academic member of staff.

1.9.6 STUDENT NOTICE BOARDS

You should consult the undergraduate student notice boards for physics several times each week. These are located on the same level as the Chemistry Lab (LJ1.60), next to the submission boxes, on the right corridor as you come up the stairs from the foyer. Details about any changes to the delivery of your lectures and other classes together with information on any other urgent matters are posted there. These notice boards and the student e-mail system are the principal means of communication between yourself and the department.

1.9.7 HANDBOOK OF MATHEMATICS, PHYSICS AND ASTRONOMY DATA

The Department has prepared a handbook containing selected basic physical, astronomical and electronic data, together with much of the mathematical information that is used in Principal courses in the department. Additional copies of the handbook can be purchased from the staff in charge of laboratories.

**Most important note:** Students are not allowed to take written or printed materials into examinations and this includes their own copies of the handbook, unless the examination is clearly of the open-book variety. Physics data sheets are given out as part of all examinations and tests if appropriate.
1.9.8 DISABILITY AND DYSLEXIA SUPPORT

The Disability and Dyslexia Support services support and assist anyone with a disability, including specific learning difficulties, mental health and wellbeing issues and with physical and/or unseen disabilities.

http://www.keele.ac.uk/dds/

The Disability Officer for the Lennard Jones building is Mr Phil Callaghan: phone – 733853 or e-mail p.l.callaghan@keele.ac.uk

1.9.9 THE ACADEMIC YEAR

The University publishes the term and semester dates for each academic year well in advance and they are available on the Keele website at:

http://www.keele.ac.uk/ps/governance/universitydiary/

1.9.10 PERSONAL DEVELOPMENT PLANNING (PDP)

Personal Development Planning is a “structured and supported process undertaken by an individual to reflect upon their own learning, performance and / or achievement and to plan for their personal, educational and career development” (National PDP definition from QAA). The primary objective for PDP is to improve a person’s capacity to understand what and how they are learning, and to review, plan and take responsibility for their own learning. PDP is a procedure that helps you to get the most out of your student experience. It is a way of taking responsibility for your work and managing your activities at Keele in a way that will help you to succeed academically and personally as well as lay the foundations for your future career.

PDP is all about recording your achievements, identifying your strengths and weaknesses, and setting clear targets for the future. It is a continuous process of appraisal, reflection and planning. You have the opportunity to attend sessions, individual or group, with a university personal development tutor to discuss your personal development at regular intervals, but maintaining your personal development records and managing your learning is up to you.

How Does PDP Help?

PDP enables you:

- become a more effective, independent and confident self-directed learner;
- understand how you are learning and relate your learning to a wider context;
- improve your general skills for study and career management;
- articulate personal goals and evaluate progress towards your achievement;
- Record you involvement in activities outside of your core academic learning, such as societies, part-time work and volunteering.

How Does PDP Work?

PDP is based on you getting into the habit of thinking hard about what you are doing, what you are getting out of it, and what you should be aiming to achieve in the immediate future. As part of that you will keep a record of your activities, make notes on targets and achievements as you progress through your time at Keele, and have meetings with the university PDP tutors to discuss your personal development if you wish to.
To help you, the university provides you with IT support tool which gives you the opportunity to keep a record of your personal and academic achievements. You can make use of this tool by yourself or with the support of the PDP unit. The University also provide you with access by appointment to the university PDP tutors.

**Further Information**
For more information on personal development planning or to make an appointment with a university personal development tutor please contact the unit via email pdp@keele.ac.uk. You will also find information about contacting the PDP unit in locations such as the Students’ Union, departmental notice boards and other notice board/information areas.

To access the IT support tool for PDP go to [www.kusu.net](http://www.kusu.net) and follow the links to PDP (you must register on kusu.net to use this service).

**1.9.11 Distinctive Keele Curriculum (DKC)**

The DKC is the name given to the package of additional opportunities offered to students alongside their academic programmes. It provides you with an opportunity to design your individual student experience, in order to develop your knowledge, skills, attitudes and values and enhance your talents so you can make a difference to your world.

The DKC is made up of the ‘Development Strand’ (opportunities for personal and professional development), the ‘Distinctive Academic Programmes’ which you find at Keele, the ‘Co-curriculum’ (activities that take place outside of the academic programme of study, such as sports and societies) and the ‘graduate attributes’ (a list of 10 qualities Keele graduates are expected to develop). You can find more information on the DKC here: [http://www.keele.ac.uk/distinctive/](http://www.keele.ac.uk/distinctive/)

To get the most out of your studies, improve your performance and achieve your full potential there are a number of development opportunities available to you, including Development Strand workshops and activities. Some of these are embedded into your academic programmes whilst others can be found on the Tune IN events calendar at: [http://www.keele.ac.uk/curriculumsupportanddevelopment/tuneincalendar/](http://www.keele.ac.uk/curriculumsupportanddevelopment/tuneincalendar/)

You can reflect on your development in your Keele University Skills Portfolio (KUSP) with an option of gaining an Institute of Leadership and Management accreditation if you meet certain criteria. Full details are available at: [http://www.keele.ac.uk/curriculumsupportanddevelopment](http://www.keele.ac.uk/curriculumsupportanddevelopment)

**1.10 ABSENCE FROM CLASSES FOR MEDICAL REASONS**

A statement of university policy on absence for illness and other good cause can be found in the University **Regulation 10**:

[http://www.keele.ac.uk/regulations/regulation10/](http://www.keele.ac.uk/regulations/regulation10/)

- **LEAVE OF ABSENCE**

If you feel you need a break from your course it is possible to take a period of leave of absence. A leave of absence would normally be for either a semester or a year. You
would need to have a reason for taking this break; reasons the University will consider when granting a leave of absence include maternity, personal problems including bereavement, financial difficulties, work placement or to change course.

It is important to speak to your Personal Tutor or another member of staff in your School(s) about taking a leave of absence, as taking a break can affect your funding, and, if you are an international student, your visa and right to remain in the UK. Further information about leave of absence can be found here:

http://www.keele.ac.uk/ssds/changeofcircumstances/takingaleaveofabsence/

Physics and Astrophysics students are asked to observe the following procedures:

- **TELEPHONE THE SCHOOL OFFICE** (01782 733527)
  
  You must contact the School Office to inform us of your absence and the day of your likely return. You must also telephone the School Office again if you are away longer than you initially expected. This information will be relayed to your Year Tutor.

- **SELF CERTIFICATION CERTIFICATES**
  
  You must go directly to the School Office on your first day back and obtain a Student Sickness Self-Certification form (see Appendix 5 of this Handbook and the University Regulations Handbook) from the Physics Secretary. You must complete the form and return it immediately to the Secretary.

  **YOU MUST OBTAIN A NOTE FROM YOUR OWN G.P. OR A REPORT FROM THE UNIVERSITY MEDICAL OFFICER IF YOU ARE ABSENT FOR MORE THAN SEVEN DAYS OR ARE PERSISTANTLY ABSENT FOR SHORT PERIODS.**

### 1.11 ACADEMIC MISCONDUCT

Academic Misconduct refers to a number of situations where you might attempt to gain an advantage for yourself and/or another student by doing something that goes against University Regulations. This could refer to your conduct during assessments, coursework, and exams. The University takes any breach of the regulations seriously, and in a minority of cases students are required to withdraw from Keele. It is important that you understand the University’s guidelines and you should speak with your Personal Tutor if you have any queries.

It is important that students are familiar with the exam regulations. If you don’t abide by the regulations, you may be given a penalty, which could impact on your marks and your degree classification. The exam regulations concern all aspects of cheating in exams, including: taking unauthorised notes into exam halls; using unauthorised calculators and other equipment; talking during exams; using a mobile phone or other communication device during exams.
1.11.1 PLAGIARISM, COLLUSION AND ACADEMIC DISHONESTY

A statement of university policy on plagiarism can be found in the University Regulations Handbook at:

http://www.keele.ac.uk/regulations/regulation8/

Please see Appendix 3 for Guidance on how to avoid Plagiarism.

1.11.2 ACADEMIC WARNINGS

A statement of university procedures for issuing academic warnings can be found at:

http://www.keele.ac.uk/paa/academicwarnings/

It is essential that you attend all lectures, tutorials, problem classes, laboratory classes, year tutor meetings and personal tutor meetings, and meet all course submission deadlines in order to progress successfully through your degree programme. Attendance will be monitored throughout the academic year. It is the responsibility of students to sign the attendance register at classes. Students will be recorded as absent without good cause if they do not sign the register and be required to explain any absences. In the event of unsatisfactory attendance or non-submission of coursework students will receive formal warnings which may lead to the requirement to be withdrawn from the University.

In the event of unsatisfactory attendance and/or coursework the following procedures will be set in motion.

At the first indication of an unsatisfactory performance by a student – for example missing a class or non-submission of work - there will be an informal discussion between the student and the student’s Academic Tutor. If a further class is missed there will be an interview with the Year Tutor with the option of issuing an informal warning to the student. An account of the interview, signed by the student and Year Tutor, will be kept in the student’s record. A student who has received an informal warning will be monitored for compliance over a period of up to 2 weeks.

If the student fails to comply with the conditions of the informal verbal warning or misses a further class the case will be referred to the DUS who may decide to issue a first formal warning, and the student will be monitored for a period of 2 weeks. The DUS will report all such cases to the teaching committee. If the student fails to comply with the written warning during this period, he/she may be given a second formal warning.

If there is only partial compliance with the second formal warning after the 2 weeks have expired, the case will be considered by the DUS and the teaching committee who will decide whether a formal warning under University regulations should be given to the student or whether no further action is taken.

If after 2 weeks the student has not complied/does not comply with the second formal warning then a final formal university warning will be issued by PAA. If a student does not comply with the final formal warning issued by PAA, matter is referred to the PAA and a requirement for the student to withdraw from the University may result.

A diagrammatic representation of the timescale for the issue of academic warnings appears overleaf.
### PHYSICS ACADEMIC WARNING PROCEDURE

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student has an unsatisfactory attendance record and/or non-submission of coursework (e.g. failed to attend without good cause a minimum of 3 consecutive monitored events or missed 3 cumulative monitored events within a 2 week period).</td>
<td>First Informal Warning and/or Meeting with Course Director/Year Tutor</td>
</tr>
<tr>
<td>Student’s attendance record and/or submission of coursework do not improve within 2 weeks of warning (e.g. accumulates subsequent absences without good cause).</td>
<td>Second Informal Warning</td>
</tr>
<tr>
<td>Student’s attendance record and/or submission of coursework do not improve within 2 weeks of second informal warning.</td>
<td>First Formal Warning</td>
</tr>
<tr>
<td>Student’s attendance record and/or submission of coursework do not improve within 2 weeks of first formal warning.</td>
<td>Second Formal Warning</td>
</tr>
<tr>
<td>Full Compliance with Formal Warning</td>
<td>No Further Action</td>
</tr>
<tr>
<td>Partial Compliance with Formal Warning</td>
<td>Course Director to Consider Case</td>
</tr>
<tr>
<td>Non-Compliance with Formal Warning</td>
<td>Request Final Formal Warning by PAA</td>
</tr>
<tr>
<td>No improvement in attendance or submission of coursework.</td>
<td>Inform PAA – Student to be Withdrawn</td>
</tr>
</tbody>
</table>
SECTION 2 (FHEQ LEVEL 5)

2.1 COURSE STRUCTURES

During the induction period you will confirm your degree and study programme for the year ahead. Some limited flexibility is possible for transfer between principal courses in physics and astrophysics, right up until the start of semester 2 of the second year. There is no distinction between dual and major physics, until FHEQ Level 6.

Degrees incorporating 60 credits (Principal Physics or Astrophysics) at FHEQ Level 5:

Degrees based on Principal Physics or Astrophysics at FHEQ Level 5:

Dual Honours Physics

Dual Honours Astrophysics

For these two routes you will study a second principal subject in parallel to complete your dual honour programme.

This handbook is concerned with your study programme at FHEQ Level 5. For details of the study programmes at other levels of the courses, you are referred to the University Module Catalogue at:

http://www.keele.ac.uk/recordsandexams/

2.2 PRINCIPAL PHYSICS AND PRINCIPAL ASTROPHYSICS COURSE STRUCTURES

You will study FOUR lecture-based modules of core physics or astrophysics. Note that modules are valued at 15 credits at level 2.

Principal Physics (FHEQ Level 5)

<table>
<thead>
<tr>
<th>AUTUMN SEMESTER</th>
<th>SPRING SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY-20006 Quantum Mechanics</td>
<td>PHY-20026 Statistical Mechanics and Solid State</td>
</tr>
<tr>
<td>PHY-20027 Optics and Thermodynamics</td>
<td>PHY-20009 Nuclear and Particle Physics</td>
</tr>
</tbody>
</table>
Practical Astrophysics (FHEQ Level 5)

<table>
<thead>
<tr>
<th>AUTUMN SEMESTER</th>
<th>SPRING SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY-20006</td>
<td>PHY-20026</td>
</tr>
<tr>
<td>Quantum Mechanics</td>
<td>Statistical Mechanics and Solid State</td>
</tr>
<tr>
<td>PHY-20027</td>
<td>PHY-20002</td>
</tr>
<tr>
<td>Optics and Thermodynamics</td>
<td>Stellar Astrophysics</td>
</tr>
</tbody>
</table>

The lecture-based modules are supported by problem classes and assessed problem sheets with an end of semester examination in each. The module descriptors provide detailed synopses of each module with suggested study reading and are available on the website. There are lectures and problem classes in further mathematical techniques associated with module PHY-20006 which will run in semester 1. The laboratory sessions in semester 1 associated with PHY-20027. All the laboratory work in semester 2 is assigned equally to modules PHY-20026 and PHY-20009 or PHY-20002. Physics students and Astrophysics students carry out different programmes of laboratory work in semester 2. There is clearly significant overlap between modules studied in these two routes: they are essentially common during the first semester with divergence of laboratory work and modules PHY-20009, PHY-20002 in the second semester. These are, however, time-tabled in parallel.

2.3 LABORATORY WORK AND MATHEMATICS AT FHEQ LEVEL 5

You will undertake laboratory, project work and further mathematics tuition throughout the year on both principal routes. However, this is not structured as a separate module. Rather, the assessment marks you achieve for practical work and mathematics contribute to some of the lecture-based modules you take at FHEQ Level 5.

**Autumn Semester:** All principal students take a programme of laboratory work, mainly in optics. This takes place over ten weeks of the semester and is credited to PHY-20027. You will also study mathematical techniques for at least nine weeks and the assessment in mathematics is credited to PHY-20006.

**Spring Semester:** There are separate programmes of laboratory work for the two principal subjects. Physics students undertake practical work based on the theme of instrumentation and measurement culminating in a short team project. Astrophysics and Physics with Astrophysics students study astrophysical methods via short exercises and projects including understanding observations, data reduction and analysis leading to measurement of specific properties of astronomical objects as well as the use of Internet resources as a research tool. These are assigned equally to PHY-20026 and PHY-20002/PHY-20009.
2.4 TEACHING METHODS AND TIMETABLES

2.4.1 LECTURES AND LABORATORIES

We expect you to attend all lectures, laboratory classes and tutorials; your attendance will be monitored and actions taken should you be absent.

Core physics and astrophysics modules taken by all students have two lectures per week, supported by a tutorial each week.

All students will attend one of the two scheduled problem classes per; you will be told the class to which you have been assigned.

All students will attend scheduled laboratory classes per.

2.4.2 DISCIPLINE AND CONDUCT

All students are expected to behave in a reasonable and responsible manner when in classes within the school. Disruptive behaviour, of any kind, will not be tolerated and in addition, students are expected to observe a rule of silence during lectures. Mobile phones and other electronic devices (i.e Laptops, mp3 players) should be switched off during all classes.

Any unreasonable behaviour will be dealt with immediately under the University’s regulations on discipline and conduct which can be found at:

http://www.keele.ac.uk/regulations/regulation20/
2.5 ASSESSMENT

The regulations governing your assessment and the procedures by which your degree classification is determined are to be found in the University Regulations Handbook at:

http://www.keele.ac.uk/paa/academicadministration/assessment/

and

http://www.keele.ac.uk/paa/academicadministration/degreeclassification/

A statement of university assessment procedures, and procedures when students fail assessments, can be found in the University Regulations Handbook at:

http://www.keele.ac.uk/regulations/regulation1aafter0910/

Assessment is part of your learning process in that the feedback you get through the return of marked work by the tutor, aids your understanding of the topics. It is also of course the means by which your tutors and the university determine what you have achieved during your programme of study at Keele. We use many different methods of assessment on the physics and astrophysics modules.

The University’s Assessment Criteria can be found at:

http://www.keele.ac.uk/paa/academicadministration/assessment

Extenuating Circumstances (ECs):

If your personal circumstances are affecting your studies then you should speak with your Personal Tutor or School as soon as possible to see if any arrangements can be made. If it is deemed necessary then you may have to submit a claim for extenuating circumstances.

It is in your best interests to speak with someone as quickly as possible, and certainly before any assessment deadline or exam. If you leave it too late then it may be more difficult to give you the necessary help. You should also not wait until you receive your end of year results and then decide to ask for extenuating circumstances to be taken into account as this will not be allowed.

Detailed information on extenuating circumstances criteria, the claims process and evidence requirements can be found in the “Extenuating Circumstances Guide to Students” which can be downloaded from: http://www.keele.ac.uk/ec/

Assessment Attempts

What happens if I fail a module?

If you fail a core module within your programme, you will be allowed one re-assessment opportunity which would normally have to be completed before the start of the next academic year. You will also be allowed to progress to the next level of study even if you
fail one 15 credit module as long as your mark for this module, following re-assessment, is at least 30% and not a qualified fail.

If you fail an elective module, you will also be allowed one re-assessment opportunity and after that, if necessary due to a failed re-assessment, one opportunity to retake a different elective module the following academic year.

For more information on re-assessment of failed modules, see the University’s Regulation 1A 11 and 12. For more information on re-assessment of failed modules, see the University’s Regulations 1A 11 and 12.

A summary of each module and its assessment pattern is given below. This gives the breakdown of assessment methods contributing to each module together with the weighting of each.

<table>
<thead>
<tr>
<th>Module</th>
<th>Semester</th>
<th>Exam</th>
<th>Problem Sheets</th>
<th>Problem Classes</th>
<th>Maths</th>
<th>Laboratory Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY-20006</td>
<td>1</td>
<td>60%</td>
<td>20%</td>
<td>10%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>PHY-20027</td>
<td>1</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>PHY-20026</td>
<td>2</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>PHY-20009</td>
<td>2</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>PHY-20002</td>
<td>2</td>
<td>60%</td>
<td>10%</td>
<td>10%</td>
<td>20%</td>
<td></td>
</tr>
</tbody>
</table>

The pass mark for a module is 40% overall. However where a module is assessed via various individual components of assessment e.g. an examination and problem sheets, you will normally be required to achieve a minimum mark of 30% in each component (the minimum mark for the laboratory component is 40%), as well as the overall module mark of 40% in order to pass the module.

Failed modules will require reassessment. Reassessment will depend on the module concerned but for the core theory modules a referred examination will normally be set together with any other appropriate work if needed. The re-examination of Autumn Semester modules is held in June and any required written work must also be submitted by a specified date. Spring Semester re-examinations take place in late August. The maximum mark you can achieve for a reassessed module is 40%.

You are referred to the University Academic Regulations for further details on the reassessment regulations (section 2.6).

2.5.1 EXAMINATIONS

All examinations are 2 hour unseen papers. The structure of each paper is detailed in the module descriptor for that module. Examinations for autumn semester modules are taken at the beginning of January while those for spring semester modules are taken in May.

Please visit http://www.keele.ac.uk/recordsandexams/examinations/ for further information relating to exams at Keele, including exam dates and timetables, and an FAQ section.
• **Use of Calculators in Exams**

The University has an approved list of calculators that can be used in examinations. These are:

- Aurora SC582 series
- Casio FX-83 series
- Casio FX-85 series
- Casio FX-350 series
- Sharp EL-531 series
- Texas Instruments TI30 series

The KeeleSU Shop will have a stock of the approved calculators available for purchase.

Any student who brings a non-approved calculator into an exam will have it removed by an exam invigilator.

**2.5.2 PROBLEM SHEETS**

Problem solving skills are developed by applying the principles and techniques, learned in lectures, to a range of applications with physics or astrophysics. This is achieved by working through the problem sheets set by each lecturer and submitting them for marking. The physics may be discussed during the weekly tutorial sessions but help on specific problems set by the lecturer, should not be sought.

The problem sheets will be handed out by the lecturer and the completed solutions should be returned to the problems boxes in the corridor near the laboratories. **You MUST submit an Assessed Coursework Submission (ACS) form with each piece of work for assessment.** The sheets will be marked and returned within two weeks at the most. These marks will contribute to your module mark. **Details on this process are given in section 2.6.**

Problem sheets and other course-work will be handed out and deadlines set according to the following table:

<table>
<thead>
<tr>
<th>FHEQ Level 5 Problems Sheet Schedule 2015-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester</td>
</tr>
<tr>
<td>Autumn</td>
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<td></td>
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<td></td>
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<td>Spring</td>
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</tbody>
</table>

**Note**
The above is a guide only and may vary, reference the Module Tutor.
2.5.3 LABORATORY ASSESSMENT

For your laboratory work you will need a hard-backed laboratory notebook. This is normally kept in the laboratory and marked following each practical session. You will also be required to submit laboratory reports according to the schedule issued by the tutor:

In semester 1, you will submit one laboratory report by the Monday of week 8 and the second report by the Monday of week 12.

In semester 2, assessment comprises of continuous assessment and lab reports are submitted by week 12.

You will be given full instructions on the use of laboratory notebooks and the writing of laboratory reports by the tutor responsible for your practical class.

2.5.4 PROBLEM CLASSES

The problem classes are designed to give you the opportunity to learn by applying your knowledge to physics problems and to practice exam questions.

The problem classes cover topics from a range of modules during the semester. In general, each problem class will cover topics from one module (see the year timetables). Engagement with the problem classes counts for 10% of your marks for each of the modules covered.

- There is one maths tutorial every week.
- There are two problem classes held every week, you are required to attend one of them each week. (AS DETAILED IN YOUR TIMETABLE)
- You will be given a different worksheet every week to work through. You can work by yourself or in small groups. Ask for help from the demonstrators if you need it.
- The worksheets will have two types of questions on them:
  - Standard questions covering material essential to pass the module.
  - Advanced questions, some requiring an understanding at a first-class level.
- Please bring your lecture notes or handouts (or any other relevant material as indicated by the lecturer in charge of the modules), calculator and textbook (if you have one) to every problem class.
- **Make sure you have your work signed-off by one of the demonstrators before you leave the problem class.** Demonstrators will not sign-off work until the problem class has been running for at least 1.5 hours. The problem class will run for 2 hours in total.
- You **MUST** attend a 1 hour maths tutorial each week (groups to be assigned).
- Keep your work from every problem class and maths tutorial. The signed-off work is your record that you did engage with the problem class and will be useful for reVision for the examination.
- You can obtain a copy of the model answers for the worksheet from the demonstrators once you have had your worked signed-off or at the end of the problem class.
- The demonstrators will be given the following guidance to help them determine which students have engaged with the problem class.
Has the student used the problem class effectively to learn about the subject of the worksheet?

Did the student arrive on-time for the class?

Did the student appear to be working for most of the time?

Has the student produced some written work that will help them prepare for the exam?

Has the student completed most of the worksheet?

**OR**

Has the student made a genuine effort to complete the worksheet?

- The marks for engagement with the problem classes/maths tutorials will be assigned as follows and will count for 10% of the marks for every module covered during the problem classes/maths tutorials.
  - Signed-off or absent with good cause for 9 or more of the 11 problem classes/maths tutorials - **100% PASS**
  - Signed-off or absent with good cause for 8 of the 11 problem classes/maths tutorials - **50% PASS**
  - Signed off or absent with good cause for 7 or fewer of the 11 problem classes/maths tutorials - **0% FAIL**

- If you miss a problem class or maths tutorials for medical reasons or with some other good cause, you should:
  - Complete a self-certification form as normal for any absence.
  - Obtain the worksheet and model answers for your reVision.
  - Contact your year tutor to explain why you were absent. You can do this in person by e-mail or via the general office.

If you have good cause for missing the problem class it will count towards your total of signed-off problem classes and maths tutorials.

### 2.5.5 EXTERNAL EXAMINERS

External Examiners are experienced academics from other institutions or professional practitioners with significant expertise in their field. Their role is to provide an independent assessment that appropriate standards are maintained in Keele’s academic awards in comparison with other universities in the UK.

Their duties involve approving examination papers, checking that marking has been carried out consistently and within the regulations, advising on changes to programme content and writing an annual report. Schools share the reports with students, usually in SSLC meetings, and you can find the latest reports, along with a response from the School, here: [http://www.keele.ac.uk/qa/externalexaminers/reportsandresponses/](http://www.keele.ac.uk/qa/externalexaminers/reportsandresponses/). NB: you must not contact external examiners directly as they have no remit in relation to individual students.

For the academic year 2015 – 2016 the External Examiners are:

**Physics:** Professor Mike Bentley, York University

**Astrophysics:** Dr Graham Wynn, Leicester University
2.6 SUBMISSION OF ASSESSED COURSEWORK

The procedures for submission of assessed coursework are explained in detail below. These procedures are designed to ensure that the School maintains a complete record of your academic progress. For all assessed coursework you have to complete an ASSESSED COURSEWORK SUBMISSION FORM (ACS FORM) (Appendix 2) that you staple to the front of your work prior to submission.

2.6.1 GENERAL INSTRUCTIONS

- AN ASSESSED COURSEWORK SUBMISSION (ACS) FORM MUST BE ATTACHED TO ALL ASSESSED COURSEWORK PRIOR TO SUBMISSION.
- THE FHEQ LEVEL 5 ACS FORM IS BLUE.
- ANY WORK THAT IS SUBMITTED WITHOUT AN ACS FORM ATTACHED WILL NOT BE MARKED.
- ANSWERS TO DIFFERENT MODULES MUST BE KEPT SEPARATE
- All coursework with an attached ACS form must be deposited in the one of the Physics/ Astrophysics MAILBOXES situated in front of the notice boards in the corridor outside the Teaching Laboratories.
- ACS forms and a hole punch and treasury tags are located next to the MAILBOXES.
- The MAILBOXES are emptied on a daily basis by one of the Teaching Laboratory technicians.

2.6.2 PROBLEM SHEETS AND LABORATORY REPORTS

- Attach a completed ACS form to your work and deposit it in the MAILBOX.
- The Physics/Astrophysics Undergraduate Administrator collects your work; each answer is stamped with the date and distributed to the staff markers. The undergraduate administrator files the completed ACS form in your individual record folder.
- Your work is returned to you during the tutorials, lectures or the laboratory class or from the school office.

2.6.3 SUBMISSION DEADLINES

- Submission deadlines for problems sheets and laboratory reports are given in sections 2.72/ 2.73 of this handbook.
- All problem sheets must be submitted by the deadline. This is to enable lecturers to give rapid feedback and model answers for the problem sheets.
- This applies to all problem sheets on all modules, but does not apply to lab reports, project reports and dissertations.
- If, for good cause, you cannot submit a problem sheet on time, you should submit an extenuating circumstances form, as usual. For more information about extenuating circumstances, please see http://www.keele.ac.uk/regulations/regulation8/guidanceonextenuatingcircumstancesregulation815/) The exam board can take this into account, and can, for example, give you an alternative problem sheet, or use the percentage mark from the other problem sheets.
2.6.4 GRANTING OF EXTENSIONS FOR LAB REPORTS, PROJECT REPORTS AND DISSERTATIONS

- An extension to the published deadline for submission will only be granted to an individual student under circumstances that constitute good cause.
- **Only your Year Tutor or, exceptionally, the Director of Studies has the authority to grant individual extensions.**
- Any request for an individual extension must be directed to your Year Tutor **PRIOR to the published deadline unless there are mitigating circumstances.**
- In the event that an individual extension is granted, you must ensure that your year tutor completes the relevant section of the ACS form. If the Year Tutor has not signed the ACS form then a late work penalty will be applied.
- If you have a learning difficulty, please discuss with your Year Tutor if you require an extension.

2.6.5 RETURN OF MARKED COURSEWORK

In accordance with the University's good practice, marked work should be returned to you **WITHIN TWO WEEKS** of the submission date, and certainly **NOT MORE THAN FOUR WEEKS**. If this is not the case then please inform your Year Tutor or the Director of Undergraduate Studies immediately. The School may retain a copy of your work for Quality Assurance purposes.

2.6.6 PUBLICATION OF RESULTS

Module marks, including a breakdown of marks for the examination, laboratory work and required coursework, can be accessed via e-Vision.

2.6.7 PROGRESSION

The guidelines used by Examination Boards can be found here. Please speak to staff, such as your Personal Tutor if you need help understanding the information.

*University Level 5 Progression Guidelines (UG Year 2)*
2.7 EVALUATION OF TEACHING

2.7.1 MODULE QUESTIONNAIRE FORMS

Your views concerning the content, delivery and general organisation of individual modules will be sought through printed module questionnaire forms to be completed at the end of each semester. The questionnaires are anonymous and you will be given plenty of time to complete them. The responses to the questionnaires are computer analysed to generate scores for different aspect of the student experience and summary reports, including specific comments by students, are prepared and discussed at a meeting of the Physics and Astrophysics Teaching Committee. This forms an important part of our annual review of teaching in Physics.

2.7.2 PEER OBSERVATION OF TEACHING

The School operates a system of peer observation of teaching. Thus from time to time, a second member of the teaching staff will be present in your lecture, tutorial or laboratory class as an observer. The observer provides feedback to the lecturer, to enable continuing professional development and the dissemination of best practice. The Director of Undergraduate Studies oversees the peer review process for Physics.
APPENDIX 1: STUDENT COMPLAINT FORM – PHYSICS/ ASTROPHYSICS

STUDENT COMPLAINT FORM – PHYSICS/ ASTROPHYSICS

PLEASE COMPLETE THIS FORM. IT MAY BE USED FOR REFERENCE SHOULD AN INTERVIEW WITH A MEMBER OF STAFF BE NECESSARY.

Name: __________________________________________________________________________

First Name  Initials  Last/Family Name

Physics/ Astrophysics (delete as appropriate)

Second Subject (if dual honours): ______________________________________________________________________

SPECIFIC ITEMS THAT YOU WISH TO COMPLAIN ABOUT:

COMMENTS BY INTERVIEWER:

DATE AND TIME OF INTERVIEW ________________________________

SIGNED: Student ______________  Interviewer: ____________________
APPENDIX 2: ASSESSED COURSEWORK SUBMISSION (ACS) FORM

Students must complete all relevant sections of the form, attach it to each separate piece of work and place it in the appropriate mailbox in the teaching laboratory corridor before the submission deadline.

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School of Physical & Geographical Sciences

PHYSICS/ASTROPHYSICS COURSEWORK SUBMISSION FORM

In order for the written work to be accepted both sections of this cover sheet must be completed and signed by the student.

STUDENT NAME.............................................................. STUDENT NUMBER..............................................

MODULE - PLEASE TICK/CIRCLE BELOW (as applicable)

<table>
<thead>
<tr>
<th>AUTUMN SEMESTER</th>
<th>SPRING SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY-20006 Quantum Mechanics</td>
<td>PHY-20027 Optics &amp; Thermodynamics</td>
</tr>
<tr>
<td>PHY-20002 Stellar Astrophysics</td>
<td>PHY-20009 Nuclear &amp; Particle Physics</td>
</tr>
<tr>
<td>PHY-20026 Statistical Mechanics &amp; Solid State</td>
<td></td>
</tr>
</tbody>
</table>

DEADLINE FOR SUBMISSION................................................. DATE SUBMITTED............................

---

I certify:
A. That the above dissertation, project or lab report or other piece of submitted work is my own account, based on work actually carried out by me and that all sources of material not resulting from my own experimentation, observation or specimen collecting, including observational data, have been clearly indicated.
B. That no part of the work incorporated in the above dissertation, project or lab report or other piece of submitted work is a quotation from published or unpublished sources, except where this has been clearly acknowledged as such and that any specific direction or advice received is also properly acknowledged.
C. That I have read understood and abided by terms of University Academic Regulation 8. Conduct with regard to Dissertations, Projects, Essays, etc.

STUDENT SIGNATURE..................................................................

EXTENSIONS FOR LAB REPORTS, PROJECTS AND DISSERTATIONS

Individuals with good cause for an extension to the published submission deadline must discuss their problem with their YEAR TUTOR or, exceptionally, with the DIRECTOR OF UNDERGRADUATE STUDIES who, if they agree to an extension must complete the relevant section below. ONLY these individuals may consider authorising extensions. It is the student’s responsibility to ensure this form is completed before the original deadline expires.

If you have a disability please discuss with your year tutor if an extension is required.

NEW SUBMISSION DEADLINE.................................................................

Brief reason for extension..............................................................................................................................

STAFF SIGNATURE...................................................................................

Work (Except lab reports, projects and dissertations) submitted after the published deadline will not be marked, you will receive no credit and the work will be awarded a mark of 0.
APPENDIX 3: GUIDANCE ON AVOIDING PLAGIARISM


Plagiarism is defined as "the act of stealing the words, ideas, etc. of another and using them as one’s own". This is a serious academic offence and is covered by the University Ordinance IV. and the University Regulations Handbook at: http://www.keele.ac.uk/regulations/regulation8/

It is implicitly assumed that all written work submitted for assessment is the individual work of the student submitting it. This important principle applies to all coursework, for example, solutions to problems sheets, laboratory reports, essays, interim and final project reports, dissertations, and posters. It makes no difference whether the work is handwritten or printed or submitted electronically. A student who includes in their submitted work another person’s work as if it is their own is guilty of plagiarism. The University, as do all Universities, treats plagiarism as CHEATING.

It should be very clearly understood that direct copying of one student’s work by another student (one of the more blatant examples of plagiarism) is completely unacceptable and both parties will be subject to penalty or even to disciplinary action.

However, it is also true that some instances of plagiarism are unintended examples of poor practice in which the students concerned have no intention to cheat but do not realise the extent to which sources must be declared and do not know the appropriate forms such declarations may take. Such situations can arise in the context of assigned problems where the underlying Chemistry has been discussed with other students, laboratory reports where pairs or groups of students have worked together in the laboratory in collecting data, in reports and presentations on team projects, and in laboratory and project work in which the student has been supervised by academic staff. The following guidelines are intended to illustrate the kind of acknowledgements that may be required in written coursework. More detailed guidance is given to third and fourth year students in the context of project reports.

This section should be read in conjunction with Section 3-7 of the University’s Student Handbook 2000-2001 on Plagiarism and Academic Dishonesty.

ACKNOWLEDGEMENT OF SOURCES AND AVOIDANCE OF PLAGIARISM

THE GOLDEN RULE IS THAT AUTHORS MUST ACKNOWLEDGE ALL SOURCES AND INPUTS TO THEIR WORK. THIS RULE IS BOTH A MATTER OF GOOD PROFESSIONAL PRACTICE AND OF FAIRNESS IN THE CONTEXT OF AN ASSESSED PIECE OF ACADEMIC WORK.

Sir Isaac Newton wrote, ‘If I have seen further it is by standing on the shoulders of giants’ [1]. So, even great scientists rely on the work of predecessor and contemporary scientists.
The full disclosure of sources is a positive attribute in scientific writing because it demonstrates knowledge of the context, and because the selection, use and presentation of appropriate theory and data is itself a creative process. Above all, the proper use of sources and references is helpful to the reader of the work and is an important aspect of good working relationships with professional colleagues.

Sadly, there are known cases of scientists who have plagiarised the work of others or who have "invented" data; where the discovery occurred after they had become famous, their reputation suffered grievously. Scientific plagiarism is viewed as deeply unfair and unprofessional.

Plagiarism is often unintended, and some care and judgement must be exercised. Matters which require citation are anything (text, data or illustrations) reproduced directly as the originator will own the copyright in this, ideas or analyses that are being followed or modified, and anything which inspires or supports or contradicts the work being reported. If in doubt, the author should err on the side of caution and cite the source. The relationship between the student’s work and the cited source is indicated by the words used to cite the source; "reproduced from", “following”, “from”, etc., all give a different sense.

Reference 2 lists some types of plagiarism. These are reproduced below in (italics) and advice on how to proceed is given in each case.

1. Use of data, even if adapted in presentation, from a source that is not acknowledged.

   This might occur if data, a table or graph or best-fit expression, found in the literature, is being used. The source must be given, usually by including the source in the list of references and by citing the reference at the point of use in the text. If there are only one or two sources of data, and there are no other references (an unlikely scenario!), the source could be given in the text or a footnote could be used.

   This case is applicable to a laboratory report being written on an experiment carried out jointly. Reference should be made to the person or people who made the measurements, even if the author participated. For example: Table 4: Variation of diode voltage drop with temperature (measurements made by Amanda N Other and the author, 21st February 2002).

2. Repeating another person’s particularly apt phrase without acknowledgement.

   Generally, we do not need to acknowledge the originator of the name ‘electron’ (by the physicist G. Johnstone Stoney in 1891), or the term ‘black hole’ (coined by John Wheeler, Princeton Physicist in 1967) for example, because they have become universally adopted as part of the language of science. However, more recent or less well known coined terms or apt phrases might well require acknowledgement. Staff will be able to advise on these matters.
3. Repeating as your own someone else’s sentences, more or less verbatim and/or Paraphrasing another person’s argument as if it were your own.

The area of greatest danger is in the quotation or paraphrasing of an appropriate text from the work of another student or scientist. An example follows. Suppose that in a dissertation, a student wishes to include a review of time-reversal symmetry including the violation of time-reversal symmetry by kaon decay, and to make use of an explanation given by P. C. W. Davis (reference 3). One option is to quote the original text verbatim (i.e. word for word, exactly, with the authors punctuation, spelling and emphases, and in quotation marks) and to cite the source, as below:

Davis [3] offers the following explanation, “A possible way to think about how the kaon violates T symmetry is this. The $K_1$ and $K_2$ states arise, as I have explained, as a sort of hybrid or mixture of kaon and antikaon. Envisage the particle rapidly flipping back and forth in identity: kaon – antikaon –kaon –antikaon … One can ask whether these flips are perfectly symmetric – i.e. whether the rate of going from kaon to antikaon is exactly the same as the rate of going from antikaon to kaon. If not, the hybrid entity might linger longer as a kaon than an antikaon, or vice versa. Everyone assumed that, as the laws that induce kaon-antikaon flips should be exactly symmetric in time, nature ought not distinguish one process from its inverse, and the two rates should match precisely. But there is a tendency for the kaon to spend more time as a $\bar{K}_o$ than as a $K^o$.”

“This unexpected behaviour implies that the kaon possesses an intrinsic sense of “past-future”. Although the effect is tiny, it is deeply significant, and deeply mysterious – hence, the wild speculation by Russell Stannard to explain it in terms of the kaon popping off to visit a time-reversed parallel universe”. (Reference 3)

However, it may be necessary to paraphrase this text in order to extract the essential meaning, to use the minimum number of words, and to make the dissertation read smoothly. An example of an acknowledged paraphrase is given below:

“Davis (reference 3) has explained that the kaon possesses an intrinsic sense of the direction of time, tiny but significant, because the two states of the kaon arise as a hybrid of kaon and antikaon. The hybrid can be thought of as a rapid flipping back and forth in identity: kaon – antikaon –kaon –antikaon … , but there is a tendency for the kaon to spend more time as a $\bar{K}_o$ than as a $K^o$.”

The foregoing example is acceptable because the source of the line of thought and key phrases has been cited. It would be not be acceptable for the author of the dissertation simply to write without attribution the following:

The kaon possesses an intrinsic sense of the direction of time, tiny but significant, because the two states of the kaon arise as a hybrid of kaon and antikaon. The hybrid can be thought of as a rapid flipping back and forth in identity: kaon – antikaon –kaon –antikaon .. , but there is a tendency for the kaon to spend more time as a $\bar{K}_o$ than as a $K^o$ .”

because the line of thought and phraseology of another author is being reproduced without acknowledgement of the source. Implicitly, the author of the dissertation is
pretending that this discussion is his or her own, when it is not. Such a deceit is plagiarism and academically dishonest.

Some books and papers are published free of copyright. However, the copyright-free status of a source does not remove the obligation to cite the source if material from it is used.

The copyright status (and accuracy!) of material available on the Internet or World Wide Web is often uncertain. Even if material that is quoted or used is in the public domain, the source must be cited, as URL and date of access.

In team activities, a student may wish to include, either directly or in redrawn or re-written form, diagrams, etc., prepared wholly or in part by other students. This is acceptable provided that the sources are acknowledged in the references.

4. Presenting another person’s line of thinking in the development of an idea as though it is your own.

This case includes situations where a student has engaged in a discussion of questions from assigned problems sheets prior to sitting down and doing them, where students have discussed the interpretation of data from an experiment with students or staff and an approach has been suggested. The source and the nature of the suggestion should be cited. For example: The author is grateful to Dr J. Cobbleigh (Widdicombe University) for drawing her attention to the explanation of this phenomenon given by Marks and Spencer (reference 4).

In team project work, as in ordinary pair-worked laboratory experiments, some shared interpretations, as well as data, graphs, theory, etc., may be needed in a student’s individual report. This does not remove the obligation to acknowledge the inputs of others. For example: Figure 2: The data of Table 4 together with a least-squares best-fit line (computation carried out by Amanda N. Other, 22nd February 2002).

Unintended plagiarism often occurs in student work in connection with diagrams and illustrations. It should be noted that the author or publisher of text, a tabulation, a photograph or a piece of artwork owns the copyright in this as well as having a moral right to be identified as the originator. Some examples:

A photograph is taken especially for the work concerned. The caption should name the photographer (even if it is the author of the report or dissertation) and give the date.

A diagram is photocopied and cut-and-pasted into the report. The caption should include the words ‘reproduced from reference ‘x’ or ‘reproduced with permission from reference x’. Note that, in the case of a document intended for publication, permission for reproduction would be required from the owner of the copyright.

A diagram from a book or other work is re-drawn or adapted by the author. In this case the words ‘after reference <x>’ or ‘adapted from reference <x>’ or similar in the citation would be an appropriate acknowledgement.

A derivation, argument or description is adapted from, or summarised from, or extended from another work (a book, paper, or even a note from the supervisor). In
such as a case, the citation should include the phrase ‘adapted from reference <x>’, ‘summarised from reference <x>’, ‘based upon the approach of reference <x>’, as is appropriate.

Finally, if more than one or two sources have been cited, a Reference section should be compiled. Laboratory classes will generally provide guidance on this as well as other aspects of report writing. The References section is compiled by listing the publications, data sheets, WWW pages, unpublished documents or private communications, etc., in the References section, and by referring to them at appropriate points in the text of the Report or in figure captions. It is to be expected that a marking penalty will be applied to written work in which the References section is inadequate.

Each reference should include sufficient information to enable a reader of the work to trace it.

Papers should have author(s), title of paper, title of journal, volume, pages, date/year.

Books should have author(s), title, publisher, date/year.

Internet sources should have author and address/organisation (if known), full URL, date of access.

Unpublished material should be referred to as such or as "private communication" and the source's name and address should be given together with title and date if appropriate.

The precise format to be adopted is at the discretion of the author, but a consistent format must be used. Examples will be seen in the literature and below. References must be cited either by number (if they are numbered) or by author and date.

References

APPENDIX 4: GUIDANCE ON PROOFREADING

If you decide that you would like someone to proofread your work or you wish to use a proofreading company it is very important that you read the document ‘Proofreading - a Guide for Students.’ Failure to follow the guidance in this document, if you have your work proofread, could result in you being found guilty of academic misconduct due to you having unpermitted assistance. The proofreading guidance document can be downloaded from the website at: http://www.keele.ac.uk/studentacademicconduct/.
APPENDIX 5: STUDENT SICKNESS SELF-CERTIFICATION FORM (FROM THE SCHOOL OFFICE)

SCHOOL OF PHYSICAL AND GEOGRAPHICAL SCIENCES
ASTROPHYSICS/CHEMISTRY/FORENSIC SCIENCE/
MEDICINAL CHEMISTRY/PHYSICS

ABSENCE FORM

<table>
<thead>
<tr>
<th>PERSONAL DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME</td>
</tr>
<tr>
<td>STUDENT NUMBER</td>
</tr>
<tr>
<td>PERSONAL TUTOR</td>
</tr>
<tr>
<td>PRINCIPAL SUBJECTS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERIOD OF SICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>First date of absence</td>
</tr>
<tr>
<td>Date of return</td>
</tr>
<tr>
<td>What classes did you miss? (Give module numbers)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DETAILS OF SICKNESS OR INJURY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of sickness</td>
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<table>
<thead>
<tr>
<th>DECLARATION</th>
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<tbody>
<tr>
<td>Signature</td>
</tr>
<tr>
<td>Date</td>
</tr>
</tbody>
</table>

CONFIDENTIAL
## Appendix 6: MODULE TUTORS AND STAFFING

**Module Tutors and Staffing**

<table>
<thead>
<tr>
<th>Module</th>
<th>Module Tutor</th>
<th>Other Teaching Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY-20002 Stellar Astrophysics</td>
<td>Prof. C Hellier</td>
<td>Laboratory: Dr J Oliveira</td>
</tr>
<tr>
<td>PHY-20006 Quantum Mechanics and Atomic Physics</td>
<td>Dr P F L Maxted</td>
<td>Mathematics: Prof. R Jeffries</td>
</tr>
<tr>
<td>PHY-20009 Nuclear and Particle Physics</td>
<td>Dr J van Loon</td>
<td>Laboratory: Dr B Smalley</td>
</tr>
<tr>
<td>PHY-20026 Statistical Mechanics and Solid State</td>
<td>Prof A Evans</td>
<td>Laboratory: Dr J Oliveira / Dr B Smalley</td>
</tr>
<tr>
<td>PHY-20027 Optics and Thermodynamics</td>
<td>Dr J Oliveira &amp; Dr J van Loon</td>
<td>Laboratory: Dr J Oliveira</td>
</tr>
</tbody>
</table>

HANDBOOK WAS LAST REVIEWD/REVISED ON SEPTEMBER 2015