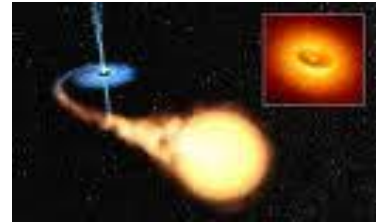


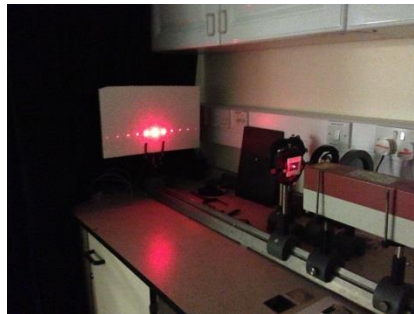


Keele
University

SCHOOL OF PHYSICAL AND GEOGRAPHICAL SCIENCES

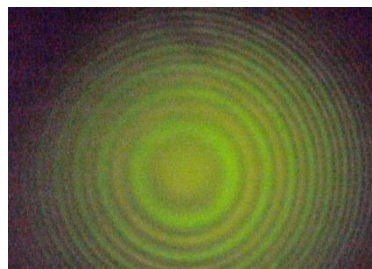


PHYSICS and ASTROPHYSICS



Level 2 Handbook

2013-2014



Semester Dates 2013-2014 (Level 2)

AUTUMN SEMESTER

Monday 30th September 2013 – Friday 24th January 2014

Teaching Weeks (1 – 12):

Monday 30th September 2013 – Friday 20th December 2013

Christmas Vacation:

Saturday 21st December 2013 – Sunday 12th January 2014

Examinations and Assessment:

Monday 13th January 2014 – Friday 24th January 2014

Re-examination period Wednesday 23rd April 2014 – Tuesday 29th April 2014

SPRING SEMESTER

Monday 27th January 2014 – Friday 13th June 2014

Teaching Weeks (1 –10):

Monday 27th January 2014 – Friday 4th April 2014

Easter Vacation:

Saturday 5th April 2014 – Sunday 4th May 2014

Teaching Weeks (11-12)

Tuesday 6th May 2014 – Friday 16th May 2014

Examinations and Assessment:

Monday 19th May 2014 – Friday 30th May 2014

Academic Year ends on Friday 13th June 2014

Re-examination period Monday 18th August 2014 – Friday 22nd August 2014

For details on the undergraduate academic year see:

<http://www.keele.ac.uk/depts/aa/undergraduate/sci/courseinfo.htm>

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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/media/keeleuniversity/facnatsci/schpgs/spgsdocuments/SPGS%20schoolhandbook.pdf>

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 712378

1.1 INTRODUCTION

This Handbook provides you with all the necessary information you require that relate to your study programme in Physics or in Astrophysics at Keele University with particular reference to the teaching and assessment of Level 2. 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/depts/aa/regulationshandbook/index.htm>

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 gain the 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 Levels 1 and 2, and project work at level 3, you will achieve competence in practical skills, data analysis and reporting skills within 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.
- On a Single Honours programme you will study a wider range of topics.

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 which is the home of the School of Physical and Geographical Sciences.

1.5 PHYSICS ACADEMIC AND SUPPORT STAFF

The Physics academic staff exhibits a research profile with three 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 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

- Dr Raphael Hirschi** LJ2.09 (73)3324 r.hirschi@keele.ac.uk
Postgraduate Admissions Tutor
Reader of 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 3 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 2 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 Astrophysics with research interests in stellar atmospheres and the fundamental parameters of stars.
- Dr Jacco van Loon** LJ2.07 (73)3331 j.t.van.loon@keele.ac.uk
Year 1 Tutor,
Reader in Astrophysics, studying mass-loss from evolved stars and its implications for stellar evolution and chemical enrichment of galaxies.
- Patricia Pointon** LJ0.16 (73)3527 p.pointon@keele.ac.uk
Physics/Astrophysics Undergraduate Administrator
- Phil Callaghan** LJ1.09 (73)3853 p.i.callaghan@keele.ac.uk
Technician, Disability Officer
- Dr Steven Wye** LJ1.09 (73)3852 s.m.wye@keele.ac.uk
Technician

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 University circulates important information by email to the appropriate groups of students using the usernames and group aliases assigned by Keele Information Services. 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 HIGHER EDUCATION ACHIEVEMENT REPORT (HEAR)

The HEAR is an excellent way for you to articulate to other people, including employers, the skills you've learnt throughout your studies. Students will receive a single document detailing their academic and non-academic achievements during their time at University. It is a national scheme and will be available to Keele undergraduate degree students who graduate in the summer of 2014, and anyone graduating thereafter. For all other programmes, Keele will provide them with a transcript.

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

1.7 SOURCES OF HELP AND ADVICE

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

1.7.1 YOUR PERSONAL TUTOR

You will be assigned a personal tutor. If you require help or advice on any matter that affects your life and work as a student at Keele then please do not hesitate to contact your Personal Tutor. If your tutor is unable to help you directly, s/he will be able to advise you of an appropriate advisor within the university.

1.7.2 LEVEL 2 TUTOR

Dr Joana Oliveira

Dr Joana Oliveira is responsible for the pastoral care of all 2nd Year 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, Dr Oliveira monitors general problems that affect the level 2 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/studentsupport>

1.7.4 STUDENT SUPPORT AND DEVELOPMENT SERVICES

<http://www.keele.ac.uk/studentsupport>

Located in Walter Moberly Building is a first stop for anyone needing help and is responsible for the overall wellbeing of all students at Keele. If we can't help you directly we can refer you to other someone who can in the form of the other services such as Learning Support, Disability Services or the Independent Advice Unit.

In addition to general advice, the SSDS offers a professional and confidential Student Support Service open to all students. For British students with financial difficulties there is the Student Finance Service. International students can get advice on any subject from the International Student Support Service. For students living on campus there is additional out-of-normal-office-hours support, available through the teams of Resident Tutors in each hall of residence and their details are published in the halls.

For further details please contact:

Student Support

<http://www.keele.ac.uk/studentsupport/>

Counselling

<http://www.keele.ac.uk/studentcounselling/>

Student Finance Service

<http://www.keele.ac.uk/studentfunding/>

International Students' Support

<http://www.keele.ac.uk/iss/>

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/international/afteryouapply/preparereforkeele/visasandimmigration/>

1.7.5 PROVISION OF REFERENCES

You may ask your Year 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 Year 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. You will be given a form to complete prior to your interview, for you to note any items that you wish to raise. The interviews are treated as confidential between you and your Year Tutor, though a copy of the interview form will be included in your personal file.

The interviews will take place at the following approximate times:

INDIVIDUAL PROGRESS INTERVIEW 1 AUTUMN SEMESTER, WEEKS 4-6

INDIVIDUAL PROGRESS INTERVIEW 2 SPRING SEMESTER, WEEKS 4-6

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 Secretary 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/paa/governance/disciplinecomplaintsgrievancesappeals/studentcomplaints/>

1.7.10 ACADEMIC APPEALS PROCEDURE

A statement of the university appeals procedure can be found in the *University Regulation 7: Appeals against decisions of boards of examiners*,

<http://www.keele.ac.uk/paa/governance/disciplinecomplaintsgrievancesappeals/academicappeals/>

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 students 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 by ballot if necessary. 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 student notice boards.

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. 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.

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)

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. Our services include the wireless network, printing service, IT Suite and Labs, Laptop Loan and Laptop repair service. We provide help and advice using Keele systems such as

the Keele Learning Environment, eVision, office software or Google Mail and seek 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 which can be found on 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:-

- Keep a clean machine 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.
- Think before you act, if you are wary of a communication as it sounds too good to be true or asks for personal information you are probably best deleting it.

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 our services, or to report a problem or seek advice please visit: 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. Mr David Emley maintains the site.

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.i.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 and follow the links to PDP (you must register on kusu.net to use this service).

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*:

- **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 4 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/depts/aa/newacadregpages/warnings.htm>

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 the student will have 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 on 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.

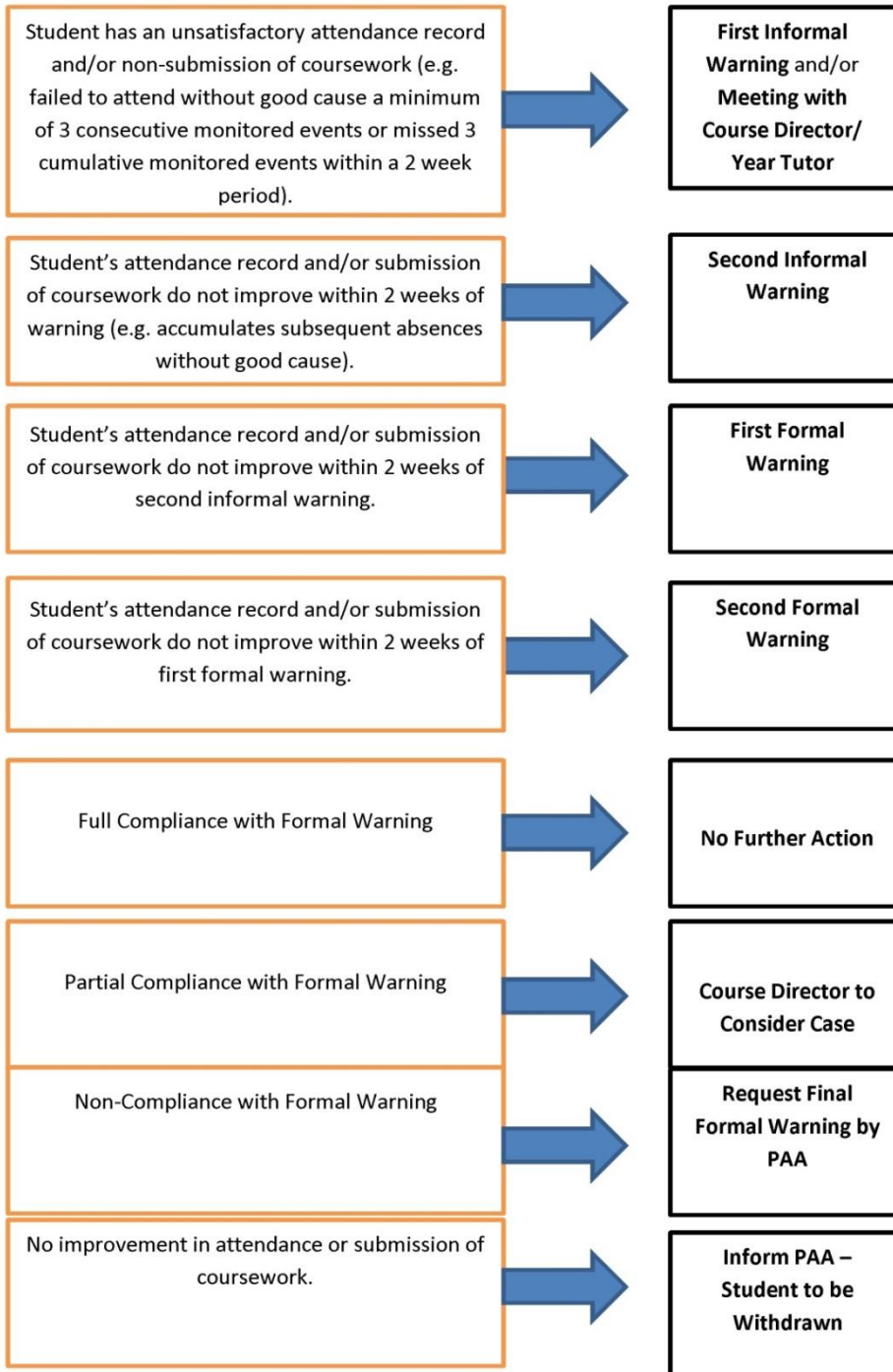
If the student fails to comply with the conditions of the informal verbal warning or misses a further class the case will be referred to the DUS who may decide to issue a first formal warning, and the student will be monitored for a period of 2 weeks. The DUS will report all such cases to the teaching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



SECTION 2 (LEVEL 2)

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 level 3.

The routes available during 2012-2013 at level 2 are described below.

Degrees based on Principal Physics or Astrophysics at Level 2:

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 level 2. 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 all modules are valued at 15 credits at level 2.

Principal Physics (Level 2)

AUTUMN SEMESTER	SPRING SEMESTER
PHY-20006 Quantum Mechanics	PHY-20026 Statistical Mechanics and Solid State
PHY-20027 Optics and Thermodynamics	PHY-20009 Nuclear and Particle Physics

Principal Astrophysics (Level 2)

AUTUMN SEMESTER	SPRING SEMESTER
PHY-20006 Quantum Mechanics	PHY-20026 Statistical Mechanics and Solid State
PHY-20027 Optics and Thermodynamics	PHY-20002 Stellar Astrophysics

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 LEVEL 2

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 level 2.

Autumn Semester: All principal students take a programme of laboratory work in optics. This takes place over ten weeks of the semester and is credited to PHY-20006. 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.

The timetable for classes at level 2 in physics and in astrophysics is given in Appendix 6.

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/depts/aa/newacadregpages/assessment.htm>

and

<http://www.keele.ac.uk/depts/aa/newacadregpages/degreeclass.htm>

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.

Assessment Criteria are based on the University's generic criteria given at:

<http://www.keele.ac.uk/paa/academicadministration/assessment/markingscriteria/index.php>

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.

Module	Semester	Exam	Problem Sheets	Problem Classes	Maths	Laboratory Reports
PHY-20006	1	60%	20%	10%	10%	
PHY-20027	1	60%	10%	10%		20%
PHY-20026	2	60%	10%	10%		20%
PHY-20009	2	60%	10%	10%		20%
PHY-20002	2	60%	10%	10%		20%

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 during the Easter vacation 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:

Level 2 Problems Sheet Schedule 2013-2014

Semester	Week Issued	Week Work Submitted	Week Work Returned
Autumn	3	5	6-7
	5	7	8-9
	7	9	10-11
	9	11	12
Spring	2	4	5-6
	4	6	7-8
	6	8	9-10
	8	10	11-12

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 be kept in the laboratory and marked following each practical session. You will also be required to submit laboratory reports according 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.

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

All students will attend **one** of the two scheduled problems classes per week. During this session you will be working on problems set by module tutors. Note once again that your attendance at problem class will be monitored and marks will be awarded towards final module assessment. Students will be awarded the full 10% for missing less 1-2 problem classes, 5% will be awarded if a student misses 3 problem classes and no marks will be awarded if a student has missed more than 3 problem classes per semester. Marks will also be deducted if a student attends but fails to engage with the problems set.

(Additional information about the Problem Classes available on <http://www.keele.ac.uk/physics/forcurrentstudents/problemclasses/>)

2.5.5 EXTERNAL EXAMINERS

For the academic year 2013 – 2014 the External Examiners are:

Physics: Professor Stephen J Swithenby, Centre for Open Learning of Mathematics, Science, Computing and Technology “COLMSCT, The Open University”

Astrophysics: Professor Mike Bode, John Moores University, Liverpool

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 2nd YEAR 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.
- As from the start of September 2011 we have implemented a new policy such that problem sheets can no longer be submitted up to a week late to receive a "capped" mark.
- 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 complete an extenuating circumstances form, as usual. . For more information about extenuating circumstances, please see <http://www.keele.ac.uk/regulations/regulation8/guidanceonextenuatingcircumstances/regulation815/>) 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 EXTENTIONS 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 RETENTION AND SUBMISSION OF COURSEWORK PORTFOLIO

We require you to retain **ALL** the coursework you have submitted and we have marked and returned to you, over the year. You maybe asked to submit this to us as a portfolio at a specified date towards the end of the academic year. We may need to second-mark this coursework as part of the process whereby we set your module marks at the examination board.

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 on-line 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 2: ASSESSED COURSEWORK SUBMISSION (ACS) FORM

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

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)

AUTUMN SEMESTER		SPRING SEMESTER		
PHY-20006 Quantum Mechanics	PHY-20027 Optics & Thermodynamics	PHY-20002 Stellar Astrophysics	PHY-20009 Nuclear & Particle Physics	PHY-20026 Statistical Mechanics & Solid State

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

PHYSICS/ASTROPHYSICS COURSEWORK SUBMISSION FORM

STUDENT NAME..... DATE SUBMITTED.....

MODULE (PLEASE TICK/CIRCLE BELOW)

AUTUMN SEMESTER		SPRING SEMESTER		
PHY-20006 Quantum Mechanics	PHY-20027 Optics & Thermodynamics	PHY-20002 Stellar Astrophysics	PHY-20009 Nuclear & Particle Physics	PHY-20026 Statistical Mechanics & Solid State

DEADLINE FOR SUBMISSION.....

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.**
- 11.2 Dissertations, projects or essays or other like in-course assessments must be in the student's own words, except for quotations from published and unpublished sourced, which must be clearly indicated as such and be accompanied by full details of the publications concerned. The source(s) of any map, photograph, illustrations, or similar must be similarly indicated. The student must indicate clearly the source(s), whether published or unpublished, of any material not resulting from his/her own experimentation, observation or specimen collecting, including observational data.

Students will be required to sign a statement to that effect. Failure to comply with these requirements may be construed as cheating.

Students are advised that they should expect their work to be subjected to electronic and other checks aimed at detecting plagiarism.

STUDENT SIGNATURE.....

EXTENTIONS 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

*SCHOOL OF CHEMISTRY & PHYSICS, KEELE UNIVERSITY. © P K GRANNELL, A EVANS AND K
UNIVERSITY, 1998-2001.*

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. 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 \overline{K}_0 than as a K^0 ."

"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 \overline{K}_0 than as a K^0 ."

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 \overline{K}_0 than as a K^0 ."

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 practice 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.

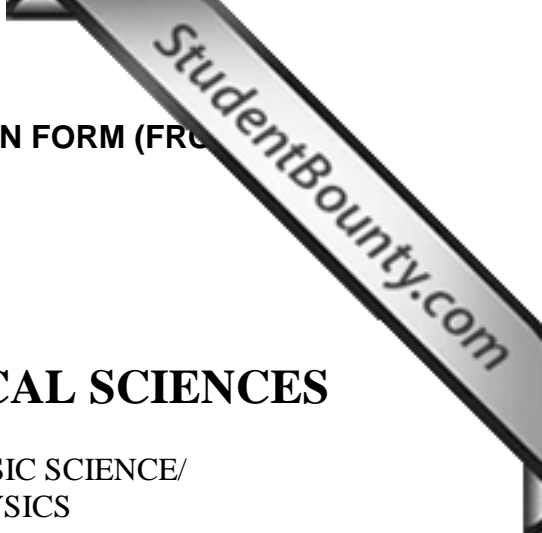
Unpublished material should be referred to as such or as "private communication" and the source's name and address should be given together with title and date if appropriate.

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

1. Letter to Robert Hooke, 5 February 1676, in H. W. Turnbull (ed.) 'Correspondence of Isaac Newton' vol. 1 (1959) p 4.
2. Keele University Student Handbook (2002-2003).
3. "About Time", Davis, P.C.W., Penguin, 1995, p212.
4. Marks, A B and Spencer, C D, Journal of Unreproducible Studies (1984), 18, 200-210.

APPENDIX 4: STUDENT SICKNESS SELF-CERTIFICATION FORM (FROM SCHOOL OFFICE)



Keele
University

**SCHOOL OF
PHYSICAL AND GEOGRAPHICAL SCIENCES**

ASTROPHYSICS/CHEMISTRY/FORENSIC SCIENCE/
MEDICINAL CHEMISTRY/PHYSICS

ABSENCE FORM

CONFIDENTIAL

PERSONAL DETAILS

NAME	
STUDENT NUMBER	
PERSONAL TUTOR	
PRINCIPAL SUBJECTS	

PERIOD OF SICKNESS

First date of absence	
Date of return	
What classes did you miss? (Give module numbers)	

DETAILS OF SICKNESS OR INJURY

Nature of sickness	
--------------------	--

DECLARATION

Signature	
Date	

Appendix 5: MODULE TUTORS AND STAFFING***Module Tutors and Staffing***

Module	Module Tutor	Other Teaching Staff
PHY-20002 Stellar Astrophysics	Prof C Hellier	Laboratory: Dr J Oliveira
PHY-20006 Quantum Mechanics and Atomic Physics	Dr P F L Maxted	Mathematics: Dr J Reeves
PHY-20009 Nuclear and Particle Physics	Dr J van Loon	Laboratory: Dr B Smalley/ Dr V Tyne
PHY-20026 Statistical Mechanics and Solid State	Prof A Evans	Laboratory: Dr J Oliveira / Dr B Smalley/ Dr V Tyne
PHY-20027 Optics and Thermodynamics	Dr J Oliveira & Dr J van Loon	Laboratory: Dr J Oliveira

APPENDIX 6: LEVEL 2 TIMETABLES 2013-14 (Subject to change)

SCHOOL OF PHYSICAL & GEOGRAPHICAL SCIENCES
PHYSICS & ASTROPHYSICS
AUTUMN SEMESTER - 2ND YEAR 2013/14

Commencing Monday, 30th September 2013

Welcome Back Meeting 30th September 2013 at 10.00 in LJ1.70

Teaching Commences 1st October 2013

		MON 10.00-12.00	MON 10.00-13.00	TUE 10.00-13.00	TUE 13.00-14.00	THU 10.00-13.00	THU 17.00-18.00	FRI 09.00-10.00	FRI 14.00-15.00	FRI 15.00-16.00
ROOM		DH0.21	LJ1.17	CBA1.074/075	HNB0.26	CBA1.099/100	HNB0.26	DH0.16	WS.06	WS.06
MODULE		LAB	LAB	Problem Class	PHY-20027	Problem Class	PHY-20006	PHY-20006	PHY-20027	Maths
		Optics Lab	Optics Lab	Group A	Optics & Thermodynamics	Group B	Quantum Mechanics	Quantum Mechanics	Optics & Thermodynamics	Maths Class
Sept 30	1				JO (Optics)		PFLM		JvL (Thermodynamics)	JR
Oct 7	2	JO		QM	JO (Optics)	QM	PFLM		JvL (Thermodynamics)	JR
Oct 14	3		JO	Optics/Thermo	JO (Optics)	Optics/Thermo	PFLM	PFLM	JvL (Thermodynamics)	JR
Oct 21	4		JO	Maths	JO (Optics)	Maths	PFLM	PFLM	JvL (Thermodynamics)	JR
Oct 28	5		JO	QM	JO (Optics)	QM	PFLM	PFLM	JvL (Thermodynamics)	JR
Nov 4	6		JO	Optics/Thermo	JO (Optics)	Optics/Thermo	PFLM	PFLM	JvL (Thermodynamics)	
Nov 11	7		JO	QM	JO (Optics)	QM	PFLM	PFLM	JvL (Thermodynamics)	JR
Nov 18	8		JO	Maths	JO (Optics)	Maths	PFLM		JvL (Thermodynamics)	
Nov 25	9		JO	Optics/Thermo	JO (Optics)	Optics/Thermo	PFLM	PFLM	JvL (Thermodynamics)	JR
Dec 2	10		JO	QM	JO (Optics)	QM	PFLM		JvL (Thermodynamics)	JR
Dec 9	11		JO	Optics/Thermo	JO (Optics)	Optics/Thermo	PFLM	PFLM	JvL (Thermodynamics)	CLASS TEST TO BE ARRANGED
Dec 16	12		JO	QM	JO (Optics)	QM	PFLM		JvL (Thermodynamics)	

PHY-20006 Quantum Mechanics - Module Leader Dr P Maxted (PFLM)

PHY-20027 Optics & Thermodynamics - Module Leader Dr J Oliveira (JO) & Dr J van Loon (JvL)

Optics Lab - Module Leader Dr J Oliveira (JO)

Maths Classes - Module Leader Dr J Reeves (JR)

Problem Classes - Module Leaders Dr P Maxted (PFLM) & Dr A Mahendrasingam (AM)