1 Introduction

Welcome to PHYS1500 Astronomy, a Junior course offered by the School of Physics at the University of Sydney. The information presented here describes most aspects of the course so please read it carefully (much of it may also be found on the web at http://sydney.edu.au/science/physics/current/jphys/astro1500.shtml).

We hope you enjoy Astronomy and learn something about the universe around us and how science is done.

Who can do the course?
Astronomy is a 6 credit point unit of study offered in the July semester to all interested students from any Faculty. There is no assumed knowledge and no prerequisites. You will need to display an ability to think analytically, but the unit requires only a minimal level of mathematics.

The unit is stand-alone and does not require that you be enrolled in any other Physics unit of study. Of course you may take Astronomy in addition to other Physics units if you wish. However, it will not count towards the 12 credit points of Junior Physics required to continue into Intermediate Physics. Details of other Junior Physics courses may be found in the Junior Physics Information for Students booklet or on the Junior Physics web pages at http://sydney.edu.au/science/physics/current/jpc.shtml.

If you want to continue your study of astronomy and astrophysics in greater depth, other astronomy courses are offered by the School of Physics, although these have a prerequisite of 12 credit points of Junior Physics (not including Astronomy). Intermediate Physics includes a Cosmology and Relativity unit and other courses, such as Astrophysics and High Energy Physics are offered as options in the Senior year. Projects with one of the Research Departments are offered in the Senior year and are a major component of the Honours Year. Astronomy courses with no prerequisites are offered as part of the University’s Continuing Education Program.

1.1 Assumed Knowledge and Prohibitions

There is no assumed knowledge and no prerequisites.

2 Course Aims, Learning Objectives and Graduate Attributes

2.1 Course Aims

The focus of this unit is to introduce you to the key concepts of modern astronomy and an appreciation of the techniques used to gather astronomical data. The unit is also designed to help you develop appropriate methods of study that will allow you to become an independent learner, capable of organising new information into a coherent conceptual framework, interpreting that information and applying it in both familiar and unfamiliar situations.

2.2 Learning Outcomes

After successfully completing this unit, you should be able to demonstrate:
1. an appreciation and understanding of the methodology and techniques of astronomy, including
   - the importance of physical principles and physical thinking,
   - the relevance of other sciences (geology, chemistry,...),
   - the technology of astronomical observation,
   - threats to astronomy such as pollution by light and radio.

2. an understanding of the contributions of astronomy to culture and the changing world view;

3. a broad understanding of
   - the nature of the planets, stars and galaxies,
   - the scale, structure and diversity of the universe.

4. a qualitative knowledge and understanding of the following list of important concepts
   - how distance is measured - the distance ladder,
   - the make-up and age of the solar system,
   - the life cycle of a star,
   - the origin of the elements,
   - redshift and its significance,
   - the large scale structure of the universe,
   - universal expansion.

5. the ability to find and analyse information and judge its reliability and significance;

6. the ability to communicate scientific information appropriately, both orally and through written work;

7. the ability to engage in team and group work for scientific investigations and for the process of learning;

8. a sense of responsibility, ethical behaviour and independence as a learner and as a scientist.

2.3 Graduate Attributes

Graduate Attributes are generic attributes that encompass not only technical knowledge but additional qualities that will equip students to be strong contributing members of professional and social communities in their future careers. The overarching graduate attributes identified by the University relate to a graduate’s attitude or stance towards knowledge, towards the world, and towards themselves. These are understood as a combination of five overlapping skills or abilities, the foundations of which are developed as part of specific disciplinary study. For further details please refer to the Science faculty website at: http://www.itl.usyd.edu.au/graduateAttributes/facultyGA.cfm?faculty=Science
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A4.</strong></td>
<td>Critically examine the truth and validity in scientific argument and discourse, and evaluate the relative importance of ideas.</td>
</tr>
<tr>
<td><strong>A5.</strong></td>
<td>Disseminate new knowledge and engage in debate around scientific issues.</td>
</tr>
<tr>
<td><strong>A6.</strong></td>
<td>Value the importance of continual growth in knowledge and skills, and recognise the rapid, and sometimes major, changes in scientific knowledge and technology.</td>
</tr>
<tr>
<td><strong>B Information Literacy</strong></td>
<td></td>
</tr>
<tr>
<td><strong>B1.</strong></td>
<td>Use a range of searching tools (such as catalogues and databases) effectively and efficiently to find information.</td>
</tr>
<tr>
<td><strong>B2.</strong></td>
<td>Access a range of information sources in the science disciplines, for example books, reports, research articles, patents and company standards.</td>
</tr>
<tr>
<td><strong>B3.</strong></td>
<td>Critically evaluate the reliability and relevance of information in a scientific context.</td>
</tr>
<tr>
<td><strong>B4.</strong></td>
<td>Consider the economic, legal, social, ethical and cultural issues in the gathering and use of information.</td>
</tr>
<tr>
<td><strong>B5.</strong></td>
<td>Use information technology to gather, process, and disseminate scientific information.</td>
</tr>
<tr>
<td><strong>C Communication</strong></td>
<td></td>
</tr>
<tr>
<td><strong>C1.</strong></td>
<td>Explain and present ideas to different groups of people in plain English.</td>
</tr>
<tr>
<td><strong>C2.</strong></td>
<td>Write and speak effectively in a range of contexts and for a variety of different audiences and purposes.</td>
</tr>
<tr>
<td><strong>C3.</strong></td>
<td>Use symbolic and non-verbal communication, such as pictures, icons and symbols as well as body language and facial expressions, effectively.</td>
</tr>
<tr>
<td><strong>C4.</strong></td>
<td>Present and interpret data or other scientific information using graphs, tables, figures and symbols.</td>
</tr>
<tr>
<td><strong>C5.</strong></td>
<td>Work as a member of a team, and take individual responsibility within the group for developing and achieving group goals.</td>
</tr>
<tr>
<td><strong>C6.</strong></td>
<td>Take a leadership role in successfully influencing the activities of a group towards a common goal.</td>
</tr>
<tr>
<td><strong>C7.</strong></td>
<td>Actively seek, identify, and collaborate with others in a professional and social context.</td>
</tr>
<tr>
<td><strong>D Ethical, Social and Professional Understanding</strong></td>
<td></td>
</tr>
<tr>
<td><strong>D1.</strong></td>
<td>Demonstrate an understanding of the significance and scope of ethical principles, both as a professional scientist and in the broader social context, and a commitment to apply these principles when making decisions.</td>
</tr>
<tr>
<td><strong>D2.</strong></td>
<td>Appreciate the importance of sustainability and the impact of science within the broader economic, environmental and socio-cultural context.</td>
</tr>
<tr>
<td><strong>D3.</strong></td>
<td>Demonstrate empathy with, and sensitivity towards, another's situation, feelings and motivation.</td>
</tr>
</tbody>
</table>
### E Personal and Intellectual Autonomy

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>E1.</td>
<td>Evaluate personal performance and development, recognise gaps in knowledge and acquire new knowledge independently.</td>
<td>1, 5, 8</td>
</tr>
<tr>
<td>E2.</td>
<td>Demonstrate flexibility in adapting to new situations and dealing with uncertainty.</td>
<td>5, 8</td>
</tr>
<tr>
<td>E3.</td>
<td>Reflect on personal experiences, and consider their effect on personal actions and professional practice.</td>
<td>8</td>
</tr>
<tr>
<td>E4.</td>
<td>Set achievable and realistic goals and monitor and evaluate progress towards these goals.</td>
<td>8</td>
</tr>
<tr>
<td>E5.</td>
<td>Demonstrate openness and curiosity when applying scientific understanding in a wider context.</td>
<td>8</td>
</tr>
</tbody>
</table>

### 2.4 Threshold Learning Outcomes

The Threshold Learning Outcomes (LTOs) are the set of knowledge, skills and competencies that a person has acquired and is able to demonstrate after the completion of a bachelor degree program. The TLOs are not equally weighted across the degree program and the numbering does not imply a hierarchical order of importance.

<table>
<thead>
<tr>
<th>Threshold Learning Outcomes</th>
<th>Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Understanding science</strong></td>
<td></td>
</tr>
<tr>
<td>1.1 Articulating the methods of science and explaining why current scientific knowledge is both contestable and testable by further inquiry</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Explaining the role and relevance of science in society</td>
<td>2</td>
</tr>
<tr>
<td><strong>2 Scientific knowledge</strong></td>
<td></td>
</tr>
<tr>
<td>2.1 Demonstrating well-developed knowledge in at least one disciplinary area</td>
<td>3, 4</td>
</tr>
<tr>
<td><strong>3 Inquiry and problem solving</strong></td>
<td></td>
</tr>
<tr>
<td>3.1 Gathering, synthesising and critically evaluating information from a range of sources</td>
<td>5</td>
</tr>
<tr>
<td>3.4 Collecting, accurately recording, interpreting and drawing conclusions from scientific data</td>
<td>5</td>
</tr>
<tr>
<td><strong>4 Communication</strong></td>
<td></td>
</tr>
<tr>
<td>4.1 Communicating scientific results, information or arguments, to a range of audiences, for a range of purposes, and using a variety of modes</td>
<td>6</td>
</tr>
<tr>
<td><strong>5 Personal and professional responsibility</strong></td>
<td></td>
</tr>
<tr>
<td>5.1 Being independent and self-directed learners</td>
<td>5, 8</td>
</tr>
</tbody>
</table>
5.2 Working effectively, responsibly and safely in an individual or team context

For further details on course learning outcomes see the Specific Objectives listed in the Lecture Module Outlines available on the unit eLearning site.

3 Study Commitment

Students enrolled in any 6-credit point unit of study offered by the Faculty of Science should consider spending up to 12 hours per week on that unit during the 13 teaching weeks and the study vacation. In PHYS 1500 this involves:

- 26 one-hour Lectures divided into 4 main lecture modules:

<table>
<thead>
<tr>
<th>Introduction</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 lecture</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solar System</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 lectures</td>
<td>Formation and evolution, Terrestrial planets, Giant planets, Rings and moons, Small bodies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stars</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 lectures</td>
<td>Analysis of starlight, Spectra of stars, Properties of stars, Structure of stars, Evolution of stars, Stellar deaths</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The Milky Way</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 lectures</td>
<td>Multiwavelength astronomy, Star formation, Galactic structure, Galactic evolution, Galactic centre, Galaxies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extra-galactic Astronomy</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 lectures</td>
<td>Galaxy Clustering, Distance scale, Active Galactic Nuclei, Gamma-ray bursts, Cosmology, Dark matter, Dark Energy</td>
</tr>
</tbody>
</table>

The lectures are intended to guide you in your study of the textbook:

- 12 Special Lectures involving the whole class, but outside of the main lecture series. They are used to present material which doesn't fit within the flow of the normal lectures. Some topics are specifically examinable, while most other topics are directly relevant to assessable objectives of the unit. Many of the sessions will be run by guest speakers. Topics include orbits, seasons, eclipses, The Sun and Stellar Oscillations, and X-ray Binary Stars.

- 10 one-hour Tutorials where you will work in small teams to look at real-world astronomy issues. The topics are chosen to parallel the lecture content, but broad enough to encourage wide-ranging discussions, for example the implications of an asteroid colliding with Earth and ‘Astronomy in the Movies’. After the tutorial you will receive a summary of the main points on the topic. Some tutorial material will appear in the final examination and you will be expected to be familiar with the main points and be able to write a short summary of the topics. One session will be devoted to observing the Sun using a specially equipped telescope.

- 5 two-week Laboratory sessions, each of two hours. Since it is impractical to ask you to conduct extensive observations using real telescopes, computer simulations in a lab provide a useful
alternative. These directly support the lectures by illustrating the observing techniques required to gather the astronomical knowledge presented in lectures using CLEA software (Contemporary Laboratory Experiences in Astronomy). No special computing knowledge is required.

- 1 two-hour Night Sky Viewing session. This meets the need for any astronomy unit to provide an opportunity to observe the night sky. The School of Physics has a computerised Meade 30 cm (12-inch) LX-200 Schmidt-Cassegrain telescope and a 20 cm (8-inch) Dobsonian-mounted Newtonian telescope that are used for scheduled observing sessions. The University's location near the centre of Sydney is certainly not the best place to observe the sky, but the telescope does remarkably well on many objects and appropriate filters can help penetrate the light pollution. The objective is to develop some basic familiarity with the sky and let you see some of the objects discussed during the course.

- 4 web-based MasteringAstronomy sets of Tutorial/Assignment questions. Working with you individually, MasteringAstronomy provides questions that use a “Socratic dialogue” - when you get stuck in answering a problem it offers a simpler problem and provides feedback tailored to your answers. It offers the opportunity to develop your understanding of concepts and your problem solving ability through compulsory assignment questions and optional extra questions. The four assignments roughly correspond to the four main subject areas of the Unit. ‘Introduction to MasteringAstronomy is an extra, short assignment illustrating the features of the system (compulsory even if you are familiar with MasteringPhysics).

- Up to 6 hours per week of independent study. You are expected to use this time to read through and understand the relevant sections of the textbook, to attempt the various MasteringPhysics questions, and to study for the laboratory test and the final examination.

- All students must complete an on-line exercise describing Plagiarism and academic honesty before the Laboratory session in Week 3 of semester. This exercise is located at [http://www.library.usyd.edu.au/elearning/learn/plagiarism/index.php](http://www.library.usyd.edu.au/elearning/learn/plagiarism/index.php). A digital certificate of completion must be saved and printed after completing the exercise and taken to the Lab session. Many Science students will already have done this exercise and may have a certificate of completion that can simply be reprinted.

### In class activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures (26 @ 1 hr each)</td>
<td>26</td>
</tr>
<tr>
<td>Special Lectures (12 @ 1 hr each)</td>
<td>12</td>
</tr>
<tr>
<td>Tutorials (10 @ 1 hr each)</td>
<td>10</td>
</tr>
<tr>
<td>Laboratory sessions (5 @ 2 week x 2 hrs each)</td>
<td>20</td>
</tr>
<tr>
<td>Night Viewing Session (2 hr)</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
</tr>
</tbody>
</table>

### Independent Study

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 web-based MasteringAstronomy sets (4 @ 3 hr each)</td>
<td>12</td>
</tr>
<tr>
<td>Reading of text for lectures (26 @ 0.5 hr each)</td>
<td>13</td>
</tr>
<tr>
<td>Reading of lecture notes after lectures (26 @ 0.25 hr each)</td>
<td>7</td>
</tr>
<tr>
<td>Revision and self-assessment (1 hr each week)</td>
<td>13</td>
</tr>
<tr>
<td>Preparation for Laboratory sessions (0.5 hr each)</td>
<td>2.5</td>
</tr>
<tr>
<td>Preparation for laboratory test</td>
<td>3</td>
</tr>
<tr>
<td>Library on-line exercise</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51</strong></td>
</tr>
</tbody>
</table>

### Study Tips
You are now in control of your own study strategy, and as an adult learner it is up to you to devise a study plan that best suits you. If you attend classes regularly and involve yourself in all of these learning experiences, you will gain a good understanding of the course work. This will have a considerable impact on your exam preparation and performance.

**Good study habits** are also very important - we offer some suggestions on our Learning Physics web page ([http://sydney.edu.au/science/physics/current/learningphysics.shtml](http://sydney.edu.au/science/physics/current/learningphysics.shtml)).

### 4 Learning and Teaching Activities

**WEEKLY SCHEDULE**

You will be scheduled into one lecture stream, with two regular one-hour *lectures* per week and one one-hour *special lecture*, each in the lecture theatre indicated below.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Where</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bosch LT 1 (western Avenue)</td>
<td>Monday 2pm</td>
<td>Thursday 3pm</td>
</tr>
<tr>
<td></td>
<td>beginning week 1, Mon 29 July</td>
<td>ending week 13, Thu 31 October</td>
</tr>
<tr>
<td><strong>Special Lecture</strong></td>
<td>Bosch LT 3 (Western Avenue)</td>
<td>Tuesday 1pm</td>
</tr>
<tr>
<td></td>
<td>beginning week 1, Tue 31 July</td>
<td>ending week 13, Thu 1 November</td>
</tr>
</tbody>
</table>

*Note: One extra regular lecture in week 13 will be scheduled in the Tuesday 1pm time slot in Bosch LT 3.*

You should also attend a single one-hour *tutorial* per week. All tutorials are held in Room 331 of the Madsen Building. Workshop tutorials start in the second week of semester, with the final tutorial in week 12.

<table>
<thead>
<tr>
<th>Where</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>12 noon</td>
</tr>
</tbody>
</table>
You should also attend a single two-hour **laboratory** per week. All laboratory sessions are held in Computer Lab Room 300 of the Madsen Building. Laboratory sessions start in the second week of semester. The final laboratory sessions will be the lab exam in week 13.

You should also attend a single Night Sky Viewing session. They will start at 6:30pm and finish at 8:30pm. Sessions will begin on an evening in week 3, with as many further dates scheduled as required to have everyone attend (consistent with appropriate phases of the Moon). You will need to sign-up for one of the nights on the sheet that will be available during your computer lab sessions. To avoid overcrowding it is essential that you only turn up on your selected night. If your night is cloudy it will be rescheduled to the same day in a following week. At 4.30pm each day we check the weather and decide whether or not to proceed with the night. An email will then be sent to all students to let you know if the observing is on or off. For more information see [http://www.physics.usyd.edu.au/current/jphys/astro1500_observing.shtml](http://www.physics.usyd.edu.au/current/jphys/astro1500_observing.shtml)

**Note:** there will be no lecture or tutorial classes during the mid-semester break and Labour Day Holiday (Monday 30 September to Monday 7 October inclusive). There are no tutorials or labs on some weeks (consult the back cover of your Lab Manual for details).
5 Teaching Staff and Contact Details

<table>
<thead>
<tr>
<th>Unit Coordinator</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/Prof John O'Byrne</td>
<td><a href="mailto:john.obyrne@sydney.edu.au">john.obyrne@sydney.edu.au</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teaching Staff</th>
<th>Email</th>
<th>Room</th>
<th>Phone</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/Prof. John O'Byrne</td>
<td><a href="mailto:john.obyrne@sydney.edu.au">john.obyrne@sydney.edu.au</a></td>
<td>Physics building, Room 205</td>
<td>9351 3184</td>
<td>Lectures &amp; Special lectures</td>
</tr>
<tr>
<td>Prof. Elaine Sadler</td>
<td><a href="mailto:ems@physics.usyd.edu.au">ems@physics.usyd.edu.au</a></td>
<td>Rosehill St building, Room 218</td>
<td>9351 2622</td>
<td>Lectures</td>
</tr>
</tbody>
</table>

6 Learning Resources

Textbook

The lecture modules are based on the textbook:


with *Voyager SkyGazer Planetarium Software*

by Jeffrey O. Bennett, Megan Donahue, Nicholas Schneider, Mark Voit

Pearson / Addison Wesley, San Francisco CA, USA

available at the Co-op Bookshop

The latest price for the textbook was around $144 (for Co-op members). Earlier editions are also acceptable. *The Essential Cosmic Perspective* by the same authors is a less comprehensive version of the same text. It has some significant omissions that have led us to adopt the larger version. Nonetheless, *The Essential Cosmic Perspective* is an acceptable alternative.

Note that it is also possible to obtain access to an electronic version of the book through *MasteringAstronomy*. The cost is US$30.80. This may be a convenient and cost-effective option for some students.

Laboratory Manual
The laboratory segment of the unit is covered by *Astronomy Computer Exercises*, prepared by the School of Physics available at the Co-op Bookshop for about $9.

**Web Resources**

The University eLearning system provides resources to help you with your studies, please spend time getting acquainted with this site. *MyUni* [http://sydney.edu.au/myuni](http://sydney.edu.au/myuni) is the student portal providing University information and services. Access to *MyUni* and eLearning requires a Unikey username and password that is issued with your confirmation of enrolment. The University provides computer facilities described on the *Student IT* pages at [http://sydney.edu.au/ict/student/](http://sydney.edu.au/ict/student/). The 'Current Student' link on the School of Physics web page [http://sydney.edu.au/science/physics](http://sydney.edu.au/science/physics) also provides resources to help you with your studies.

**Email**

The University provides you with email access based on your username. We may use this email address to provide you with important information regarding this unit of study. **We expect you to periodically read your email account or to forward mail from it to an account you do read (eg a gmail account).**

**Where to go for help**

If you need help, you can:

- as a first step, always check your unit eLearning pages for information, documents and links
- ask other students using the Discussion Board on the unit eLearning page.
- go to the Physics Student Services Office, Room 210 in the Physics building, or phone 9351 3037
- ask your lecturer or tutor
- consult one of the many services provided by the University, such as the Maths Learning Centre. These can be found by choosing *Junior Physics Resources and Links* from the unit eLearning page or your *MyUni* pages [http://sydney.edu.au/myuni](http://sydney.edu.au/myuni).
- for *MasteringPhysics* issues contact Dr Chris Dey, mastering_physics@physics.usyd.edu.au

**Providing us with feedback**

We welcome comments on all aspects of this unit. You should feel free to contact your lecturers, tutors or the Unit Coordinator by email using the People@Physics list on the Physics web pages. There is also a formal opportunity for feedback at the Staff-Student Liaison meeting, held one lunch time towards the end of semester with staff and student representatives from the various units of study, including this one.

**Changes this year**

As a result of student feedback and other initiatives there will be a number of changes this year:

- Access to *MasteringAstronomy* is being changed to remove the need for students to have access codes.
- Assessment policies are changing progressively, so there will be changes in the way your assessment marks are used to produce your final grade.
- We have a new building project underway - see [http://www.physics.usyd.edu.au/about/building.shtml](http://www.physics.usyd.edu.au/about/building.shtml)

**7 Assessment Tasks**
Assessment

Assessment tasks are intended to allow you to demonstrate what you have learned related to the goals of this unit. They also serve to encourage you to work with the material, but should not dominate your approach to learning. See them as another learning activity, accompanying and complementing those listed earlier.

Assessment of this unit of study is based on achievement of specific learning objectives (listed in the module outlines) demonstrated in a combination of assignments, tests, examination and laboratory work. Satisfactory performance in all aspects of assessment is necessary to ensure a pass in this unit.

In addition, students in physics must be able to express themselves accurately by clear, efficient use of the English language in their written work. Spelling, grammar, punctuation and correct use of language will be taken into account when written reports and examination work are assessed. Students should refer to the University’s WriteSite (http://writesite.elearn.usyd.edu.au/) if they are looking for guidance on grammar and other aspects of academic and professional writing.

You should be familiar with the new University Assessment policy, which can be found at the University Policy Register at http://sydney.edu.au/policies/.

7.1 Summative Assessments

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Percentage Mark</th>
<th>Due Date</th>
<th>Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to MasteringAstronomy</td>
<td>1</td>
<td>Week 3 Friday, 16 August 2013</td>
<td>5</td>
</tr>
<tr>
<td>Assignment 1 and Tutorial Questions</td>
<td>2.25</td>
<td>Week 5 Friday, 30 August 2013</td>
<td>1, 2, 3, 4, 5, 8</td>
</tr>
<tr>
<td>Assignment 2 and Tutorial Questions</td>
<td>2.25</td>
<td>Week 8 Friday, 20 September 2013</td>
<td>1, 2, 3, 4, 5, 8</td>
</tr>
<tr>
<td>Assignment 3 and Tutorial Questions</td>
<td>2.25</td>
<td>Week 10 Friday, 11 October 2013</td>
<td>1, 2, 3, 4, 5, 8</td>
</tr>
<tr>
<td>Assignment 4 and Tutorial Questions</td>
<td>2.25</td>
<td>Week 13 Friday, 01 November 2013</td>
<td>1, 2, 3, 4, 5, 8</td>
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<td>Week 12 Friday, 25 October 2013</td>
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<td>Laboratory exam</td>
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<td>Exam Period</td>
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<td>Tutorials</td>
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Descriptions of Summative Assessments

Introduction to MasteringAstronomy
MasteringAstronomy may be accessed directly from the eLearning site. Access instructions will be updated here shortly. To register for the MasteringAstronomy class you will need your full 9 digit Student ID number (SID) (e.g. 430759311). Please enter it correctly as accounts with incorrect or duplicate SIDs are checked and will be suspended. If you do enter an incorrect SID, then it is possible to correct it via MasteringAstronomy.

Assignment questions must be completed by 7pm (local time) on the date noted in the table above. MasteringAstronomy will not accept late assignments. Available marks ramp down to zero in the five hours until midnight on the day the assignment is due.

‘Introduction to MasteringAstronomy’ is an extra, short assignment illustrating the features of the system with a mark value (given in full on completion) approximately half that of a regular assignment. This introduction MUST be completed, even if you used MasteringPhysics in semester 1! Worked solutions to all assignment questions will be posted on the web, although you should have the answer and method once you complete each MasteringAstronomy question. Note that some assignment questions use randomised values - i.e. different students see the question with different values.

answer and method once you complete each MasteringAstronomy question. Note that some assignment questions use randomised values - i.e. different students see the question with different values.


Assignment 1 and Tutorial Questions
MasteringAstronomy on-line assignment.

Assignment 2 and Tutorial Questions
MasteringAstronomy on-line assignment.

Assignment 3 and Tutorial Questions
MasteringAstronomy on-line assignment.

Assignment 4 and Tutorial Questions
MasteringAstronomy on-line assignment.

Report (night viewing project)
Assessment of the Night Sky Viewing is based on completion of a short answer sheet that should be completed on the night or returned to the Physics Student Services Office as soon as possible afterward.

Laboratory Work - Experiments

Assessment in the laboratory is based on successful completion of laboratory work. The computer-based experiments are divided into a series of checkpoints where tutors check that your progress is on track. Two sessions are assigned for each CLEA exercise but many people finish early. Note that each exercise must be signed off no later than the end of the second week assigned to that exercise. Full details are provided in the Laboratory Manual.

Satisfactory performance in Laboratory work is necessary for a pass in the unit, but if you work well in the laboratory you will learn a lot and be well on the way to passing this unit.

Laboratory exam

This test is a short, open-book, exam closely based on lab exercises to test your understanding of those exercises.

Final Examination

A two-hour examination covering the material included in the unit of study is held at the end of the
semester. You will be asked to write descriptive answers to questions, to explain physical principles and to answer quantitative questions, all aimed at demonstrating your progress in achieving the goals of the unit. Note that you must bring your own non-programmable calculator to any Junior Physics examination. See the University policy on calculators at http://www.usyd.edu.au/current_students/student_administration/examinations/students.shtml#calculators

Tutorials

Contributing to Workshop Tutorials is an important part of success in this Unit of Study. We measure your contribution by collecting group answer sheets and assigning an overall mark for your work during the semester, up to 2% of your final grade. To obtain full marks you must participate in all 10 tutorials.

7.2 Formative Assessments

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<th>Assessment Task</th>
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<th>Learning Outcomes</th>
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<td>Always Available</td>
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Descriptions of Formative Assessments

Plagiarism and academic honesty

All students must complete an on-line exercise describing Plagiarism and academic honesty before the Laboratory session in Week 9 of semester. This exercise is located at http://www.library.usyd.edu.au/elearning/learn/plagiarism/index.php. A digital certificate of completion must be saved and printed after completing the exercise and taken to the Lab session. Many Science students will already have done this exercise and may have a certificate of completion that can simply be reprinted.

7.3 Assessment Grading

Final grades in this unit are awarded at levels of HD (High Distinction), D (Distinction), CR (Credit), P (Pass) and F (Fail) as defined by the Academic Board Assessment Policy. These achievement levels are described below. Details of the policy are available on the University's Policy Register at http://sydney.edu.au/policies/.

The assessments for this unit are described in this unit of study outline. This description includes the purpose, timing and weighting of each assessment item and an explanation of how each task relates to the learning outcomes of the unit. Students are responsible for actively engaging with these assessments, including carefully reading the guidance provided, spending sufficient time on the task, ensuring their work is authentic and their own (whether individual or group work), completing work on time and acting on feedback provided.

Grades:

High Distinction (HD)

At HD level, a student demonstrates a flair for the subject and comprehensive knowledge and understanding of the unit material. A ‘High Distinction’ reflects exceptional achievement and is awarded to a student who demonstrates the ability to apply subject knowledge to novel situations.

Distinction (D)
At D level, a student demonstrates an aptitude for the subject and a solid knowledge and understanding of the unit material. A 'Distinction' reflects excellent achievement and is awarded to a student who demonstrates an ability to apply the key ideas of the subject.

**Credit (CR)**

At CR level, a student demonstrates a good command and knowledge of the unit material. A 'Credit' reflects solid achievement and is awarded to a student who has a broad understanding of the unit material but has not fully developed the ability to apply the key ideas of the subject.

**Pass (P)**

At P level, a student demonstrates proficiency in the unit material. A 'Pass' reflects satisfactory achievement and is awarded to a student who has threshold knowledge of the subject.

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8 Learning and Teaching Policies

**Academic Dishonesty/Plagiarism**

We will NOT accept assessments that are simply copied. Copying the work of another person without acknowledgment is plagiarism and contrary to University policies on Academic Dishonesty and Plagiarism [http://sydney.edu.au/ab/policies/Academic_Honesty_Cwk.pdf](http://sydney.edu.au/ab/policies/Academic_Honesty_Cwk.pdf)

**Academic Dishonesty** means seeking to obtain or obtaining academic advantage (for example, in assessments) by dishonest or unfair means or knowingly assisting another student to do so. Academic Dishonesty includes, but is not limited to:

(a) recycling – that is, the resubmission for assessment of work that is the same, or substantially the same, as work previously submitted for assessment in the same or in a different unit of study (except in the case of legitimate resubmission with the approval of the examiner for purposes of improvement);

(b) fabrication of data;

(c) the engagement of another person to complete or contribute to an assessment or examination in place of the student, whether for payment or otherwise or accepting such an engagement from another student;

(d) communication, whether by speaking or some other means, to other candidates during an examination;

(e) bringing into an examination forbidden material such as textbooks, notes, calculators or computers;

(f) attempting to read other student’s work during an examination;

(g) writing an examination or test paper, or consulting with another person about the examination or test, outside the confines of the examination room without permission;

(h) copying from other students during examinations;
(i) Inappropriate use of electronic devices to access information during examinations.

Plagiarism means presenting another person’s work as one’s own work by presenting, copying or reproducing it without acknowledgement of the source. Plagiarism is a form of Academic Dishonesty, but is treated separately. Plagiarism includes presenting work for assessment, publication, or otherwise, that includes:

(a) phrases, clauses, sentences, paragraphs or longer extracts from published or unpublished work (including from the Internet) without acknowledgement of the source; or

(b) the work of another person, without acknowledgement of the source and presented in a way that exceeds the boundaries of legitimate cooperation.

CONSIDERATION OF FACTORS AFFECTING YOUR STUDY

If your academic performance in a Science Faculty unit of study is adversely affected by illness or some other serious event, such as an accident or important commitment, you should complete an Application for Special Consideration or an Application for Special Arrangements, with accompanying documentation.

You should not submit an application of any type if:

- there is no assessment associated with a missed class, or
- you have a reasonable opportunity to make up any work you missed.

See Consideration of factors affecting your study or your Unit Outline for further details.