SCIF1121 Physics Module – Course Outline

Information about the course

Course Authorities: Prof. Michael Ashley (Physics)

Lecturers: Prof. Michael Ashley OMB-166, email m.ashley@unsw.edu.au

Consultation: To consult with Prof. Ashley, email to arrange a time.

Credit: SCIF1121 counts for 6 Units of Credit (6UOC) in total. The Physics module represents half of SCIF1121.

Lectures: There is one 2-hour lecture slot per week for the Physics module of SCIF1121. The details are

Wednesdays 4–6pm in ASB105 (grid ref E12)

Schedule:

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Course structure:

The “Lecture and discussion” activities will consist of a mixture of lectures from Ashley (or invited guest lecturers), debates and discussions.

During weeks 12 and 13 the students will present their projects.

Assessment:

Each student will complete a project report and give a presentation. Each project is worth 65% of the total mark for the Physics module, and each presentation is worth 25%. The remaining 10% is for attendance and contribution to the weekly discussions, as assessed by the lecturer.

Online information: We are using a software system called Moodle. You can login to this and participate in fora, etc, at [https://moodle2.telt.unsw.edu.au/login/index.php](https://moodle2.telt.unsw.edu.au/login/index.php)

Course aims and content.

This course aims to introduce Advanced Science students to research methodology and foundational issues in physics. We will be concerned with how physics knowledge is obtained/invented, what it is, how reliable it is, and much else. Moreover, we aim to develop research skills, which involve the ability to search for, organize and present knowledge effectively.
Specifically, we will be exploring how physics can help us understand the issues involved in climate change, suggest and evaluate technological solutions, and guide humanity towards a sustainable future with respect to our energy needs. We will be exploring the “debate” about the science of climate change, and how we can evaluate the accuracy of statements.

The Project

The major tangible outcome of a project will be a written report compiled by the student. It should be word processed with suitable embedded graphs and diagrams and be submitted electronically, as a pdf document.

The report should show evidence of substantial, independent, research and understanding of the topic—it should not just be a quick cut-and-paste from on-line sources. You need to use multiple original authoritative sources, and synthesise the knowledge in a coherent fashion.

The project report must be submitted on or before Friday 1 June by email to Michael Ashley m.ashley@unsw.edu.au.

Late reports will be penalised by a 5% reduction in marks per day late. Because of the time deadline, you should be thinking about the report from the first meetings. A report would normally be around 15 pages in length, including bibliography and figures. A common layout for the report should be:

1. Title page. Title, date, student name.
2. Abstract. up to 200 word summary of the report.
3. Introduction. This should include a clear statement of the problem and include any background information.
4. Body of the report. The lecturer can give help in formulating the content.
5. Conclusions
6. References / Bibliography. References can be in any standard format but must include for a journal paper: authors, title, journal, volume, first and last page numbers, year; and a book: authors, title, publisher, number of pages, place of publication, year.

It is important that the work is your own, and not plagiarised. Reports having large chunks quoted from books or downloaded from the net will receive no marks. (Note that there are websites such as plagiarism.org that allow plagiarism to be detected.) Material found from such sources must be carefully worked into your own text. Written or other sources, whether directly quoted or summarised, should have full references given, in footnotes and/or bibliography. There are different styles of giving references that can be used, but references must be full enough so that a reader can easily check them.

During lectures you will be provided with a list of potential projects. No two students
may have the same topic. You may choose a topic which is not on the list, but you
need to get approval from the lecturer involved, before you can proceed with it.

**The Presentation**

The presentation will be marked for clarity, interest/content and organisation of the
material. The media (projectors etc) should assist the material, not be a distraction.
The talk should be a presentation that convinces the audience that the topic is
interesting and so it should not consist simply of reading the report, although reading
some parts may be appropriate. Powerpoint presentations can be effective, but are
not compulsory. Students in the class will assist with evaluation of the talks.

**Textbooks**

There is no textbook for the course. You may find the following book interesting:

- James Hansen, *Storms of my grandchildren*

**List of Potential Projects**

A list of potential projects will be provided during the first lecture in Week 2. The
projects will cover aspects of climate change science, the nature of debate on climate
change, and prospects for technological solutions to climate change and future energy
sources.