Faculty of Science - Course Outline

1. Information about the Course

NB: Some of this information is available on the UNSW Handbook[1]

Year of Delivery	2021
Course Code	PHYS1211
Course Name	Energy and the Environment

2. Staff Involved in the Course

Staff	Role	Name	Contact Details	Consultation Times
Course Convenor		Prof. Michael Ashley	m.ashley@unsw.edu.au	Email to arrange a time
Additional Teaching Staff	Lecturers	Prof. Michael Ashley Dr. Christine Lindstrøm	m.ashley@unsw.edu.au c.lindstrom@unsw.edu.au	Immediately after the synchronous sessions
	Other Support Staff	Zofia Krawczyk-Bernotas	z.krawczyk-bernotas@unsw@edu.au	Email to arrange a time
	Laboratory demonstrators		Laboratory demonstrators will be available online. See	

3. Course Details

Course Description (Handbook Entry)	Energy, its uses and environmental impacts, thermodynamics, heat engines, heat transfer, solar radiation and its uses, properties of fluids, alternative energy sources, photons and atoms, photovoltaic energy, nuclear science and technology, environmental effects of natural and technological radiation sources, energy management.

4. Rationale and Strategies Underpinning the Course

Teaching Strategies	Due to the ongoing Covid-19 pandemic, the course is mostly taught online in 2021, with hybrid synchronous sessions the only (optional) face-to-face component. This has resulted in certain adaptions. Each week focuses on a specific set of course material. Students are introduced to the weekly material through clear and detailed learning goals informing them explicitly of what they are expected to learn. Students are presented with learning resources (textbook, videos, websites and diagrams) to enable them to achieve the learning goals. To ensure students engage with the material, students will complete a pre-lecture quiz covering the weekly material every week. This quiz has a dual function of requiring students to work more deeply with the material and provide the lecturer with information about what students are finding difficult to learn on their own. In response to the weekly pre-lecture quiz, the lecturer will create a lecture that elaborates on the course material students found particularly challenging. This lecture is recorded asynchronously and uploaded for the students to view. The lecturer will also prepare a 2-hr synchronous session with Peer Instruction questions, group work problems, discussion questions, and opportunities for students to ask questions and clarifications. Students are also required to write their own answers, explanations and/or examples for some of the learning goals; this compilation of a learning goals portfolio will be assessed as part of the exam. In the online laboratory exercises, students will practice and apply important skills such as collecting, analyzing and interpreting data. Laboratory exercises are related to material covered in lectures, giving students an opportunity to work through difficult concepts, with the opportunity to ask a laboratory demonstrator for help online. Students are also provided with practice problems with solutions and past Tm0.0667 gl7 reW*nBT/F1 12 Tf1 0 0 1d

found to be more effective for learning than completing all the engagement with material in one sitting (Dunlosky et al., 2013). Over the course of the week, students engage in spaced practice by first being introduced to the learning goals and the course material, then do the pre-lecture quiz, followed by watching the lecture addressing student difficulties based on the quiz, followed by the synchronous student-active session, before rounding it off with the laboratory exercise.

Student-active learning activities have been found to significantly improve student learning (Freeman et al., 2014). Such activities are the focus of the weekly synchronous sessions to offer opportunities to engage in discussions of course material, address common misconceptions, and practice applying course content to problems and applications. This will primarily be done using Peer Instruction (Mazur, 1997) 174.02 608.74 Tm0.0667 g0.0667 G[1)-3(9)-3(9)6(7)]TJETQq168.8

	Labs are also assessed. As physics is an experimental science, a key learning goals is that students are able to conduct measurements to test models.

5.

10. Academic integrity, referencing and plagiarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at student.unsw.edu.au/referencing