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This course is an introduction to the key research topics in modern astrophysics. It is taught by Brian Schmidt and Paul Francis, and Paul Francis is the course convenor. Brian helped develop the course, but is now the vice-chancellor of the ANU and so has very little time for day-to-day involvement in this course, so Paul will be your main contact.

*Welcome to ASTR1001, the Australian National University’s Introductory Astrophysics Course.*

Brian Schmidt is an astrophysicist at the Australian National University (ANU). He led the team that discovered dark energy – work which won him the 2011 Nobel Prize for Physics. He is now Vice Chancellor of the ANU.

# Welcome to ANU-ASTRO1X

Paul Francis is an astrophysicist at the Australian National University. He has won many prizes for teaching and science communication, and does research on comets, quasars and high redshift galaxies.

# An Experiment

It is based on a set of four MOOCs (Massive Open Online Courses), which were developed in 2014-2016, and which have been offered for free to students from all around the world (over a quarter of a million students have enrolled in them).

MOOCs are great for those who cannot get to a university. But MOOCs do not count for university credit, mostly because we can’t verify the identity of the person doing them.

So, a group of universities belonging to the edX consortium decided to try and offer MOOCs for university credit. To begin with, this is only being offered to students already enrolled in one of these universities. Students can enrol in a course offered by any of the partners. They will complete most of the course online, but will do an invigilated exam at their host institution at the end of the course, to ensure that it really was them (and not their dog…) who learned the material.

# The Students

We expect the students in this class to be a mix of local ANU students, and international students from the other partner universities (at the time of writing, mostly from Delft in the Netherlands and Hong Kong University of Science and Technology).

# How the course will work

The course is made up of modified versions of four MOOCS:

* Greatest Unsolved Mysteries of the Universe: ANU-ASTRO1x
* Astrophysics: Exoplanets: ANU-ASTRO2x
* Astrophysics: The Violent Universe: ANU-ASTRO3x
* Astrophysics: Cosmology: ANU-ASTRO4x

You should do these four MOOCs in turn.

Each MOOC should take around 3 weeks to finish. We expect this to take you around 10 hours per week of effort.

Each MOOC is divided into 9 sections, so you should aim to complete three sections a week. Each section starts with a lesson - which is basically an online lecture, broken up into short videos with questions between them to test your understanding.

Then there is a homework exercise in each section. There are also worked examples and practice questions to help prepare you for the homework exercise.

If you want help, or would like to ask questions or discuss anything in the course, there is a discussion board built in to each MOOC. We will be checking this daily and answering your questions. In addition, for on-campus students there will be an optional in-person drop-in tutorial each week (Monday 12-1pm in the Physics Drop-in Centre, Building 38a).

## What if you’ve done one or the MOOCs before?

Some of you may have done one or more of the MOOCs before. If this is the case, we won’t insist that you do it again – email me ( [paul.francis@anu.edu.au](mailto:paul.francis@anu.edu.au) ) to let me know, and we’ll work out credit for it.

# Assessment

## Lecture Questions. 10%

These are multiple-choice questions after each video clip in the lessons. You have unlimited chances to get each question right, and after your first attempt, you can click on the “show answer” box to get clues. So everyone should be able to get 100% on this. The purpose of these questions is to make you think about the videos you’ve watched.

## Online Homework. 40%

These are online questions in each section of the course. Some are multiple choice, some require you to type in a number, and others require you to type in an equation. You only have typically five chances to answer each question, and you should not share answers with other students.

These online homework assignments have weekly deadlines. They are intended to help you keep up with the course. You will have at least two weeks between when each section is released and when the associated homework is due. Deadlines are shown online – note that they on Mondays at 12.00 Universal Time, which is 11pm Monday in Canberra and 1pm Monday in the Netherlands.

## Final Exam, 50%

There will be a final 3 hour exam, held at your home institution. You need to pass this exam (get a mark of at least 50%) in order to pass the whole course, regardless of your mark from the lecture questions and online homework. This is to verify that you did the work yourself.

You are allowed to bring one page of notes into the exam with you. The exam will ask similar questions to the online homework and practice exams.

# Course Dates

7th July 2018: Course web page goes live. Students can start the course early if they wish.

23rd July 2018: Official course start date. Students should start MOOC ANU-ASTRO1x on Greatest Unsolved Mysteries of the Universe.

30th July 2018: first homework deadline. Students should have completed the first three sections of the course by now.

3rd – 15th September: ANU mid-semester break. There will be no deadlines during this period, but you can get ahead with later materials.