



This course explores cosmology: the study of the nature, origin and fate of our universe. This course is free and open to anyone. If you have done Maths and Physics at school you should be able to get the most out of the course, but even if you don't know Maths and Physics at all, there should still be a lot here for you.



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



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.

This course will run for ten weeks, and should take about one hour per week if you just watch the videos, or around three hours per week if you do all the homework.

A new lesson will appear each week (in the courseware tab). There are nine lessons in all, followed by a bonus section and the final exam.

Videos

Play around with the buttons below the video to change the speed, display captions, change the resolution or view full screen (depending on the speed of your internet connection).

A link below each video allows you to download it. Feel free to share the videos with friends or show them in class. All our content is available for use under a Creative Commons Attribution-ShareAlike License.



The questions between the videos are worth 10% of the course mark. You have as many chances as you like to answer each question correctly.

Mystery

In this course, we aim to give you the chance to experience what it is like to be a research astrophysicist.

To do this, we have invented a mystery for you to solve. We have made up a universe that is very different from ours - one with only a single star in the sky, and a great red fuzzy ball.

This universe is different from ours, but the methods you will need to employ to solve it are just the same as those we explain in the videos: the methods astrophysicists use to understand our own universe.

Each week we will present new clues for you to discuss on the discussion page. And you can propose new observations or experiments - we will generate the data you request and post it for you.

The final examination will test how much you have figured out!



Assessment

If you intend to get a certificate from this course, you will need to do the assessment, and get a grade of at least 50%.

Marks Breakdown:

Lesson Questions: 10%. These conceptual multiple choice questions can be challenging, but you can have as many tries as you wish to answer them, and after your first attempt a button will appear which allows you to see the answer.

Homework: 50%. These are harder, more mathematical questions. There is a homework assignment in each section, and you have two weeks from when the section becomes visible to do them. You get five chances to solve each of the mathematical questions. The answer will not be released until the deadline has passed.

In preparation for attempting the homework, there are optional worked examples and practice questions in each section. These are not worth marks - they are there to give you a chance to practice your skills before doing the homework.

The first homework assignment is due on 17th February. A new one will be released every week, and the last one will be due on 14th April.

Final Examination: 40%. This examination will test how much you have deduced about the mystery (the simulated universe). It will be released on 7th April, and you will need to complete it by 28th April.

Deadlines and Time Zones

The due dates for each piece of homework and for the exam can be found in the courseware section.

New course sections will be released each week on Tuesdays. You will have two weeks to complete the homework for each section.

All times in this course are given in Universal Time (UTC). Homework deadlines are all 14:00 UTC on the Tuesday of each week. You will need to convert this into your time zone.

Discussion Board

This is where you discuss what you're learning, contact other students, ask questions, answer them, get help with the homework, and propose observations to solve the course mystery. There is a discussion page below every video and question where you can ask and answer questions specific to that topic. And in addition you can access all discussions from the discussion tab (as shown above).

There are a few rules for the course:

- 1) You must abide by the edX terms of service and honour code, which can be found at <https://www.edx.org/edx-terms-service>. This honour code, amongst other things, bans the following from being posted on the site:
 - Content that defames, harasses or threatens others;
 - Content that discusses illegal activities with the intent to commit them;
 - Content that infringes another's intellectual property, including, but not limited to, copyrights or trademarks;
 - Profane, pornographic, obscene, indecent or unlawful content;
 - Advertising or any form of commercial solicitation;
 - Content related to partisan political activities;
 - Viruses, trojan horses, worms, time bombs, corrupted files, malware, spyware or any other similar software that may damage the operation of another's computer or property;
 - Content that contains intentionally inaccurate information or that is posted with the intent of misleading others.
- 2) Answers to homework questions should not be posted on the discussion board. You can post hints (e.g. "use the inverse square law") but not the actual answers (e.g. "the answer to question 5 is 4.342").
- 3) If you are aiming to earn a certificate, you must do the lessons, homework questions and exam yourself.

Self Paced Course

Once the course finishes on 28th April, certificates will be issued to anyone who has achieved a grade of at least 50% by that time. The course will then be re-opened as a self-paced course. All deadlines will be removed, and you will be able to do any parts of the course whenever you like. Any marks you obtained before 28th April will be preserved, so if you had to miss some of the course, you can go back and complete it then. Every three months we will check for people who have newly passed the course and will issue you with certificates.