UNIVERSITY OF CAMBRIDGE

Institute of Continuing Education

Weekend Courses 2023-24

Fossils and the history of life

Start date:	7 June 2024	**End date:**	9 June 2024
Venue	Madingley Hall Madingley Cambridge CB23 8AQ		
Tutor:	Dr Peter Sheldon	**Course Code:**	2324NRX041

Tutor biography

Dr Peter Sheldon is an Honorary Associate in the School of Environment, Earth and Ecosystem Sciences at the Open University, where he was a Senior Lecturer in Earth Sciences. He has given over 80 residential courses in geology, palaeontology and evolution for the University of Cambridge Institute of Continuing Education (ICE) since 1979. He has also taught courses for the International Summer Programme at ICE, most recently *Understanding life: evidence from the fossil record* in 2023 and contributed to the Diploma in Evolutionary Biology. From 2008 to 2011 he was External Examiner for Scientific Studies at Oxford University's Department for Continuing Education, where he has given over 40 day-schools.

His teaching style combines fieldwork, hands-on study of real specimens of rocks, minerals and fossils, and interactive lectures. Dr Sheldon chaired the Open University course on *Geology* and has contributed to many other OU courses, including *Fossils and the History of Life*, *Evolution, Earth's Physical Resources*, *Discovering Science*, *The Geological History of the British Isles* and *Earth Science*. He is well known for research on evolutionary patterns in the fossil record and the relationship between evolution and environmental change.

Course programme

Friday
Please plan to arrive between 16:30 and 18:30. You can meet other course members in the Terrace Bar which opens at 18:15. Tea and coffee making facilities are available in the study bedrooms.

19:00	Dinner
20:30 – 22:00	**How fossils become preserved and the nature of the fossil record**
22:00	Terrace Bar open for informal discussion

Saturday

07:30	Breakfast (for residents only)
09:00 – 10:30	**Some evidence of evolution. The earliest history of life, the puzzling Ediacaran Fauna and the Cambrian Explosion**
10:30	Coffee
11:00 – 12:30	**Animal evolution in the Palaeozoic Era and the rise of plants, and a practical session studying fossils in the teaching room**
13:00	Lunch
14:00 – 16:00	Free time
16:00	Tea
16:30 – 18:00	**Further evolution in the Palaeozoic Era and the mass extinction at the end of the Permian Period, 250 million years ago**
18:00 – 18:30	Free time
18:30	Dinner
20:00 – 21:30	**Life in the Triassic and Jurassic Periods, from ammonites to dinosaurs and early mammals**
21:30	Terrace Bar open for informal discussion

Sunday

07:30	Breakfast (for residents only)
09:00 – 10:30	**Life in the Cretaceous Period. End of an Era by meteorite impact? And a practical session**
10:30	Coffee
11:00 – 12:30	**Ups and downs in the last 66 million years. Mammoths, woolly rhinos and hominids. Current threats to the biosphere. What next?**
12:45	Lunch

The course will disperse after lunch

Course syllabus

Aims:
The course will allow you to:

- understand how fossils become preserved, sometimes in exquisite detail
- gain an overview of major events in the history of life
- experience hands-on study of real fossils in the teaching room
- develop sufficient basic understanding of the topic to enable you to pursue an interest in it for yourself

Summary of content:
This course is a wide-ranging look at evolution and the history of life, using evidence from the fossil record. Fossils may form in a variety of ways and sometimes soft tissues can be preserved in surprising detail. Exciting finds continue to be made, and new methods of investigation, such as the use of medical imaging techniques, can reveal aspects of ancient life previously unavailable.

Topics include:

1. How fossils get preserved.
2. Key ideas about evolution and the fossil record.
3. An overview of the history of life.
4. How to recognise some major fossil groups.
5. Mass extinctions and their evolutionary significance.
6. Recent finds and remaining mysteries.
7. The influence of humans on the biosphere.

There will also be a chance to study many real fossils put out in the teaching room.

You are very welcome to bring along your own fossil specimens which you would like to be identified or which you think are of special interest.

Presentation of the course:
The course will be richly illustrated using PowerPoint slides, with plenty of opportunity to ask questions and discuss interesting points. There will also be practical sessions in which you can pick up and personally examine a large number of fossils put out on tables in the teaching room.

As a result of the course, within the constraints of the time available, you should be able to:

- give examples of the various ways in which organisms can become preserved in the fossil record
- outline some of the key events in the history of life, including evolutionary radiations
- discuss the nature and significance of extinction in the history of life, especially the mass extinctions at the end of the Palaeozoic and Mesozoic Eras, and their probable causes
- identify some common types of fossil organisms and suggest the environments they indicate

Reading and resources list

There are no compulsory readings for this course. However, you may find the below recommended reading list of interest to supplement your course.

Many useful books on fossils, evolution, geology and palaeontology will be available for people to look at during the course, and a detailed and extensive booklist will be provided.

If you wish to read something before the course, the following is an excellent, well-illustrated general introduction:

Fortey, Richard, *Fossils - the Key to the Past*, Cornell University Press (2015)
Full colour, 256 pp, paperback, ISBN 978-1501700538
also published by the Natural History Museum, London (2015) ISBN 978-0565093754

Online resources

Among the many excellent websites you may wish to explore if you have access to the Internet are the following, which have links to a vast number of other relevant sites:

http://www.nhm.ac.uk - The Natural History Museum, London.
http://www.ucmp.berkeley.edu - Many exhibits and palaeontology/evolution links.
http://www.si.edu - The Smithsonian Institution.
http://www.amnh.org - The American Museum of Natural History.
http://www.geolsoc.org.uk - The Geological Society of London.
http://www.bgs.ac.uk - British Geological Survey.

Note: Institute of Continuing Education (ICE) students are entitled to 20% discount on books published by Cambridge University Press (CUP) which are purchased at the Press bookshop, 1 Trinity Street, Cambridge (Mon-Sat 9am – 5:30pm, Sun 11am – 5pm). A letter or email confirming acceptance on to a current ICE course should be taken as evidence of enrolment.

(*Information correct as of 15 May 2023*)