

## Rocks, minerals and fossils: an introduction to geology

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<b>Start date</b>	21 June 2019	<b>End date</b>	23 June 2019
<b>Venue</b>	Madingley Hall Madingley Cambridge		
<b>Tutor</b>	Dr Peter Sheldon	<b>Course code</b>	1819NRX038

**Director of ISP and LL** Sarah Ormrod

**For further information on  
this course, please contact  
the Lifelong Learning team** Zara Kuckelhaus, Fleur Kerrecoe  
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**To book** See: [www.ice.cam.ac.uk](http://www.ice.cam.ac.uk) or telephone 01223 746262

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### 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 until 2015. He has given nearly 80 residential courses in geology, palaeontology and evolution for the University of Cambridge Institute of Continuing Education since 1979. 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 since 1993. His teaching style combines fieldwork, hands-on study of real specimens of rocks, minerals and fossils, and interactive lectures. He 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*.

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## Course programme

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### Friday 21 June 2019

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

19:00	Dinner
20:30 – 22:00	Introduction: plate tectonics, a unifying concept in Earth Sciences.
22:00	Terrace bar open for informal discussion

### Saturday 22 June 2019

07:30	Breakfast
09:00 – c.9.40	<p>40-minute talk followed by field excursion to at least one local quarry.</p> <p><i>Please bring stout footwear (essential; preferably walking boots (to give good ankle support), or wellington boots), waterproof clothing in case of bad weather, and, if you wish, a thermos flask which can be filled at breakfast. See also 'Equipment required' and 'Level of fitness required for the field trip' below.</i></p> <p>A packed lunch will be provided.</p> <p>Return by 17.30</p>
18:30	Dinner
20:00 – 21:30	Sedimentary rocks, relative dating and fossils.
21:30	Terrace bar open for informal discussion

### Sunday 23 June 2019

07:30	Breakfast
09:00 – 10:30	Practical session - yesterday's finds and how to identify other rocks and minerals.
10:30	Coffee
11:00 – 12:30	Key events in the geological history of Britain. Final summing up.
12:45	Lunch

**The course will disperse after lunch**

## **Course syllabus**

### **Aims:**

This course aims to:

1. Provide a wide-ranging, practical introduction to geology, including first-hand experience of rocks, minerals and fossils in the field and teaching room.
2. Stimulate a continuing interest in geology.
3. Give course members sufficient basic understanding and practical skills to enable them to begin to pursue an interest in geology for themselves.

### **Content:**

A major part of the course is an excursion to get first-hand experience of rocks, minerals and fossils in the field.

Topics to be covered during the sessions at Madingley Hall will be:

- the main igneous, sedimentary and metamorphic rocks: how they form and how to recognise them;
- minerals; how to distinguish the most common ones;
- fossils; preservation, main types and what they reveal about ancient environments;
- plate tectonics: an explanation for volcanoes and earthquakes, mountains and oceans;
- key events in the geological history of Britain.

**N.B. Level of fitness required for the field trip:** Participants will at times need to be able to walk continuously for about 15-20 minutes within quarries and over very rough and quite steep ground for short distances.

No previous background in geology is needed for the course, and no reading is required in advance.

Programme Please note that the field trip on Saturday may be subject to modification, depending on weather, state of the quarries and so on.

### **Presentation of the course:**

The course will employ a wide variety of teaching and learning methods, including a field excursion, richly illustrated lectures, and the opportunity to pick up and personally examine a large number of rocks, minerals and fossils put out on tables in the teaching room. On Sunday morning, participants are invited to put out their own specimens found on the excursion, so that everyone can examine, identify and learn from each other's finds.

### **Outcomes:**

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

1. Explain in simple terms the difference between igneous, sedimentary and metamorphic rocks, and identify a few of the most common rocks and minerals.
2. Identify some common types of fossils, and, in a few cases, suggest the geological periods they may have come from.
3. Use a basic knowledge of plate tectonics to explain briefly such points as why there are no volcanoes and few earthquakes in Britain today, and why we are moving away from North America at the rate of a few centimetres each year.

#### 4. Outline a few events in the geological history of Britain.

##### **Equipment required:**

Warm and waterproof clothing — **ESSENTIAL**. Please note that quarries stipulate that, for safety reasons, shorts or skirts should not be worn.

Walking boots (preferably, as they support your ankles) or wellington boots — **ESSENTIAL**.

**N.B.** Ordinary walking shoes or trainers are *not* acceptable. Quarries are nearly always wet and muddy in places, and adequate foot protection is required within working areas, near machinery, etc. Bear in mind that wellington boots can be rather hot to wear in summer (compared with walking boots).

- Thermos flask — you might find this to be a good idea.
- Notebook, pen, pencil, rubber.
- Hand-lens (optional) — you'll find your enjoyment and understanding of fossils and rocks increases if you have a hand-lens. Some hand-lenses should be available for purchase from Peter Sheldon for only £2 during the course. Hand-lenses can be also bought from stamp shops (philatelists) and some hobby shops. Magnification x 10 is recommended.
- Plastic bags (a few strong, medium-sized shopping bags); paper — to wrap specimens.
- A geological hammer (optional) — if you have one, it could be useful; otherwise we will lend out a few to share for the trip. Much study can be done without one and there is **NO** need to obtain a geological hammer for the course. (Note that an ordinary hammer should *not* be used to break open rocks; the metal is too brittle and metal chips may fly off.)

**N.B.** In addition to suitable footwear (see above), visitors to quarries have to wear standard safety helmets and high-visibility waistcoats. We will supply these items on loan.

##### **Reading:**

*No reading is required in advance and no books need to be bought (or consulted) for the course.*

*Many useful books on general and specific aspects of geology will be available for people to look at during the weekend, and a detailed and extensive booklist will be provided.*

There are so many fine books available on general aspects of geology, but here is just one that you may find particularly useful (though it is certainly **not** necessary for the course):

*Understanding Earth*. J. Grotzinger and T. Jordan. (2014, 7th Edition). An outstanding, clearly written, widely used introduction to Earth Sciences with many colour illustrations. A global perspective and probably the best overview of its kind. Freeman. ISBN 9781464138744. £59.99.

##### **Website addresses:**

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.geolsoc.org.uk> - The Geological Society of London.

<http://www.bgs.ac.uk> - British Geological Survey.

<http://www.nhm.ac.uk> - The Natural History Museum, London.

**Note** Students of the Institute of Continuing Education 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 Institute course should be taken as evidence of enrolment.

*Information correct as of:* 28 May 2019