UNIVERSITY OF CAMBRIDGE

Institute of Continuing Education

# The history of science

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| **Start date** | 27th October 2017 | **End date** | 29th October 2017 |
| **Venue** | Madingley Hall<br>Madingley<br>Cambridge | | |
| **Tutor** | Dr Vasos Pavlika | **Course code** | 1718NRX075 |

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| **Director of Programmes** | Emma Jennings |
| **For further information on this course, please contact** | Public Programme Coordinator, Clare Kerr<br>clare.kerr@ice.cam.ac.uk or 01223 746237 |
| **To book** | See: www.ice.cam.ac.uk or telephone 01223 746262 |

## Tutor biography

Vasos Pavlika is member of the Biochemical Engineering Department at University College London, Tutor in the Department for Continuing Education, University of Oxford, Saturday School Lecturer at the London School of Economics and Political Science and an Online Tutor for SOAS, University of London. He teaches Applied Mathematics, Engineering Mathematics, the History of Mathematics, Mathematical Economics, Statistics and Computer Programming at undergraduate and postgraduate level. Vasos is an Applied Mathematician with a background in CFD and Mathematical Physics. He has 28 years teaching experience in many UK universities as well external examining experience overseas in: Australia, Greece, Sri Lanka, Singapore, Malaysia, Greece, Egypt and Myanmar on undergraduate and postgraduate degrees. Vasos has been interested in the History of Science for nearly 30 years and has published over 50 peer reviewed papers in Applied Mathematics, Computational Fluid Dynamics), Magnetostatics, the History of Mathematics, the History of Science, Teaching Computer Programming and novel methods of teaching in Higher Education.

## Course programme

### Friday

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.

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| 19:00 | Dinner |
| 20:30 – 22:00 | **The Science of Egypt and Babylon** |
| 22:00 | Terrace bar open for informal discussion |

### Saturday

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| 07:30 | Breakfast |
| 09:00 – 10:30 | **The Science of Greece, Islam and India**. |
| 10:30 | Coffee |
| 11:00 – 12:30 | **The Science of the Enlightenment**. |
| 13:00 | Lunch |
| 14:00 – 16:00 | Free |
| 16:00 | Tea |
| 16:30 – 18:00 | **Copernicus, Galileo, Descartes and their contemporaries.** |
| 18:00 – 18:30 | Free |
| 18:30 | Dinner |
| 20:00 – 21:30 | **Newton, gravity and the toppling of the Aristotelian Worldview, his Alchemy or Chemistry.** |
| 21:30 | Terrace bar open for informal discussion |

### Sunday

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| 07:30 | Breakfast |
| 09:00 – 10:30 | **The History of 20$^{th}$ century Science including Quantum Physics, the Theory of Relativity and Computer Science**. |
| 10:30 | Coffee |
| 11:00 – 12:30 | **The History and legacy of Darwin.** |
| 12:45 | Lunch |

**The course will disperse after lunch**

## Course syllabus

To appreciate the gradual development of science, scientific thought, discovery and its divorce from religion.

To appreciate the historical importance of the great theoretical ideas of 20th century Physics as well as looking at the contribution of Alan Turing in the creation of Computer Science.

To appreciate the origins and the history of the theory of Evolution.

**Content:**

The course will commence with a discourse on Egyptian Science, which will describe many of their inventions including: the lever and the ramp and we will also look at their metallurgical endeavours.

We will also investigate Babylonian Science, in particular at their astronomy and their sexadecimal number system.

This will be followed by a discussion of the Greeks of antiquity where we will attempt to analyse their Philosophy, Science and Mathematics looking at the works of Plato, Socrates and Aristotle. This will be accompanied by an investigation of the work of Euclid and Archimedes.

Moving onto India and Islam we will look at how the work of the ancient Greeks found their way to the west via Indian and Islamic scholars and at how these scientists were more than just copyists of these Greek texts.

We will also consider the Scientific Revolution commencing with the publications of Copernicus, Galileo and Kepler who paved the way for Newton.

We will conclude the course with more recent developments of the 20th century including: Quantum Physics, Relativity, the theory of Evolution and the development of the more recently developed Computer Science after the work of Turing.

**Presentation of the course:**

Each session will have an associated power point presentation and if appropriate this will be accompanied by a relevant video illustrating the requisite theory.

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

- To understand the contribution of the ancient Babylonian, Egyptian and Greek civilisations on the development of Science.

- To appreciate the importance of the Scientific Revolution and the toppling of the so-called Aristotelian worldview.

- To appreciate the great developments in technology and how these are intimately related to the developments of 20$^{th}$ century Science including: Quantum Physics, Relativity and Computer Science.

- To appreciate the significance of the theory of Evolution.

**Reading and resources list**

Listed below are a number of texts that might be of interest for future reference, but do not need to be bought (or consulted) for the course.

| Author | Title | Publisher and date |
|---|---|---|
| Brynum. W | A little History of Science | Yale University Press, 2013 |
| Gleick. J. | Isaac Newton | Pantheon Books, 2004 |
| Gribbin. J. | Science a History | Penguin, 2003 |
| Gutfreund. H | The road to Relativity: The Historical meaning of Einstein's "The Foundation of General Relativity" | Labyrinth Books, 2015 |
| Lloyd. G. | Early Greek Science | Random House books,1974 |
| Robertson. J. | The Enlightenment: A Very Short Introduction (Very Short Introductions) | Oxford University press, 2015. |
| Scott. K. | Story of Life: Evolution (Welcome to the Museum) | Big Picture Press, 2015 |
| Weinberg. S. | To Explain the World: The Discovery of Modern Science. | Harper Perennial, 2016. |

**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:* 13 October 2017