UNIVERSITY OF CAMBRIDGE

Institute of Continuing Education

The history of science

Start date	5 April 2019	**End date**	7 April 2019
Venue	Madingley Hall Madingley Cambridge		
Tutor	Dr Vasos Pavlika	**Course code**	1819NRX025

Director of Academic Centres Sarah Ormrod

For further information on this course, please contact Head of Academic Centre Administration, Zara Kuckelhaus
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To book See: www.ice.cam.ac.uk or telephone 01223 746262

Tutor biography

Dr Vasos Pavlika is a Senior Teaching Fellow in Mathematics at University College London where he based in the Biochemical Engineering Department. He is also a Saturday School lecturer at the London School of Economics and Political Science where he also directs a week long summer school in Mathematics to the most able year 12 students from inner city London schools and colleges. He has been a lecturer in the Department for Continuing Education, Oxford University since October 2004 delivering courses in Computer Programming, Statistics, Mathematics of Computer Games and the Mathematics of Computer Science, the History of Mathematics and Mathematical Bilology. Vasos is also an Online Tutor of Master's courses in Mathematical Economics at SOAS, University of London a role he has fulfilled since October 2003. Vasos has also acted as an External Examiner/Advisor for UK universities on overseas collaborations in Australia, Sri Lanka, Greece, Egypt, Malaysia and Singapore as well as for many UK institutions including City, Bournemouth, Plymouth and Lincoln universities. Vasos has taught at the Institute of Continuing Education, Cambridge since 2016.

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.

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

Saturday

07:30	Breakfast
09:00 – 10:30	**The Science of Greece, Islam and India.**
10:30	Coffee
11:00 – 12:30	**The Scientific Method and the Scientific Revolution.**
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/Chemistry.**
21:30	Terrace bar open for informal discussion

Sunday

07:30	Breakfast
09:00 – 10:30	**The History of 20th century Physics including Quantum theory and Relativity.**
10:30	Coffee
11:00 – 12:30	**A brief History of Chemistry.**
12:45	Lunch

Course syllabus

This course will enable students to appreciate the gradual development of science, scientific thought and discovery as well as the divorce of science from religion. Use of a historical perspective will enable key advances to be introduced in the context of their historical importance and their long term influence. Students will develop an appreciation of some of the key figures of scientific development and thought, with a particular focus on the disciplines of Chemistry and Physics.

Aims:

- The course aims to discuss the lives and work of a number of pivotal Scientists through history.
- The course aims to discuss the consequences and legacies of many of the Scientists that shaped its development.
- The course will also attempt to discuss how these great Scientists arrived at their monumental work and to explain it.

Content:
The course will commence with a discourse on Sumerian, Babylonian and Egyptian Science, describing many of their inventions including: the lever, the wheel and the ramp as well as looking at beer and glass manufacturing and their metallurgical endeavours.

We will also investigate Babylonian astronomy and their sexadecimal number system and the invention of the calendar and time keeping devices.

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 Pythagoras, Aristotle, Euclid and Archimedes and others.

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

We will also consider the Scientific Revolution commencing with the publications of Copernicus, Galileo and Kepler who paved the way for Newton and the toppling of the Aristotelian world view. A discourse on Newton and on his pivotal and unique position in Science will also be delivered.

We will also look at the two great theories of 20th century Physics, namely Quantum Physics and Relativity and to conclude we will briefly discuss the history of Chemistry and how it has ultimately been shaped by the much older disciplines of Physics and Mathematics.

Presentation of the course:

Each seminar will include a power point presentation that will assist with the presentation. On occasion video clips will be used to emphasise certain topics. These notes will be made available to the attendees.

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

- Understand the contribution of the ancient Babylonian, Egyptian and Greek civilisations on the development of Science.
- Appreciate the importance of the Scientific Revolution and the toppling of the so-called Aristotelian worldview.
- Appreciate the great developments in technology and how these are intimately related to the developments of 20th century Science including: Quantum Physics, Relativity and Chemistry.

Reading and resources list

Listed below are texts that might be of interest should you wish to supplement your learning on the course. Any essential reading is marked with an asterisk *

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.
Brock. W.H	The Chemical Tree: A History of Chemistry (Norton History of Science)	W.W.Norton & Co Inc
Weinberg. S.	To Explain the World: The Discovery of Modern Science.	Harper Perennial 2016.

Website addresses

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: 30 January 2019