

## Renaissance arts and sciences

**Start date** 5 June 2020 **End date** 11 June 2020

**Venue** Virtual Classroom

**Tutor** Piers Bursill-Hall **Course code** 1920NRR049

**Director of ISP and LL** Sarah Ormrod

**For further information on this course, please contact the Lifelong Learning team** Zara Kuckelhaus, Fleur Kerrecoe  
[shortcourses@ice.cam.ac.uk](mailto:shortcourses@ice.cam.ac.uk) or 01223 764637

**To book** See: [www.ice.cam.ac.uk](http://www.ice.cam.ac.uk) or telephone 01223 746262

---

### Tutor biography

Dr Piers Bursill-Hall is an academic in the Cambridge University Faculty of Mathematics who lectures on the history of mathematics and history of science in the maths faculty. A mathematician by training, he has also trained in the humanities to become a recognised historian. He has lectured in a number of different countries in Europe, North America, South Asia and the Far East on a range of topics to do with history of mathematics, its culture and behaviour as a social actor. His research studies have ranged over much of past mathematics and mathematical sciences, from pre-Euclidean proof theory and pre-Euclidean geometry, ancient astronomy, renaissance engineering, the changing status of mathematics and mathematical arts in the Renaissance, and Enlightenment mathematics. Recently he has also become interested in early Islamic science and Islamic/Persian algebra. He has taught very widely on the last two or three thousand years of history of science, history of mathematics and history of medicine for the Institute for Continuing Education.

## Course programme

---

These interactive online sessions will start at 4.30pm each day for 7 days beginning on Friday 5 June. Each session will last approximately one hour (often with additional time for questions and discussion) and all sessions will be recorded and made available to students shortly after the course has finished. The lectures will be online using a secure version of Zoom, and you will get an email before the lecture with the meeting invitation, URL, and password. If you are new to Zoom, there will be a separate guide for how to set it up.

### Friday 4.30pm

Session 1: From Brunelleschi to the Vatican Obelisk: an illustrated story with a shocking end. The Renaissance isn't just about history of art.

### Saturday 4.30pm

Session 2: Origins, books, humanism, the Great Ecumenical Council, and reading Plato.

### Sunday 4.30pm

Session 3: Neo-platonism, the authority of the Greeks, and the problem causal explanations; sober and not-so-sober alternative natural philosophy.

### Monday 4.30pm

Session 4: The problem with classical cosmology. Copernicus, the wrong answer and the problem of physics; why did nobody care about Copernicus?

### Tuesday 4.30pm

Session 5: Kepler, Platonism, circles and ellipses, the right answer for the wrong reason?

### Wednesday 4.30pm

Session 6: Printing, algebra, and engineers get ambitions above their station; looking ahead to ... a professor of mathematics at Padua.

### Thursday 4.30pm

Session 7: Vesalius, Paracelsus, and renaissance medical developments. Renaissance naturalism, alchemy, and the search for an alternative natural philosophy.

## Course syllabus

### Aims:

This course will explore the richness and complexity of renaissance science and some aspects of allied technical arts (like engineering and architecture), to see how even though it isn't 'modern' science, scientific thinking was vibrant, innovative, and changing over the 15th and 16th centuries, and to see how "external" influences, (theological, philosophical, social, political ... and so on) influenced renaissance science, and how in return science was central and hugely influential on the rest of renaissance thinking. Leonardo da Vinci is far from the whole story, and if possible, he may not be mentioned.

### Content:

The course begins with some engineering phenomena over the 15th and 16th centuries, just to surprise you. There will be an explanation of how the renaissance began from very unexpected sources, and developed in quite surprising and odd ways, and how renaissance *humanism* was far more concerned with scientific questions than most people understand. We will look at the influence of some religious controversies on science (but only in passing on the Reformation – that's a whole other topic and generally later in the story), and try to show the breadth of science at the time (properly: *natural philosophy*), and *why* it was so much broader than we understand today. Then we will look at the changing status of mathematical arts and mathematical knowledge, how algebra changed everything (don't worry, no equations on the blackboard), and how mechanics or the mechanical arts changed from a fringe practical subject to a central model for scientific thinking. Renaissance astronomy follows and – perhaps, depending on what the class wants – alchemy or medicine to map how radically science changed over the 16th century. What is most interesting in all of this should be that although there are few 'modern' scientific theories or ideas in all of this, you can see the seeds of modern scientific thinking emerging – for all the 'wrong' reasons. Well, 'wrong' in 21st century terms, not 'wrong' at the time. Finally we will look briefly at figures like Kepler and Galileo, right at the start of the 17th century, and how they were moving beyond renaissance ideas, but still deeply rooted in renaissance thinking. From the chaos of new and strange ideas a new template for scientific thinking will evolve in the 17th century.

### Presentation of the course:

The lecture style is engaging, humorous and without the use of PowerPoint. There will be plenty of time for questions and discussion. Sadly we do not have the resources to re-do any 16th century surgical procedures, or calibrate the firing of a decent sized canon, or even recreate alchemical experiments in the lecture room, so there is no field work in this course. Mostly this will just be about thinking, and thinking about the renaissance and early science from new perspectives and in a new context.

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

- (1) Think about past science in a richer, more historiographically sophisticated way, avoiding the dread errors of the Whig Interpretation of History;
- (2) read scholarly and popular literature about past science and about the renaissance from a very different perspective;
- (3) understand well known past figures like Leonardo da Vinci or Copernicus or Galileo from a very different perspective;
- (4) see the Cathedral of Florence – for example – in a completely new light, and next time you're in Florence, stand there and see it differently from everyone else around you. You will feel magical, you will understand its engineering, you will see it as contemporaries saw it.

---

## Reading and resources list

---

Listed below are texts that might be of interest should you wish to supplement your learning on the course.

There is no 'essential' reading for this course; There will be **no** presumption that you have detailed knowledge of the history of renaissance science, so don't feel you need to get up to speed on anything technical. If you are not familiar with the history of the renaissance generally, then you might spend an afternoon or an evening just getting a very general idea about the intellectual history of the renaissance; a light read of any one of the 'background' books below would be sufficient introduction to the general story of the Renaissance. Try not to get sucked into the history of renaissance art – it's great, but not relevant to these lectures. The *arts* in this course are the *practical arts*. I would not recommend the *renaissance* article in Wikipedia, but then I would not recommend *anything* in Wikipedia.

Author	Title	Publisher and date
Lindberg, DC	The beginnings of western science	2 <sup>nd</sup> ed Chicago UP 2008
Debus, Allen G.	Man and nature in the renaissance	CUP 1978
Hall, Marie Boas	The scientific renaissance	Dover 2011 (and many others). Also available online (see below)
Hall, AR	The Revolution in Science 1500-1750	CUP and other editions
Galuzzi, P	Renaissance Engineers from Brunelleschi to da Vinci	Giunti Editore, 2008 (only if you can find a library copy)

### Background Reading related to the Renaissance period

Brotton, Jerry	The Renaissance: A Very Short Introduction	OUP 2006
Campbell, G	The Oxford Illustrated History of the Renaissance	OUP 2019

Aston, M	The Renaissance Complete	Thames and Hudson 2009
Nauert, CG	Humanism and the Culture of Renaissance Europe	CUP 2006
Burckhardt, Jacob	The Civilisation of the Renaissance in Italy	Many editions – eg. Penguin 1990
Kristeller, OP	Renaissance thought and its sources	Many editions – eg. Columbia UP 1981

**Website addresses** M.B. Hall: The Scientific Renaissance  
<https://archive.org/details/scientificrenais007153mbp/page/n10/mode/2up>

---

### Additional information

---

#### Venue

Online using 'zoom'. A link to the course will be made available via email, and any queries should be emailed to [shortcourses@ice.cam.ac.uk](mailto:shortcourses@ice.cam.ac.uk).

**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:* 27 May 2020