

## Section 2 - Connect with your University



### Reading List – Physics

If you are looking to do some reading/preparation ahead of starting University here are some suggested tasks which you might like to try:

#### From Science Daily

- Articles on [Dark Matter](#)
- Articles on [Big Bang](#)
- Articles on [Cosmology](#)
- Articles on [Astrophysics](#)
- Articles on [Matter and Energy](#)

#### From the Institute of Physics

- Journal on [Nuclear Fusion](#)
- Journal of [Applied Physics](#)
- Article on “[Hubble’s best shots: A cheeky gravitational grin](#)”

#### Engineering

##### From Science Daily

- Articles on [Aerospace](#)
- Articles on [Engineering and Construction](#)
- Articles on [Energy and Resources](#)

##### From the Institute of Physics

- Journal on [Fluid Dynamic Research](#)
- Journal on [Progress in Energy](#)

- Journal on [Functional Composites and Structures](#)
- Journal on [Engineering Research](#)

### **Computer Science and Mathematics**

#### **From Science Daily**

- Articles on [Artificial Intelligence](#)
- Articles on [Computer Science](#)
- Articles of [Quantum Computing](#)
- Articles on [Hacking](#)
- Articles on [Mathematics](#)

#### **From the Institute of Physics**

- Journal on [Quantum Science and Technology](#)
- Journal on [Inverse Problems](#)
- Journal on [Mathematics and Theoretical Physics](#)

### **Interesting and Strange Articles**

#### **From Science Daily**

[Long spaceflights affect astronaut brain volume](#)

[Engineers 3D print soft, rubbery brain implants](#)

[Why the solar wind is hotter than expected](#)

[Puzzle of Compton scattering solved: New approach for testing theories in quantum mechanics](#)

[New formation theory explains the mysterious interstellar object 'Oumuamua](#)

[New 'refrigerator' super-cools molecules to nanokelvin temperatures](#)

[Expert mathematicians stumped by simple subtractions](#)

[Mysterious release of radioactive material uncovered](#)

#### **Videos on YouTube**

##### **Physics**

[The Secrets of Light and Energy – BBC](#)

[Everything and Nothing – Reel Truth Science - Part 1](#)

[Everything and Nothing – Reel Truth Science – Part 2](#)

[Atom: The Illusion of Reality – Reel Truth Science](#)

[The True Nature of Time – Discovery Channel](#)

### **Engineering**

[High-tech in the Air – Free Documentary](#)

[The Making of a Wind Turbine – Free Documentary](#)

[Mega Cranes – Free Documentary](#)

[How do Engineers Build Safe Bridges? – Spark](#)

[How to Make Sure Ships Don't Slink – Spark](#)

### **Computing and Mathematics**

[Quantum Computing Pyramid – National Geography](#)

[Calculating Ada – The Countess of Computing - BBC](#)

[Magic Numbers – Mysterious World of Maths – BBC](#)

[The Math Mystery Mathematics in Nature and Universe – Science Documentary – Nova](#)

[The Story of Binary Number – Documentary Warehouse](#)

### **Top 5 Books for Physics**

1. Six easy pieces - Book by Richard Feynman
2. Seven Brief Lessons on Physics - Book by Carlo Rovelli
3. Physics of the Impossible: A Scientific Exploration into the World of Phasers, Force Fields, Teleportation, and Time Travel - Book by Michio Kaku
4. A Short History of Nearly Everything - Book by Bill Bryson
5. Why Does  $E=mc^2$ ? - Book by Brian Cox and Jeff Forshaw

### **Reading Lists for Physics for University (Oxford)**

Riley, K.F., Hobson, M.P., and Bence, S.J.	<i>Mathematical Methods for Physics and Engineering</i> (this is the recommended maths textbook for the first year of the course)
Boas	<i>Mathematical Methods in the Physical Sciences</i> (Wiley)
Lorrain and Corson	<i>Electromagnetism, Principles and Applications</i> (W.H. Freeman)
Lyons	<i>All you wanted to know about Mathematics...</i> Vols. 1 & 2 (Cambridge)
Krane	<i>Modern Physics</i> (Wiley)
Hecht	<i>Optics</i> (Addison Wesley) (not for Physics and Philosophy)
Main	<i>Vibrations and Waves in Physics</i> (Cambridge)
McCall, M.W.	<i>Classical Mechanics</i> (Wiley)

### **Reading List for Engineering (Cambridge) – Shortened**

#### ***Sustainable Energy – Without the Hot Air***

**by David J.C. MacKay**

Published by UIT, 2008

ISBN: 0954452933

This book is available as a free download from [www.withouthotair.com/download.html](http://www.withouthotair.com/download.html)

#### ***How Do Wings Work?***

**by Holger Babinsky**

Published by Physics Education, 2003

doi: 10.1088/0031-9120/38/6/001

Not a book but a paper published in the Institute of Physics journal *Physics Education* that is available as a free download from the [Physics Education website](http://www.physicseducation.org)

#### ***Sustainable Materials – With Both Eyes Open***

**by Julian Allwood and Jonathan Cullen**

Published by UIT Cambridge Ltd., 2012

ISBN: 190686005X

This book is available as a free download from <http://withbotheyesopen.com/read.php>

***Engineering in Society***

**edited by Rob Lawlor**

Published by the Royal Academy of Engineering, 2013

An e-book published by the Royal Academy of Engineering that is available as a free (pdf) download from the [RAEng website](#)

***Engineering: A Beginner's Guide***

**by Natasha McCarthy**

Published by Oneworld Publications, 2009

ISBN: 1851686622

***What Engineers Know and How They Know It: Analytical Studies from Aeronautical History***

**by W.G. Vincenti**

Published by Johns Hopkins University Press, 1993

ISBN: 0801845882

***Bebop to the Boolean Boogie: An Unconventional Guide to Electronics***

**by Clive Maxfield**

Published by Newnes (Elsevier), 2009

ISBN: 1856175073

***Invention by Design – How Engineers get from Thought to Thing***

**by Henry Petroski**

Published by Harvard University Press, 1998

ISBN: 0674463684

***To Engineer is Human: The Role of Failure in Successful Design***

**by Henry Petroski**

Published by Vintage Books, 1992

ISBN: 0679734163