



St Benet Biscop Sixth Form

Personal Development

Physics

1. MOOCs (Massive Open Online Courses)

Pre-University Physics - DelftX

Prepare for your technical studies by reviewing the fundamentals of physics. Become familiar with the way physics and physics related topics are taught at university level.

Mechanics Part 1: Rice University

This course is an introduction to mechanics and follows a standard first-semester university physics course. You will learn fundamental mechanics concepts and mathematical problem solving required for all STEM fields.

Astrophysics: Cosmology – Australian National University

This course is designed for people who would like to get a deeper understanding of astronomy than that offered by popular science articles and shows. You will need reasonable high-school level Maths and Physics to get the most out of this course.

The Einstein Revolution: Harvard University

Participants in the course will follow seventeen lessons, each of which will present a mix of science (no prerequisites!) and the broader, relevant cultural surround. Some weeks will examine the physics concepts, while others will see excerpts of films or discuss modernist poetry that took off from relativity. Or we might be looking at the philosophical roots and philosophical consequences of Einstein's works. At other times we will be fully engaged with historical and political questions: the building, dropping, and proliferation of nuclear weapons, for example.

2. Books

Surely You're Joking Mr Feynman: Adventures of a Curious Character

ISBN - 009917331X - Richard Feynman was a Nobel Prize winning Physicist. In my opinion he epitomises what a Physicist is. By reading this book you will get insight into his life's work including the creation of the first atomic bomb and his bongo playing adventures and his work in the field of particle physics. (Also available on Audio book).

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God intends us to be.*



Moondust: In Search of the Men Who Fell to Earth

ISBN – 1408802384 - One of the greatest scientific achievements of all time was putting mankind on the surface of the moon. Only 12 men made the trip to the surface, at the time of writing the book only 9 are still with us. The book does an excellent job of using the personal accounts of the 9 remaining astronauts and many others involved in the space program at looking at the whole space-race era, with hopefully a new era of space flight about to begin as we push on to put mankind on Mars in the next couple of decades.

Quantum Theory Cannot Hurt You: Understanding the Mind-Blowing Building Blocks of the Universe

ISBN - 057131502X - Any Physics book by Marcus Chown is an excellent insight into some of the more exotic areas of Physics that require no prior knowledge. In your first year of A-Level study you will meet the quantum world for the first time. This book will fill you with interesting facts and handy analogies to whip out to impress your peers!

A Short History of Nearly Everything

ISBN – 0552997048 - A modern classic. Popular science writing at its best. A Short History of Nearly Everything Bill Bryson's quest to find out everything that has happened from the Big Bang to the rise of civilization - how we got from there, being nothing at all, to here, being us. Hopefully by reading it you will gain an awe-inspiring feeling of how everything in the universe is connected by some fundamental laws.

Thing Explainer: Complicated Stuff in Simple Words

ISBN – 1408802384 - This final recommendation is a bit of a wild-card – a book of illustrated cartoon diagrams that should appeal to the scientific side of everyone. Written by the creator of online comic XTCD (a great source of science humour) is a book of blueprints from everyday objects such as a biro to the Saturn V rocket and an atom bomb, each one meticulously explained BUT only with the most common 1000 words in the English Language. This would be an excellent coffee table book in the home of every scientist.

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3. Films/Documentaries

Oppenheimer (2023) – Rating 15

During World War II, Lt. Gen. Leslie Groves Jr. appoints physicist J. Robert Oppenheimer to work on the top-secret Manhattan Project. Oppenheimer and a team of scientists spend years developing and designing the atomic bomb. Their work comes to fruition on July 16, 1945, as they witness the world's first nuclear explosion, forever changing the course of history.

Moon (2009) – Rating 15

Astronaut Sam Bell has a quintessentially personal encounter toward the end of his three-year stint on the Moon, where he, working alongside his computer, GERTY, sends back to Earth parcels of a resource that has helped diminish our planet's power problems.

Gravity (2013) – Rating PG-13

Dr. Ryan Stone (Sandra Bullock) is a medical engineer on her first shuttle mission. Her commander is veteran astronaut Matt Kowalsky (George Clooney), helming his last flight before retirement. Then, during a routine space walk by the pair, disaster strikes: The shuttle is destroyed, leaving Ryan and Matt stranded in deep space with no link to Earth and no hope of rescue. As fear turns to panic, they realize that the only way home may be to venture further into space.

Interstellar (2014) – Rating PG-13

In Earth's future, a global crop blight and second Dust Bowl are slowly rendering the planet uninhabitable. Professor Brand (Michael Caine), a brilliant NASA physicist, is working on plans to save mankind by transporting Earth's population to a new home via a wormhole. But first, Brand must send former NASA pilot Cooper (Matthew McConaughey) and a team of researchers through the wormhole and across the galaxy to find out which of three planets could be mankind's new home.

The Imitation Game (2015) – Rating PG-13

In 1939, newly created British intelligence agency MI6 recruits Cambridge mathematics alumnus Alan Turing (Benedict Cumberbatch) to crack Nazi codes, including Enigma -- which cryptanalysts had thought unbreakable. Turing's team, including Joan Clarke (Keira Knightley), analyse Enigma messages while he builds a machine to decipher them. Turing and team finally succeed and become heroes, but in 1952, the quiet genius encounters disgrace when authorities reveal he is gay and send him to prison.

The Prestige (2006) – Rating PG-13

An illusion gone horribly wrong pits two 19th-century magicians, Alfred Borden (Christian Bale) and Rupert Angier (Hugh Jackman), against each other in a bitter battle for supremacy. Terrible consequences loom when the pair escalate their feud, each seeking not just to outwit -- but to destroy -- the other man.

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Chernobyl 1986 (2021) – Rating PG 13

After the explosion at the Chernobyl nuclear power plant number 4, the USSR and all of Europe is faced with an even greater threat -- a possible steam explosion that would eject even more radioactive material into the atmosphere over the entire continent. Firefighter Alexey volunteers for what seems like a suicide mission: manually drain the plant's reservoir before the melting reactor collapses into it. Risking their lives in service to their country, Alexey and his colleagues must navigate the labyrinthine passages of the plant's underground, facing danger at every turn from the facility's quickly failing infrastructure. With time running out, and the fate of all of Europe hanging in the balance, this team of ordinary citizens turned heroes must use all their strength and bravery to save their nation from complete devastation.

Litvinenko – TV series

Alexander Litvinenko, a former Russian spy and Kremlin critic, dies in a London hospital bed, but not before accusing President Vladimir Putin of his murder.

4. You Tube Clips

Veritasium
Physics Girl
V Sauce
Crash course
Kurzgesagt – In A Nutshell
Numberphile (Physics & maths)
Sixty Symbols (higher level)

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