Engineering Reading List

We're looking forward to welcoming you on to the Engineering course, and we hope you're looking forward to joining us too!

If you'd like to start exploring the subject ahead of the start of your course, here's a list of resources that will help you engage with some of the ideas you'll be exploring in more depth. These are by no means in order of importance and you don't have to look at all of them – let your instinct choose what sounds more interesting to you.

Whether you're doing the one or two week course, the reading list below is applicable!

- **Activity:** Ahead of our first tutorial, please take the time to research and prepare a short 3-minute presentation on an engineering project of your choice. This project can be from any point in human history. Talk about why it was innovative, any new technologies used in its creation, its economic/cultural/social impact and any other defining features of it.

- **Article: Roll's Royce's all-electric airplane smashes record with 387.4 MPH top speed by Steve Dent** – Rolls-Royce's Spirit of Innovation, a light propeller aircraft powered by an electric motor, has hit a top speed of 387.4 mph, smashing the speed record in the all-electric aircraft category. All-electric aeroplanes are not seen as practical just yet as the battery technology currently in service is about 50 times less energy-dense than jet fuel, but they could be useful over short ranges. The battery pack used in the Rolls-Royce plane is the most power-dense propulsion battery pack ever assembled.

  Link: Read here

- **Article: British Air Force Set A World Record For First Flight Using Only Synthetic Fuel by Ameya Paleja** – In a related story to the one above, the 21-minute flight of a microlight aircraft from the Royal Air Force (RAF, UK) set a Guinness World Record for completing the world's first flight powered only by synthetic fuel. Synthetic fuel is made by capturing carbon dioxide from the air and converting it to fuel by adding hydrogen molecules from water. It delivers the same energy density as fossil fuels but without the environmental costs of drilling (no mention of combustion bi-products or emissions however...) and can be used in conventional engines

without modifications. The RAF plans to become a net-zero force by 2040, which is interesting given that war and defence is among the most polluting and destructive industries.

Link: Read here

- **Article: A New Quantum Computing Method Is 2,500% More Efficient by Brad Bergan** – Today, most quantum computers can only handle the simplest and shortest algorithms as they're so wildly error prone, not something you want from your computer. Q-CTRL has discovered a way to reduce computational errors in quantum systems, increasing the likelihood of quantum algorithms succeeding by 2,500%. It uses specialised software to alter quantum logic gates and can be used on any quantum system (hardware-agnostic). Breakthroughs in this industry have been highly anticipated for many years and this one is unprecedented.

  Link: Read here

- **Article: Rivian Soars Past $100 Billion Following America's Biggest IPO Since Facebook by James Gilboy** – Those of you in the loop with the business world will know that EV stock is pretty hot at the moment – Tesla hit a $1 trillion market cap, Arrival (another innovator in EV) recently listed and now Rivian is the latest to add to the growing list of phenomena in the sector. The start-up's initial public offering raised almost 53 times as much as Tesla's did, becoming not just the largest of 2021, but of the last nine years and the 12th-biggest in history, becoming the second highest-valued US carmaker behind Tesla – not bad for a company that has technically only delivered just over 100 vehicles... The IPO's success was likely due to the positive reception to its electric R1T pickup and its close ties to Amazon, who is contracted to buy 100,000 of Rivian's electric vans. Where it closed on the first day of trading makes for good headlines but more significant is where Rivian's stock price will be once the IPO fever wears off, and the hype settles.

  Link: Read here

- **Article: Apple will sell you iPhone parts to fix your own phone at home by Jacob Kastrenakes** – Whether you consider yourself an Apple fan or not, the engineering world has to acknowledge them for finally opening up iPhones and Macs to at-home repairs. They will start selling (obviously) more than 200 individual parts and tools for users to repair their devices at home, starting with the iPhone 12 and 13. Repair manuals will be available so customers can review the process before buying parts and they can receive a recycling credit for returning used parts after completing repairs. Self Service Repair will launch early next year in the US and then expand to other countries. The right to repair movement has put pressure on Apple to support

its products and until now they have done little to change their stance on repairs, so this U-turn is as much overdue as it is 'revolutionary' (for them), so it's generally positive in my opinion.

Link: Read here

Next Steps:
We're really looking forward to welcoming you to our Engineering course! If you'd like to take your learning to the next level, you're welcome to join one of our other related programmes too – many of our students sign up to multiple programmes as they prepare for their futures. Your options include:

- Our month-long Engineering Internships are a great option – you'll gain hands-on experience, co-authoring a paper with an academic researcher on a niche engineering topic (this could be particularly helpful as work experience can be hard to find!)
- At Oxford Scholastica, we run a residential Oxford Summer School every summer - you might be interested in the Experience Engineering Academy. This is an immersive, two-week residential experience which takes place on the Oxford University campus – you'll take your understanding of engineering to the next level while meeting like-minded students from around the world

Other Resources:
Clarity about your future career direction will help you in your academic studies and in your university applications. We've created a quick Careers Test to help you to know what careers might suit you best. You'll then receive a personalised Careers Report, with recommended careers and resources to explore. We hope you'll find it useful!

Try the Test here

If you know you're applying to university soon, and are keen to stand out from the crowd, we've created a short (free) **University Preparation Report** for you – simply fill in the quick form on this page, and we'll send you subject-specific reading and podcast recommendations, tailored to your interests, to help guide your university preparation.

Take the University Preparation Report here