

INSIDER INFORMATION

YOUR CHEMICAL ENGINEERING DEGREE OPENS THE DOOR FOR YOU TO WORK IN A VAST ARRAY OF SECTORS. WE ASKED RECENT GRADUATES NOW WORKING IN INDUSTRY TO SELL YOU THEIR SECTOR.

METALS AND MINERALS



Alister King lives in Australia and works in the steel industry. He graduated in 2011.

WHY DID YOU CHOOSE THE METALS AND MINERALS SECTORS?

I was interested in making core products by applying the theory and principles I learned at university. Also, having a hands-on role in heavy industry while still living in a capital city is a big bonus.

WHY WOULD YOU RECOMMEND OTHER RECENT GRADUATES FOLLOW YOU INTO THE SECTOR?

The hands on, operational experience you gain in this sector is invaluable, and learning what the key factors are to a successful and efficient process is really beneficial. You'll find the work is very interesting and varied. And if your experience is anything like mine, you'll learn to solve problems quickly and

you'll be given a large amount of responsibility straight out of university. That's a great advantage of the sector. You are also producing materials that are critical to society. Oh, and the pay is very good too.

IF YOU COULD GIVE ONE PIECE OF ADVICE THAT YOU WISH YOU'D BEEN GIVEN, WHAT WOULD IT BE?

As cost reduction becomes more and more important to businesses the contribution of every role is scrutinised in greater and greater detail. Ensure you are contributing to the value of the business. And keep in mind everyone is judging you so it is important to remain professional regardless of who you are working with and talking to.

WHAT TIPS WOULD YOU GIVE FRESH GRADUATES ABOUT CPD AND NETWORKING?

You should surround yourself with friends in similar roles and industries. Keep in contact with university peers as you never know when you might need a favour. Establishing a mentor early on is also a really good idea as they can provide advice and potentially lead you to new opportunities. A good professional LinkedIn profile is also important.





WATER

Mehtaab Hussain graduated in 2014 and works in the UK. Mufeed Hassan also graduated in 2014 and works in the UK. Agnes Chan graduated in 2011 and works in Hong Kong. Michael Ball graduated in 2012 and works in the UK. All four work in the water sector.

ASKED WHY GRADUATES SHOULD JOIN THE WATER INDUSTRY, OUR INTERVIEWEES RAISED THE PREVALENCE AND DIVERSITY OF OPPORTUNITIES WITHIN THE SECTOR:

MEHTAAB: Currently the water industry is expanding at an extremely high rate, facing a large number of different challenges such as climate change, demand, and strain on the current water infrastructure in the country. Which sparked my interest and desire to be involved.

MUFEEED: Everyone needs water! Whether it be for industrial, mining or domestic use, water treatment is important to everyone. I also love being challenged and with the water sector it's ever-changing with constant new developments and increased environmental concerns. It really allows me to push boundaries.

AGNES: Water engineering for process engineers is not only about water treatment, but also about sludge treatment, odour treatment, renewable energy generation by sludge, treated effluent reuse and so on. I think it is interesting, as there is always something new - new treatment technology, new regulation or new models. I would recommend that the

graduates join my sector if they are looking for a job that is interesting as well as meaningful. You will make some contributions to the lovely beaches, rivers, or even the drinking water from the taps.

MICHAEL: Working with water means that you can get really hands on straight away, and making mistakes in the lab doesn't cause major disasters! This means that you can be given more responsibility quicker and can learn by doing and find effective ways of working using your own methods.

WHAT ADVICE DO YOU HAVE FOR THOSE ENTERING THE WORLD OF WORK?

MEHTAAB: You have to plan out your own career path towards getting Chartered. After starting in my role I quickly realised that I would have to chase people up for information, to get more involved on projects, and to make the most of the resources available. This is highly important, since it helps you network and learn about new opportunities so you can register your interest in certain projects.

MICHAEL: Learn who your customers are and what they want to know from you. Your 'customers' doesn't necessarily mean someone you're selling something to, but colleagues, management, and people from other departments. Compared



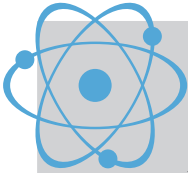
to university, in the world of work clear, concise conclusions are often all that is required. You must realise that not everyone is a scientist or engineer and nobody wants to wade through mountains of data to get to a recommendation that could be summarised in a short paragraph.

WHAT WOULD YOU RECOMMEND STUDENTS AND FRESH GRADUATES DO TO BOOST THEIR CPD?

MEHTAAB: Get involved in a professional organisation such as IChemE. There are several different Special Interest Groups available. Attend meetings and external presentations, ask questions, and always keep a diary of what you do or what you attend. But keeping a diary isn't enough by itself, always write a note about what you learnt and what benefit it has given you.

AND DO YOU HAVE ANY ADVICE ON SUCCEEDING AT INTERVIEW?

MUFEEED: Take the opportunity during the interview to ask them questions. Many people forget this. You are interviewing the employer just as much as the employer is interviewing you. This is your opportunity to find out if this is an organisation where you see yourself working. Good luck!



NUCLEAR

Adil Sardardeen works in the UK and graduated in 2014. Madeleine Jones also works in the UK and graduated in 2012. Both work in the nuclear industry.

WHY THIS SECTOR?

ADIL: Nuclear is a growing sector, especially with the UK government committing to new-builds. Whilst the oil and gas job market is getting tougher, the nuclear job market is growing more, giving greater flexibility to find the right job for you. The roles available within this sector go far beyond your straightforward process engineering. This gives me the ability to develop a broad range of skills to help me get chartered early.

MADELEINE: I wanted a job with long term opportunities that wasn't all about delivering a profit.

HOW DID YOU GET THE JOB YOU HAVE NOW?

Both Adil and Madeleine were offered graduate positions with Sellafield as a result of their good performance on their industrial placement years with the company.

ADIL: Getting onto a placement scheme is a very good method of illustrating your value to the company.

MADELEINE: As part of the graduate scheme I did four six-month secondments so that I could get a good idea of the opportunities available and then decided to become a system engineer. I am now a system engineer for uranium purification in one of our reprocessing facilities.

SELL YOUR SECTOR TO THE NEXT GENERATION

ADIL: The strategy set out by the UK government has clear expectation on nuclear playing a significant role in the UK energy mix in the future. Further, the government sees the domestic new-build and wider nuclear market as an essential platform to further enhance the UK nuclear commercial base and grow global market share. Coming into the nuclear sector now, you are not only making yourself more valuable in the future across the UK, but globally. It is an industry that will experience a great deal of growth and the competition for chemical engineers is only likely to increase. It is an industry definitely worth applying for.

MADELEINE: The work available to engineers in the nuclear industry is hugely varied and challenging. From decommissioning the UK atomic weapons legacy, to recycling spent fuel, to power generation, to R&D for the future of nuclear power, there really is something for everyone. The skills we learn as young nuclear engineers are universally sought-after – process safety is embedded into everything we do. It's an industry that is unique in the level of responsibility you will be given and the training programmes are comprehensive. There are many real opportunities for innovation and, with a fleet of new UK reactors on the horizon, a truly renaissance industry.



WHAT'S ONE PIECE OF ADVICE YOU WISH YOU'D BEEN GIVEN BEFORE ENTERING THE WORLD OF WORK?

ADIL: Try to put yourself out of your comfort zone and challenge yourself. That is the way to get ahead in the world of work, to be able to go that extra distance and be prepared to challenge yourself as well as others.

MADELEINE: Take every job interview you are offered. The only way to get better at interviews is to practise!

WHAT TIPS CAN YOU GIVE UNDERGRADUATES ABOUT FURTHERING THEIR CAREERS?

ADIL: The likes of CPD and networking are a great opportunity to sell yourself to someone who may be significant in helping you get your next role. First impressions are key, so it is always useful to make an extra effort and have your elevator speech polished. Getting involved in CPD, networking and general STEM activities also helps to develop useful communication skills.

MADELEINE: Once you are through the door at any company your network can be crucial to getting the job you want. It's really crucial to maintain relationships once



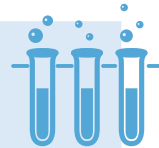
you have established them; pop to their office to see how they're getting on or give them a call every so often. Training and CPD all help develop your skills. You never know when you might be called upon to demonstrate knowledge of something – especially in job interviews! Never forget the secretaries and admin team. They are usually the best people to know in the office!

ARE THERE ANY BOOKS, APPS OR ONLINE SERVICES THAT YOU'D RECOMMEND TO JOBSEEKERS?

ADIL: Getting through the numerical and analytical skills tests at the early stage of a job application can be difficult at times, but what I found useful was carrying out numerous practices online using the various free practice websites that are available. Furthermore, using tools such as LinkedIn to find out more about the company as well as maybe talking to some of the people working there can give a really good idea of whether the company is right for you.

MADELEINE: For me there's no substitute for real world work experience and interview practice, but I do like to remind myself of the *7 Habits of Highly Effective People* by Stephen Covey every now and again.

BIOTECHNOLOGY



James Rutley works in the biotechnology industry in the UK and is studying for an Engineering Doctorate (EngD)

WHAT MADE YOU CHOOSE BIOTECHNOLOGY?

Biotechnology is an area which I have always been very excited by. I believe it offers the best route to solving some of the biggest problems that we face today and for a number of years I have seen it as the sector where I would like to build my career. Then, as a biochemical engineer by training, and based on what I know and am passionate about, bioprocessing was the best way for me to get into and to contribute to this.

HOW DID YOU GET YOUR CURRENT JOB?

I was offered my current position while undertaking my engineering doctorate. I was recruited by my sponsor company two and a half years into the four years program and continue my EngD alongside my job.

WHY SHOULD A GRADUATE CONSIDER BIOTECHNOLOGY?

Biotechnology is a growing sector, and one which people are taking increasing notice of for the importance of the role that it plays as part of a huge range of industries. The outputs of the biotechnology sector are vast, and the products that are developed and manufactured go on to improve the quality of life of millions of people the world

over. To me, that makes it an incredible thing to be a part of!

WHAT'S THE BEST PIECE OF ADVICE YOU WISH YOU'D BEEN GIVEN BEFORE ENTERING THE WORLD OF WORK?

Make sure you put in the effort from day one. Whether you like it or not, your performance will be constantly judged and even if it isn't for a formal review, the people offering you your next promotion or role will look favourably on those who constantly perform to a high level.

WHAT TIPS CAN YOU GIVE UNDERGRADUATES ABOUT FURTHERING THEIR CAREERS?

When I was an undergraduate, networking was always something I was worried was a bit of a sleazy word. But you really cannot underestimate the importance of making contacts both in terms of the knowledge you might be able to share now, but also the opportunities they may hold for you in the future. You have to put yourself out there and if you can make someone remember you, all the better!





PALM OIL

Alan Chan (graduated 2006), Toh Seong Hing (graduated 2007) and Liew Sin Lu (graduated 2008) all work in Malaysia's palm oil industry.

WHAT MADE YOU CHOOSE THE SECTOR?

ALAN: There are palm trees everywhere in Malaysia and I think it is interesting to learn about the processing and application.

SEONG HING: I love this industry because Malaysia could control the entire supply chain from the raw material to the end product locally. The processes cover oil palm plantation, fresh fruit bunches milling, refining, logistics and sales. The palm oil industry has proven to be economically robust. Besides that, sustainable palm oil is the most land-use efficient vegetable oil. It is the source of livelihoods for millions of farmers and communities across Indonesia and Malaysia, and is growing in importance in Africa and Latin America. As well as being a staple foodstuff for billions of people, palm oil and its derivatives are key ingredients for thousands of consumer products.

SIN LU: I have always wanted to be involved in the food industry, and the edible oil industry fits both into my studies and interests.

SELL YOUR SECTOR TO THE NEXT GENERATION OF CHEMICAL ENGINEERS.

ALAN: The vegetable oil processing industry, especially palm oil milling and refining, are still facing many challenges. Many interactive properties of palm oil are yet to be identified to design an efficient

production of safe and healthy edible oil.

SEONG HING: The palm oil industry can be divided into two major streams – upstream, which includes estate and oil mill, and downstream which includes refining and further processes. There are a few key benefits. As a mill engineer or mill manager, there are plenty of job opportunities in other countries like Indonesia, Papua New Guinea, Nigeria, and Brazil. There are chemical engineering opportunities in edible oil refining, oleochemicals and biodiesel all over the world. Applying chemical engineering knowledge to the industry can improve people's lives. It's a resilient industry during economic meltdown. There's high job security and fast promotion opportunities due to the rapid growth of the industry.

SIN LU: The knowledge applied in the job is very relevant to what chemical engineers study at university. As a process engineer in the company, I am not only in charge of the process plant design, but also involved in plant commissioning to gain actual experience at site. This is very interesting as I get to apply theoretical knowledge that I learnt into practical solutions, and a chance to innovate further to provide better solutions to existing technologies. Moreover, the industry has a very bright future to provide a better quality of edible oil, an essential necessity for many citizens in the world, and convert



edible oil to oleochemicals and biodiesel.

WHAT'S THE ONE PIECE OF ADVICE YOU WISH YOU'D BEEN GIVEN BEFORE ENTERING THE WORLD OF WORK?

ALAN: Expose yourself to the industry, for example through an internship in order to understand the application of subjects that you are studying instead of blindly studying the theory.

SIN LU: Work on your communication skills to be able to deal with people from different backgrounds.

WHAT TIPS CAN YOU GIVE UNDERGRADUATES ABOUT FURTHERING THEIR CAREERS THROUGH THE LIKES OF CPD, NETWORKING AND OTHER ACTIVITIES?

ALAN: Consider joining and be active in some IChemE Special Interest Groups. It is an excellent platform for knowledge sharing and networking among chemical engineers. It also keeps me updated on the chemical engineering industry by knowing engineers from different sectors.



SEONG HING: Usually, I will plan to attend two courses in a year to improve my soft skills and competency. Another tip is to engage with clients and suppliers frequently to exchange knowledge because they have more exposure in the business world. It can save our time when we need certain solutions in the work place.

WHAT BOOKS, APPS OR ONLINE SERVICES WOULD YOU RECOMMEND TO JOBSEEKING GRADUATES?

SEONG HING: The book *How to Interview Like a Top MBA: Job-Winning Strategies From Headhunters, Fortune 100 Recruiters, and Career Counselors* by Shel Leanne is useful for fresh graduates as they can pick up interview strategies. Besides that, it could help to present the candidate's 'selling points' in a more organised form.

SIN LU: I would recommend *The Magic of Thinking Big* by David J. Schwartz, to help people achieve what they would like to achieve, and *Everyone Communicates, Few Connect* by John C. Maxwell to help to develop effective communication skills.

CHEMICALS

Istiazah Binti Ab Aziz (graduated 2010) and Aizat Bin Ismail (graduated 2012) both work in Malaysia's chemicals sector.



WHAT IS IT ABOUT THE CHEMICALS SECTOR THAT YOU THINK SHOULD MAKE IT THE TOP CHOICE FOR CHEMICAL ENGINEERS?

ISTIAZAH: There is a need for continuous technological improvement in the sector. It will be a driving force for you to always be ready to take action at all times. The chemicals sector is also fast-paced and customer-orientated, whereby issues at operational plants need to be solved in a matter of hours or days. Even though it is challenging as a fresh graduate, it offers an exciting experience. Choose the chemicals sector and you will accelerate your technical capability and enhance your creativity.

AIZAT agrees that the creative challenge of dealing with the constant change in technology is a big draw. He also recommends the sector for its variety of roles and opportunities for travel.

IF YOU COULD OFFER ONE PIECE OF ADVICE FOR THE NEXT GENERATION OF CHEMICAL ENGINEERS ENTERING THE WORLD OF WORK WHAT WOULD IT BE?

AIZAT: Be enthusiastic to learn.

ISTIAZAH: Treat challenges

as opportunities to develop your technical capability and soft skills for your future career growth. And never give up. Each success comes with failure.

WHAT TIPS DO YOU HAVE ON HOW GRADUATES CAN SUCCEED AT INTERVIEW?

AIZAT: Do your homework, and remember: Google is your friend. Study extensively the background of the company you're applying for. Also, it's never too late to equip yourself with public speaking skills that will allow you to speak with ease to job assessors. And if you read one book, I'd recommend Stephen Covey's *The 7 Habits of Highly Effective People*.





FOOD & DRINK

Mark Naylor lives in the UK and works in the food & drink industry. He graduated in 2014.

WHY DID YOU CHOOSE THE FOOD & DRINK INDUSTRY?

I have always had a passion for food - both making and eating it! As a result of watching television programmes such as 'How it's Made' when growing up, I have been fascinated by the operation of industrial production lines and how they work so wanted a job where I could have the opportunity to visit different sites.

WHAT EXPERIENCE HELPED YOU GET THE JOB YOU HAVE NOW?

Much of my job involves validating thermal processes including sterilisation, pasteurisation, chilling and freezing in food factories. The aim is to assess both the performance of the equipment and ensure that the food is both safe and palatable for the consumer. For my final year research project, I investigated the sterilisation of hospital waste using an autoclave. Although the definitions of sterility differ between the food and medical industry, both operate in a

pressurised steam environment and operate using the same underlying principles of applying a known temperature for a predetermined time to reduce microbiological contamination. It also meant I had practical experience using wireless time and temperature logging systems used for this work.

SELL YOUR SECTOR TO THE NEXT GENERATION OF CHEMICAL ENGINEERS.

Food and drink will always be in high demand so provides a stable industry in which to develop a career. It is also a very dynamic and constantly evolving industry, where new products and processes are developed to keep up with changes and trends in the consumer driven market. For a chemical engineer, the numbers of possible opportunities in the food sector are endless; from optimising product quality and safety to reducing energy and carbon consumption.

WHAT'S THE ONE PIECE OF ADVICE YOU WISH YOU'D BEEN GIVEN

BEFORE ENTERING THE WORLD OF WORK?

Don't get too worried about planning your long-term career before it even begins. Over time as you learn more skills, meet more people, and even make the odd mistake, it will help you understand what subjects you are passionate about and would like to pursue further. And what you want to avoid.

WHAT TIPS CAN YOU GIVE UNDERGRADUATES ABOUT FURTHERING THEIR CAREERS?

As much of my job involves working off-site, I constantly have the opportunity to network with new people, including senior management, machine operators and engineers. I take these opportunities to try and learn as much possible, as everyone has different areas of expertise. I have also been able to attend a wide range of training courses, which has greatly improved my confidence and technical capability when speaking to clients.



CONTRACTING

Alex Gall graduated in 2010 and now works in the oil and gas contracting sector in the UK

WHAT ATTRACTED YOU TO CONTRACTING?

When at university I really enjoyed my design projects and when I started work I wanted to work on something similar. I liked the idea of moving from one project to another and therefore working in

the oil and gas contracting industry seemed like the best option. The fact that a lot of the design offices are in major cities around the world was also very attractive.

HOW WOULD YOU SELL YOUR SECTOR TO THE NEXT GENERATION

OF CHEMICAL ENGINEERS?

Within the contracting industry there is a wide variety of interesting jobs and projects available. We work onshore and offshore. We look to improve existing technologies and also develop groundbreaking new ones. You

OIL & GAS EXPLORATION AND PRODUCTION



Yasmin Ali lives in the UK and works in the oil and gas exploration and production sector. She graduated in 2010.

WHAT LED YOU TO JOIN THIS SECTOR?

After working in power stations, I wanted to be at the very beginning stages of the energy supply chain. I wanted to learn about and contribute to the extraction of fuels for energy generation.

SO, YOU STARTED IN GENERATION BUT MOVED FURTHER UPSTREAM. SOUNDS LIKE YOU'VE HAD AN INTERESTING JOURNEY. WHAT PATH HAVE YOU TAKEN?

It all started between my third and fourth years at university when I did a summer placement at a gas-fired power station. Following this, I completed a two year engineering and leadership graduate scheme which took me to other power stations in the UK as well as business development in Turkey. My final placement was in oil and gas operations, I enjoyed this work and decided to stay on permanently after the graduate scheme. Within exploration and production, I had the opportunity to work in different

departments, including drilling, before joining my current team as a development engineer working on a North Sea gas field development project.

HOW WOULD YOU SELL THE SECTOR TO THE COMING GENERATION OF CHEMICAL ENGINEERS?

The world we live in today depends on oil and gas for energy, so we need people with the skills to provide it. There is a lot of room for progress in the industry from increasing efficiency to improving environmental standards, so as a young chemical engineer you can influence development and make a huge impact in this area. As we transition away from fossil fuels to other energy types, a background in oil and gas provides applicable transferable skills. Alongside this, if you enjoy travelling, this industry opens up the world. It's the most international career I have come across.

DO YOU HAVE ANY TIPS FOR STUDENTS ON HOW TO SUCCEED IN

THEIR CURRENT EFFORTS TO SECURE A JOB?

There is no substitute for talking to someone that has been through the interview process you are about to go through. Look for events run by the companies you are applying to or try to contact existing employees through the likes of LinkedIn or Twitter. You have nothing to lose. The worst case scenario is that they don't reply.

WHAT ADVICE DO YOU HAVE ON CPD AND NETWORKING?

Outside of work I am involved with the IChemE, the Institution of Engineering and Technology and Women's Engineering Society. I also regularly present at schools, career fairs and events. I find this helps me to reflect on my work and think about the future, it also inspires the next generation of engineers. I think taking part in activities outside of work, staying open minded and talking to new people has increased my 'luck', as it has opened doors that I wouldn't have otherwise stumbled across.

also get exposure to the complete life cycle of a project, from initial conceptual studies through to operation.

WHAT'S THE BEST PIECE OF ADVICE YOU CAN GIVE TO SOMEONE ENTERING THE WORLD OF WORK?

It is a good idea to have some idea of how you want your career to develop as it will be down to you to try to make it happen.

WHAT TIPS WOULD YOU GIVE TO GRADUATES HUNTING FOR A JOB?

I used Gradcracker to find jobs. Before my interview I researched the company using their website, plus I also made use of my career service at university and had a practice interview with them.

