

**Transcript:** Interview with Dr. Uyioghosa Igie, Programme Director for the Thermal Power and Propulsion MSc at Cranfield University

**Violeta Da Rold:** All right. Hello. How are you doing today?

**Uyioghosa Igie:** I'm fine, thank you. I hope you too.

**VDR:** Very well. Thanks. So, we're going to talk a little bit about the Thermal Power and Propulsion MSc today, and you'll take us through all of the exciting things to do with the course. But before we get started, how about you tell us a little bit about yourself? What brought you to Cranfield? How did your own journey shape up along the way?

**UI:** Thanks for the question. My, my, my background is mechanical engineering. I have a bachelor's and master's degree, and, I joined Cranfield in 2009. You know, I came for a PhD in gas turbine engineering, and, since then, I had moved up the ladder, if you might say, had my research fellowship lectureship and became a senior lecturer as well. And, in these 15 years, I've been able to have, you know, direct input to the thermal power MSc course, which we'll be talking about today, in which I am the programme director.

**VDR:** Excellent. Well, that sounds like a very exciting journey and hopefully one that our listeners can, can relate to and also aspire to. Righty. So let's talk about the Thermal Power course. So for those who don't know much about it, what is it all about? What are the big focus areas that students will dive into?

**UI:** Sure. The Thermal Power and Propulsion MSc of Cranfield is a it's a gas turbine engineering course which equips students with the fundamental and applied knowledge of the design and operations of gas turbines for air, for land and for sea. Some of the key areas, you know, of the course includes modules like combustion, turbomachinery, engine performance simulation, diagnostics, fatigue and fracture, mechanical design and turbomachinery, amongst others as well. And we have experts in all of these areas.

**VDR:** That's quite broad, isn't it? It looks like they really get a very, very sort of extensive, get very extensive knowledge on, on the topic area. And I can imagine it's got, you know, very it's rooted in very sort of theoretical scientific, background as well. But how about the hands-on stuff? What kind of practical experiences can students expect?

**UI:** Actually, apart from the taught modules and the thesis projects, are students engaged in lab activities. These include, for example, the strip and build where students assemble and disassemble critical components of a gas turbine with similar overhaul and repair procedures performed in industry. We also have the Saab 340 B actual flight tests under the auspices of the National Flying Laboratory Center, where our students participate as test specialists. You know, on this fully instrumented aircraft, taking real time measurement data, you know, a different flight segments, to work out, you know, aircraft and, you know, engine performance analysis.

**VDR:** Brilliant. Thanks. Thanks for talking to us about that. I mean, yeah, the labs and the labs and all of the facilities that we have at Cranfield really do make the course experience very unique. And also, you know, we're very strong on industry connections. So how about we explore that a bit? How does the programme make the most of our industry partnerships to boost the student experience?

**UI:** I mean, you're really right in that, in fact, the Thermal Power and Propulsion MSc has graduated more than 200 students through our Rolls-Royce, you know, University of Technology centre. I must say that all of our students are assigned a thesis project focused on real world problems. More than 50% of the classes are allocated to a project related to a company, you know, again, industry links. This experience offers them a multi-dimensional perspective on technical problems. Basically, and also the confidence building, to frequently present their work to industry experts as well.

**VDR:** That sounds like a very, very interesting opportunity. How do students usually get on when they present to the industry, to industry panels?

**UI:** I think it varies. It gets better, I must say. You know, so I mean, for many people, it will be many students', you know, it will be their first time interacting with, you know, industry experts, you know, and as, as many things, as time progresses, you begin to see more and more confident presentation of, you know, of ideas, you know, as time progresses.

**VDR:** Yeah. And they're absolutely fundamental skills for going into industry. So it's brilliant that they have the chance to practice those in, you know, what is, I guess a fairly safe environment as well. Of course, you know, they know that they're being evaluated and assessed and so there is a bit of pressure there. But it's an excellent sort of place in which to practice, practice those skills.

**UI:** I mean, most definitely. I mean, you know, when I, when I say multi-dimensional here, sometimes, you know, we're trying to optimise designs and not just based, for example, on efficiencies, but also trying to minimise, you know, for example, emissions or even the reliability improvement as well. So it's always good for them to basically see that, you know, it's wanting to design things on paper for high efficiency. But it's another thing to also learn to appreciate that is more than just one particular criteria.

**VDR:** Yeah. Completely. Completely. So while we're on the topic of, of sort of industry and, and getting ready to, to enter industry. How do you find that students' transition sort of works out from, from, from sort of the academic life through to entering the world of work. And how does the course help them to hit the ground running, you know, on top of the, you know, the experiences that we just spoke about?

**UI:** I mean, I would start by saying that, you know, the Thermal Power and Propulsion academics like me, you know, very fortunate, you know, that most of our students go on to work in specialist areas that we've taught them. So it's typical that they become our industrial partners in companies. But my point really is that we have a good sense of this transition because we're often in contact with them in industry as well, you know, so we get this feedback, the, the applied nature of the course modules, you know, and the thesis projects, you know, which is focused on real world problems, makes this transition smoother, actually.

**VDR:** Yeah, I can imagine. And, on the topic of real world, real world problems and the applied elements of the course, what are what are some of the cutting edge technologies or cool projects that students get to work on?

**UI:** Okay. So, our students will have the opportunity to investigate, for example, burning hydrogen efficiently to minimize, you know, NOx emissions. So we have experimental rigs to burn hydrogen at engine conditions. So these are high temperatures, high pressures. It could also be the use of digital twin and machine learning algorithm to detect, quantify and even predict faults in in gas

turbines. And alternatively could also be the use of computational fluid dynamics, you know, and high performance computing to investigate new compressor designs or even complex flow intakes for a jet engine.

**VDR:** Excellent. No, thanks for taking us through those. And I imagine, you know, as things evolve as well, there will be, you know, more interesting projects coming in. And, and because of the, the industry connections and, and, you know, industry, sort of live projects, you know, who knows, who knows where that will take students in the future.

**UI:** Sure.

**VDR:** Okay. So the Thermal Power and Propulsion MSc has two intakes throughout the year. So one in the autumn and one in March. Could you just tell us a little bit about, about the two of them, you know, are there any differences? You know, are there benefits on, on joining one over the other, or is it more just about timing or preference?

**UI:** Yeah. So, the course content, you know, for both intakes, you know, the, the March and the September is the same and the March class, of course, the smaller, smaller cohort, but again, similar to the delivery as well. For the March cohort, as they're smaller, you know, a greater percentage of students, you to get bursaries, you know, by virtue of the size, basically.

**VDR:** Thank you. And last but not least, what are you most excited about when it comes to the future of this field, where do you feel, sorry, where do you see Cranfield graduates making their mark in the years to come?

**UI:** I mean, I would reiterate by saying that the core of this course is gas turbine engineering, which cuts across, you know, applications for air, land and sea. So by default, we're looking at aerospace and aviation, marine energy and power and oil and gas. All of these industries need to decarbonise. To achieve this, we would require talented and enthusiastic minds to tackle these complex problems. You know, where the solutions often require navigating conflicting requirements. As I mentioned, there's never been a better time to transition these industries with highly talented people. Actually, for the future of our planet, to be quite frank. What excites me most, from what we do, we are positioned to positively impact our environment. I think it is the legacy we leave behind for the next generation, actually. So, yeah, there's a lot of excitement about it.

**VDR:** Yeah. And I completely agree with that final part that you said about, you know, how do we impact our world and what is the legacy that we leave behind also for, you know, for future generations, what kind of world are we leaving behind? And it very much links in to, to our, you know, our values and our ambitions here at Cranfield University.

**UI:** Sure.

**VDR:** I'm going to throw you one more surprise question.

**UI:** Sure.

**VDR:** So you were saying about talented students, what does it take to be an excellent Thermal Power and Propulsion MSc student?

**UI:** I mean, so what it takes to be an excellent Thermal Power and Propulsion student requires, you know, a lot of, of course dedication, no doubt about that. You know, attention to details, willing to think critically about problems and being, you know, creative about, you know, about approaching problems, you know, as well. Again, the cliché thinking out of the box, is really a thing here. And, also trying to connect the dots basically, and getting inspirations, you know, from, you know, other areas of science as well. Some of the most exceptional students we do have will be those who, again, like I say, willing to think critically, you know, and offer new ideas, you know, to very complex problems.

**VDR:** That's a really helpful answer, and I hope our listeners can resonate with that, because of course, you need you need the scientific, you know, theoretical background, you know, that's, correct me if I'm wrong, but that's sort of a, you know, a fundamental requirement. But to become an excellent student it's that critical thinking. It's the thinking outside the box. It's, you know, thinking beyond what is just perhaps, you know, figures on a page.

**UI:** Absolutely. It's about taking well understood, you know, knowledge theories and the willingness to be creative of, of of how to apply them in new situations basically.

**VDR:** Yeah. Well, thank you so much for talking to us today. As I said, you know, I hope, I hope our listeners have got a better flavour for what the what the MSc is about, what it takes to, you know, to really make an impact in this area and actually how they would join, you know, a cohort of people who really are trying to make a difference through, of course, you know, studying the theory, but really sort of rolling up their sleeves and, and getting hands on and, you know, making things, changing things in, in, I guess, every, every way possible.

**UI:** Absolutely. Sure. Yeah.

**VDR:** All right. I'm going to, yeah, I'm going to close it for now. So thank you very much. Thank you, everyone, for listening. And thank you to you, Uyi, for joining us today.

**UI:** Thank you so much. Thank you.