

The Modern Engineer

Dr. Mike Murphy, Dean of the Faculty of Engineering at Dublin Institute of Technology talks about engineering as a profession.

Q: What exactly does it mean to be a professional engineer in the 21st century?

One thing that has struck me during visits to schools is that while most second level students no longer characterise engineers as wearing overalls with an oily rag in their back pocket, many still struggle to explain just what an engineer *is* and what one actually *does*.



To be formal about it, a modern professional engineer is someone who uses creativity, knowledge and understanding to develop and put technology to use. An engineer is someone who applies theoretical and practical methods to analyse and solve technical problems.

But to be less formal and more descriptive, think of an engineer as someone who *plans, designs, builds* and *operates* systems.

Q: So is that it: Engineers plan, design, build and operate?

In a word, yes. When I worked in the States we called it PDBO. It could be a telecommunications network, an electronic component, a mobile phone, a robotic production line, heating systems or escalators for large buildings, lighting systems, bridges, roads, whatever. An individual engineer may be responsible for only part of the PDBO, for example the design, but engineers will generally be involved in all the activities.

Q: What about technicians – what do they do?

Engineering technicians and technologists usually work under the supervision of a professional engineer on many of the same PDBO tasks. As a general rule, professional engineers may be involved in more of the planning and designing stages while technicians and technologists are mostly involved in the building and operating stages.

Q: What's the money like?

Currently engineers with honours degrees coming fresh out of college are starting at around €25,000 pa. For engineering technicians, salaries start at about €23,000 pa.

Q: So would an engineer spend their whole career in some aspect of PDBO?

Perhaps, but more likely an engineer will advance relatively quickly from PDBO work to project management and technical management. Salaries rise reasonably swiftly as engineers assume greater responsibility within the company, which engineers are educated to do. It's not unusual for engineers to move into general management and on up to chief executive. Others get to be the boss by starting their own successful companies. In more ways than one, engineering is a *rewarding* career.

Q: Well then, why are the numbers of students studying engineering falling?

There is a perception that engineering is hard. What people don't realize is how much fun engineering can be. Let me give you some examples from DIT.

We have one person researching different shapes for dental implants (crowns) so that the implant won't loosen under all the grinding and gnashing pressure inside a person's mouth.

We have a young woman who, in her final year, started investigating deep vein thrombosis (DVT), which is what people traveling for long hours on an airline in cramped seats are at risk of developing. She is now developing and testing a system to reduce the risk of DVT.

We have people designing "green buildings" that require very little energy to heat them in the winter, cool them in the summer, and provide natural light throughout the building.

We have someone working on designing very small antennas that can fit inside even smaller phones and gadgets.

Engineering is *fun* – there is so much interesting stuff going on.

Q: But don't too many engineering students drop out of College?

It is true that engineering programmes suffer from attrition. Most attrition occurs in first year and is due to fairly well known reasons: students' expectations of what they will learn in an engineering programme often don't match the reality; this is compounded by the natural difficulties of moving from second to third level. Often, for technician-level programmes, students with poorer maths skills find the analytical aspects of engineering difficult.

At DIT we have recognised this and in 2003 began a peer-mentoring initiative for all of our first year engineering programmes. We set up a programme where our second, third and fourth year students mentor our first year students. The results are very encouraging, and we will expand and improve the programme in 2004. At DIT we are proud of our supportive and caring ethos, and we believe that we have a responsibility to every student who comes through our doors to help them succeed.

Q: Is DIT doing anything else that is new?

We have begun a number of initiatives that are worth mentioning. For September 2003, we upgraded many of our diploma programmes to three-year ordinary degree programmes. We also began a new four-year degree in product design. This new degree has about 70% engineering design, 20% industrial design and 10% business skills. It attracted high interest through the CAO process and beyond, with international students calling up looking for places. We continue to improve our highly respected honours degree programmes in electrical, electronic, computer, structural, mechanical, manufacturing and building services engineering and our honours degree in transport technology.

Q: Are there jobs for Engineers? All we seem to hear is how bad the technology sector is.

Absolutely there are jobs out there for graduates. But let me address three trends that are causing students to perhaps make the wrong career decisions.

First, the government continues to spend many millions on infrastructure development – on roads, rail and bridges. The results of this spending are very visible, so large numbers of students want to become civil and structural engineers.

Second, the dotcom bubble burst and the effects on computer engineering, telecoms and electronic engineering were severe. This was particularly true in the US, but less so here in Ireland.

Third, low-cost low-tech manufacturing jobs continue to leave Ireland to move to lower-cost lower-tech countries, typically in Eastern Europe.

The net result is that many students interested in engineering believe that the best or only jobs are in civil/structural engineering; that telecoms/IT/electronic sectors have no career opportunities; and that students should steer clear of manufacturing engineering because Ireland will continue to lose jobs in that sector.

We have to remember that today's 5th and 6th year students will graduate with degrees from college in about five years time. While civil and structural engineering projects will continue, by 2008 much of the NDP infrastructure work will be complete and there may well be an oversupply of civil and structural engineers. The dotcom and telecoms collapse is already effectively over and as a result there will be growing shortages of computer, electrical and electronic engineers over the coming years. High-tech manufacturing in Ireland is reasonably stable, particularly in industries such as pharmaceutical-chemical and medical devices, where large numbers of manufacturing and mechanical engineers are needed and will continue to be needed.

Q: So, you believe the future is bright for students who choose engineering?

Absolutely. What I have tried to convey is the challenge and the fun of engineering, and also the great career prospects for engineers. As we say here – *engineering at DIT is challenging, fun and rewarding.*

But don't take my word for it. Come in and visit us. We would be delighted to show any of your members around and have you meet the students and the staff.

For further information on engineering programmes at DIT log onto www.dit.ie/engineering or contact DIT's Admissions Office on 01 402 3445 or email admissions@dit.ie



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