

WHAT DOES A PHOTONICS ENGINEER DO?

CAREER FACT SHEET

WHAT IS PHOTONICS ENGINEERING?

Being an engineer is about problem solving, having a design focus, and utilising technology to benefit society. Photonics engineering encompasses the design, production, and application of technology which generates, senses or transmits light. Photonics involves the use of light instead of electrons to process and transmit energy and information.

WHAT DOES A PHOTONICS ENGINEER DO?

Photonic engineers do with light what electronic engineers do with electrons, that is, photonics engineers design, build, test and manage systems that carry out the transmission, processing and storage of information as optical signals for applications such as telecommunications, imaging and sensing.

WHAT SKILLS DOES A PHOTONICS ENGINEER NEED?

- project management skills
- high level of technical expertise
- good communication skills
- leadership capability
- strong analytical skills
- ability to work as part of a team
- problem solving capabilities
- practical/resourceful
- creativity (invention, innovation, thinking outside box)

Did you know?

Engineering is not just about the 'hard hats and boots' variety such as building bridges and commercial buildings (civil, mechanical), engineering provides a variety of specialisations and is a creative profession with design at its core.

Engineering offers an internationally portable qualification enabling you to work in different countries, a high employment rate, a broad degree with flexible career paths, and a high starting salary.

WHAT CAREER OPPORTUNITIES ARE AVAILABLE?

- computer and communication networking
- photonics system design and manufacturing
- engineering research and development
- engineering sales and service
- project and technology management

WHERE DO PHOTONICS ENGINEERS WORK?

- telecommunications companies such as Optus, Telstra, Nokia, Vodafone, Alcatel-Lucent, Toshiba and Erickson
- media companies such as TV, radio
- public sector institutions at both state and federal level such as Department of Defence
- government and university research laboratories such as CSIRO, DSTO (Defence Science and Technology Organisation), ANSTO (Australian Nuclear Science and Technology Organisation), and university research laboratories around the world

WHAT DOES A PHOTONICS ENGINEER DO?

CAREER FACT SHEET

HOW MUCH DO THEY EARN?

According to GradStats 2007, Careers Council of Australia's annual Australian graduate survey, the median starting salary for bachelor degree Engineering graduates aged less than 25 and in first full-time employment in Australia was \$50,000. This was the fourth highest starting salary of professionals in Australia in 2007. This salary ranking has been consistent for engineering for at least 5 years. By comparison, Economics, Business and Accounting graduates had a median annual starting salary of \$40,000 in 2007, \$10,000 less than that for engineers.

ABOUT THE ENGINEERING PROGRAM AT MACQUARIE UNIVERSITY

The Bachelor of Engineering in Photonics Engineering at Macquarie University is 4 years full-time and begins with a solid foundation of basic sciences and core electronics engineering and then focuses on the core areas of photonics engineering such as mathematics, optics and electromagnetics. Students are then able to develop skills in one or more related areas such as digital electronics or the design and implementation of telecommunication networks.

The types of units studied in photonics engineering may include the following topic areas along with a range of other units:

- electronics
- information technology
- instrumentation and control
- mathematics and physics
- optoelectronics and optical technology
- telecommunications networks

ENTRY REQUIREMENTS

2 unit HSC Mathematics (Band 4) or its equivalent is a subject prerequisite for Physics and Mathematics units which form part of the Bachelor of Engineering degree. Students not meeting this requirement will need to enrol in an additional mathematic unit in their first year of study. A combination of higher levels of mathematics, physics, chemistry, engineering studies, senior science, information processes, technology or software design and development are also strongly recommended. Other units taken as part of the degree may have assumed knowledge, prerequisites or recommended studies. Therefore, students should refer to the University Handbook for full degree requirements (www.handbook.mq.edu.au).

OTHER CAREER FACT SHEETS IN THIS SERIES

- electronics engineering
- computer engineering
- software engineering
- wireless engineering
- telecommunications engineering
- instrumentation and control engineering

FOR MORE INFORMATION

Department of Electronic Engineering

– Student Support Services

Tel: (61 2) 9850 9500

Fax: (61 2) 9850 9102

Email: enquiries@engineering.mq.edu.au

Web: www.engineering.mq.edu.au

Double-Degree Option

The Bachelor of Engineering combined with Bachelor of Science allows students to undertake a computing major along with a major in software engineering or telecommunications engineering. The Bachelor of Engineering with Bachelor of Commerce combines software engineering or telecommunications engineering with an economics major. The Bachelor of Engineering with a major in any of the seven engineering specialisations can also be combined with the Bachelor of Business Administration. These degrees offer an efficient way for students to broaden their skills and obtain two qualifications in five years.