WHAT IS TELECOMMUNICATIONS ENGINEERING?
Being an engineer is about problem solving, having a design focus, and utilising technology to benefit society. Telecommunications engineering is a broad specialisation of electrical engineering encompassing the design, construction and management of systems that carry out the transmission, processing and storage of information as electrical or optical signals.

WHAT DOES A TELECOMMUNICATIONS ENGINEER DO?
Telecommunications engineers design, build and manage systems that carry out the transmission, processing and storage of information as electrical or optical signals. A wide range of technologies are involved in any telecommunication system. Satellites, radio, telephone cables, and optical fibres all play an important role in telecommunication networks. Computers are used to process, transform and store information, and to control telecommunication networks.

WHAT SKILLS DOES A TELECOMMUNICATIONS 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)

WHAT CAREER OPPORTUNITIES ARE AVAILABLE?
- computer and communications networking
- electronics design and manufacturing
- engineering research and development
- sales and service of technical equipment
- software design and development
- telecommunication systems design and installation
- project and technology management

TYPES OF JOBS AVAILABLE IN TELECOMMUNICATIONS ENGINEERING
- IT or management consultant
- programmer
- systems developer/manager

WHERE DO TELECOMMUNICATIONS ENGINEERS WORK?
- telecommunications companies such as Optus, Telstra, Nokia, Vodafone, Alcatel-Lucent, Toshiba and Erickson
- IT companies such as IBM, Hewlett-Packard and EMC
- banks and financial institutions such as The Macquarie Group, NAB and Commonwealth Bank
- public sector institutions at both state and federal level
- government and university research laboratories such as CSIRO, DSTO (Defence Science and Technology Organisation), and university research laboratories around the world
WHAT DOES A TELECOMMUNICATIONS ENGINEER DO?

CAREER FACT SHEET

HOW MUCH DO THEY EARN?
According to GradStats 2007 the 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 Telecommunications Engineering at Macquarie University is a 4 year full-time degree and begins with a solid foundation of basic sciences and core electronics engineering and then focuses on the underlying technologies used in telecommunication systems and on the design and implementation of telecommunication networks. Optional units allow the student to develop skills in related areas such as optical technology and photonics, electromagnetics and wireless systems, signal processing and information coding, and computer hardware and software.

The types of units studied in telecommunications engineering may include the following topic areas along with a range of other units:
- computer networking
- computer security
- communication electronics
- eCommerce technology
- embedded systems
- software engineering
- information technology

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
- photonics engineering
- instrumentation and control engineering
- wireless engineering

FOR MORE INFORMATION
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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.