WHAT IS SOFTWARE ENGINEERING?
Being an engineer is about problem solving, having a design focus, and utilising technology to benefit society. Software engineering encompasses knowledge, tools and methods for software testing, defining software requirements, performing software design, software construction, and software maintenance tasks.

WHAT DOES A SOFTWARE ENGINEER DO?
Software engineers create, maintain and modify computer and software programs such as operating systems, communications software, utility programs, and compilers.

WHAT SKILLS DOES A SOFTWARE ENGINEER NEED?
- project and technology 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 communication networking
- business systems design and management
- engineering research and development
- sales and service of technical equipment
- software design and development
- project and technology management
- systems development and management
- financial analysis
- investment
- planning/policy analysis
- stockbroking
- urban and regional planning

TYPES OF JOBS AVAILABLE IN SOFTWARE ENGINEERING
- IT or management consultant
- programmer
- systems or business analyst
- software designer and developer
- network engineer

WHERE DO SOFTWARE ENGINEERS WORK?
- IT companies such as IBM, Hewlett-Packard, EMC
- technology and manufacturing companies such as Honeywell
- accounting and consulting firms such as Deloitte Australia, Accenture
- banks and financial institutions such as The Macquarie Group, NAB, Commonwealth Bank
- telecommunications companies such as Optus, Telstra, Toshiba, Vodafone, Nokia
- computer software and hardware companies such as Google, Microsoft, Cisco, Netcomm
- defence companies such as BAE Systems
- public sector institutions at both state and federal level
- NGOs (Non-Governmental Organisations) such as Greenpeace and World Health Organisation
- 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

Did you know?
Macquarie University’s Department of Electronic Engineering works with its industry partners to ensure its engineering programs remain relevant to industry needs. Through the Department’s Industry Partnership Program, undergraduate students in their final semester are eligible to undertake a 16 week industry-based internship with one of our industry partners such as Cochlear, Optus, EMC, CSIRA, Honeywell, Mimix Broadband, OEM Technology Solutions, and BCS Innovations. Many of the Department’s industry partners are located in one of Australia’s leading high-technology precincts where the University’s campus is also located.
WHAT DOES A SOFTWARE ENGINEER DO?

DEPARTMENT OF ELECTRONIC ENGINEERING

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 Software Engineering at Macquarie University is 4 years full-time and begins with a solid foundation of basic sciences and core electronics engineering and then immerses students in the engineering science of quality software development.

This program equips students with knowledge and experience in software engineering areas such as:

- formal specification methodologies
- software development
- requirement analysis
- information systems analysis and design
- quality control and testing
- human-computer interaction

Units studied in software engineering may include the following topic areas along with a range of other units:

- computer and telecommunications networks
- computer security
- eCommerce technology
- embedded systems
- information systems and technology
- language technology
- software engineering
- web technology
- applied econometrics
- business law and economics
- statistics and econometrics

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 mathematics 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
- wireless engineering
- photonics engineering
- telecommunications engineering
- instrumentation and control

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.