WESTERN SYDNEY
UNIVERSITY

POSTGRADUATE STUDY

Information and Communications Technology

INFORMATION AND COMMUNICATIONS TECHNOLOGY

GLOBAL LEADERSHIP IN TECHNOLOGY.

Information and Communications Technology (ICT) has penetrated into major functional areas of all industry sectors, such as retail, banking, health and education and requires ICT professionals with cross-discipline knowledge and skills.

The speed of change in ICT requires professionals to update their knowledge and skills every few years. Western Sydney University recognises this and our Postgraduate ICT courses reflect the changing landscape.

Our ICT courses concentrate on developing and extending your knowledge and skills that are needed for ICT roles within the fast-growing ICT industry and other industry sectors where ICT is used.

This is reflected in our range of specialisations and rich set of units that cover core ICT discipline topics such as Networking, Distributed Computing, Web and Mobile Computing, and cross discipline topics such as Management, Artificial Intelligence, Cybersecurity and Data Analytics.

Under the Postgraduate ICT umbrella are four courses: Master of Information and Communications Technology (Advanced), Master of Information and Communications Technology, Graduate Certificate in Information and Communications Technology and Graduate Diploma in Information and Communications Technology.

These courses have a cascading structure that allows students to move from one course to another for further studies. Regardless of whether a student is from an ICT or non-ICT background they can enrol in these courses to advance their knowledge and skills in an ICT discipline, and to be more adaptive to the high demands of the ICT industry and/ or to proceed to Higher Degree Research (HDR) studies.

Anecdotal evidence suggests that more than 80 per cent of the ICT workforce has not acquired university-level qualifications in ICT. These courses offer formal training in the theoretical aspects of ICT and thus a solid base from which to continue progression in the ICT field.

SPECIALISATIONS

The following specialisations are available in Postgraduate ICT studies at Western Sydney University:

Networking

The Networking specialisation is aimed at providing students with knowledge in emerging areas of networking. It focusses on essential fundamentals as well as advanced knowledge on the principles, practices, protocols and standards in some key areas of the networking discipline. This specialisation prepares students for a career in networking security and management, multimedia and wireless communications, and other contemporary and emerging networking areas. The specialisation is also designed to introduce the trends and key research areas in some emerging fields of networking so as to provide students with initial skills and knowledge for future research studies or careers.

Students must complete four units from the following:

→ Advanced Topics in Networking
→ Multimedia Communication Systems
→ Internet of Things
→ Systems and Network Security
→ Wireless Networking

Distributed Computing

The Distributed Computing specialisation provides students with in-depth knowledge for the analysis, design, and evaluation of distributed and service oriented systems. It offers the opportunity to develop the research and technical skills needed for development and management of a broad range of large-scale systems such as Cloud computing systems.

Students must complete the following four units:

→ Cloud Computing
→ Big Data (PG)
→ Modern Software Architectures
→ Systems and Network Security

Management

The aim of the specialisation is to prepare students to move from technical positions such as programmer, network administrators and business analyst into a supervisory, senior management, executive or CIO role within the IT industry. In this specialisation emphasis will be placed on topics such as strategic management, understanding contemporary business environment, financial reporting, economics, and people and organisation management.

Students must complete:

→ Marketing Systems
→ Financial Reports for Decision Making
→ Understanding Contemporary Organisations

And one unit from the following:

→ Contemporary People Management
→ Governance, Ethics and Social Entrepreneurship
→ Economics
→ Strategic Business Management

Web and Mobile Computing

The widespread deployment of web and mobile devices has made them the platform of choice for companies to carry out their everyday business. Contemporary developers are expected to understand the strengths and limitations of web and mobile technologies and use them to create successful user-friendly web and/ or mobile applications. This specialisation is aimed at developing knowledge and skills in theoretical concepts and practical technologies needed to design and develop complex software applications across a range of web and mobile platforms. Graduates with this set of knowledge and skills will have greater prospects of finding employment with reputable companies or building their career as self-employed developers.

Students must complete four units from the following:

→ Web Engineering
→ Mobile Computing
→ Advanced Topics in User System Interaction
→ Software Testing and Automation
→ Modern Software Architectures

Health Informatics

The widespread adoption of ICT solutions within the health sector, such as electronic health records, has created high demand for professionals who not only understand the context of healthcare provision, but are also proficient in ICT. This specialisation is aimed at developing knowledge and skills in the theoretical concepts and practical technologies, needed to design and develop complex software applications across a range of eHealth settings. Graduates with this set of knowledge and skills will have greater prospects of finding employment with major healthcare providers or building their career as self-employed developers.

Students must complete the following three units

→ Advanced Health Classifications and Coding
→ Advanced Healthcare Data Environments
→ Advanced Healthcare Software and Systems

And one unit from the following:

→ Genomic Data Science
→ Modern Software Architectures
→ Visualisation

Data Analytics

Extracting information from data has become a science in itself, blending skill sets from mathematics, statistics and computing. With a strong applications focus, this specialisation covers the nature of data, how to embark on data driven investigations and visual and computational analytics. Graduates will have the knowledge and skills required to operate effectively in a data driven world.

Students must complete the following three units:

→ The Nature of Data
→ Data Science
→ Predictive Analytics

And one unit from the following:

→ Visualisation
→ Programming for Data Science
→ Social Media Intelligence

Artificial Intelligence

Artificial Intelligence (AI) is a fast growing area in computer science with a broad range of applications. The Artificial Intelligence specialisation aims to develop graduates with advanced knowledge and skills in the discipline of artificial intelligence and machine learning. This specialisation covers fundamental statistical analysis, machine learning, deep learning as well as AI applications. Students will also learn the basic theories and algorithms that are essential in the design and development of intelligent systems.

Students must complete the following four units:

→ Advanced Topics in Artificial Intelligence
→ Advanced Machine Learning
→ The Nature of Data
→ Predictive Analytics

Cybersecurity

Cybersecurity is a fundamental aspect of information and communication systems and protecting these systems from various attacks and threats is becoming one of the major technology challenges for public and private sectors. The Cybersecurity specialisation aims to develop graduates with advanced knowledge and skills in the discipline of information and communication security. This specialisation covers fundamental knowledge in system and network security, security protocols and their applications in computer systems and networked systems such as cloud computing. Students will also learn other related topics such as artificial intelligence and visualisation and their application in cybersecurity development.

Students must complete the following three units:

→ Advanced Topics in Cybersecurity
→ Applied Cybersecurity
→ Systems and Network Security

And one unit from following:

→ Cloud Computing
→ Advanced Topics in Artificial Intelligence
→ Visualisation
→ Information Security Management

Masoumeh Arasteh

MASTER OF INFORMATION AND
COMMUNICATIONS TECHNOLOGY

Once I graduated from a Bachelors degree, I was looking to further my studies in ICT, but at a University where I could not only develop my IT skills, but also find a connection with the IT market. I found Western Sydney University to be one of the best, and a university which also has a great connection to different businesses.

Studying at Western Sydney University provided me with the opportunity to improve my skills in professional technical presentation, team work, innovation and to apply my knowledge in practice. One of the key features of WSU was the supportive teaching staff. Lecturers and academic staff of WSU are always available to assist students. With their great support and wonderful teaching methods, I graduated with a High Distinction GPA and became a member of the Golden Key International Honour Society.

Western Sydney University provides an excellent pathway to the market for students. The Western Sydney Career Hub team have an excellent connection with different businesses, organizations and councils. I am now employed as a permanent Technical Support Consultant in a famous software testing company in Sydney.
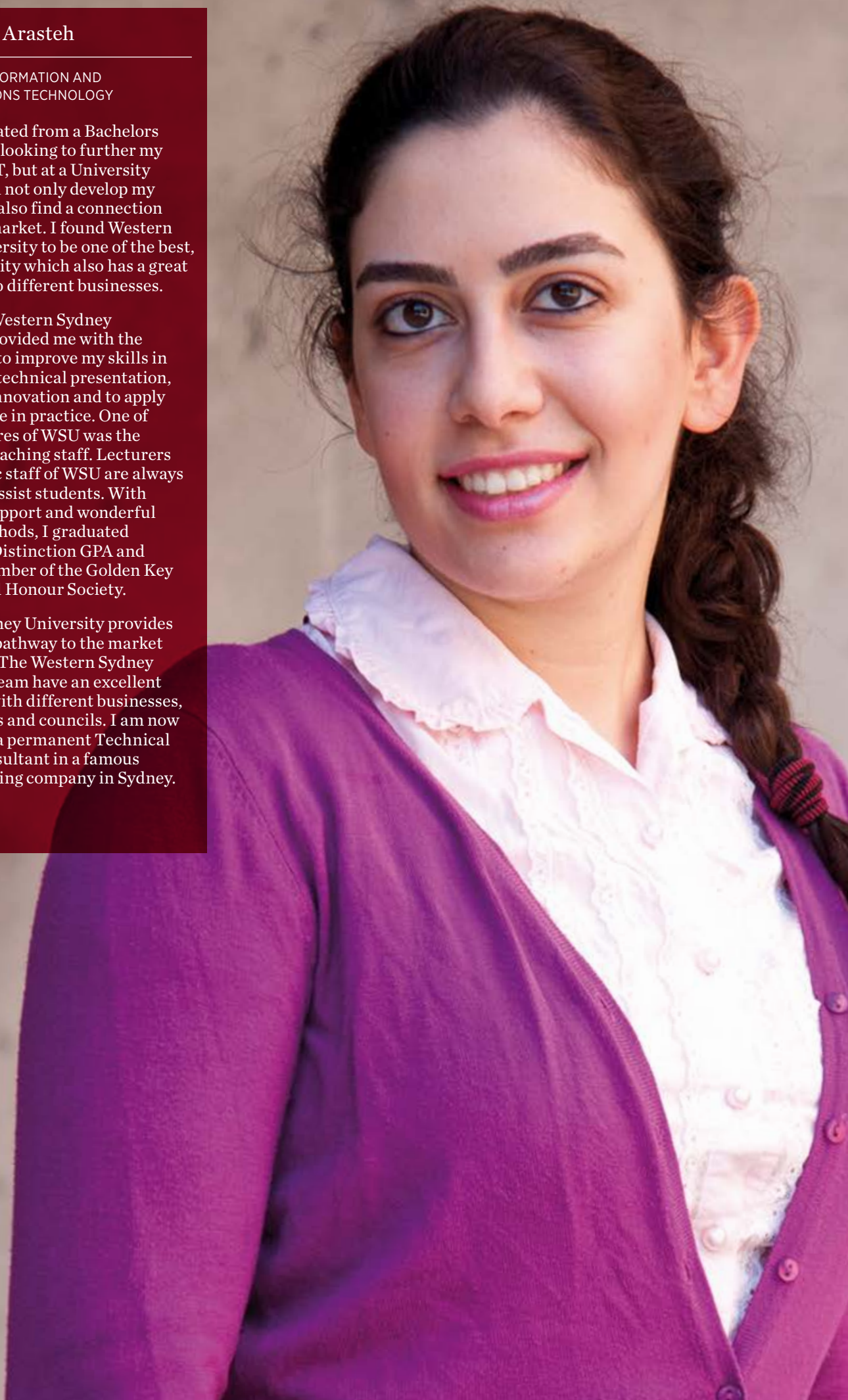
COURSE	COURSE CODE	CRICOS CODE	DURATION	INTAKE	CAMPUS
Master of Information and Communications Technology	3699	063546M	1.5 or 2 years^	March/July	Parramatta
Master of Information and Communications Technology (Advanced)	3698	063545A	2 or 2.5 years^	March/July	Parramatta
Graduate Diploma in Information and Communications Technology	3700	085559B	1 or 1.5 years^	March/July	Parramatta
Graduate Certificate in Information and Communications Technology	3701	065034G	6 months or 1 year^	March/July	Parramatta

^ Duration depends upon entry qualification. Please refer to online handbook **westernsydney.edu.au/handbook**

CAREER OPPORTUNITIES

Western Sydney University ICT courses are designed to fulfil the skill requirements of (but not be limited to) the following roles: ICT consultant; software engineer; database administrator; project manager; business analyst; ICT architect; systems administrator; systems analyst; computer network systems engineer; software and app programmer; ICT security specialist.

COURSE INFORMATION

The course length and structure vary based on the student's previous study background and level, and work experience. For those who are seeking admission on the basis of work experience must support their application with a Statement of Service for all work experience listed on the application.

Digital Futures

Digital technology is influencing practically every aspect of today's knowledge economy and is driving advances in all sectors of society. Many jobs require broad competencies and understandings of the powerful role of technology in society. There is also an increasing demand for practical computing and software skills including for research and analysis of data. This specialisation will allow students to develop practical as well as theoretical skills in this field.

Students must complete the following two units:
→ Mobile Media
→ Global Digital Futures

And two units or 20cp from the following:
→ Researching Convergent Media
→ Cyber Justice
→ Foundations of Media Arts Production (PG)
→ Media Project Proposal

Innovation and Entrepreneurship

Entrepreneurship, innovation and new markets are pertinent activities that have collectively become cornerstones of how firms grow and interact with society. This specialisation is aimed at developing knowledge and skills in the processes to create new economic and social value, seeking funding for new ventures, application of digital technologies in emerging businesses and developing start-ups and rejuvenating existing businesses.

Students must complete the following two units:
→ Innovation, Creativity and Foresight
→ New Venture Finance

And two units or 20cp from the following:
→ Innovation for New Markets
→ Innovation Through Digital Technology
→ Entrepreneurial Management Capabilities
→ Start-up

INDUSTRY PLACEMENT

Students in MICT and MICT (Advanced) courses will undertake 120 hours full-time or part-time equivalent industry placements as a compulsory Work Integrated Learning (WIL) component. Students will work in an external organisation in Australia or within a department/division at Western Sydney University, carrying out tasks related to ICT. This provides students real-world ICT industry experience in Australia. In order to register for WIL component, students must enrol in the ICT Practicum unit. The School will organise suitable work placements for students.

Students with substantial post-qualification work experience in Australia maybe eligible for advanced standing in this unit.

PROFESSIONAL ACCREDITATION

Western Sydney University has a long history of providing well-designed degrees in ICT that are accredited at the professional level by the Australian Computer Society (ACS). Both MICT and MICT (Advanced) courses are fully accredited at the professional level by ACS.

ENTRY REQUIREMENTS

Pathway A - Applicants must have successfully completed an undergraduate degree in any discipline.

Pathway B - Applicants must have successfully completed an Honours or Master degree in any discipline.

Pathway C - Applicants must have successfully completed an Australian Computer Society accredited (or equivalent) undergraduate degree in Information and Communication Technologies, Computing or Information Systems

OR

An undergraduate degree in any discipline AND a Graduate Certificate or Graduate Diploma in ICT. Applicants seeking admission on the basis of work experience must support their application with a Statement of Service for all work experience listed on the application.

	MICT			MICT (Advanced)		
COURSE CODE/CRICOS CODE	**3699/063546M**			**3698/063545A**		
Entry Qualification/Pathway	Pathway A	Pathway B	Pathway C	Pathway A	Pathway B	Pathway C
Total Credit Points	160	120	120	200	160	160
Number of Core Units	8	8	5	12	12	9
Number of Electives Allowed	8	4	7	8	4	7

FOUNDATIONAL UNITS

	Pathway A	Pathway B	Pathway C	Pathway A	Pathway B	Pathway C
Professional Practice and Communication	Core	Core	Core	Core	Core	Core
Research Preparation in Post Graduate Studies	Core	Core	Core	Core	Core	Core
Programming Proficiency	Core	Core	Elective	Core	Core	Elective
Advanced Topics in User System Interaction	Core	Core	Elective	Core	Core	Elective
Systems Analysis and Database Management Systems	Core	Core	Elective	Core	Core	Elective
Network Technologies	Core	Core	Core	Core	Core	Core
Web Technologies	Elective	Elective	Elective	Core	Core	Core
IT Project Management	Core	Core	Core	Core	Core	Core
Content Management Systems & Web Analytics	Elective	Elective	Elective	Elective	Elective	Elective
Systems and Network Security	Elective	Elective	Elective	Elective	Elective	Elective

SPECIALISED UNITS

	Pathway A	Pathway B	Pathway C	Pathway A	Pathway B	Pathway C
Advanced Topics in Networking	Elective	Elective	Elective	Elective	Elective	Elective
Internet of Things	Elective	Elective	Elective	Elective	Elective	Elective
Multimedia Communication Systems	Elective	Elective	Elective	Elective	Elective	Elective
Wireless Networking	Elective	Elective	Elective	Elective	Elective	Elective
Web Engineering	Elective	Elective	Elective	Elective	Elective	Elective
Advanced Robotics	Elective	Elective	Elective	Elective	Elective	Elective
Advanced Health Classifications and Coding	Elective	Elective	Elective	Elective	Elective	Elective
Advanced Topics in ICT	Elective	Elective	Elective	Core	Core	Core
Advanced Topics in Artificial Intelligence	Elective	Elective	Elective	Elective	Elective	Elective
Software Testing and Automation	Elective	Elective	Elective	Elective	Elective	Elective
Advanced Mobile Robotics	Elective	Elective	Elective	Elective	Elective	Elective
Advanced Healthcare Data Environments	Elective	Elective	Elective	Elective	Elective	Elective
Advanced Healthcare Software and Systems	Elective	Elective	Elective	Elective	Elective	Elective
Modern Software Architectures	Elective	Elective	Elective	Elective	Elective	Elective
Cloud Computing	Elective	Elective	Elective	Elective	Elective	Elective
Mobile Computing	Elective	Elective	Elective	Elective	Elective	Elective
Data Science	Elective	Elective	Elective	Elective	Elective	Elective
Information Security Management	Elective	Elective	Elective	Elective	Elective	Elective
Predictive Analytics	Elective	Elective	Elective	Elective	Elective	Elective
Advanced Machine Learning	Elective	Elective	Elective	Elective	Elective	Elective
Advanced Topics in Cybersecurity	Elective	Elective	Elective	Elective	Elective	Elective
Applied Cybersecurity	Elective	Elective	Elective	Elective	Elective	Elective
Big Data (PG)	Elective	Elective	Elective	Core	Core	Core

PROJECT UNITS

	Pathway A	Pathway B	Pathway C	Pathway A	Pathway B	Pathway C
Master Project 1	Core	Core	Core	Core	Core	Core
Master Project 2	Elective	Elective	Elective	Core	Core	Core

CORE UNIT DESCRIPTIONS

Programming Proficiency

This unit is aimed at students whose undergraduate study is in a discipline other than computing or information technology. This unit first covers the programming fundamentals on data types, conditional selections and loop structures, and then further develops the problem solving skills through the use of user-defined functions, records, files, as well as the basic concept and techniques of object-oriented programming. A high level programming language is employed to implement all the problem solutions.

Systems Analysis and Database Management Systems

The main purpose of this unit is to provide students with an opportunity to gain knowledge and experience of developing a business information system in a systematic way. This unit examines the general methodology of systems development life cycle, including different phases and various modelling techniques. The unit specialises in the development of a full systems analysis and design documentation by using system development methodologies, including data analysis and modelling methods. It extensively covers database design techniques where students will use a set of business rules obtained from requirements and use case analysis, and database implementation using a commercial database management system. At the same time, student learning, intercommunication and collaborative working skills are enhanced by student participation in tutorial presentations and group assignments.

Advanced Topics in User System Interaction

The domain of User System Interaction or also known as Human Computer Interaction (HCI) dictates that IT graduates must be able to develop and evaluate interfaces that not only look professional but are usable, functional and accessible. This post graduate unit also examines HCI as a field of research and discusses novel areas of research in the area. Students in this unit will be required to complete a research project alongside a literature review document both of which comprise of content that is of a standard of being able to be considered for publication and/or presentation in a HCI conference or journal.

Network Technologies

Computer networking is probably among the fastest growing technologies of our times. The Internet interconnects millions of computers providing many new exciting opportunities and challenges. The Internet and the World Wide Web have provided the communication and infrastructure needed for global collaboration and information exchange. As a result of the rapid growth of networked systems and the diverse applications that run on them, success in many professions depends on a sound understanding of the technologies underlying these systems and applications. This unit explores these issues further and provides the students with such an understanding. It covers the principles and current practices pertinent to computer networking and communications. It describes some of the important technologies and devices used in modern networks for information distribution and data sharing. The unit helps students to understand important relevant models, protocols and standards in networking and internetworking.

Professional Practice and Communication

This unit introduces some of the concepts, standards and techniques associated with the current professional practice for engineering and information technology students. These include the various elements of engineering and IT practice, basic knowledge of law of contracts and legal responsibility, competence in verbal communication and presentations and in reading and writing reports, and an understanding of ethical considerations.

Research Preparation in Post Graduate Studies

This unit introduces some of the concepts, standards and techniques associated with current professional practice for engineering and information technology students. These include the various elements of engineering and IT practice, basic knowledge of law of contracts and legal responsibility, competence in verbal communication and presentations and in reading and writing reports, and an understanding of ethical considerations.

Advanced Topics in ICT

The information and communications technologies are advancing at an ever-increasing rate. The whole world is now interconnected. The World Wide Web community is actively engaged in developing the next generation of the Web. Social networking on the Internet is facilitated by applications such as Facebook, YouTube and Twitter. Artificial Intelligence is increasingly intertwined with the decisions we make every day. Large scale storage technologies are leading to Cloud Computing where data and applications may reside anywhere in the world. Research in how to access meaningful data from the vast amounts on the Web has led to initiatives such as Semantic Web and Linked Data. Mashups mix data from disparate sources to enable users to work more efficiently. Wireless and mobile computing are changing the market place. All of these trends are still in their early stages. To make sense of all these developments, the top echelons of the World Wide Web Consortium are actively engaged in creating a new discipline called Web Science. Advanced Topics in ICT will enable students to appreciate the scale of new developments and create prototypes of applications in their desired domain. This unit consists of three Topics selected each semester. Assessment will be via a series of discussion paper assignments.

Web Technologies

This unit covers the technologies required for the construction and maintenance of web pages and web sites. It focuses on the web page and site design, mark-up languages, client-side technologies such as Cascading Style Sheets and Javascript, as well as server-side technologies such as web servers, database connectivity, and server side scripting. It also includes the use of multi-media, security, access rights, and the exploration of some of the latest technologies on the Internet. This unit is heavily orientated towards practical experience based on amplifying the theoretical concepts.

Big Data (PG)

"Big data" is the label given to the ever-increasing amount of data with which humanity has to cope in the digital age. The availability of data and the development of cloud computing architectures to process and analyse these data have made data analytics a central tool in our endeavours. This unit will introduce students to the realm of "big data", covering the important principles and technologies of retrieving, processing and managing massive real-world data sets. It is designed to provide the basic techniques required by any discipline that needs to make sense out of the growing amount of data, and to equip students with the knowledge and key set of skills to be competitive in the growing job market in the analytics field.

IT Project Management

This unit is designed to provide students with an opportunity to learn and apply the knowledge, values and skills of consultancy, project management, and research by undertaking an approved computer-related project, preferably on behalf of a client. The unit covers preparing and presenting project proposals in various ICT areas, project management, time management, communication skills, and the evolving legal, ethical, and social responsibilities of IT professionals. Students may work in teams or individually, under the supervision of a staff member, to plan and investigate their project.

Master Project 1

This unit is a problem based project unit. Students are expected to conduct self directed study under supervision of academic staff. Students will identify research topics in consultation with supervisors, carry out literature survey in the selected topic area, define research objectives and scope, establish research methodology and prepare a research plan.

Master Project 2

This unit is a continuation of Master Project 1 and is a problem based project unit. Students are expected to conduct self directed study under supervision of academic staff and deliver the final outcomes of the research topics that are proposed in Master Project 1. Students will employ the identified methodologies to carry out the research plans and fulfill the research objectives with the defined scope. Each student is required to produce an oral presentation and a final written report related to the project. Students will acquire problem solving skills in this unit.

WHY POSTGRADUATE STUDY AT WESTERN SYDNEY?

You've come a long way. Go further.

Located in the heart of one of Australia's fastest growing economic regions, Western Sydney University offers unlimited potential to students with the drive, ambition and will to succeed.

Ranked amongst the top two per cent of universities on the globe, Western Sydney is a world-class university with a growing international reach and reputation for academic excellence and impact-driven research.

To take your career to the next level, you need more than classrooms, more than theory. That's why we offer a combination of on campus learning environments, with real-life, on-the-ground, hands-on opportunities for skill development in professional and community settings. We value academic excellence, integrity and the pursuit of knowledge.

We equip our students with the means to do more than just advance their careers. We are unlocking the potential of the next generation of global citizens, leaders and change-makers.

PROGRESS. UNLIMITED.

HOW TO APPLY

International students apply direct to Western Sydney University.
westernsydney.edu.au/international/apply

Applicants must meet minimum academic entry and English proficiency requirements.
westernsydney.edu.au/international/ entryrequirements

International students are also required to have genuine access to sufficient funds while studying in Australia. Funds should be sufficient to contribute to the cost of travel, tuition, school costs for any dependants, and living costs.
westernsydney.edu.au/international/fees

FURTHER INFORMATION

For further details about courses, including course structure, unit descriptions, work placement requirements (if applicable), visit
handbook.westernsydney.edu.au

For information about studying at Western Sydney University, including assessment methods, course progression and attendance requirements, accommodation options, working and living in Australia, visit
westernsydney.edu.au/studyandlife

TOP 2%
OF UNIVERSITIES WORLDWIDE*

#1 UNI
IN SYDNEY FOR EMPLOYER SATISFACTION**

5 STARS
FOR FACILITIES, INCLUSIVENESS, INNOVATION AND TEACHING*

*Times Higher Education Rankings 2018
**Employer Satisfaction Survey 2018 (85.6% satisfaction rating)
^QS Top Universities: QS Stars University Ratings 2018

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