Australian IT Education

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Australia, Brisbane 2023

Agenda

- Introduction. Employment forecasts
- Tertiary Education in Australia
- IT Programs and Degrees
- Accreditation and Quality Assurance
- ICT and Cybersecurity programs TAFE QLD
- Q&A

Oleg M. Vaynberg

- Educator TAFE QLD
- CCNA, Instructor Cisco
- Certified Network Engineer
- Certified Project Manager
- MBA
- Certified coach ICTA
- M.A.NLP
- Former CIO of a big Russian company (about 2500 workstations, 70 servers in 15 branches)
- Former software developer

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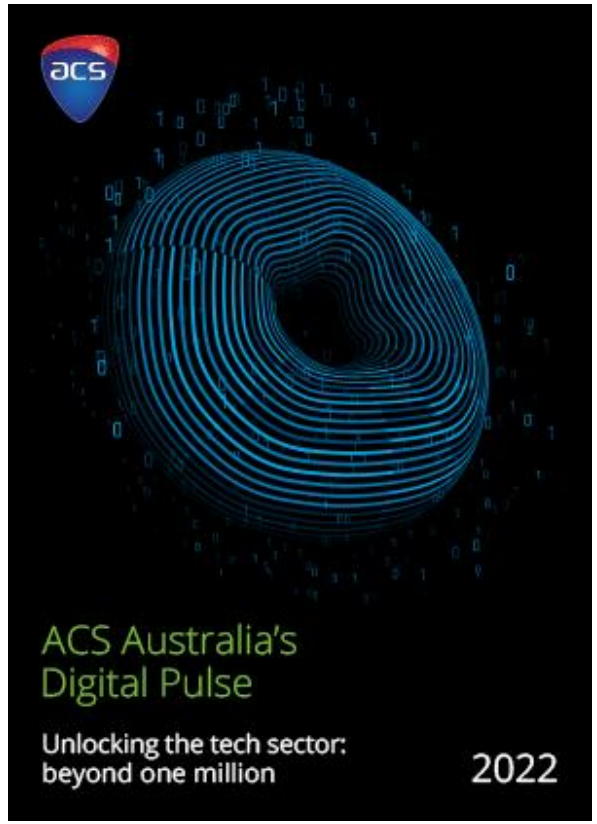
https://vk.com/oleg.vaynberg
https://t.me/Sky_Stranger
https://www.youtube.com/c/OlegVaynberg
https://www.ovaynberg.com/category/life-in-australia/

Employment forecasts 2021 to 2027

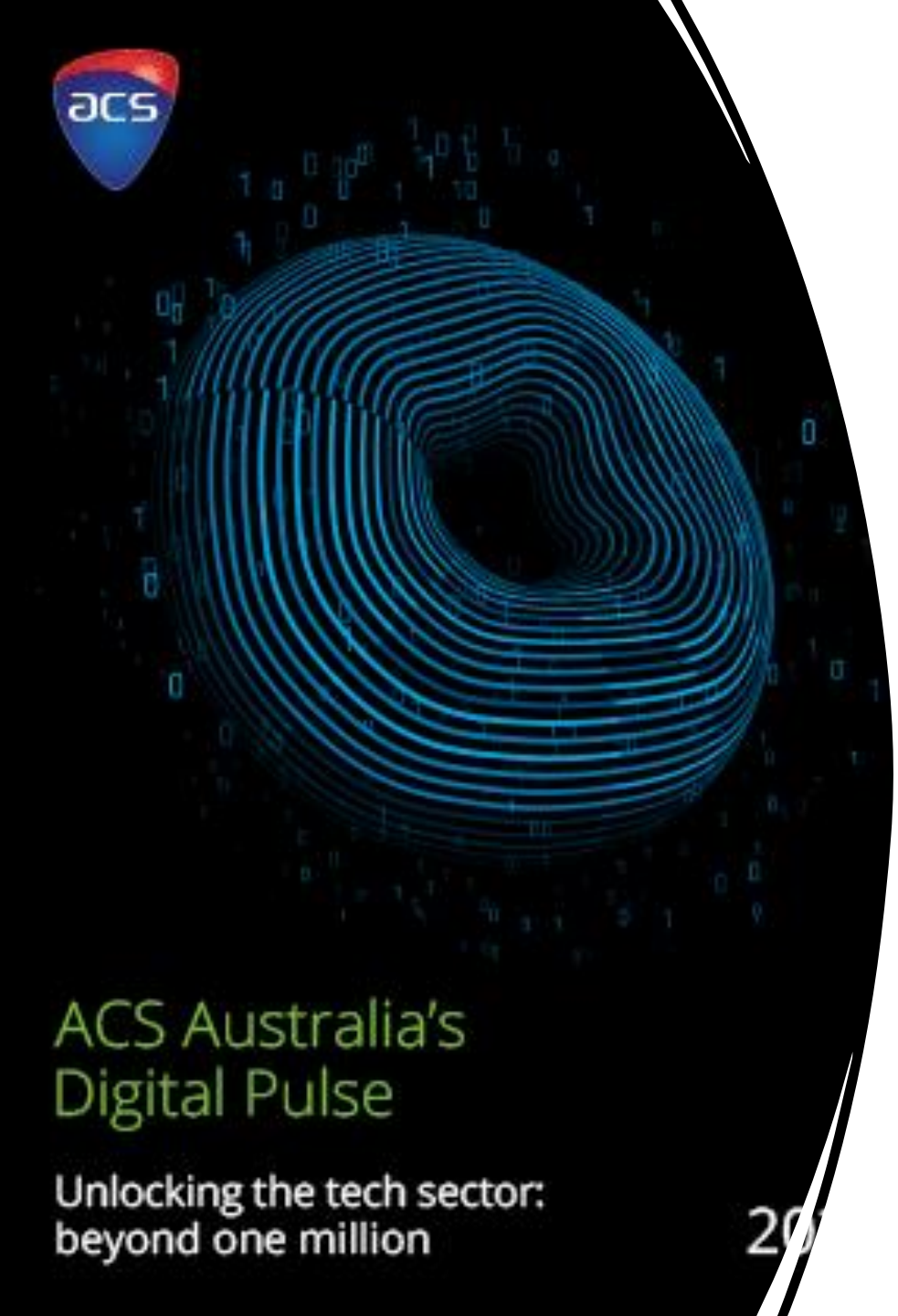
Occupational grouping	2021	2027	Average **annual** growth, 2021 to 2027 %
ICT management and operations	288,851	414,160	6.2
ICT technical and professional	336,809	492,788	6.5
ICT sales	36,778	37,376	0.3
ICT trades	87,948	110,354	3.9
Electronic trades and professional	3,093	4,980	4.1
ICT industry admin and logistics support	115,979	139,611	3.1
Total technology workers	**870,268**	**1,199,270**	**5.5**



https://www.acs.org.au

Technology skills forecasts by occupation grouping, 2021 to 2027

ICT management and operations			
Postgraduate	114,215	172,285	7.1
Undergraduate	205,522	303,799	6.7
Diploma or Advanced Diploma	82,087	121,371	6.7
Certificate III or IV	47,494	68,061	6.2
Certificate I or II	23,373	34,248	6.6
ICT technical and professional			
Postgraduate	113,058	175,760	7.6
Undergraduate	261,091	395,668	7.2
Diploma or Advanced Diploma	90,887	136,460	7.0
Certificate III or IV	45,493	66,193	6.4
Certificate I or II	23,144	34,243	6.7



Has Australia run out of talent?

Amidst an ongoing shortage of skilled workers – the newly launched ACS *Digital Pulse 2022* report flagged ongoing demand to add **300,000 workers to Australia's tech workforce by 2026** – the figures reflect Australian employers' growing acceptance of remote work as both desirable and commercially necessary.

Science, technology, engineering and mathematics (STEM)

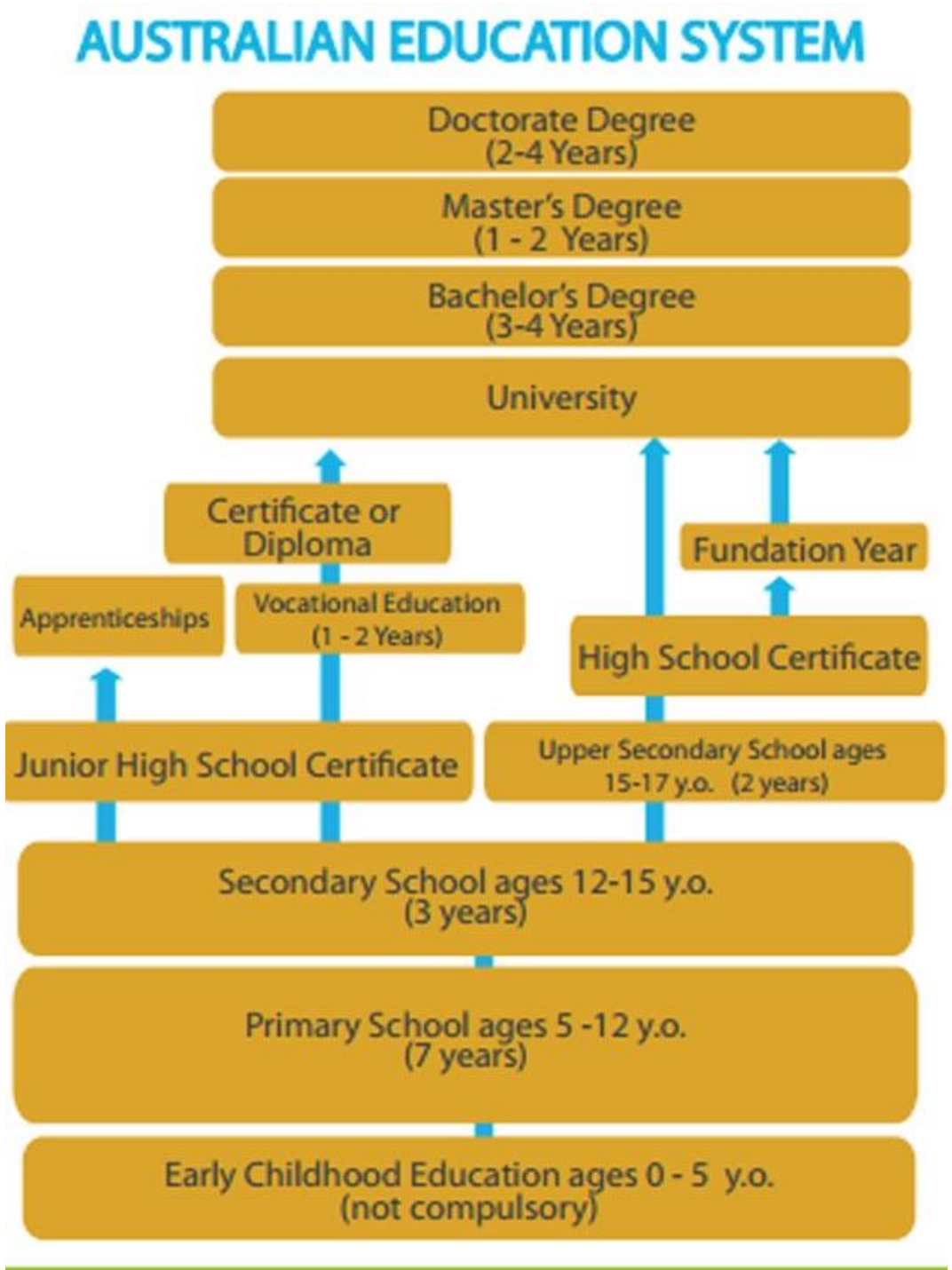
Graduates in IT

Overall Enrollment 2020 in IT in Australia - **100,000**
(https://universitiesaustralia.edu.au/wp-content/uploads/2022/09/220207-HE-Facts-and-Figures-2022_2.0.pdf)

Demand for IT Specialists

Demand for IT Specialists in Australia 2023 - **172,400**

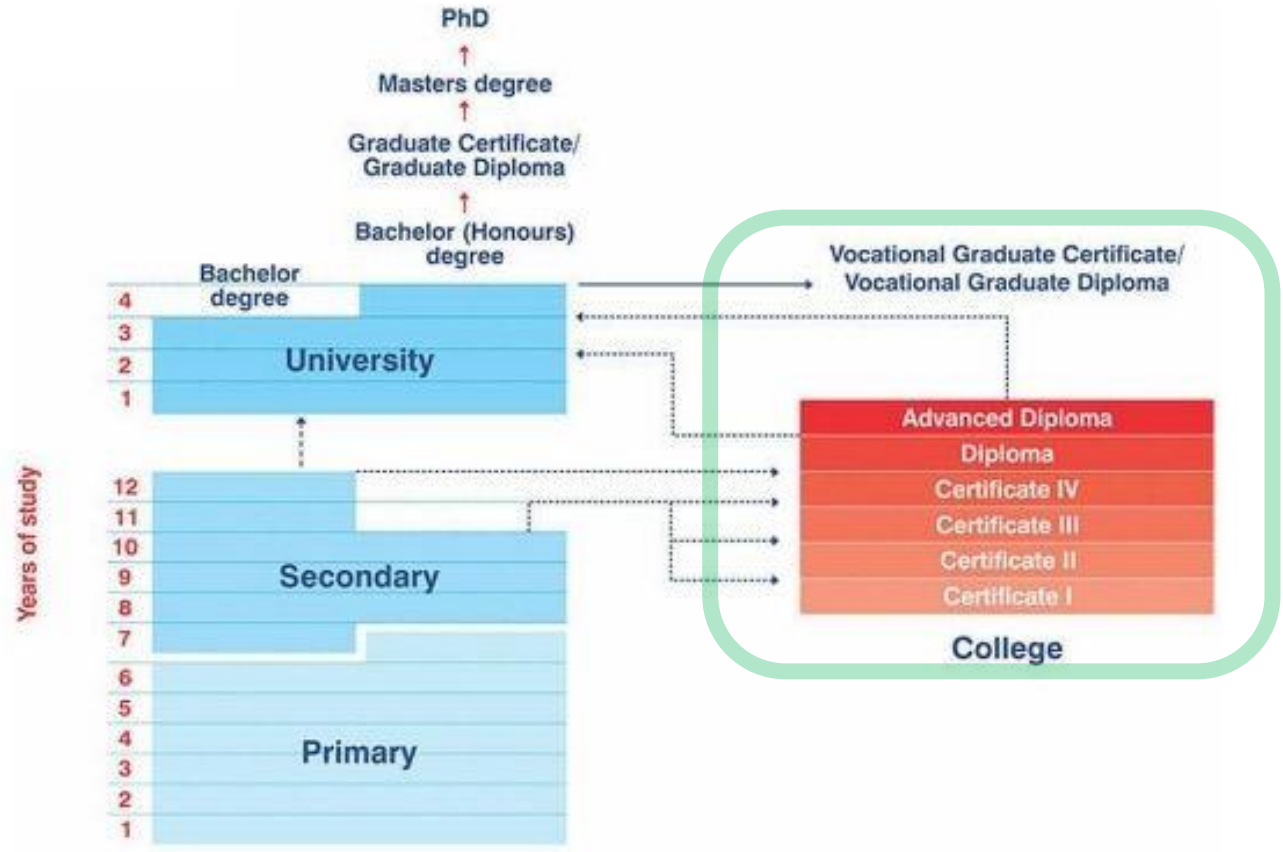
400,000 tech workers needed by 2027
(https://www.acs.org.au/insightsandpublications/reports-publications/ACS-guide-to-IT-professions-2022.html)



AQF - The Australian Qualifications Framework

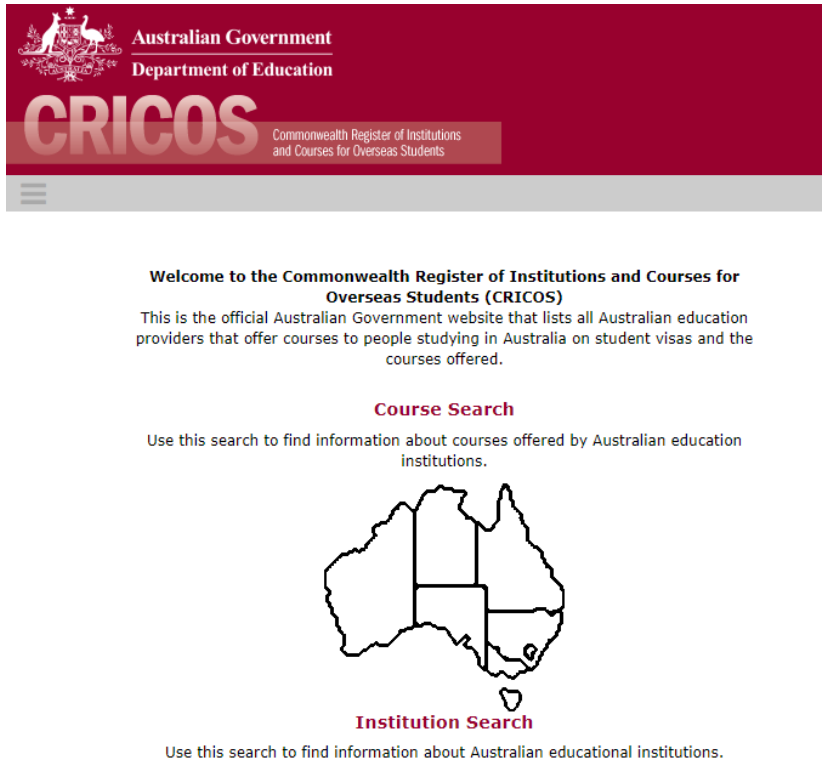
AQF Level	Qualification(s)
1	Certificate I
2	Certificate II
3	Certificate III
4	Certificate IV
5	Diploma
6	Advanced Diploma Associate Degree
7	Bachelor Degree
8	Bachelor Honours Degree Graduate Certificate Graduate Diploma
9	Masters Degree
10	Doctoral Degree

LEVELS OF AUSTRALIAN EDUCATION SYSTEM



Accreditation and Quality Assurance

- Australia maintains high-quality education through TEQSA (Tertiary Education Quality and Standards Agency) - https://www.teqsa.gov.au/
- CRICOS (Commonwealth Register of Institutions and Courses for Overseas Students) - https://cricos.education.gov.au/

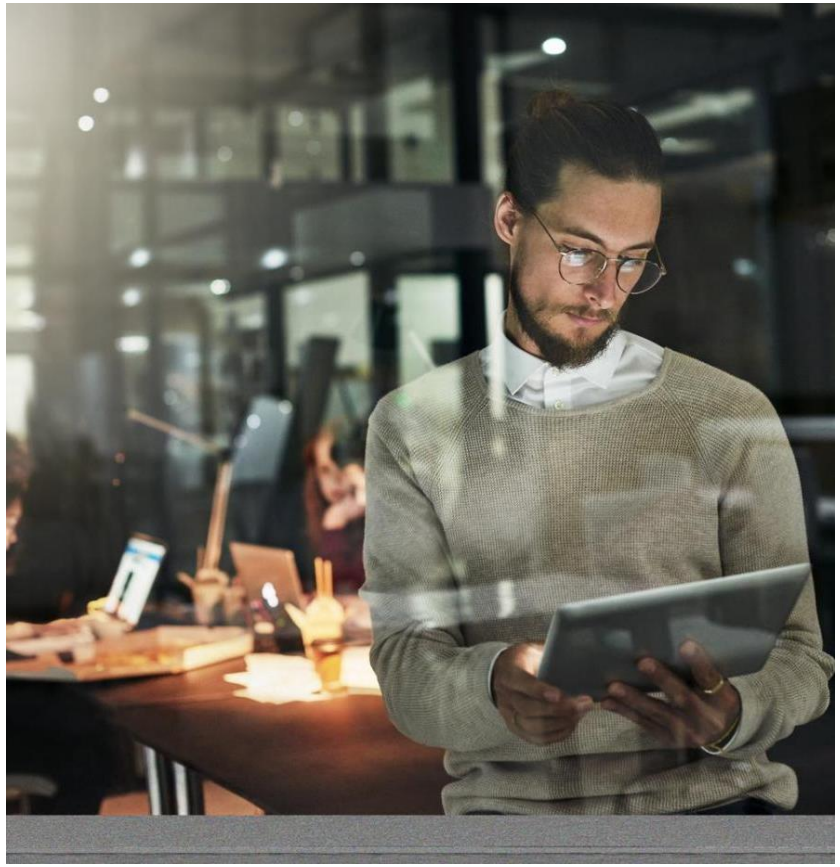


HIGHER EDUCATION

- Higher education requires intensive study over a number of years to achieve a recognised high-level qualification.
- The Australian higher education sector offers a wide diversity of programs that lead to highly regarded and internationally recognised qualifications.
- There are 43 universities in Australia, of which two are international universities, and one is a private specialty university.
- About one-quarter of students enrolled in Australian universities come from overseas. A list of these universities is available on the National Register at the TEQSA website found at http://www.teqsa.gov.au/national-register

VOCATIONAL EDUCATION AND TRAINING

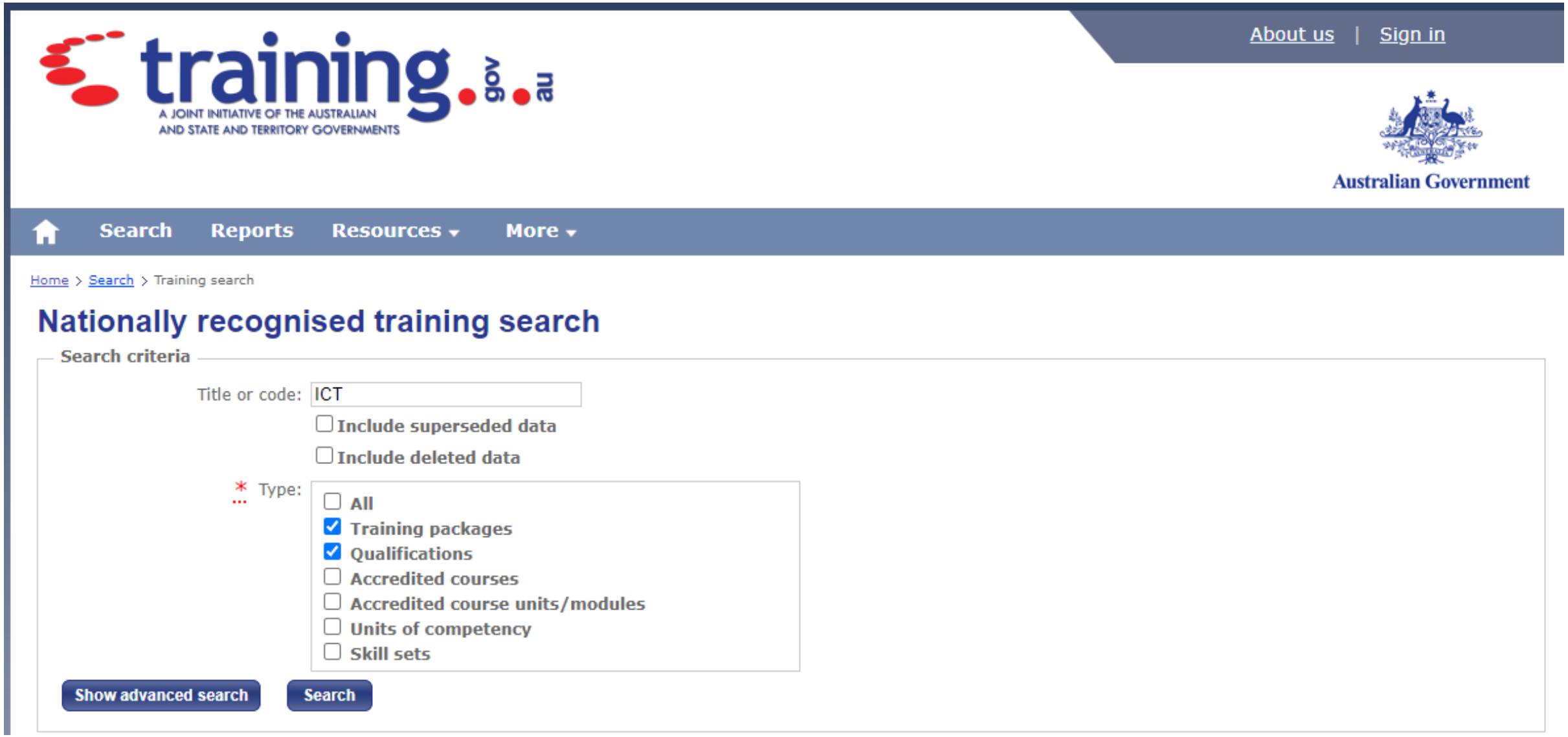
- The **primary goal of VET is to provide students with the practical skills and experiences** to perform tasks effectively and safely across a wide range of employment fields.
- Government-funded TAFE institutes, adult and community education centres and private RTOs provide courses. VET can begin in secondary school, and many VET institutions have formal pathways arrangements with universities whereby VET students have assured entry into university on successful completion of their VET qualification.



What's inside of VET courses?

https://training.gov.au/

ICT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Nationally recognised training search

Your search for **ICT** has returned **13** results. If you are unable to find an appropriate result try restricting your search criteria.

Modify Search | New Search

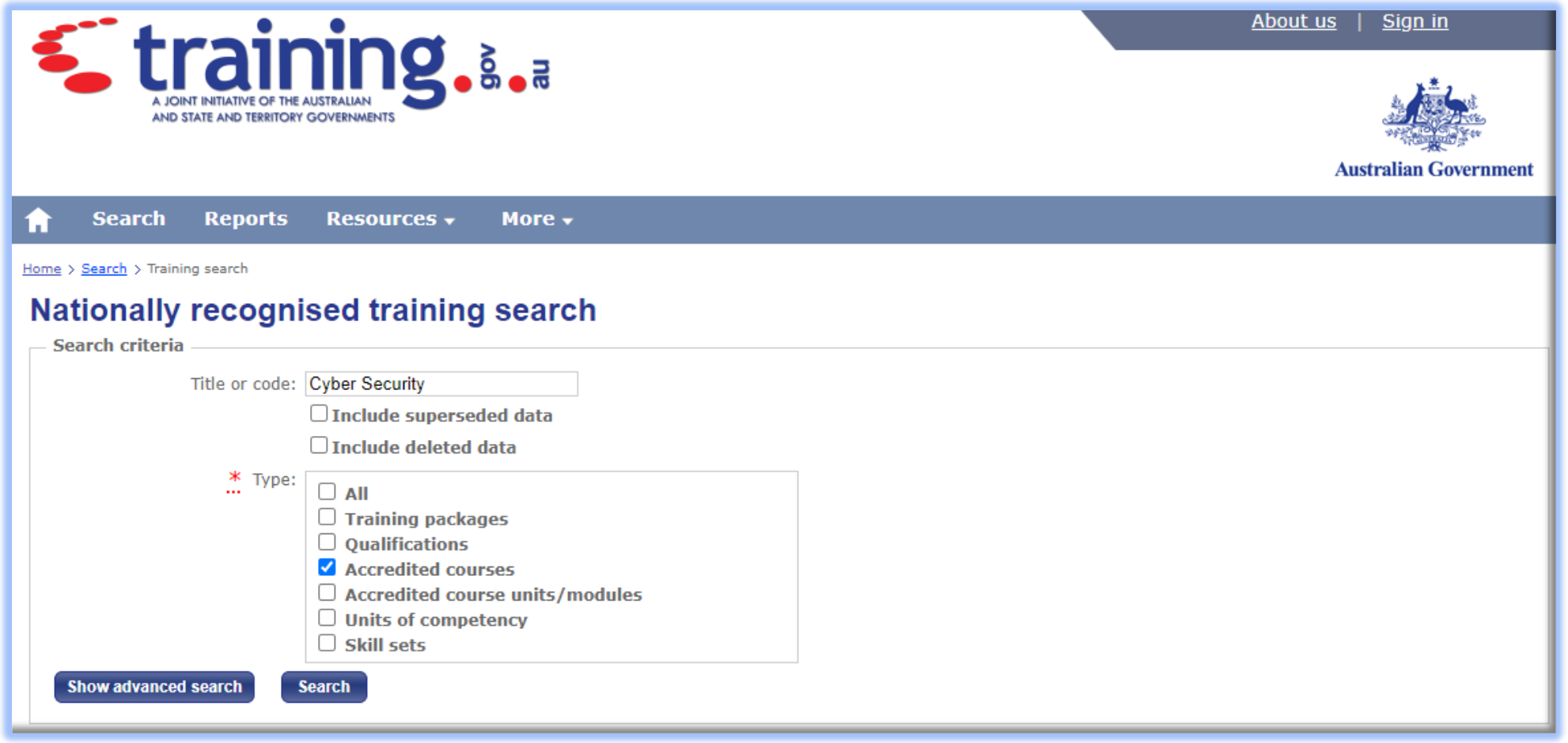
Training packages (1 results) >

Qualifications (12 results) v

Code	Title ▲	Usage recommendation
ICT60220	Advanced Diploma of Information Technology	Current
ICT20120	Certificate II in Applied Digital Technologies	Current
UEE21720	Certificate II in Technical Support	Current
ICT20219	Certificate II in Telecommunications Network Build and Operation	Current
ICT20319	Certificate II in Telecommunications Technology	Current
ICT30120	Certificate III in Information Technology	Current
ICT30419	Certificate III in Telecommunications Network Build and Operation	Current
ICT30519	Certificate III in Telecommunications Technology	Current
ICT40120	Certificate IV in Information Technology	Current
ICT41219	Certificate IV in Telecommunications Engineering Technology	Current

1 2 Items per page **10** | 20 | 50 | 100 Displaying items 1 - 10 of 12

Cyber Security



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Nationally recognised training search

Your search for **Cyber Security** has returned **4** results. If you are unable to find an appropriate result try restricting your search criteria.

Modify Search New Search

Accredited courses (4 results)

Code	Title ▲	Usage recommendation
22610VIC	Advanced Diploma of Cyber Security	Current
22603VIC	Certificate IV in Cyber Security	Current
11062NAT	Certificate IV in Offensive Cyber Security	Current
10907NAT	Graduate Certificate in Networking and Cyber Security	Current

1 Items per page **10** | 20 | 50 | 100 Displaying items 1 - 4 of 4

ICTNWK435	Create secure virtual private networks
ICTNWK538	Install and maintain valid authentication processes
ICTPRG435	Write scripts for software applications
VU23224	Identify the implications of cloud based security systems
ICTCLD301	Evaluate characteristics of cloud computing solutions and services
ICTSAS526	Review and update disaster recovery and contingency plans
ICTSAS440	Monitor and administer security of ICT systems
BSBINS401	Analyse and present research information
BSBWHS309	Contribute effectively to WHS communication and consultation processes
VU23225	Investigate Windows security features
VU23219	Manage the security infrastructure for an organisation
VU23216	Perform basic cyber security data analysis
VU23215	Test concepts and procedures for cyber security
VU23221	Evaluate and test an incident response plan for an enterprise
VU23218	Implement network security infrastructure for an organisation
ICTNWK544	Design and implement a security perimeter for ICT networks
ICTICT426	Identify and evaluate emerging technologies and practices
ICTPRG434	Automate processes
ICTNWK546	Manage network security
VU23214	Configure and secure networked end points
ICTCLD401	Configure cloud services
ICTNWK422	Install and manage servers
VU23226	Test concepts and procedures for cyber exploitation
VU23220	Develop and carry out a cyber security industry project
VU23217	Recognise the need for cyber security in an organisation
VU23222	Expose website security vulnerabilities
ICTICT443	Work collaboratively in the ICT industry
VU23223	Apply cyber security legislation, privacy and ethical practices
ICTNWK537	Implement secure encryption technologies
VU23213	Utilise basic network concepts and protocols required in cyber security

22603VIC - Certificate in Cyber-Security

Technical and further education - TAFE. About 450000 students https://en.wikipedia.org/wiki/Technical_and_further_education

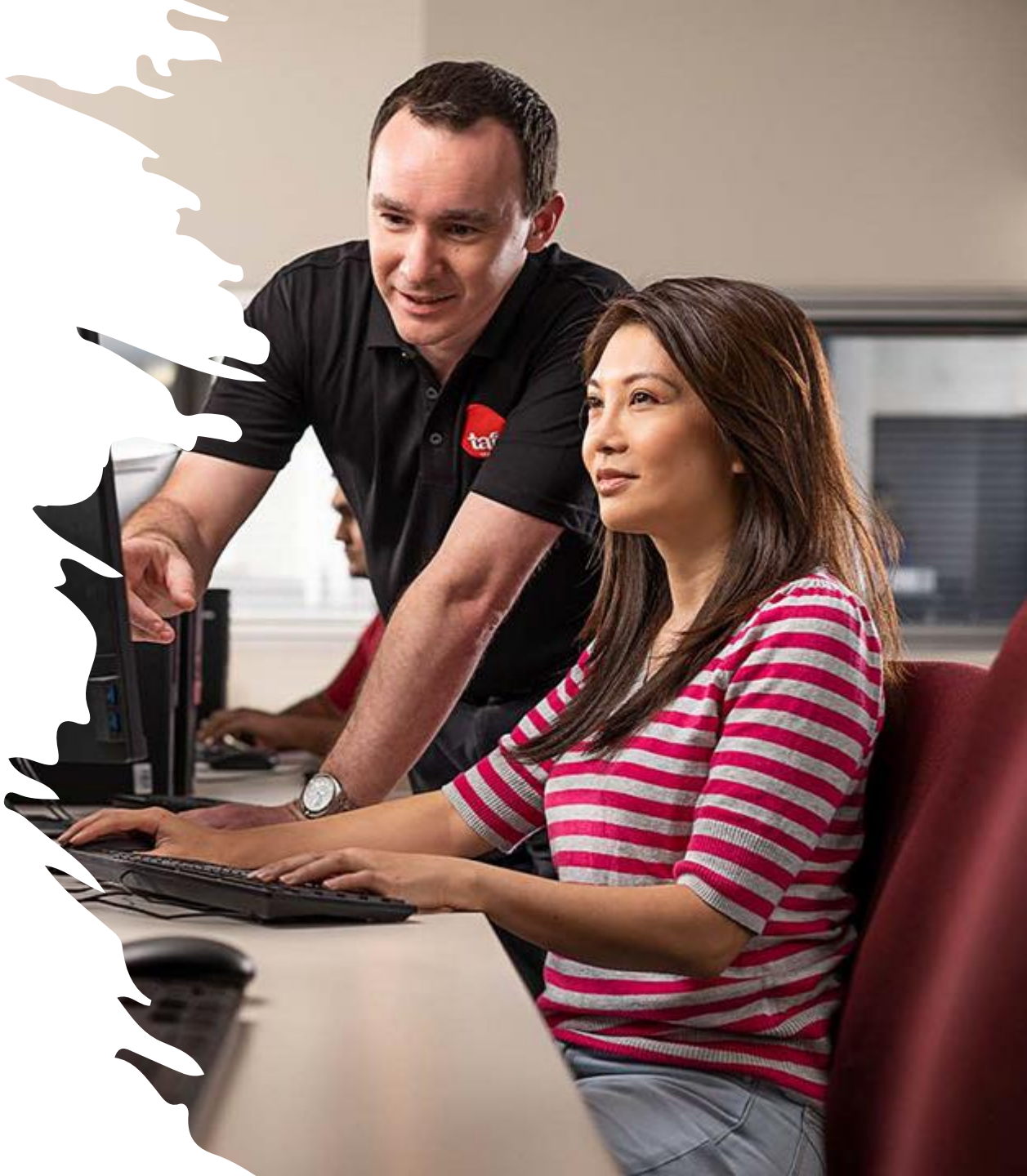
TAFE colleges award Australian Qualifications Framework (AQF) qualifications accredited in the Vocational Education and Training (VET) sector that align to Certificate I, Certificate II, Certificate III, Certificate IV, Diploma, Advanced Diploma, Graduate Certificate and Graduate Diploma qualifications.

In many instances, TAFE study at a Diploma or above level can be used as partial credit towards bachelor's degree-level university programs.
https://www.tafecourses.com.au/resources/what-is-tafe/

TAFE QLD ICT team CADD

- Certificate III-IV in Information Technology
- Diploma in Information Technology
- Bachelor of Information Technology
- Certificate III-IV in Cyber Security
- Diploma in Cyber Security

- From the next year – **TAFE University Degree in Cyber Security!**



Core and elective units.
One year, 30 assessments

Core units

1. **BSBINS401** Analyse and present research information
2. **BSBWHS309** Contribute effectively to WHS communication and consultation processes
3. **ICTICT443** Work collaboratively in the ICT industry
4. **VU23213** Utilise basic network concepts and protocols required in cyber security
5. **VU23215** Test concepts and procedures for cyber security
6. **VU23217** Recognise the need for cyber security in an organisation
7. **VU23220** Develop and carry out a cyber security industry project
8. **VU23223** Apply cyber security legislation, privacy and ethical practices

Elective units

9. **ICTPRG434** Automate processes
10. **ICTPRG435** Write scripts for software applications
11. **VU23216** Perform basic cyber security data analysis
12. **VU23218** Implement network security infrastructure for an organisation
13. **VU23221** Evaluate and test an incident response plan for an enterprise
14. **VU23222** Expose website security vulnerabilities
15. **VU23224** Identify the implications of cloud based security systems
16. **VU23226** Test concepts and procedures for cyber exploitation

22603VIC - Certificate IV in Cyber Security. ICTPRG435 - Write scripts for software applications

ELEMENT	PERFORMANCE CRITERIA
1. Specify software application requirements	1.1 Identify required software application outcomes 1.2 Discuss expectations of final software application with required personnel
2. Determine script requirements	2.1 Identify main characteristics of scripting languages 2.2 Identify integrated development environment (IDE) 2.3 Identify protocols and object model used in chosen scripting language
3. Design and build scripts	3.1 Create pseudo code and describe logic required in script 3.2 Review pseudo code and amend missing logic and errors 3.3 Translate pseudo code into scripts, incorporating use of basic language elements 3.4 Incorporate item manipulation using chosen scripting language
4. Finalise scripts	4.1 Create internal documentation in script according to organisational procedures 4.2 Review, debug and document script according to organisational procedures 4.3 Finalise, save and confirm work with required personnel

22603VIC - Certificate IV in Cyber Security. ICTPRG435 - Write scripts for software applications

Week / Session	Topic Covered / Content
Week 1-2	Introduction to scripting, pseudocode, variables
Week 3-4	Integrated Development Environments (IDEs). Operators, conditional statements (IF)
Week 5-6	Control flow statements (loops, iteration, recursion), lists
Week 7-8	Control flow statements (cont.). Debugging
Week 9-10	Software development lifecycles, legal issues
Week 11-12	Strings and string operations
Week 13-14	Files and file operations
Week 15-16	Network scripting and practice exam
Week 17	Re-submissions
Week 18	Re-submissions

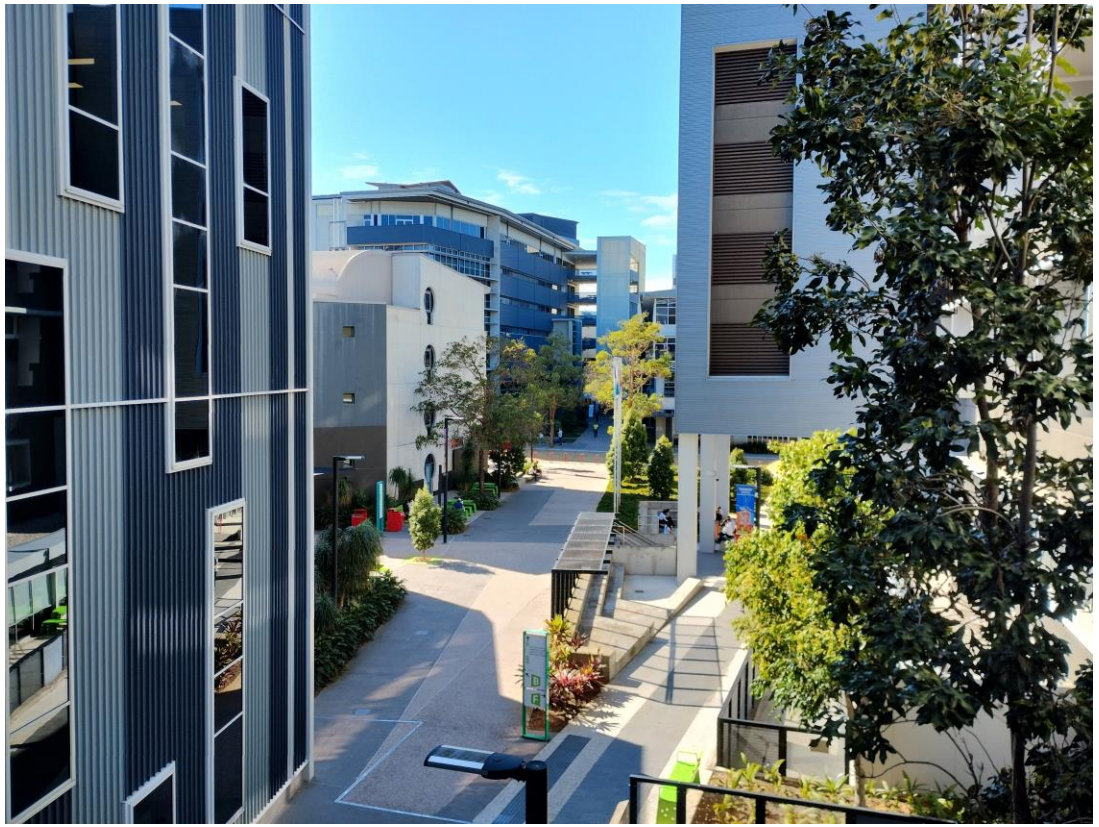
Example. PROJECT SCENARIO

You got your first job as a cybersecurity specialist at Midtown IT. Your boss wants to update the Incident Response Plan. To make a risk assessment matrix, he needs to conduct an assets audit. The first task he assigns to you is to write a Python program that will collect information on all computers used on the Midtown IT network and keep a Microsoft Excell (CSV) file up to date with the following information on all computers:

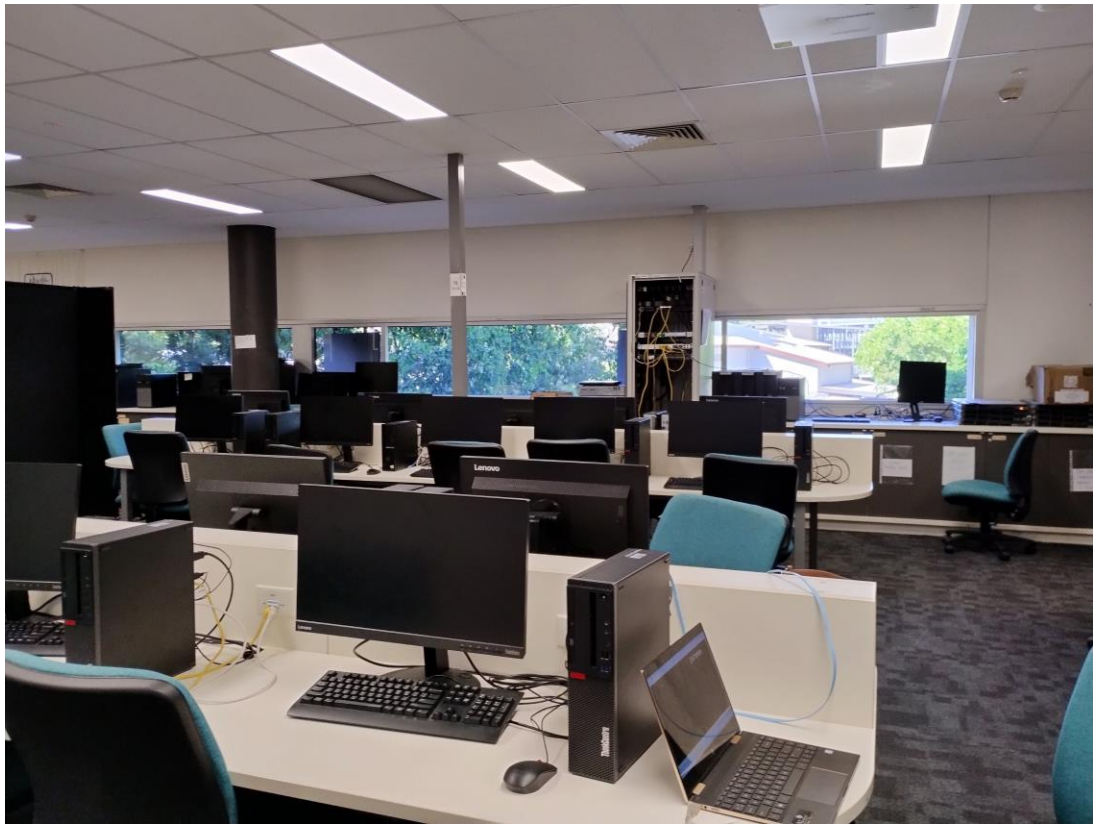
- Computer Name
- IP-address
- MAC-address
- Processor Model
- Operation System
- System time
- Internet connection speed
- Active ports

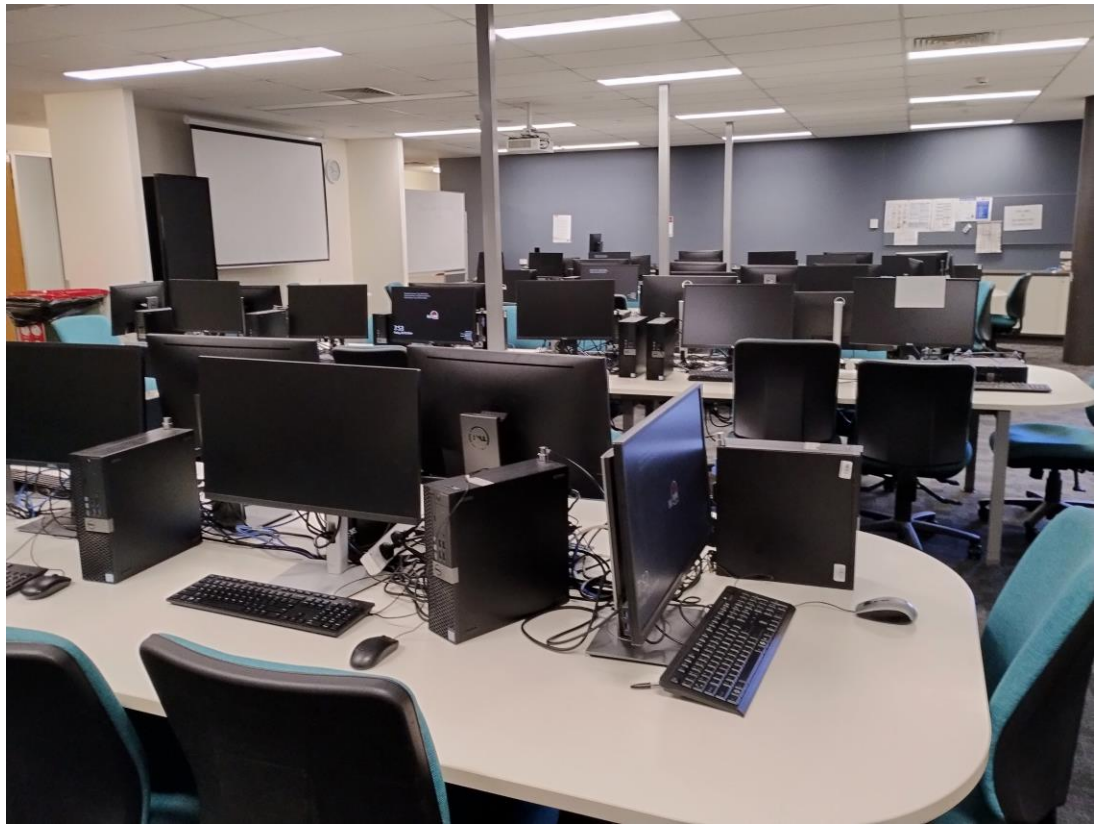
The organisation uses computers with Windows and Linux operating systems.

Campuses and labs



TAFE labs

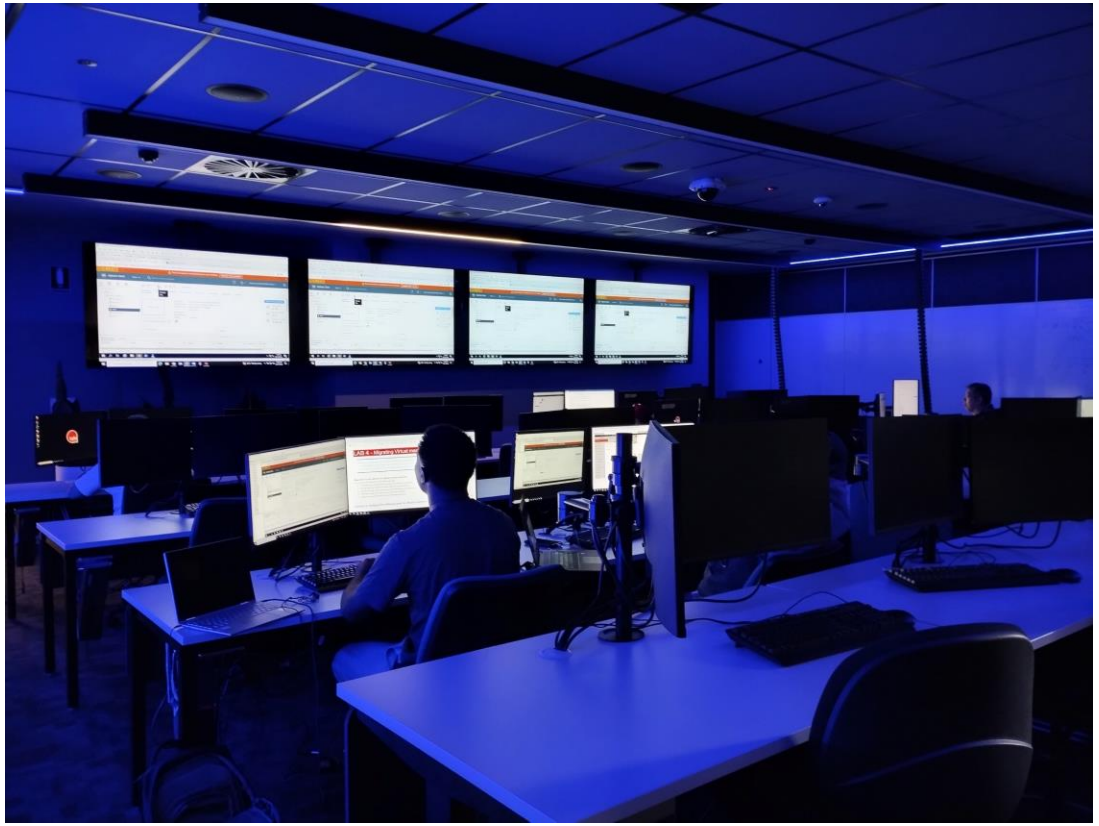




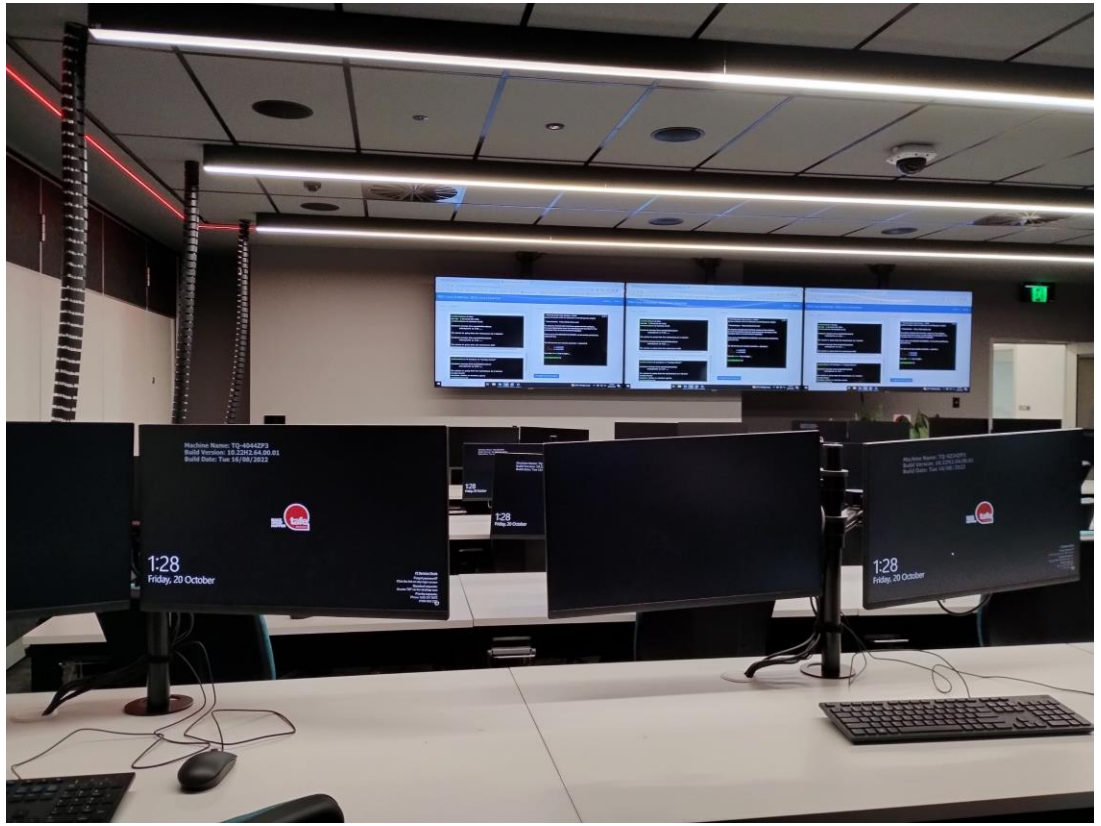
SOC - Security Operations Centre (TAFE education laboratory). Lego City

TAFE Education Laboratory.
SOC - Blue Team room

Blue team



Red team



Q&A

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