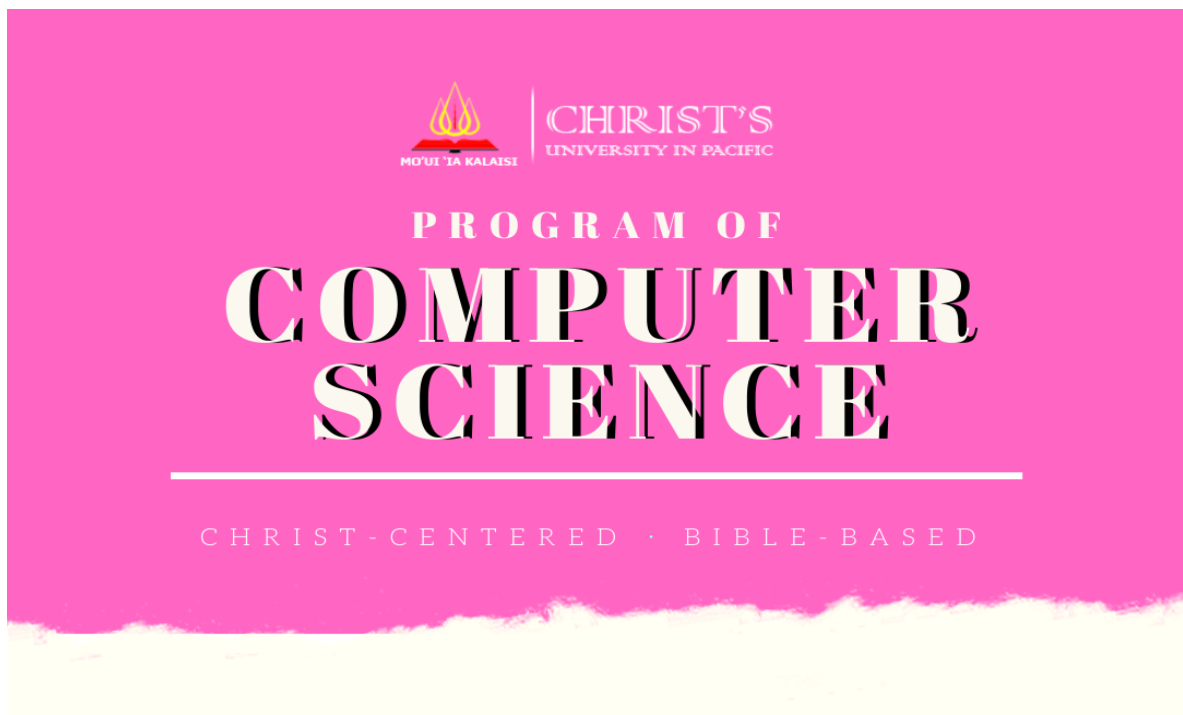


SCHOOL OF COMPUTER SCIENCE

Master of Cyber Security

(M.CS.)



**True cybersecurity is, preparing what's next, not
what was last!**

John 17:17

2023

“TNQAB Act Cap 30.14 of the 2016 Revised Edition”

**CUP School of Computer Science Handbook
Department of Cyber Security**

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Christ’s University in Pacific
Nuku’alofa, Tonga
KINGDOM OF TONGA**

PROGRAMME REGULATIONS

Master of Cyber Security

DESCRIPTION

A Master of Cyber Security (M.CS) introduces students to the frontiers of knowledge and trains them in the relevant techniques of cyber security. Students will gain an advanced understanding and knowledge of cyber security from the point of view of preventative security, detection of security breaches, and offensive security (such as computer system penetration testing). At the same time, students will gain an advanced understanding and knowledge of cloud computing technologies, computer infrastructure, legal aspects of cyber security and a capacity to think innovatively and be able to use research-led knowledge to advance professional practice.

Delivery Mode: *Mostly face-to-face and self-directed learning. Additional learning materials are offered via the University's learning management system.*

Student Learning Hours: The learning hours are a guide to the total time needed for a student to complete the paper:

On campus sessions 48

Self-Directed Learning 102

Total learning Hours 150

Content Statement The learning hours are a guide to the total time needed for a student to complete one course:

Start Date: Semester 1, 2023

Qualification Developer Christ's University in Pacific

Contact(s):

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Head for School of Computer Science
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Phone: (+676) 28-125

CUP CALENDAR YEAR 2023

<p>JANUARY</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 12.5%;">M</th> <th style="width: 12.5%;">T</th> <th style="width: 12.5%;">W</th> <th style="width: 12.5%;">R</th> <th style="width: 12.5%;">F</th> <th style="width: 12.5%;">Sa</th> <th style="width: 12.5%;">Su</th> </tr> </thead> <tbody> <tr> <td>23</td> <td>24</td> <td>25</td> <td>26</td> <td>27</td> <td>28</td> <td>29</td> </tr> <tr> <td>30</td> <td>31</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	M	T	W	R	F	Sa	Su	23	24	25	26	27	28	29	30	31						<ul style="list-style-type: none"> ● 25th January: CUP UNIVERSITY STAFF & TEACHERS BEGINS @ 10am ● 27th and 31st January: STAFF PROFESSIONAL DEVELOPMENT @ 10am 																												
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Tonga Public Holidays will update!

PROGRAMME SCHEDULE

1. Programme Schedule

This Programme Schedule applies to the CUP Master of Cyber Security (M.CS)
Level 8 & 9 Credits 240.

2. Entry requirements

Completed one of the following with a B grade average or higher at level 7 or equivalent:

- Bachelor of Computer and Information Sciences or
- Graduate Diploma in Computer and Information Sciences.

An applicant who does not meet the admission requirements above must submit evidence to the dean (or representative) of their ability to study at postgraduate level.

- An applicant will be required to supply references.
 - An applicant may be required to attend a selection interview.
-

3. Selection

3.1 Selection criteria

When the number of eligible applicants for admission exceeds the number of places available, the following selection criteria will be applied:

- a) Professional qualifications that are relevant to the proposed field of study;
- b) Assurance of commitment to undertaking all aspects of the programme and to meeting the learning outcomes;
- c) Recommendation from employers;
- d) Academic and technical aptitude;
- e) Relevant work experience.

3.2 Selection process

Selection will be made by the Programme Committee or by those with authority delegated by the Programme Committee. In some cases, a telephone or face-to-face interview may be required.

4. Requirements for the Award of the Qualification

The Award

To be awarded the Master of Cyber Security, a candidate shall have successfully completed 240 credits together with the requirements.

CAREERS IN CYBER SECURITY

There is a growing global demand for skilled cyber security professionals. Some possible career options are listed below:

- Chief Information Security Officer
- Entrepreneurs of new security products and services
- Penetration Testers/Security Assessment Consultants
- IT Security Consultants

RELATED CAREERS

- Cyber Security Analyst,
- Cyber Security Officer,
- Technical IT Security Officer,
- Network Security Engineer,
- Digital Forensic Practitioner (Acquisition and Analysis),
- Information Security Analyst,
- Security Consultant,
- Systems Administrator (Security),
- Information Security Officer,
- Penetration Tester.

5. Prerequisites

Prerequisites may be waived by the Programme Committee for candidates who have acquired the requisite knowledge through work experience or formal study in another programme.

6. Credit Recognition

Transfers from Postgraduate Diploma in Cyber Security

- a) Graduates of the Postgraduate Diploma in Computing may apply (as required) to the CUP Programme Committee for a transfer of credit of up to a maximum of 120 credits towards the Master of Cyber Security (MCS) provided that the period between completing the award of the postgraduate diploma and applying for admission to the master's programme does not exceed three years.
- b) Candidates who have not completed CMAP 812 and CMRM 811 – Apologetics and Research Methodology as part of the postgraduate diploma shall be required to complete this course, in addition to the thesis to be awarded the Master of Cyber Security.
- c) For postgraduate diploma graduates who are subsequently awarded the degree, CUP's academic record shall show only the qualification of the Master of Cyber Security, and the award of the postgraduate diploma shall be revoked.

7. Commencement

These regulations will be enforcing in Semester 1, 2023.

Table: Courses for Master of Cyber Security

Level	Course ID	Course Name	Credits
8	CMRM 811	Research Methodology	15
8	CMAP 812	Apologetics	15
8	CMCS 813	Computer & Network Security	15
8	CMCS 814	Wireless and Mobile Security	15
8	CMFIT 825	Cyber Criminology & IT Governance	15
8	CMFIT 826	Cyber Investigation	15
8	CMFIT 827	Cryptography & Anti Forensics	15
8	CMCS 828	Ethical Hacking and Defence	15
9	CMCS 829	Cyber Security & Cloud Computing	15
	CMCP 8210	Christian Philosophy	15
	CMCS 900	Thesis	90

PROGRAMME STRUCTURE

MAJOR IN CYBER SECURITY

A Master of Cyber Security degree student can complete his/her degree in two years, taking full time studies for four semesters.

Cyber Security majors for M.CS Degree that enrol part-time will complete their studies more than two years.

MASTER OF CYBER SECURITY RECOMMENDED COURSE SEQUENCES						
QUALIFICATION	COURSE CODE	COURSE TITLE	SEMESTER	OFFER	LEVEL	CREDIT
Postgraduate Certificate (Level 8)	1. CMRM 811	Research Methodology	S-1	Cohort ONE	8	15
	2. CMAP 812	Apologetics		Cohort ONE	8	15
	3. CMCS 813	Computer & Network Security		Cohort TWO	8	15
	4. CMCS 814	Wireless and Mobile Security		Cohort TWO	8	15
Postgraduate Diploma (Level 8)	5. CMFIT 825	Cyber Criminology	S-2	Cohort ONE	8	15
	6. CMFIT 826	Cyber Investigations		Cohort ONE	8	15
	7. CMFIT 827	Cryptography & Anti Forensics		Cohort TWO	8	15
	8. CMCS 828	Ethical Hacking and Defence		Cohort TWO	8	15
	9. CMCS 829	Cyber Security & Cloud Computing	S-2	Cohort ONE	9	15
	10. CMCP 8210	Christian Philosophy		Cohort TWO	9	15
Qualification	Course Code	Course Title	Year		Credit	
Master (Level 9)	CMCS 900	THESIS	One Year		90	

NB:

- **Blue Courses – Compulsory courses**
- **Black Courses – Core courses**

COURSE DESCRIPTIONS

Postgraduate Certificate (Level 8)

CMRM 811 Research Methodology

Research methodology in the fields of computer, information and mathematical sciences, including: literature reviews, writing research proposals, formulating research questions or hypotheses, and applying methods that answer research questions. Students undertake a small-scale research project using appropriate methods in a rigorous manner.

CMAF 812 Apologetics

A philosophical study and defence of the Christian faith as it relates to natural science, humanism, reason, and experience. An emphasis is placed on the necessity of Christ's deity, His supernatural Incarnation, His substitutionary death, and His physical resurrection. The intent is to instil an ability to defend the faith from a philosophical and theological view.

CMCS 813 Computer & Network Security

This unit covers the threats to computer systems and the countermeasures that can be put in place to minimise these. The unit covers a wide range of security issues and concepts from authentication and encryption through to network threats and password management. Students will examine computer security issues from the perspective of detecting threats and implementing secure computing environments.

This unit is an introduction to securing modern networks with a particular focus on TCP/IP based systems. Students will develop an understanding of modern tools and techniques that can be deployed to secure a network.

CMCS 814 Wireless and Mobile Security

This unit is an introduction to wireless and mobile computing security. The unit will focus on securing wireless services, mobile devices including computer laptops, handheld computers, Personal Digital Assistants and portable flash memory devices. Students will be exposed to a wide range of techniques, tools and policy to protect a wireless or mobile computing environment.

Postgraduate Diploma (Level 8)

CMFIT 825 Cyber Criminology and IT Governance

Develops specialist understanding of the rapidly evolving world of cybercrime and also critically evaluates methods for managing and governing the use of technology in sensitive areas within the context of ethical, organisational, technical and legal frameworks.

CMFIT 826 Cyber Investigations

Evaluates and assesses a range of digital forensic investigation models and techniques used for civil and criminal investigations in the cyberspace and professional practice. Organizing, managing and directing an investigation according to best practice guidelines, International Standards and legal requirements. Conduct researches of the underlying risks, registers of volatility and low level details behind each investigatory action to be taken in order to successfully manage an investigation scenario and scene.

CMFIT 827 Cryptography & Anti Forensics

Develops specialist understanding of methods and protocols used to encrypt and decrypt digital information for secure communication as well as their application in computer forensics

CMCS 828 Ethical Hacking and Defence

This unit is an introduction to ethical hacking with a particular focus on internet enabled services and technologies. Students will develop an understanding of modern techniques that can be employed to evaluate the security of implemented network configurations. Based on this understanding students will develop the ability to defend against network based threats. Ethical hacking is an emerging field which favours the practical application of skills to penetrate secure systems in order to demonstrate vulnerability so that steps can be taken to mitigate risk.

Master of Cyber Security (Level 9)

CMCS 829 Cyber Security and Cloud Computing

To equip the participants with an in-depth understanding of concepts, procedures and computing techniques for cyber-security in the context of cloud-based systems and small size business infrastructure planning.

CMCP 8210 Christian Philosophy

In every area of study, CUP wants to help parents train their children to understand God's perspective and think His thoughts after Him. To do this, they must grow in their knowledge of the Word of God and learn the mind of Christ. They must learn to reason in terms of biblical truth, and develop a truly consistent biblical worldview. By godly instruction and precept, through the inculcation of scriptural wisdom, students are to develop their God-created minds unto Christian maturity. They must be taught how to rightly discern and judge all things in the light of Scripture. Christian education fails if it does not instil the pattern of

thinking after God's words and logic. If a student learns to think in terms of himself or the creature, his decisions regarding right and wrong, truth and error, reality and fantasy, will be humanistic or naturalistic. Without realizing it, he will be acting as his own god, determining for himself good and evil (Genesis 3:5). Committed to the Bible as the standard for education, CUP desires to interpret it in line with the historic Christian faith and biblical principles.

Biblical Foundation

The CUP program is committed to an educational philosophy which is not after the traditions of men, or the principles of this world, but after Christ, in whom are hidden all the treasures of wisdom and knowledge (Colossians 2:8). Christian education means that Christ is central to education. Consequently, our educational theory, methods, and practice must be built upon Christ as their cornerstone. But how can we know Christ apart from His Word which is the truth? The sacred Scriptures are the Word of Christ written. In them God has revealed Himself and His saving purpose in Christ.

Because there is only one God and one Christ, there is only one truth. This truth is the centre and criterion of Christian education. While the Bible is not used as the textbook in every subject, it is the foundational handbook for every course and the standard for teaching. As the foundational book, Scripture is the only infallible rule for faith and practice, for grammar and literature, for mathematics and science, for health and physical education, for geography and history, and for social studies and the arts. The beginning of wisdom is the fear of God.

Biblical Principles

In order for education to be consistently Christian the teacher must self-consciously teach all subjects in the framework of biblical authority. To accomplish this we must have a methodology that guarantees its biblical character. The proper method is to use the Bible in each and every course both directly and indirectly. It is applied directly when we derive our understanding of each topic from the actual statements of the Bible, and use the text of Scripture appropriately in each subject. It is applied indirectly as we work out the implications of biblical truth as the proper framework for understanding each subject.

Biblical doctrines must regulate the way we teach and learn. One important goal of Christian education is to teach the student to reason biblically. Because of this, the educational process must show how the doctrinal truths of God's Word provide the Christian worldview. This worldview is a unified system of principles that guides the way we educate. It requires that every thought be made captive to the obedience of Jesus Christ (2 Corinthians 10:5).

CMCS 900 Thesis90 credits

Demonstrates a capacity for independent research, conducted under supervision, and an ability to critique prior work and define, design and conduct research in a rigorous and robust manner, and to deliver a substantial piece of original high-quality work which significantly enhances aspects of the body of knowledge in the chosen research domain.

Doctor of Philosophy (Level 10)

CDPhil 1000 Thesis360 credits

Demonstrates a capacity for independent research, conducted under supervision, and an ability to critique prior work and define, design and conduct research in a rigorous and robust manner, and to deliver a substantial piece of original high-quality work which significantly enhances aspects of the body of knowledge in the chosen research domain.

GRADING SYSTEM

CHRIST'S UNIVERSITY in PACIFIC CURRICULUM AND ASSESSMENT AUTHORITY (CUPCAA)

CUPCAA issues the official statements of results to students. It is a cumulative record of all results for the student. Christ's University in Pacific is undertaking the 15.0 grading system for all students. Results for units in transferred to and attained from CUP studies are reported and follow the following grading system.

Numerical Score	Letter Grade	Grade Points	Achievement Level
90 – 100	A ⁺	15.0	Excellent
85 – 89	A	14.0	Outstanding
80 – 84	A ⁻		
75 – 79	B ⁺	13.0	Satisfactory
70 – 74	B		
65 – 69	B ⁻		
60 – 64	C ⁺	9.0	Passed
55 – 59	C		
50 – 54	C ⁻		
40 – 49	D	5.0	Failing
Below 40%	F	0.0	Failing

Other grades that may be awarded to a candidate apart from those above, are as follows:

CT	Credit Transfer awarded following the assessment of previous learning. (Earned Points to be awarded by the head of the Department of Mathematics)
Res. Pass	Restricted pass which does not permit a Candidate to proceed to a further stage in that subject's Course of Study.
Aeg. Pass	Aegrotat consideration in respect of illness or injury.
Comp. Pass	Compassionate Pass in consideration for unavoidable circumstances.
DNS	Did not sit the final exam (Final grade is F with Earned Points of Zero.)
WC	Withdrawal from Course before the deadline.
W	Withdraw from the University
I	Incomplete

The following grades shall not be included in the calculation of the GPA. They are Aeg. Pass, Comp. Pass, P, Q and W.

SCHOOL OF COMPUTER SCIENCE: FACULTY OF CYBER SECURITY DIVISION

Dean for School of Computer Science: Professor Pavel Kromer

- Ing (M,Sc), Computer Science, VSB-TU Ostrava, Czech Republic
- Ph.D., Computer Science and Applied Mathematics, VSB-TU Ostrava, Czech Republic
- Associate Professor, Computer Science, VSB-TU Ostrava, Czech Republic

Head of School - Computer Science: Dr. Paula Palavilala Latapu

- BSc (Computing Science and Information System) USP, Fiji
- Diploma in Computer Science (TIHE)
- PG.Dip.FIT (Postgraduate Diploma in Forensic IT) CUP, Nuk., Tonga
- MFIT Hons., (Master of Forensic Information Technology with Second Class Honours) CUP, Nuk., Tonga
- (Doctoral candidate) CUP, Nuk., Tonga

Senior Lecturer: Dr Siaosi Maeakafa (Research Project Manager)

- PG.Dip.FIT (Postgraduate Diploma in Forensic IT) CUP, Nuk., Tonga
- MFIT Hons. (Master of Forensic Information Technology with First Class Honours) CUP, Tonga
- Ph.D (Thesis: Governance, Management and Control of Security Risk: A Socio-Technical System Design) CUP, Nuk., Tonga

Lecturer: Mr Viliami Fe'aomoeata

- B.A (Communication) Patten University, Ca., USA
- PG.Dip.FIT (Postgraduate Diploma in Forensic IT) CUP, Nuk., Tonga
- MFIT Hons. (Master of Forensic Information Technology with Honours) CUP, Tonga

Visiting Lecturer: Professor Vimal Kumar

- Head of the Waikato University Cyber Security Lab ([CROW](#)) and a member of the Institute for Security and Crime Science.
- Research interests are broadly in the areas of Cybersecurity, Wireless sensors networks and Internet of Things.
- Current research projects and publications can be found on the research page.

Visiting Lecturer: Dr. Jeffrey Garae

- B.Sc., Comp.Sci. & Information Systems, USP, Suva, Fiji
- PG.Dip., Comp. Science, Waikato University, Hamilton, NZ
- M.CS., Cyber Security, Waikato Uni., Hamilton, NZ
- Ph.D., Cyber Security, Waikato Uni., Hamilton, NZ