

# SCHOOL OF SCIENCE

**Bachelor of Science (Mathematical Science)  
(B.Sc.)**



CHRIST'S  
UNIVERSITY IN PACIFIC

PROGRAM OF

# MATHEMATICS

CHRIST-CENTERED · BIBLE-BASED

**God doesn't expect us to solve all the world's  
problems, He expect us to not create them!**

**John 17:17**

**2023**

**“TNQAB Act Cap 30.14 of the 2016 Revised Edition”**

**CUP School of Science Handbook  
Department of Mathematical Science**

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

## I. WELCOME TO 2023 - NOTES

Welcome to Christ's University in Pacific, (CUP), Department of Mathematical Science! To prepare you for a successful and fulfilling career, we offer and coordinate all the requirements for study undergraduate program in Mathematical Science. We look forward to assisting you and providing many opportunities to enhance your future career. As a Mathematics student you are advised to use this handbook, along with other important information sources, for guidance in the undergraduate mathematics program. Official information sources include the Undergraduate Handbook, Student Manual, Class Schedule, and department academic advisors. Regular meeting with an academic advisor is a good way to stay informed.

## II. THE PURPOSE STATEMENT

**The purpose of the mathematics major** is to provide students with the opportunity to develop their analytical thinking, quantitative reasoning, problem-solving, and communication skills that will prepare them to succeed in either graduate school or in a variety of careers in business, industry, government, or teaching. Concurrently, the mathematics education major will help students recognize mathematics as the language God used in establishing the physical laws of the universe.

**Learning Outcomes:** Graduates of the mathematics program will be able to;

- explain key concepts in the major areas of undergraduate mathematical science,
- apply established methods of problem solving in the major areas of undergraduate mathematical science,
- apply abstract reasoning to mathematical systems, and
- communicate the nature of mathematical science as the language of science and as a means of representing the natural laws that God established in Creation.

### III. CUP CALENDAR YEAR 2023

<b>JANUARY</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 25<sup>th</sup> January: CUP UNIVERSITY STAFF &amp; TEACHERS BEGINS @ 10am</li> <li>● 27<sup>th</sup> and 31<sup>st</sup> January: STAFF PROFESSIONAL DEVELOPMENT @ 10am</li> </ul>
23	24	25	26	27	28	29	
30	31						
<b>FEBRUARY</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 3<sup>rd</sup>, 8<sup>th</sup>, 15<sup>th</sup>, and 17<sup>th</sup> Feb.: SCHOOL MEETINGS @ 10am</li> <li>● 6<sup>th</sup>, 10<sup>th</sup>, 13<sup>th</sup> Feb.: STAFF PROFESSIONAL DEVELOPMENT @ 10am</li> <li>● 21<sup>st</sup> – 23<sup>rd</sup> Feb.: UNDERGRADUATE and POSTGRADUATE ORIENTATION @ 10am</li> <li>● 20<sup>th</sup> and 24<sup>th</sup> Feb.: STAFF MEETINGS @ 10am</li> <li>● 28<sup>th</sup> Feb.: SEMESTER 1 START @ 11am</li> </ul>
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<b>MARCH</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 17<sup>th</sup> March: SCHOOL MEETINGS</li> <li>● 31<sup>st</sup> March: STAFF PROFESSIONAL DEVELOPMENT</li> </ul>
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<b>APRIL</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 10<sup>th</sup> – 14<sup>th</sup> of April: MID-SEMESTER BREAK (1 Week)</li> <li>● 7<sup>th</sup> April: GOOD FRIDAY</li> <li>● 10<sup>th</sup> April: EASTER MONDAY</li> <li>● 11<sup>th</sup> – 14<sup>th</sup>: COMMITTEE MEETINGS @ 10am</li> </ul>
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<b>MAY</b>							
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29	30	31					
<b>JUNE</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 29<sup>th</sup> May – 2<sup>nd</sup> June: STUDY WEEK (1 Week)</li> <li>● 29<sup>th</sup> May – 2<sup>nd</sup> June: COMMITTEE MEETINGS @ 10am</li> <li>● 5<sup>th</sup> – 15<sup>th</sup> June: SEMESTER 1 FINAL EXAMINATION!</li> <li>● 16<sup>th</sup> June: SEMESTER 1 ENDS!</li> <li>● 30<sup>th</sup> June: SEMC and SENATE MEETINGS</li> </ul>
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<b>JULY</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 19<sup>th</sup> June – 21<sup>st</sup> July: WINTER BREAK (5 Weeks)</li> <li>● 25<sup>th</sup> July: SEMESTER 2 BEGINS @ 11:00am</li> </ul>
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<b>AUGUST</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 11<sup>th</sup> Aug.: SCHOOL MEETINGS</li> <li>● 18<sup>th</sup> Aug.: STAFF PROFESSIONAL DEVELOPMENT</li> <li>● 4<sup>th</sup> Sept. – 8<sup>th</sup> Sept.: MID-SEMESTER BREAK (1 Week)</li> </ul>
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<b>SEPTEMBER</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 4<sup>th</sup> Sept. – 8<sup>th</sup> Sept.: COMMITTEE MEETINGS @ 10am</li> <li>● 22<sup>nd</sup> Sept.: SEMC and SENATE MEETINGS</li> <li>● 29<sup>th</sup> Sept.: SCHOOL MEETINGS</li> </ul>
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<b>OCTOBER</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 6<sup>th</sup> Oct.: STAFF PROFESSIONAL DEVELOPMENT</li> <li>● 11<sup>th</sup> and 12<sup>th</sup> Oct.: SCHOOL OF SCIENCE INTERNATIONAL CONFERENCE</li> <li>● 16<sup>th</sup> – 20<sup>th</sup> Oct.: STUDY WEEK (1 Week)</li> <li>● 16<sup>th</sup> Oct. – 20<sup>th</sup> Oct.: COMMITTEE MEETINGS @ 10am</li> <li>● 23<sup>rd</sup> Oct. – 2<sup>nd</sup> Nov.: SEMESTER 2 FINAL EXAMINATION!</li> </ul>
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30	31						
<b>NOVEMBER</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 10<sup>th</sup> Nov.: SEMESTER 2 ENDS!</li> <li>● 24<sup>th</sup> Nov.: SCHOOL MEETINGS</li> <li>● 1<sup>st</sup> Dec.: SEMC and SENATE MEETINGS</li> </ul>
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27	28	29	30				
<b>DECEMBER</b>							
M	T	W	R	F	Sa	Su	<ul style="list-style-type: none"> <li>● 14<sup>th</sup> Dec.: CUP GRADUATION (Tentative date)!</li> <li>● 22<sup>nd</sup> Dec.: CUP STAFF LAST DAY FOR ACADEMIC YEAR 2023!</li> <li>● 25<sup>th</sup> and 26<sup>th</sup> Dec.: CHRISTMAS DAY and BOXING DAY!</li> </ul>
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18	19	20	21	22	23	24	
25	26	27	28	29	30	31	

Tonga Public Holidays will update!

## IV. PROGRAMME FACTUAL SUMMARY

**Qualification Titles:** Bachelor of Science (Mathematical Science)  
**Division:** Mathematics  
**School(s):** Science  
**Total Credits:** 380  
**Level:** 5, 6, 7

**Pre-requisites:** The qualifications are CUP programmes developed and taught at CUP Entry Requirements: Have passed the Form 6 & 7 or Foundation Examination and meet the English Language entry requirements.

**Contact CUP for full details.**

**Objectives:** Students in Faculty of Mathematics:

The objective of the mathematics major is to provide students with the opportunity to develop their analytical thinking, quantitative reasoning, problem-solving, and communication skills that will prepare them to succeed in either graduate school or in a variety of careers in business, industry, government, or teaching. Concurrently, the mathematics major will help students recognize mathematics as the language God used in establishing the physical laws of the universe.

**Delivery Mode:** Mostly face-to-face with self-directed learning. Additional learning materials are offered in a virtual e-learning environment.

**Content Statement:** Mathematics communicate the nature of mathematics as the language of science and as a means of representing the natural laws that God established in Creation.

**Delivery Site:** Nuku'alofa Campus, Tongatapu  
**Start Date:** Semester 1, 2023  
**Qualification Developer:** Christ's University in Pacific

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## V. GENERAL INFORMATION

CUP University is a private, co-educational institution with a Christian philosophy of education. CUP University's purpose is to provide Tongan students with a rigorous, challenging education that is firmly based in the Bible and inspires commitment to Christian service.

When you are a student at CUP University you can expect to enjoy several advantages:

- **A Supportive Learning Environment:** CUP University's Mathematics Division appreciates the opportunity to develop personal relationships with students who desire to build on the spiritual foundation that our learning environment provides. Faculty members are committed to help each student grow as a whole person.
- **Small Class Sizes:** Our average class size of 10 students or less encourages interaction between students and faculty as well as among students. You'll enjoy a high degree of personal attention that may not be possible in larger school settings.
- **Highly Qualified Faculty:** Our faculty members are trained professionals with expertise in their academic fields. Focused on serving the Lord and their teaching, many have made CUP University their home.

### Academic Regulations & Policies

In accordance with our motto: "Mo'ui 'ia Kalaisi" and for the overall wellbeing of the campus, the Administration and faculty desire to maintain a high standard of moral conduct from the students. The policies given aim at maintaining a clean God-honouring student body where students have a high respect for God and His Word (the Bible), as well as for their Administrators, Lecturers and fellow students. Within this Christian atmosphere, the student will be encouraged to grow spiritually, mature in the Lord, develop personal responsibility, select the right kind of true friends, excel academically and prepare for Christian leadership. With these goals in mind, we have the following school regulations:

CUP University reserves the right to modify existing academic policies or to develop additional policies regarding the relationship between the institution and those who enrol in its programs. This includes tuition and fee schedules, enrolment procedures and requirements, program and course offerings, graduation requirements, and registration policies and procedures.

Those admitted to study at CUP University agree, by virtue of their enrolment, to be governed by such policies as are established by the university's Board of Trustees and administration. As a result, the university maintains disciplinary authority over students as it pertains to continuation of enrolment by students, their award of academic credit, and the conferring upon them of degrees and certificates.

### Orientation of New Students:

All new CUP University students are encouraged to attend orientation the week before classes start. During the orientation essential activities include academic advising, financial aid counselling, placement testing and registration.

### Pre-Registration for Continuing Students

Semester 1 pre-registration for all current students is normally held in the last 2 weeks of semester 2, and Semester 2 pre-registration is held in the last 2 weeks of Semester of the same year. All students expecting to return for the next semester must meet with their major advisor before preregistering for the following semester's course work. It is the student's responsibility to be familiar with departmental requirements before preregistration.

### **Undergraduate Declaration of a Major**

Each student must declare his/her major in the 1<sup>st</sup> year. This decision is made following a discussion with his/her advisor regarding interests and career plans. The student is to complete a “Declaration of Major” form, have it signed by the Academic Advisor of the new major and turn it in to the Office of Records & Registration

### **Course Numbering and Pre-requisites**

The three-letter abbreviation preceding a course number indicates the University’s first initial letter (C) and the school of instruction or the general subject area of study.

For example: CBTh = Bible; CMTH = Mathematics, CCIS = Computing & Information Science; CRM = Research Methodology, etc...

The three-number designation associated with each school and/or subject generally indicates the course level of study.

Students may not take upper division courses (second & third year) without first fulfilling lower division requirements or permission from the Major advisor for the program. The lower, sequentially-numbered courses are in most cases prerequisite to the higher.

### **Directed Study Option**

In justifiable cases an upper division student may take one directed study course to satisfy a graduation requirement. Petitions are signed by the Academic Advisor and submitted to the Academic Affair Committee for approval.

### **Registration, Add/Drop**

New students must register for classes prior to the first week of each semester. There is an “add/drop” period at the beginning of each semester. Admittance to a new course, however, is based upon available seating. Students must secure the faculty member’s signature to add/drop courses. Courses dropped during the add/drop period will not appear on the student’s permanent record. Alteration of a schedule without the approval of the Office of Records and Registration will not be recognised by the university. No student may enter a class or laboratory after the first meeting following the end of the add/drop period

### **Course Withdrawal**

Students may withdraw from a course after the add/drop period is over. They must complete forms available through the Office of Admissions and Records.

Students must secure the course instructor and the Academic Advisor’s signatures before withdrawing from a course. Completed withdrawal forms must be delivered to the main campus Office of Records & Registration no later than the last day designated to withdraw from classes. A grade of “W” will be recorded on the student’s permanent record. Students who neglect to follow this procedure will receive grades of “F” on their permanent record.

### **Total Withdrawal from the University**

Students who cannot continue their studies during a given semester must officially withdraw from the university. Withdrawals from school forms are available through the university’s main administration office or the Office of Records & Registration. Students should confer with their instructors and/or advisors, complete the withdrawal from school form and obtain clearance from the library, the financial aid and business offices. Students who neglect to follow this procedure will receive grades of “F” on their permanent record.



### **Progress Toward a Degree or a Certificate**

The time needed to complete the requirements for a degree or a certificate may vary, depending upon the student and his/her personal and academic circumstances. Many students choose to carry less than a full load for an academic semester. This may extend the time need to complete the academic programme. CUP University encourages students to work toward a degree or certificate at a pace that suits their circumstances.

### **Course Cancellation**

The university reserves the right to cancel a course due to low enrolment, to change class times or class instructors, cancel classes or create new classes, and to alter any other policies or dates related to registration and student records at any time. Notification of such changes will be published in an appropriate manner.

### **Grade Change**

When a student disagrees with the final grade of the course, that student may petition the University's Academic Committee for a review of their course grades. Grade change petitions will be allowed for up to one semester after the original grade was released.

### **Repeating Courses**

Students may repeat a course previously taken in an attempt to improve a grade if the grade is lower than a "C". All grades, including the grade for the repeated course, will appear on the student's transcript. Students may request to have grade points previously earned recalculated to exclude the former grade and to reflect the current grade. No additional credit may be earned if the previous grade was a "C" or better.

### **Attendance & Tardiness**

Students will be informed in writing of the instructor's attendance and tardiness requirements at the start of classes and will be required to adhere to those guidelines. Students are required not to miss more than 20% of the scheduled classes for the semester. Excused absences due to extenuating circumstances are left to the discretion of the instructor. Students are required to report to all classes on time.

### **Academic Integrity**

Academic honesty is expected of all students. Each instructor will inform students in the beginning of each semester the academic integrity expectations and the consequences for violating of this standard.

In the event an instructor determines and substantiates a violation of academic integrity occurred such as plagiarism or cheating, the instructor may take appropriate disciplinary action reflected in the student handbook. This action can include a lowered or failing grade, probation, dismissal or other institution actions. Detailed explanations of possible consequences are outlined in the Student Handbook.

Plagiarism, as an example of a violation of Academic Integrity, is a form of theft. It is the stealing of another's ideas, information or words and passing it off as one's own. Examples of plagiarism include quoting from a published work without the use of quotation marks and identification of the author and copying from another student's examination or report. Instructors and Academic Advisors can answer any questions about plagiarism and strategies to avoid it. Students who know accomplice in the act of plagiarism are equally guilty of academic dishonesty.

### **Cross Registration**

(Transferring Credit from another Institution)

Students who expect to enrol in a course at another institution while still planning to complete their degree at CUP University and who would like to insure the transferability of the course are encouraged to complete the Prior-Approval form, which is available through the main administration Office of Records & Registration. All courses for which prior approval is obtained are subjected to the standards and conditions of the CUP University Transfer Credit

policy. All transfer students will have to attend CUP University at least a 2 semesters credits in order to gain a degree, etc.

## VI. PROGRAMME ANALYSIS – RATIONALE FOR THE QUALIFICATIONS

### Mathematical Science: Certificate of Attainment (level 5), Diploma (level 5), Advanced Diploma (level 6), Bachelor (level 7)

Mathematics is one of the key to success in any field of studies in the classroom and working in the workplace. Having the right strategic mathematical mindset will make the work very effective, efficient, and productive. The mathematical science language will further discuss in this B.Sc. degree programme.

Here's a comparison of the mathematical science options:

	<b>Certificate &amp; Diploma</b>	<b>Advanced Diploma</b>	<b>Bachelor's</b>
Who is this program for?	-Working professionals seeking refresher courses in mathematical science fundamentals -First time students seeking an understanding of basic mathematical science principles	- Students seeking an education covering a broad overview of mathematical science fundamentals	- Students who wish to acquire a survey of mathematics fundamentals and train in a specific area of mathematical science
Common Career Paths	- Primary Math Teacher - Data Entry Clerk - Administrative Assistant	Secondary Math Teacher - Sales Representative - Bank Teller	- Sales Manager Assistant - Financial Analyst Assistant - Church Treasurer - Bank Teller
Time to Completion	1 year full-time	2 years full-time	3 years full-time
Common Graduation Requirements	- 4 courses (certificate) - 8 courses (Diploma)	- 16 courses (Adv. Diploma)	- 24 courses (Bachelor)
Prerequisites	- High School Form 6 & 7	- Associate of Arts in Mathematical Science level 5	- Diploma in Mathematical Science level 6
Level	5	6	7

### 1. Programme Overview

The B.Sc. degree is the programme requires 380 credits of course given the details below. This programme is very rich program for it both integrates Biblical Principles as core requirements. Hence, it is mandatory for all Mathematical Science students to take Bible classes to complete the requirements for a degree of B.Sc.

Given below is the schedule that provides details of all the requirements a student must achieve to complete his/her degree in B.Sc.

Schedule A are core Mathematical Science courses. Schedule B are Bible requirements and general education are in Schedule C. It will take up to 3 years full-time or up to 4 years of part-time study. That is, students must accomplish the requirements for the B.Sc. programme from level 5 – 7 courses. Courses must be completed in sequence to ensure that all prerequisites are met before continuing.

## ***2. Schedule A: Business Core Course Requirements***

<b>Course Title</b>	<b>Course Code</b>	<b>Level</b>	<b>Credit</b>
1. Mathematical Concepts	CMTH/CCIS 511	5	15
2. Programming for Engineering Application	CMTH/CCIS 513	5	15
3. Differential & Integral Calculus	CMTH 524	6	15
4. Algebra & Discrete Mathematics	CMTH 525	5	15
5. Statistics for Business	CBA/CMTH/CAC 526	6	15
6. Probability	CMTH/CCIS 611	6	15
7. Linear Algebra I	CMTH 612	6	15
8. Physics I	CMTH 613	6	15
9. Physics II	CMTH 624	6	15
10. Differential Equations	CMTH 625	6	15
11. Linear Algebra II	CMTH 626	6	15
12. Calculus and Analytic Geometry	CMTH 711	7	15
13. Secondary Teaching Internship	CMTH 712	7	15
14. Statistical Methods	CMTH 724	7	15
15. Numerical Analysis	CMTH 725	7	15
16. Physics III	CMTH 726	7	15

**3. Schedule B: Bible Requirements**

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Course Title	Course Code	Level	Credits
1. Old Testament Survey	CBTh 510	5	15
2. New Testaments Survey	CBTh 520	5	15
3. Greek Language	CBL 610	6	15

**4. Schedule C: General Education**

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Course Title	Course Code	Level	Credit
1. Academic Skills	CAS 512	5	15
2. Research Methodology	CRM 620	6	15
3. Project Management	CPM 713	7	15
4. Research & Development	CRD 710 & CRD 720	7	50

## VII. PROGRAMME STRUCTURE

### MAJOR IN MATHEMATICAL SCIENCE

Full time students who are consistently taking four courses per semester can complete his/her

Programme in 3 consecutive years. Part time students will complete in more than 3 years.

BACHELOR OF SCIENCE (MATHEMATICAL SCIENCE) Level 7 RECOMMENDED COURSE SEQUENCES								
Year ONE LEVEL 5	S-1	COURSE CODE	COURSE TITLE	CREDIT	S-2	COURSE CODE	COURSE TITLE	CREDIT
Certificate / Diploma		CBTh 510	Old Testament Survey	15		CBTh 520	New Testament Survey	15
		CMTH/CCIS 511	Linear Algebra I	15		CMTH 524	Differential & Integral Calculus	15
		CAS 512	Academic Skills	15		CMTH 525	Algebra & Discrete Mathematics	15
		CCIS 513	Programming for Engineering Application	15		CBA/CMTH 526	Statistics for Business	15
Year TWO LEVEL 6	S-1	COURSE CODE	COURSE TITLE	CREDIT	S-2	COURSE CODE	COURSE TITLE	CREDIT
Advanced Diploma		CBL 610	Greek Language	15		CRM 620	Research Methodology	15
		CMTH/CCIS 611	Probability	15		CMTH 624	Physics II	15
		CMTH 612	Statistical Analysis	15		CMTH 625	Differential Equations	15
		CMTH 613	Physics I	15		CMTH 626	Linear Algebra II	15
Year THREE LEVEL 7	S-1	COURSE CODE	COURSE TITLE	CREDIT	S-2	COURSE CODE	COURSE TITLE	CREDIT
Bachelor		CRD 710	Research & Development	15		CRD 720	Research & Development	15
		CMTH 711	Calculus and Analytic Geometry	15		CMTH 724	Statistical Methods	15
		CMTH 712	Secondary Teaching Internship	15		CMTH 725	Numerical Analysis	15
		CPM 713	Project Management	15		726	Physics III	15

**KEY:**

- Blue Courses – Compulsory Courses
- Black Courses – Core Courses

## DESCRIPTION OF COURSES

**Course Code: CMTH 411 (Level 4)**

**Course Title: Mathematical Concepts**

Prerequisite: Pass in Form 6 High School Mathematics

Provides an introduction to the mathematical concepts required for an understanding of the analysis of data and applications in computing, science, and engineering. Topics include: sets, functions, series, limits, calculus, probability and statistics.

### Certificate of Attainment (level 5)

**Course Code: CBTh 510**

**Course Title: Old Testament Survey**

A chronological overview of the Pentateuch, Israel's history from Joshua to Malachi. Special attention is given to the days of creation, the Patriarchs, the events of the Exodus, and the Tabernacle. The student will learn a broad outline of each book, including the authorship, purpose, major characters, and passages of doctrinal significance.

**Course Code: CMTH 511**

**Course Title: Linear Algebra I**

The study of Vectors in 2-Space and 3-Space. An introduction to vectors from a geometric point of view. The norm of a vector and vector arithmetic. The dot product and vector projection and the use of the dot product in determining the angle between any two vectors. The cross product and Lagrange's Identity. Lines and Planes in 3-Space.

**Course Code: CAS 512**

**Course Title: Academic Skills**

This is a foundation unit that addresses academic essay writing skills relevant to business and economic issues. The unit is designed to develop basic student proficiencies such as information collection, analysis and evaluation, and logical reasoning skills. Through the analysis of ethical issues, this unit teaches students to research: reference using the APA style; analyse data; develop an argument; and write an academic essay.

**Course Code: CMTH/CCIS 513**

**Course Title: Programming for Engineering Application**

To introduce students to the basic principles of designing and developing small computer programs within the context of programming language.

### Diploma (level 5)

**Course Code: CBTh 520**

**Course Title: New Testament Survey**

This course provides a general knowledge of the four Gospels, Acts, and Romans through Revelation. Students learn the author, theme, content, and distinctive features of each book.

**Course Code: CMTH 524**

**Course Title: Differential & Integral Calculus**

Gives the student an understanding of differential and integral calculus, and develops the ability to formulate and solve models of simple engineering and scientific systems.

**Course Code: CMTH 525**

**Course Title: Algebra & Discrete Mathematics**

Gives the student a solid foundation in algebra and discrete mathematics, providing essential background for further study in many fields of Science and Engineering, particularly those utilizing ideas from Mathematics or Computer Science

**Course Code: CCIS/CMTH 526**

**Course Title: Statistics for Business**

This course is to provide students with a fundamental knowledge of statistical theory and apply that theory to decision-making situations by means of examples and problems and to provide a broad survey of the statistical methods used in business.

**Advanced Diploma (level 6)**

**Course Code: CBL 610**

**Course Title: Greek Language**

This course lays the foundation for the skills necessary to read and properly interpret the Greek New Testament. Students will be required to memorize the most common vocabulary and paradigms, including first, second, and third declension nouns, the personal pronouns, present and aorist participles, and the most common tenses of the indicative mood.

**Course Code: CMTH/CCIS 611**

**Course Title: Probability**

Provides an introduction to a branch of statistics that deals with the study of chance. Delivers access to a range of techniques for modeling and analyzing probability problems in real-life settings.

**Course Code: CMTH 612**

**Course Title: Statistical Analysis**

**Course Code: CMTH 613**

**Course Title: Physics I**

The main objectives of the course are twofold; the first one is to provide the student with a clear and concise presentation of the basic concepts and principles of physics and the second one is to strengthen your understanding of these concepts and principles through a broad range of interesting applications to the real world.

**Course Code: CRM 620**

**Course Title: Research Methodology**

This course shall provide an introduction and overview of research methodology and design which can be applied to organizational management. This course is designed to provide students with opportunities to learn and apply research procedures that will be useful in identifying, analysing and resolving managerial problems in any organization.

**Course Code: CMTH 624**

**Course Title: Physics II**

**Course Code: CMTH 625**

**Course Title: Differential Equations**

A foundation in linear algebra. Solving and applying ordinary, and systems of differential equations.

**Course Code: CMTH 626**

**Course Title: Linear Algebra II**

Prerequisite: CMTH 612

The study of the Inner Product Space. Angles and orthogonality in Inner Product Spaces. Orthogonal Spaces and the Gram-Schmidt Process. Best Approximation using the concept of Least Squares. Orthogonal Matrices and change of Bases. Eigen Values and Eigen Vectors, Diagonalization and Orthogonal Diagonalization.

General Linear Transformation, Kernel and Range, Inverse Linear Transformations, matrices of general linear transformations, Similarity.

Some Related Topics and Applications. Application to Differential Equations, Fourier Series, Quadratic Forms, Diagonalizing Quadratic Forms and Conic Sections. Quadric Surfaces, LU Decompositions.

## Bachelor (Level 7)

**Course Code: CRD 710 & CRD 720**

**Course Title: Research & Development**

This is a compulsory task for senior students to fulfil before they achieve their first degree (BA). The standard purposes, designs, methods and instruments available for conducting, analysing and reporting research will be studied, with special emphasis placed on applied/action research within an organizational setting.

**Course Code: CMTH 711**

**Course Title: Calculus and Analytic Geometry**

Prerequisite: CMTH 524

This course starts by introducing infinite series leading on to the concept of a power series. Topics to be included must include the Maclaurin and Taylor Polynomial approximations, monotonicity of sequences, infinite series and a discussion of various convergence tests. The study of alternating series, Maclaurin, Taylor Series and Power Series. Derivatives and integrals of power series.

The next topic is polar co-ordinates. Graphs and areas in polar co-ordinates. Tangent lines and arc length for parametric and polar curves. The study of second degree equations such as the conic sections and rotation of axes.

Cartesian coordinate system and the study of vectors in 2 and 3 dimensional space. Dot and Cross products of vectors, parametric equations of lines and planes. Introduction to Vector Valued Functions, Calculus of vector valued functions, Change of parameters and arc length, Unit Tangent, Normal and Bi-normal vectors, Curvature and applications.

An introduction to Euclidean Vector Spaces, Euclidean n-space and Linear Transformation from  $R^n$  to  $R^m$ . Properties of Linear transformations from  $R^n$  to  $R^m$ .

A study of the Real Vector Spaces, Subspaces, Linear Independence, Basis and Dimension, Row Space, Column Space and the Null Space, Rank and Nullity.

**Course Code: CMTH 712**

**Course Title: Secondary Teaching Internship**

A minimum of one-half semester during either semester of a student's third year will be spent in supervised classroom teaching.

**Course Code: CPM 713**

**Course Title: Project Management** (*Compulsory course*)

Provides students with the core competencies of project management in an information technology context. A range of IT project management methodologies and approaches are compared. Some proven practices and supporting tools and techniques are further investigated, particularly with regard to planning, monitoring, estimating and implementing. Expected standards of professionalism and ethics will be highlighted.

**Course Code: CMTH 724**

**Course Title: Statistical Methods**

A study of statistical methods suitable for a range of applications in science, engineering and business

**Course Code: CMTH 725**

**Course Title: Numerical Analysis**

Develops skills in the interpretation and use of numerical methods appropriate to engineering and science, and in the development of computer programs using numerical techniques.

**Course Code: 726**

**Course Title: Physics III**



## VIII. ASSESSMENTS

During your course, you will have a number of assessments. You will be expected to turn in high quality work, of the same standard that will be expected of you in a work situation. All assessments must be submitted in English only.

### Return of Assessments

Marked assessment items will be retained for three months after the date of the assessment. During that period students may contact their lecturer during working hours to collect them.

### Assignments

These must be handed in by the date set by your lecturer. Your assignments are to be put into the "letter box" on the wall of CUP University's central office **prior to 8:30am on the due date**.

**Electronic submission** of a copy of the paper based version is required for **ALL** assignments. This copy will be used as a **backup** for the paper based version and can also be used for originality check and must be submitted prior to 8:30am on the same due date as the paper version. Any such requirement will be communicated with the assignment. Failure to submit assignments in the required format(s) may result in no marks being awarded.

Assignments which are submitted up to one day late (Monday after 8:30am to Tuesday 8:30am) will be marked, but cannot achieve more than a C- (pass only) grade. Assignments handed in late will not be marked unless Special Assessment Circumstances apply, so it would be better to hand in an incomplete assignment **on time**. All assignments **must** have a cover sheet accompanying them. The format for this sheet can be obtained from your lecturer. All assignments **must** be handed in "folders" with a clear plastic front and your papers **fastened** inside (plastic sleeves are not acceptable). Assignments containing disks or CD's are to be submitted in either a binder wallet, document wallet, or sealed envelope. A cover sheet must be attached to the outside so it is clearly visible. Later on you may need to buy more folders to handle multiple assignments. These folders will be returned to you with your assignments when they have been marked. This could take up to three weeks.

Paper for printing by students must be supplied by the students. Please do not ask your lecturer to supply paper as this is against our University's policy.

If a disk is included in an assignment, it must be **clearly labelled, virus free and readable** using software on the University's file server or it will not be marked.

As previously stated, your assessments are expected to reach the quality your prospective employers will expect of you. This means they will conform to the rules stated above, be logically set out, and neatly presented. Your assignment will not be corrected unless it achieves this, and it will be marked accordingly. Make sure that you **keep a copy** in case it is needed.

### Assistance to Other Students

Students themselves can be an excellent resource to assist the learning of fellow students, but there are issues that arise in assessments that relate to the type and amount of assistance given by students to other students. It is important to recognise what types of assistance are beneficial to another's learning and also what types of assistance are acceptable in an assessment. The CUP University Academic Statute governs the conduct of assignments and examinations, and violations of the standards will result in disciplinary action.

### Beneficial Assistance

- Study Groups
- Discussion
- Sharing reading material

- Testing another student's programming work using the executable code and giving them the results of that testing.

### Unacceptable Assistance

- Working together on one copy of the assessment and submitting it as own work
- Giving another student your work
- Copying someone else's work. This includes work done by someone not on the course
- Changing or correcting another student's work
- Copying from books, Internet etc. and submitting it as own work

### Copyright within your Assignment

#### **You can:**

- Copy *insubstantial* portions of items
- Copy for research or private study
- Print one copy only

#### **You cannot:**

- Copy for permanent electronic storage
- Copy and paste extracts or images into your own work or website
- Make multiple copies
- Upload copies to user groups and bulletin boards."

### Acknowledgement of Sources

Anything taken directly from another source must be acknowledged correctly. In particular, see the topic of Referencing: "To learn how to reference is extremely important in order to acknowledge sources of information and ideas; this is a legal and academic requirement. It also enables readers to judge the extent of your research and to locate and find further information in the sources you have referred to, if they wish."

### Use of CUP University's Logo within your Assignment

Use of the CUP logo is not permitted on assignments. The CUP logo is for CUP University's documents and only for the use of the University's staff.

## IX. TESTS/EXAMINATIONS

- You should be seated in the exam room by the official start time for each exam. Rooms are usually opened for entry 10 minutes prior to this time.
- You must go to the exam room and time allocated to the class you are **enrolled** in. If there is a need to change, you must apply at the University's Central office at least five days in advance.

- IDs are checked upon entering the room and students must sign a class roster, before being seated.
- All bags / papers (including pencil / spectacle cases / Mobile phones and other electronic devices) are to be turned off and left at the end of the room, nearest to the door. Examination stationery is supplied unless advised. You are not permitted to use your own stationery, even as scrap paper.
- Use of dictionaries in examinations is not permitted.
- No food or drink is permitted during examinations.
- Admittance to exams is by Student ID card which are to be placed on the top of the desk nearest the aisle at all times during the exam where the supervisor can easily read it. Remove from wallet or billfold.
- Once seated you may write your name and Student ID number on the exam answer booklet.
- At the commencement of the exam, reading time may be allowed (if so, it will be stated on the paper). **During reading time, NO WRITING, highlighting or marking is allowed.** This means no writing during reading times.
- No talking or communicating in any way with others is permitted, except to the supervisor (raise your hand).
- Only writing implements are allowed on desks during the exam unless specified on the exam sheet. Pencil cases are not permitted on desks.
- Make sure your name is on the front of the exam answer booklet. No extra time is allowed to do this after the exam time is finished.
- Write as legibly as you can. Do not use pencil. Use a blue or black pen only.
- Please ensure mobile phones are switched off and placed in your bag at the end of the room, nearest the door.
- No student shall be allowed to enter the room without obtaining the permission of the supervisor.
- No student shall be permitted to leave the room without obtaining the permission of the supervisor and handing in his or her script.
- If you are found with any additional material this is considered to be a dishonest practice and a breach of the rules relating to the conduct of examinations. Any dishonest practice occurring in the submission of work will result in disciplinary action, which could result in exclusion from any programme within CUP University.
- You must stay seated until **all** papers are collected.
- If an existing medical condition or extenuating circumstances are likely to affect your ability to sit an examination under these conditions you must apply, in writing to the Programme Leader, at least seven (7) days prior to the examination date.

### Credit Recognition and APL

Credit Recognition is a way of acknowledging the courses you have already been assessed in. These are compared against your new courses to see if they match.

Credit Recognition application forms are available from Student Central office. There is an administration charge per application. Please ensure you enclose certified copies of evidence of course content to support your application.

All credit recognition must be verified before the programme begins.

If you are applying for credit entirely on the basis of previously assessed courses from another education provider or another School or Faculty within CUP University, then follow the **Credit Recognition** procedures. If you are applying (at least partly) on the basis of work experience or other unassessed work, follow the **Assessment of Prior Learning** (APL) procedures. Charges will apply to both cross credits and APL.

### **Cross Credits**

Check the course prescriptions, full details are available from Student Central office to find out which credit recognition you will be applying for.

Bring all your original academic records and course outlines to this meeting (overseas qualifications must be TNQAB certified before your application can be considered). If you do not wish to wait for the meeting, move to the next step.

Complete an application form and pay the fee.

### **Assessment of Prior Learning (APL)**

You may be coming to CUP University with skills, knowledge, attitudes and values which have not been formally assessed. APL offers you the means by which these can be assessed and given credit towards your programme.

### **Advice Regarding Credit Recognition and APL Approvals**

You will be advised in writing of the success or otherwise of your application. You may be given preliminary confirmation of the result of your application within a short time frame, but the official confirmation will only come when the results are approved by the Programme Committee, which meets approximately two weeks after the end of each semester for that purpose.

### **Results and Academic Records**

We recommend that you keep a record of your results and check them against the official results published on notice boards. It is the student's responsibility to ensure results are recorded correctly. Do not leave queries until it may be too late to fix problems in time for graduation. Academic results are sent out each semester. An academic transcript of your grades will be prepared by the Registry on receipt of the appropriate form (available from CUP University's Student Central office) and a small cost recovery charge.

## X. 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 <sup>+</sup>	15.0	Excellent
85 – 89	A	14.0	Outstanding
80 – 84	A <sup>-</sup>		
75 – 79	B <sup>+</sup>	13.0	Satisfactory
70 – 74	B	11.0	
65 – 69	B <sup>-</sup>		
60 – 64	C <sup>+</sup>	9.0	Passed
55 – 59	C	7.5	
50 – 54	C <sup>-</sup>		
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.

## **XI. EXAMPLES OF ACADEMIC MISCONDUCT ARE:**

### **Plagiarism**

Plagiarism is the presentation of the (unpublished or published, including on the Internet) thoughts, ideas, writings, inventions or work of another person or other persons without proper acknowledgement and includes copying of the whole or part of the work of another, whether directly copying or summarising another's work, and using experimental results obtained by another. It is the act of taking and using another's work as one's own without proper acknowledgement (referencing) and includes:

- a) copying the work of another student
- b) directly copying any part of another author's work
- c) summarising or paraphrasing another author's work without referencing
- d) using experimental results obtained by another without referencing

This includes items from books, journals, magazines, and the internet. If you have any questions or are in any way unclear on what is or is not acceptable, then contact your lecturer for that course.

### **Cheating**

Cheating is any fraudulent or dishonest response or practice in relation to any item of assessment, including any action which may otherwise defeat the purpose of the assessment. For example, this includes copying from others for an individual assessment event or bringing notes to a closed book exam.

The above summative assessment offences (plagiarism and cheating) represent misconduct and a breach of CUP University's rules and policies.

### **Exclusion from Programme**

There are provisions to exclude students from programmes because of insufficient progress (passing less than half the credits taken over two years),

### **Change of Course or Programme**

Students who request a change of course or programme after approval of enrolment will incur a penalty fee.

### **Refunds & Withdrawals**

The policy regarding withdrawals and refunds for courses longer than 12 weeks is specified in the Enrolment & Fees Policy.

### **Evaluations**

The student evaluation of quality, "SEQUAL", will independently and systematically enable students to evaluate courses and teaching. Evaluations are confidential.

### **Testimonials**

Verbal references only will be given. Students need to advise lecturers of the details regarding such references.

## **XII. SCHOOL OF SCIENCE: FACULTY OF MATHEMATICS DIVISION**

### **Dean for School of Science: Associate Professor Viliami Tuli-ki-Hakaulahi Takau**

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- Senior Lecturer in Physics & Mathematics
- B.Sc. (Bachelor of Science - Physics) La Trobe University, Melbourne, Australia.
- M.Sc. Hons. (Master of Science - Physics), Melbourne University, Australia
- Ph.D. (Doctor of Philosophy – Nuclear & Atomic Energy.) Melbourne University, Melbourne, Australia

### **Visiting Professor and Friends of the University: Emeritus Professor Jeffrey Hunter (P.h.D.)**

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#### **Mathematician and Statistician:**

- Massey University, Palmerston North, NZ
- Auckland University of Technology, Auckland, NZ

### **Head of Mathematics Department: Mr. Tu'amelie Faitu'a Kemoe'atu (Quality Assurance Officer)**

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- Dip.Ed. (Diploma in Education) T.I.O.E., Tonga
- B.Sc. (Bachelor of Science major in Mathematics and Physics) USP, Fiji
- Work Experience: Teaching mathematics and physics in High School for almost 30 years.
- Work Experience: Administrator for over 20 years
- PG.Cert., (Postgraduate Certificate in Mathematics Administration), CUP University, Nuk., Tonga
- (Master of Science in Administration Mathematics candidate) CUP, Nuk., Tonga

### **Lecturer: Rev Nehemaia Kakaufaka'atu'i**

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- Dip.Ed. (Diploma in Education) Tonga Institute of Education (T.I.O.E), Tonga
- B.Sc. (Bachelor of Science major in Physics) USP, Fiji
- Work Experience: Teaching Mathematics and Physics in High School for almost 30 years.
- Work Experience: Administrator for over 20 years.
- PG.Cert., (Postgraduate Certificate in Mathematics Administration) Christ's University in Pacific, CUP, Tonga.

### **Assistant Lecturer: Mr Peni Lakai**

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- Dip.Ed. (Diploma in Education) T.I.O.E., Tonga
- B.Sc. (Bachelor of Science major in Mathematics) USP, Fiji
- M.CS (Master of Cyber Security), CUP University, Nuk., Tonga

### **Tutor: Mr. Hengihengi Palaa (CUP Vava'u Campus)**

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- Cert., AA., Dip., (Mathematics) Christ's University in Pacific, Nuku'alofa, Tonga
- B.Sc. (Mathematical Science) Christ's University in Pacific, Nuk., Tonga