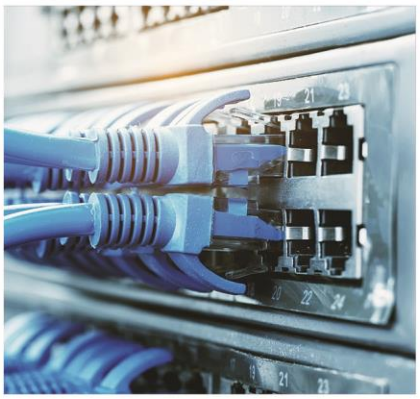
Department of
Computer Science and Informatics



Undergraduate Programmes

Yearbook 2021

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UNIVERSITY OF THE
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UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA

UFS·UV
NATURAL AND
AGRICULTURAL SCIENCES
NATUUR- EN
LANDBOUWETENSKAPPE

COMPUTER SCIENCE AND INFORMATICS
REKENAARWETENSKAP EN INFORMATIKA

This booklet is for first year students who start in 2021.
You will use the booklet until you have completed your degree.

Undergraduate Learning Programmes

The Department of Computer Science and Informatics offers two undergraduate qualifications with several learning programmes:

Bachelor of Computer Information Systems - B.CIS.

Learning Programme: Computer Information Systems (BC430156)

Bachelor of Science in Information Technology - B.Sc.(IT)

Learning programme 1: Computer Science and Chemistry (BC432221)

Learning programme 2: Computer Science and Mathematics (BC432238)

Learning programme 3: Computer Science and Physics (BC432240)

Learning programme 4: Computer Science for Business and Management (BC432255)

Learning programme 5: Data Science (BC432295)

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INTRODUCTION

The Department of Computer Science and Informatics specialises in the training of students who want to apply their knowledge of technology in scientific environments (Computer Science) or in the corporate world (Informatics). The department delivers highly trained individuals with technical skills in data science, programming, system design and analysis as well as database and network management. The department is dedicated to producing top quality graduates, equipped for a professional career in national and international companies.

PROGRAMME IN COMPUTER INFORMATION SYSTEMS (BCIS)

Programme code	BC430156
Discipline 1	Computer Information Systems (BCIS)
Discipline 2	Business and Management (B&M)

Specialists in Computer Information Systems design, build, and implement software solutions that are the driving force in every business, non-profit organisation and government department. They analyse existing systems and discover new ways to optimise performance. This programme focuses on practical applications of technology to support organisations while adding value to their services.

Some of the technical Computer Science modules found in the B.Sc. streams are not included in this programme. Instead, it covers topics that are specifically tailored for the corporate world, for example analysis and modelling of workflow in an organisation, the use of tools to develop customised software, integration of infrastructure, ethical procedures, etc. In addition, modules from the Faculty of Economical and Management Sciences, such as Business Management, Entrepreneurship, Digital Marketing, Industrial Psychology, and Labour Relations Management, are taken.

PROGRAMMES IN COMPUTER SCIENCE (BSc(IT))

Programme code	BC432221	BC432238	BC432240	BC432255	BC432295	
Discipline 1	Computer Science (CSIS)	Computer Science (CSIS)	Computer Science (CSIS)	Computer Science (CSIS)	Computer Science (CSIS)	Data Science
Discipline 2	Chemistry (CHEM)	Mathematics (MATM)	Physics (PHYS)	Business and Management (B&M)	Mathematical Statistics (STSM)	

Computer Science with Chemistry (BC432221)

This programme prepares students for a career in research laboratories and teaching at schools or universities. Students will be well-equipped for careers in the food and mining industries or engineering firms concerned with chemical activities. Careers pertaining to natural products, structural elucidations, polymer- and/or new material development, catalysis, speed of reactions, analytical chemistry and electrochemical energy transformations may also be considered.

Computer Science with Mathematics (BC432238)

This learning programme is recommended for students who wish to develop a sound mathematical base for their career as computer scientist, mathematical analyst, financial mathematician, lecturer or teacher. The combination of Computer Science with Mathematics will enable a graduate to do modelling of real world objects and scenarios and simulate potentially dangerous or expensive environments before implementation.

Computer Science with Physics (BC432240)

This programme is well-suited to students who want to follow careers in the manufacturing industries or engineering firms that are concerned with mechanical, civil, telecommunication and/or electronic and electrical activities. Careers in design, energy production, advanced instrumentation development, research laboratories, modelling and teaching are possible.

Computer Science in Business Management (BC432255)

The science and commercial sectors often overlap. This learning programme provides students with the opportunity to learn and to experience the best of both worlds as it prepares them for careers in the public and private sectors. The Computer Science content is exactly the same as for the above-mentioned streams, but it is combined with modules such as Accounting, Economics, Business Management, Entrepreneurship, Industrial Psychology, and Labour Relations Management.

Data Science (BC432295)

This programme is specifically tailored for students who want to become a data scientist. Data scientists combine their computing and statistical skills to collect, analyse and interpret large amounts of data (big data) to identify ways to help improve operations and gain a competitive edge over rivals. A data scientist can pursue a career in the technology, marketing, corporate, consulting, health care, financial services, government, academia, retail and gaming sectors.

CAREER OPPORTUNITIES FOR GRADUATES

Those who are analytical, good at problem solving and have the ability to pay attention to detail might enjoy a career in Computer Science or Information Systems.

- Applications software developers design and produce software and games that make them useful.
- Business intelligence developers design and develop strategies to assist business users in quickly finding the information they need to make better business decisions. Extremely data-savvy, they use BI tools or develop custom BI analytic applications to facilitate the end-users' understanding of their systems.
- Computer and information systems managers oversee the computer activities of organizations or companies. They implement technology that can help these entities meet their goals. While some employers hire job candidates with a bachelor's degree, many prefer those with a master's degree in Business Administration (MBA).
- Computer systems analysts assist their employers with the efficient and effective use of computer technology. Many employers prefer to hire job candidates who have bachelor's degrees and for more complex jobs, some require a master's degree.
- Computer software engineers design, test, construct and maintain computer programs to meet users' needs. They specialise in either software applications or software systems. Most employers prefer job candidates with an honours degree in Computer Science.
- Computer hardware engineers conduct research, design, develop, test and oversee the manufacture and installation of computer chips, circuit boards and computer systems. They also work with computer peripherals.
- Without computer programmers who write programs that enable computers to perform specific functions, computers would merely be pieces of plastic.
- Computer support specialists help customers and/or staff to solve computer-related problems. They assist computer users who experience difficulties with software programs, operating systems, computers or peripherals.
- Data analysts examine, transform and manipulate large data sets to identify trends, develop charts, and create visual presentations to help businesses make more strategic decisions.
- Data engineers develop, construct, test and maintain architectures, such as databases and large-scale processing systems to perform batch processing or real-time processing on collected and stored data sets.
- Data scientists implement scientific computerised methods and processes, machine learning algorithms and data models to extract knowledge and insight from large structured and unstructured datasets that can be used to explain past events or forecast future events.

- Database administrators use database software to store and manage information. They set up database systems and are responsible for the efficient operation of those systems (usually referred to as database performance tuning). They also ensure that the data they store is backed up regularly, stored effectively, and is secured from unauthorized access. Ensuring the availability of data by maximising database uptime is also an important function of the database administrator.
- Machine learning engineers design and develop machine learning and deep learning systems that are used to automate processes like text classification, speech recognition, and market forecasting.
- Machine learning scientists research new data approaches and algorithms that are used to design, develop or improve machine learning and deep learning models.
- Natural language processing engineers transform natural language data into useful features using NLP techniques to feed classification algorithms.
- Network systems analysts analyse, design, test and evaluate network systems including local and wide area networks (LANs and WANs).
- Systems software developers create operations software to run computers and other devices.
- Web developers are responsible for the proper functioning of websites. They tend to technical aspects of websites.
- Web masters maintain websites and tend to tasks such as design, analysis of user data and responding to user feedback.

ADMISSION REQUIREMENTS

Programme	National Benchmark Tests	Admission Point	Tuition Language	Mathematics	Physical Science
BC430156	Language & Maths	30	Level 4 (50%)	Level 4 (50%)	N/A
BC432221	Language & Maths	32	Level 4 (50%)	Level 5 (60%)	Level 5 (60%)
BC432238	Language & Maths	32	Level 4 (50%)	Level 6 (70%)	Level 5 (60%)
BC432240	Language & Maths	32	Level 4 (50%)	Level 5 (60%)	Level 5 (60%)
BC432255	Language & Maths	32	Level 4 (50%)	Level 4 (50%)	Level 4 (50%)
BC432295	Language & Maths	32	Level 4 (50%)	Level 6 (70%)	Level 5 (60%)

- No previous computer knowledge is required, although IT or CAT at school is recommended.
- Students who do not meet the admission requirements can consult us regarding our extended or preparation programmes.
- ***Students who only had Mathematical Literacy at school will not be admitted to our undergraduate, extended or preparation programmes.***

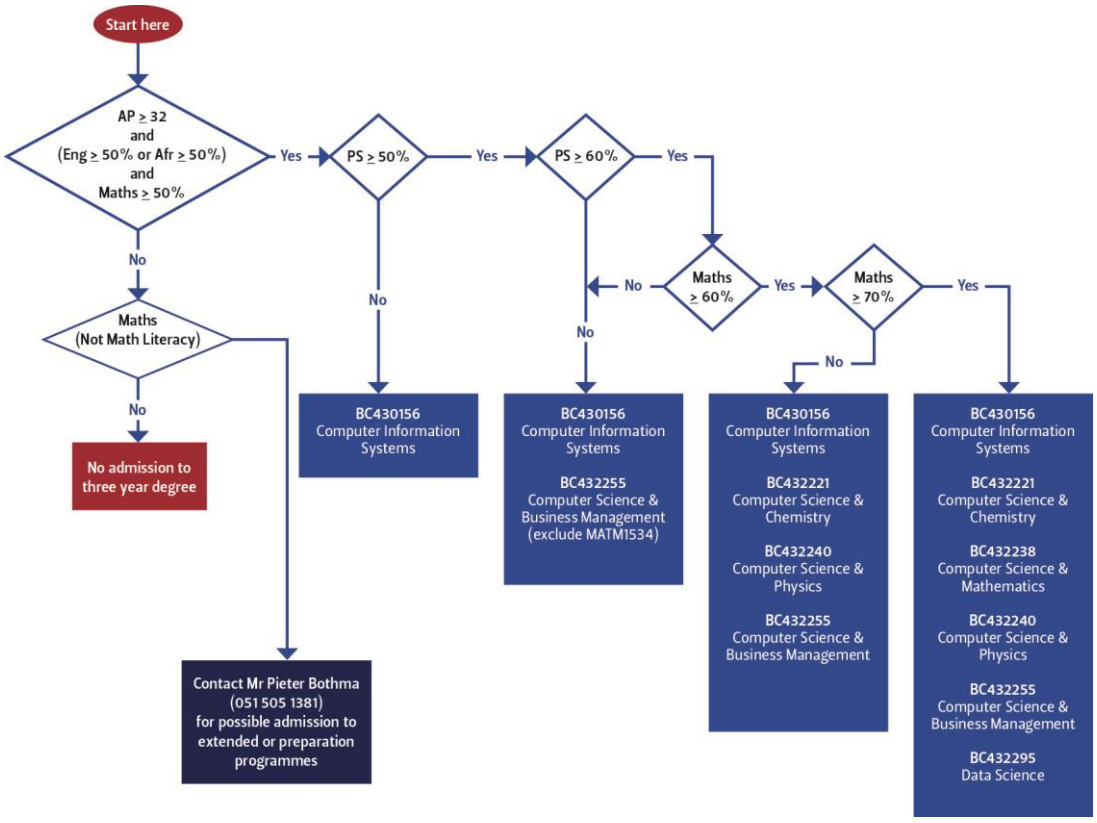
Calculation of M-score (2007 or earlier):

	A	B	C	D	E	F
HG	8	7	6	5	4	3
SG	6	5	4	3	2	1

Calculation of Admission Point (AP) (from 2008):

	30-39	40-49	50-59	60-69	70-79	80-89	90-100
Life orientation	0	0	0	1	1	1	1
Other subjects	2	3	4	5	6	7	8

- Use the following flow chart to identify the programmes for which you qualify.



LEARNING PROGRAMME IN INFORMATION SYSTEMS

Computer Information Systems (BC430156)					
Year 1		Year 2		Year 3	
Sem 1	Sem 2	Sem 1	Sem 2	Sem 1	Sem 2
UFSS1504 * EALN1508 or AGAN1508 CSIL1511 BCIS1513 CSIS1614 EBCS1514 EBUS1514 EHRM1514	CSIL1521 BCIS1623 CSIS1624 EBCS1524 EIOP1524 Electives: CSIS1683	BCIS2614 CSIS2634 EBUS1614	BCIS2624 CSIS2624 EBUS1624 ELRM2624 ENOV2624 Electives: CSIS2642	BCIS3714 CSIS3714 EBUS2714 EBUS2715	CSIS3724 CSIS3744 ESBM2724 EBMA3725

LEARNING PROGRAMMES IN COMPUTER SCIENCE

Year	CS and Chemistry (BC432221)		CS and Mathematics (BC432238)		CS and Physics (BC432240)		CS in Business and Management (BC432255)		Data Science (BC432295)	
	Sem 1	Sem 2	Sem 1	Sem 2	Sem 1	Sem 2	Sem 1	Sem 2	Sem 1	Sem2
1	UFS101/UFSS1504 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 CHEM1513+ CHEM1551 MATM1534	CSIL1521 CSIS1624 CSIS1664 CHEM1623+ CHEM1661 MATM1644 Optional Electives: CSIS1683	UFS101/UFSS1504 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 MATM1534 One of: STSM1614 PHYS1514 PHYS1534	CSIL1521 CSIS1624 CSIS1664 MATM1644 MATM1622 One of: STSM1624 PHYS1624 PHYS1644 Optional Electives: CSIS1683	UFS101/UFSS1504 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 PHYS1514 MATM1534	CSIL1521 CSIS1624 CSIS1664 PHYS1624 MATM1644 MATM1622 Optional Electives: CSIS1683	UFS101/UFSS1504 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 BCIS1513 **Stream 1:** EBCS1514 MATM1534 **Stream 2:** Two of: EBCS1514 EBUS1514 EHRM1514	CSIL1521 CSIS1624 CSIS1664 **Stream 1:** EBCS1524 MATM1644 **Stream 2:** Two of: BCIS1623 EBCS1524 EIOP1524 Optional Electives: CSIS1683	UFS101/UFSS1504 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 STSM1614 MATM1534	CSIL1521 CSIS1624 CSIS1664 STSM1624 MATM1644 MATM1622
2	CSIS2614 CSIS2634 CHEM2613+ CHEM2611 CHEM2633+ CHEM2631	CSIS2624 CSIS2664 CHEM2623+ CHEM2621 CHEM2643+ CHEM2641	CSIS2614 CSIS2634 MATM2614 One of: MATA2754 STSM2634	CSIS2624 CSIS2664 MATM2664 MATM2624	CSIS2614 CSIS2634 PHYS2614 PHYS2632 Optional Electives: MATM2614 MATA2754	CSIS2624 CSIS2664 PHYS2624 PHYS2642 Optional Electives: CSIS2642	CSIS2614 CSIS2634 **Stream 1:** Two of: BCIS2614 EECF1614 STSA2616 **Stream 2:** Two of: BCIS2614 EBUS1614 EECF1614	CSIS2624 CSIS2664 **Stream 1:** Two of: BCIS2624 EECF1624 STSA2626 **Stream 2:** Two of: BCIS2624 EBUS1624 EECF1624 EBMA2624 Electives: CSIS2642	CSIS2614 CSIS2634 STSM2616 STSM2634	CSIS2664 STSM2626 MATM2624 Optional Electives: CSIS2642
3	CSIS3714 CSIS3734 CHEM3713+ CHEM3711 CHEM3733+ CHEM3731	CSIS3724 CSIS3744 CHEM3723+ CHEM3721 CHEM3743+ CHEM3741	CSIS3714 CSIS3734 Two of: MATM3714 MATM3734 MATA3774	CSIS3724 CSIS3744 MATM3724 One of: MATM3744 CSIS3764	CSIS3714 CSIS3734 PHYS3714 PHYS3732 PHYS3752	CSIS3724 CSIS3744 PHYS3724 PHYS3742 PHYS3762	CSIS3714 CSIS3734 **Stream 1:** STSA3716 STSA3732 **Stream 2:** EBUS2714 ETRM3714	CSIS3724 CSIS3744 **Stream 1:** STSA3726 STSA3742 **Stream 2:** ESBM2724 EBMA3725	CSIS3714 CSIS3734 STSM3714 STSM3734	CSIS3724 CSIS3744 CSIS3764 STSM3764

Interpretation of Module Codes

A module is indicated by a code, consisting of four letters and four digits, e.g. CSIS2634.

- The letters indicate the department and discipline, e.g. CSIS stands for Computer Science and Information Systems.
- The first digit indicates the year of study. CSIS2634 is a second-year module.
- The second digit indicates the NQF level. Undergraduate modules range from NQF level 5 to 7. CSIS2634 is on NQF level 6.
- The third digit indicates the semester. First: 1,3,5,7; Second: 2,4,6,8; Year module: 0 or 9. CSIS2634 is presented in the first semester.
- The fourth digit indicates the number of credits. Multiply the digit with 4. Every credit supposes 10 hours of exposure, including lecture time, practicals, study, writing tests and exams. CSIS2634 is a 16-credit module and supposes 160 hours of exposure. To obtain a Bachelor's degree, you need at least 360 credits with a minimum of 120 credits on NQF level 6 and a minimum of 120 credits on NQF level 7.

LIST OF MODULES

- Students must always adhere to the pre-requisites of individual modules.
  - "With" means that the prerequisite module must be taken together with the listed module.
  - Where no required level is indicated between brackets, it means that a pass (50%) is required.

- Additional modules may be taken only if it does not cause timetable clashes.

Core Modules

The following modules are compulsory for all B.CIS. and B.Sc.(IT) students:

Code	Old code(s)	Content	Prerequisites
[1]AGAN1508 or EALN1508	AFA108 or ALN108	Academic literacy: English or Afrikaans	
[2]CSIL1511	BRS111	Computer Literacy Part 1	
[2]CSIL1521	BRS121	Computer Literacy Part 2	CSIL1511
UFS101/UFS1504		Ethics, Values and Life Skills	

[1] You are exempted from EALN1508 and AGAN1508 if you obtained at least 65% for the National Benchmarking Tests (NBT) for Language.

[2] Students who obtained 60% or more for Information Technology (IT) or 70% or more for Computer Applications Technology (CAT) in Grade 12 are exempted from CSIL1511 and CSIL1521.

Students who pass the promotion test for CSIL1511 and CSIL1521 at the beginning of the specific semester with at least 70% are exempted from class attendance, assignments and tests, but must still register and pay tuition fees.

Information Systems

Code	Content	Prerequisites
BCIS1513	Introduction to Information Systems	With CSIL1511
BCIS1623	Introduction to Software Design	
BCIS2614	Systems Analysis and Design	
BCIS2624	Systems Infrastructure and Integration	
BCIS3714	Information Systems in Organisations	

Chemistry

Code Theory | Practical	Old code(s)	Content	Prerequisites
CHEM1513 + CHEM1551	CEM114	Inorganic and Analytical Chemistry	Physical Science Level 4 (50%)
CHEM1623 + CHEM1661	CEM124	Organic and Physical Chemistry	CHEM1513 + CHEM1551
CHEM1643 + CHEM1661	CEM144	Organic and Physical Chemistry	CHEM1513 + CHEM1551
CHEM2613 + CHEM2611	CEM214	Physical Chemistry	CHEM1623 + CHEM1661 or 60% in CHEM1643 + CHEM1661 and MATM1534/1614
CHEM2623 + CHEM2621	CEM224	Organic Chemistry	CHEM1623 + CHEM1661 or 60% in CHEM1643 + CHEM1661 and MATM1534/1614
CHEM2633 + CHEM2631	CEM232	Analytical Chemistry	CHEM1623 + CHEM1661 or 60% in CHEM1643 + CHEM1661 and MATM1534/1614
CHEM2643 + CHEM2641	CEM242	Inorganic Chemistry	CHEM2613 + CHEM2611 and CHEM2633 + CHEM2631
CHEM3713 + CHEM3711	CEM314	Analytical Chemistry	CHEM2643 + CHEM2641 and MATM1544/1624
CHEM3723 + CHEM3721	CEM324	Inorganic Chemistry	CHEM3713 + CHEM3711
CHEM3733 + CHEM3731	CEM334	Physical Chemistry	CHEM2613 + CHEM2611, CHEM2633 + CHEM2631 and MATM1544/1624
CHEM3743 + CHEM3741	CEM344	Organic Chemistry	CHEM2623 + CHEM2621

Computer Science

Code	Old code(s)	Content	Prerequisites
CSIS1553	RIS153, RIS154	Introduction to Computer Hardware	With CSIL1511
CSIS1614	RIS114	Introductory Programming in C#, Part 1	With CSIL1511
CSIS1624	RIS124	Introductory Programming in C#, Part 2	CSIS1614
CSIS1664	RIS164	Internet and Web page Development	CSIS1614 or 60% for IT (Grade 12)
CSIS1683	RIS182, CSIS1682	Visual Basic in Excel	CSIL1511
CSIS2614	RIS214	Data Structures in C#	CSIS1624 or 65% in CSIE1606
CSIS2624	RIS224	Human-Computer Interaction	CSIS1614
CSIS2634	RIS294	Databases Part 1	CSIS1624
CSIS2642	RIS242	Community Service	CSIL1521
CSIS2664	RIS264	Design Patterns in C# and Java	CSIS2614
CSIS3714	RIS314	Databases Part 2	CSIS2634
CSIS3724	RIS324	Software Engineering	CSIS2634
CSIS3734	RIS334	Internet Programming	CSIS1664 and CSIS2664
CSIS3744	RIS344	Networks	CSIS1624 or CSIE1606
CSIS3764		Data Science	CSIS2614, STSM1624, MATM1644 and MATM1622

Accounting

Code	Old code(s)	Content
EACC1624	REK124, EACC62406	Accounting

Economics

Code	Old code(s)	Content	Prerequisites
EECF1614	EKN114, EECF61306, EECF61406	Economic Systems and Basic Microeconomics	Mathematics Level 4 (50%)
EECF1624	EKN124, EEF62306, EECF62406	Introduction to Macroeconomics	Mathematics Level 4 (50%)

Business Management

Code	Old code(s)	Content	Prerequisites
EBMA2624	EBUS66406	Personal Selling	
EBMA3715	OBS324, EBUS79507	Strategic Marketing	EBUS1614
EBMA3725	IBM314, EBUS71407, EBUS72507	Digital Marketing	
EBUS1514	EBUS51305, EBUS51405	Business Functions	
EBUS1614	EBUS61406	Fundamental Business Functions	
EBUS1624	OBS134, EBUS62406	General Management	
EBUS2714	OBS244, EBUS74407	Entrepreneurship	
EBUS2715	OBS314, EBUS75407, EBIS75507	Strategic Management	EBUS1624
ENOV2624	EBUS64406	Innovation Management	
ESBM2724	EBUS77407	Small Business Management	

Industrial Psychology

Code	Old code(s)	Content
EHRM1514	HUM114, EHRM51305, EHRM51405	Human Resources Management
EIOP1524	ORG124, EIOP52305, EIOP52405	Individual Differences
ELRM2624	ELR214, ELRM62406	Labour Relations Management
ETRM3714	TRG314, ETRG71407	Training Management

Mathematics and Applied Mathematics

Code	Old code(s)	Content	Prerequisites
MATM1534	WTW134	Calculus	Mathematics Level 5 (60%) or MATD1534/1564 or MATM1584
MATM1622		Introduction to Advanced Mathematics	MATM1534
MATM1644	WTW144, MATM1544	Calculus and Linear Algebra	MATM1534
MATM1574	WTW174	Precalculus 1	Mathematics Level 4 (50%)
MATM1584	WTW184	Precalculus 2	MATM1574
MATM2614	WTW214	Vector Analysis	MATM1622 and MATM1644
MATM2624	WTW224	Linear Algebra	MATM1622 and MATM1644
MATA2654	WTW244, MATA2644	Ordinary Differential Equations	(MATM1622 and MATM1644) or 60% in MATM1644
MATA2664	WTW234, MATA2634	Mathematical Modelling	(MATM1622 and MATM1644) or 60% in MATM1644
MATA2754	WTW254, MATM2654	Scientific Computing	(MATM1622 and MATM1644) or 60% in MATM1644
MATM2664	WTW264	Sequences and Series	MATM1622 and MATM1644
MATM3714	WTW314	Complex Analysis	MATM2614 and MATM2664
MATM3724	WTW324	Real Analysis	MATM2614 and MATM2664
MATM3734	WTW334	Discrete Mathematics	MATM2624 and MATM2664
MATM3744	WTW344	Algebra	MATM2624
MATA3764	WTW364	Industrial Mathematics	MATA2664 and MATA3774
MATA3774	WTW374	Numerical Analysis	MATM2614 and MATA2754
MATA3784	WTW384	Dynamical Systems	MATM2614 and MATA2654

Physics

Code	Old code(s)	Content	Prerequisites
PHYS1514	FSK114	Mechanics, Optics and Electricity	With (MATM1614 or MATM1534)
PHYS1534	FSK134	Mechanics, Optics and Electricity in Biology and Medicine	
PHYS1624	FSK124	Mechanics, Thermodynamics, Electricity and Magnetism	Min (PHYS1514 or PHYS1534) and Min (MATM1614 or MATM1534)
PHYS1624	FSK124	Mechanics, Thermodynamics, Electricity and Magnetism in Biology and Medicine	
PHYS2614	FSK214	Mechanics, Waves and Optics	PHYS1514 or 60% in PHYS1534, PHYS1624 or 60% in PHYS1644, MATM1534/1614 and MATM1544/1624
PHYS2624	FSK224	Electronics	PHYS1514 or 60% in PHYS1534, PHYS1624 or 60% in PHYS1644, MATM1534/1614 and MATM1544/1624
PHYS2632	FSK232	Practical Work	With PHYS2614
PHYS2642	FSK242	Electromagnetism	PHYS2614
PHYS3714	FSK314	Modern Physics	PHYS2614
PHYS3724	FSK324	Solid State Physics	PHYS3714
PHYS3732	FSK332	Statistical Physics 1	PHYS2614
PHYS3742	FSK342	Statistical Physics 2	PHYS3732
PHYS3752	FSK352	Practical Work	PHYS 2632, With (PHYS3714 and PHYS3732)
PHYS3762	FSK362	Practical Work	PHYS 2632, With (PHYS3724 and PHYS3742)

Statistics

Code	Old code(s)	Content	Prerequisites
EBCS1514	EBCS51405	Business Calculations 1	Mathematics Level 3 (40%)
EBCS1524	EBCS52405	Business Calculations 2	Mathematics Level 3 (40%)
STSA2616	STK216	Multiple Regression Analysis and Time Series Analysis	EBCS1524
STSA2626	STK226	Multiple Regression: Variance and Time Series Analysis	STSA2616
STSA3716	STK316	Statistical Inference	EBCS1524 and MATM1534
STSA3726	STK326	Applied Regression and Time Series Analysis	STSA3716
STSA3732	STK332	Applied Statistics I	STSA2626
STSA3742	STK342	Applied Statistics II	STSA3732

Mathematical Statistics

Code	Old code(s)	Content	Prerequisites
STSM1614	WKS114	Introductory Statistics	Mathematics Level 6 (70%) or 60% in MATD1534/1564 or MATM1534 or MATM1584
STSM1624	WKS124	Introductory Probability Theory	STSM1614 and MATM1534
STSM2616	WKS216	Sample Distribution Theory and Inference	STSM1624
STSM2626	WKS226	Bayesian Statistical Inference	STSM2616
STSM2634		Statistical Programming	STSM1624
STSM3714	WKS314	Inference	STSM2626
STSM3724	WKS324	Multivariate Analysis	MATM1624 and STSM3714
STSM3734	WKS334	Casual Inference: ANOVA, Regression & Potential Outcomes Approach	MATM1624 and STSM2626
STSM3744	WKS344	Time Series Analysis	STSM3714 and STSM3734
STSM3764		Generalised Linear Models	STSM3714 and STSM3734

CONCISE CONTENT OF UNDERGRADUATE MODULES IN THE DEPARTMENT OF COMPUTER SCIENCE AND INFORMATICS

- **BCIS1513**
  Introduction to Information Systems
  Introduction to information systems; Information systems in organisations; Hardware: input, processing, output; Software: systems and application software, organisation of data and information, telecommunications and networks, the Internet and Intranet; Transaction processing systems, management information systems, decision support systems, information systems in business and society, systems analysis, systems design, implementation, maintenance and revision.

- **BCIS1623**
  Introduction to Software Design
  The student obtains the ability to specify, visualise and document the components of a simple business software system through flow charts, class diagrams, use case diagrams and other means.

- **BCIS2614**
  Systems Analysis and Design
  Systems analysis. Systems design: construction; application architecture; input design; output design; interface design; internal controls; program design; object design; project management; system implementation; use of computer-aided development tools.

- **BCIS2624**
  Systems Infrastructure and Integration
  An overview of the infrastructure and integration of computer systems in an organisation.

- **BCIS3714**
  Information Systems in Organisations
  Information systems in organisations, social and ethical responsibilities, the role of the Informatician; IT end-user relationships; IT management.

- **CSIL1511 (Equivalent CSIQ1531 / CSIL1551 / CSIL1561)**
  Computer Literacy: Part 1
  This module contains basic knowledge of the principles of microcomputers and microcomputer hardware, the basic commands of the operating system, a general word processing program, a spreadsheet program, a presentation program and the Internet. The student must also be able to apply the knowledge.

- **CSIL1521 (Equivalent CSIQ1541)**
  Computer Literacy: Part 2
  This module covers basic commands of a database program, as well as advanced commands of a general word processing program, a spreadsheet program and a presentation program. The student must also be able to apply the knowledge.

- **CSIS1553 (Equivalent CSIQ1553)**
  Introduction to Computer Hardware
  This module contains fundamental knowledge, theories, principles and practices of Information Technology, including the underlying electronics of computer hardware, supporting Microsoft Windows, servicing PCs, operating system overview, basic computer aspects, tools and safety, inside the PC, input/output devices, miscellaneous hardware, troubleshooting, customer service and support.

- **CSIS1614 (Equivalent CSIQ1614)**
  Programming and Problem Solving Part 1
  This module deals with the professional implementation of computerised solutions in an object-oriented, high-level programming environment. The module provides an introduction to problem solving, algorithms, classes, objects, properties and methods. Control structures, e.g. selection and iteration, and input and output are also covered.

- **CSIS1624 (Equivalent CSIQ1624)**
  Programming and Problem Solving Part 2
  This module is a continuation of CSIS1614 and deals with information systems and problem solving in business and scientific environments. Advanced object oriented concepts, debugging, storing data in files and access to simple databases.

- **CSIS1664**
  Introduction to the Internet and Web Page Development
  This module deals with various web aspects and technologies. This includes the working of the Internet, graphical interfaces, Internet protocols and web page development.

- **CSIS1683**
  Visual Basic for Applications (VBA) with the focus on Excel
  This module covers concepts to insert text strings as macros; automate frequently performed tasks; automate repetitive operations; creating a custom command, toolbar button, menu command, front end, new worksheet functions; create complete macro-driven applications.

- **CSIS2614 (Equivalent CSIQ2614)**
  Data Structures and Advanced Programming
  This module deals with advanced programming that requires an understanding of data structures and the professional implementation thereof.

- **CSIS2624 (Equivalent CSIQ2624)**
  Human-Computer Interaction
  This module provides the user with an introduction to Human-Computer Interaction (HCI). Aspects that are covered include various kinds of user interfaces and style of interaction, usability, human factors, models of interaction, data collection, the design of user interfaces, visual interfaces and the evaluation of interfaces.

- **CSIS2634 (Equivalent CSIQ2634)**
  Introduction to Databases and Database Management Systems
  This module deals with database concepts, design and implementation concepts, transaction management and concurrency control, distributed database management systems, object-oriented databases and database programming.

- **CSIS2642 (Equivalent CSIQ2642)**
  Information Technology Service Learning
  This module enables the students to serve the community by ploughing back the IT knowledge gained during their studies. While serving the community the students will learn how to work with people with varying computer literacy skills or levels. By teaching or helping others, their own knowledge will be expanded.

- **CSIS2664**
  Software Design
  This module entails an introduction to UML and design patterns (or class types). Various patterns are discussed and analysed in detail. Various sub-patterns will also be covered. Practical work includes the implementation of patterns in various applications.

- **CSIS3714 (Equivalent CSIQ3714)**
  Advanced Databases and Database Management Systems
  This module deals with advanced database concepts, advanced queries, optimising queries, distributed databases, cloud computing and administrative tasks related to data and database management. The module also provides an introduction to data warehousing and OLAP.

- **CSIS3724 (Equivalent CSIQ3724)**
  Software Engineering
  This module provides the student with an introduction to Software Engineering. Aspects covered are requirement definition, program design, programming practice, programming languages, tests and debugging, documentation, maintenance, and aids.

- **CSIS3734 (Equivalent CSIQ3734)**
  Internet Programming
  This module deals with server-side Internet programming and web management.

- **CSIS3744**
  Computer Networks
  This module provides the student with an overview of network concepts. Aspects that are covered are network architecture, low level network technologies, coupling techniques, internet concepts, end-to-end protocols, security, standards and models, transmission basics, and network applications.

- **CSIS3764**
  Data Science
  This module will equip the student with the skills to collect, analyse, visualise and interpret large amounts of data (big data) through scientific methods and methodologies.

CASCADE OF UNDERGRADUATE MODULES IN THE DEPARTMENT OF COMPUTER SCIENCE AND INFORMATICS

The figure below shows the sequence of modules through the various years of study. A module cannot be taken if all prerequisites are not met.