Department of Computer Science and Informatics

Undergraduate Programmes

Yearbook 2016

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This booklet is for first year students who start in 2016.
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 Mathematics (BC432238)

Learning programme 2: Computer Science and Mathematical Statistics (BC432237)

Learning programme 3: Computer Science and Chemistry (BC432221)

Learning programme 4: Computer Science and Physics (BC432240)

Learning programme 5: Computer Science for Business and Management (BC432255)

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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 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 (B.CIS.)

Programme code	BC430156
Discipline	Computer Information Systems (BCIS)

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 (B.Sc.(IT))

Programme code	BC432238	BC432237	BC432221	BC432240	BC432255
Discipline 1	Computer Science (CSIS)	Computer Science (CSIS)	Computer Science (CSIS)	Computer Science (CSIS)	Computer Science (CSIS)
Discipline 2	Mathematics (MATM)	Mathematical Statistics (STSM)	Chemistry (CHEM)	Physics (PHYS)	Business and Management (B&M)

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 Mathematical Statistics (BC432237)

This programme is specifically tailored to train students to apply their computing knowledge to analyse data and arrive at conclusions that would empower an organization in its decision-making process. A sound knowledge of statistical concepts is highly recommended for a career in Computer Science.

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 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 and 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.

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.

- 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.
- 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.
- 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. Applications software developers design and produce software and games that make them useful.
- 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

- No previous computer knowledge is required, although IT or CAT at school is recommended.
- Participation in the National Benchmarking Tests (NBTs) for Language and Mathematics is compulsory.
- National Senior Certificate (NCS) with an M-score (2007 or earlier) or Admission Point (AP) (2008 or later) of 30 or more.
- Mathematics Level 4 (50%) or higher, depending on the learning programme.
- Physical Science Level 4 (50%) is additionally required for programmes BC432221, BC432238 and BC432240.
- Students who do not meet these 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.***

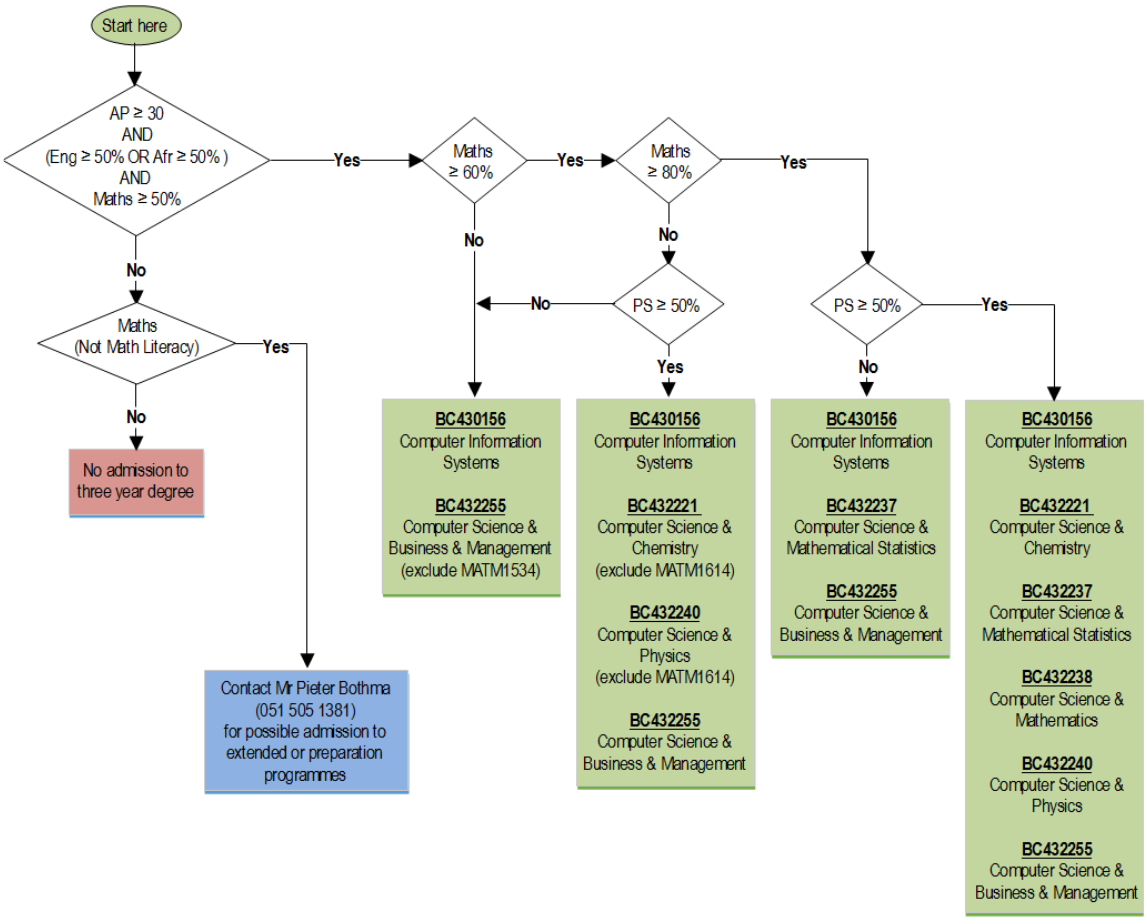
Calculation of M-score (2007 or earlier):

	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
UFS101 * 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 Mathematics (BC432238)		CS and Mathematical Statistics (BC432237)		CS and Chemistry (BC432221)		CS and Physics (BC432240)		CS in Business and Management (BC432255)	
	Sem 1	Sem 2	Sem 1	Sem 2	Sem 1	Sem 2	Sem 1	Sem 2	Sem 1	Sem2
1	UFS101 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 MATM1614 One of: CHEM1514 PHYS1514 PHYS1534 Electives: BCIS1513	CSIL1521 CSIS1624 CSIS1664 MATM1624 One of: CHEM1624 CHEM1644 PHYS1624 PHYS1644 Electives: CSIS1683	UFS101 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 STSM1614 MATM1614 Electives: BCIS1513	CSIL1521 CSIS1624 CSIS1664 STSM1624 MATM1624 Electives: CSIS1683	UFS101 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 CHEM1514 One of: MATM1614 MATM1534 Electives: BCIS1513	CSIL1521 CSIS1624 CSIS1664 CHEM1624 One of: MATM1624 MATM1544 Electives: CSIS1683	UFS101 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 PHYS1514 One of: MATM1614 MATM1534 Electives: BCIS1513	CSIL1521 CSIS1624 CSIS1664 PHYS1624 One of: MATM1624 MATM1544 Electives: CSIS1683	UFS101 * EALN1508 or AGAN1508 CSIL1511 CSIS1614 CSIS1553 Two of: BCIS1513 EBCS1514 EBUS1514 EHRM1514 MATM1534	CSIL1521 CSIS1624 CSIS1664 Two of: BCIS1623 EBCS1524 EACC1624 EIOP1524 MATM1544 Electives: CSIS1683
2	CSIS2614 CSIS2634 MATM2614 MATM2654 Electives: MATA2634	CSIS2624 CSIS2664 MATM2664 One of: MATM2624 MATA2644 Electives: CSIS2642	CSIS2614 CSIS2634 STSM2616 Electives: MATM2614 MATA2634 MATM2654	CSIS2624 CSIS2664 STSM2626 Electives: MATA2644 MATM2664 CSIS2642	CSIS2614 CSIS2634 CHEM2614 CHEM2632 Electives: MATA2634 MATM2654	CSIS2624 CSIS2664 CHEM2624 CHEM2642 Electives: MATA2644 CSIS2642	CSIS2614 CSIS2634 PHYS2614 PHYS2632 Electives: MATM2614 MATA2634 MATM2654	CSIS2624 CSIS2664 PHYS2624 PHYS2642 Electives: MATA2644 CSIS2642	CSIS2614 CSIS2634 Two of: BCIS2614 EBUS1614 EECF1614 STSA2616	CSIS2624 CSIS2664 Two of: BCIS2624 EBUS1624 EECF1624 EBMA2624 STSA2626 Electives: CSIS2642
3	CSIS3714 CSIS3734 MATA3774 One of: MATM3714 MATM3734	CSIS3724 CSIS3744 MATM3724 One of: MATM3744 MATA3784	CSIS3714 CSIS3734 STSM3714 STSM3734	CSIS3724 CSIS3744 STSM3724 STSM3744	CSIS3714 CSIS3734 CHEM3714 CHEM3734	CSIS3724 CSIS3744 CHEM3724 CHEM3744	CSIS3714 CSIS3734 PHYS3714 PHYS3732 PHYS3752	CSIS3724 CSIS3744 PHYS3724 PHYS3742 PHYS3762	CSIS3714 CSIS3734 Two of: EBUS2714 ETRM3714 STSA3716 STSA3732	CSIS3724 CSIS3744 Two of: ESBM2724 EBMA3725 STSA3726 STSA3742

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	Language literacy: English or Afrikaans	
[2]CSIL1511	BRS111	Computer Literacy Part 1	
[2]CSIL1521	BRS121	Computer Literacy Part 2	CSIL1511
UFS101		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	Computer Assisted Programming	CSIS1614 or CSIS1644
BCIS2614	Systems Analysis and Design	BCIS1513
BCIS2624	Systems Infrastructure and Integration	
BCIS3714	Information Systems in Organisations	

Chemistry

Code	Old code(s)	Content	Prerequisites
[1]CHEM1514	CEM114	Inorganic and Analytical Chemistry	Physical Science Level 4 (50%)
[2]CHEM1624	CEM124	Organic and Physical Chemistry	CHEM1514
[3]CHEM1644	CEM144	Organic and Physical Chemistry	CHEM1514
CHEM2614	CEM214	Physical Chemistry	CHEM1624 or 60% in CHEM1644 and MATM1534/1614
CHEM2624	CEM224	Organic Chemistry	CHEM1624 or 60% in CHEM1644 and MATM1534/1614
CHEM2632	CEM232	Analytical Chemistry	CHEM1624 or 60% in CHEM1644 and MATM1534/1614
CHEM2642	CEM242	Inorganic Chemistry	CHEM2614 and CHEM2632
CHEM3714	CEM314	Analytical Chemistry	CHEM2642 and MATM1544/1624
CHEM3724	CEM324	Inorganic Chemistry	CHEM3714
CHEM3734	CEM334	Physical Chemistry	CHEM2614, CHEM2632 and MATM1544/1624
CHEM3744	CEM344	Organic Chemistry	CHEM2624

[1] CHEM1514 = CHEM1513 + CHEM1151 [2] CHEM1624 = CHEM1623 + CHEM1561 [3] CHEM1644 = CHEM1643 + CHEM1561

Computer Science

Code	Old code(s)	Content	Prerequisites
[1]CSIS1534	RIS134	Introductory Programming in C#, Part 1a	With CSIL1511
CSIS1553	RIS153, RIS154	Introduction to Computer Hardware	
CSIS1614	RIS114	Introductory Programming in C#, Part 1	With CSIL1511
CSIS1624	RIS124	Introductory Programming in C#, Part 2	CSIS1614 or CSIS1644
[1]CSIS1644	RIS144	Introductory Programming in C#, Part 1b	CSIS1534
CSIS1664	RIS164	Internet and Web page Development	CSIS1614 or CSIS1644
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 or CSIS1644
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	CSIS3714
CSIS3734	RIS334	Internet Programming	CSIS1664 and CSIS2664
CSIS3744	RIS344	Networks	CSIS1553 or CSIE1606

[1] B.Sc.(IT) students may not register for CSIS1534 and CSIS1644.

Students who initially did not register for a B.Sc.(IT) and who passed CSIS1534 and CSIS1644 may change to B.Sc.(IT), but must note the following:

- Until 2009, RIS134 is acknowledged as equivalent to CSIS1614 (formerly RIS114) and RIS144 as equivalent to CSIS1624 (formerly RIS124).
- Since 2010, CSIS1534 + CSIS1644 (formerly RIS134 + RIS144) (32 credits) is acknowledged as equivalent to CSIS1614 (formerly RIS114) (16 credits).

CSIS1534 (Main campus) is equivalent to CSIS1564 (South campus).

Accounting

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

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%)

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	

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%)

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
MATM1544	WTW144	Calculus and Linear Algebra	MATM1534 or 40% in MATM1614
MATM1574	WTW174	Precalculus 1	Mathematics Level 4 (50%)
MATM1584	WTW184	Precalculus 2	MATM1574
MATM1614	WTW114	Calculus	(Mathematics Level 7 (80%) or 80% in MATD1534/1564 or 70% in MATM1584 or 50% in MATM1534) AND 60% in Departemental Admission Test
MATM1624	WTW124	Algebra and Differential Equations	MATM1614
MATM2614	WTW214	Vector Analysis	MATM1624
MATM2624	WTW224	Linear Algebra	MATM1624
MATA2634	WTW234	Mathematical Modelling	MATM1624 or 65% in MATM1544
MATA2644	WTW244	Ordinary Differential Equations	MATM1624 or 65% in MATM1544
MATM2654	WTW254	Scientific Computing	MATM1624 or 65% in MATM1544
MATM2664	WTW264	Sequences and Series	MATM1624
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	MATA2634 and MATA3774
MATA3774	WTW374	Numerical Analysis	MATM2614 and MATM2654
MATA3784	WTW384	Dynamical Systems	MATM2614 and MATA2644

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 and 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 (MATM1614 or 75% in MATM1534)
STSM2616	WKS216	Sample Distribution Theory and Inference	STSM1624
STSM2626	WKS226	Bayesian Statistical Inference	STSM2616
STSM3714	WKS314	Inference	STSM2626
STSM3724	WKS324	Multivariate Analysis	MATM1624 and STSM3714
STSM3734	WKS334	Multiple Regression	MATM1624 and STSM2626
STSM3744	WKS344	Time Series Analysis	STSM3714 and STSM3734

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

- **BCIS1513 (With CSIL1511)**
  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 (Prerequisite CSIS1614)**
  Computer Assisted Software Development
  Advanced programming with the use of a computer-aided software engineering tool.

- **BCIS2614 (Prerequisite BCIS1513)**
  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.

- **CSIE1606 (Previous codes RIN104 / CISE1606; With MATM1614 and MATM1624)**
  Introduction to object oriented programming for Engineers
  This module is an introduction to computer systems. Programming language concepts: data types, expressions, conditional statements, flow of control, structuring mechanisms, static data structures. Programming in an appropriate high-level language, such as C#, C++ or Java. Object oriented concepts and programming, classes and objects. Emphasis is placed on modular programming for engineering applications. Object models of simple problems. File handling.

- **CSIE2613 (Previous code CISE2613; Prerequisites CSIE1606, MATM1614, MATM1624 (40%))**
  Data Structures and Algorithms for Engineers
  Advanced programming language concepts in an appropriate high-level language, such as C# or C++ or Java. Dynamic data structures, stacks, queues, lists, trees, searching and sorting algorithms, theory for the design and analysis of algorithms, more advanced strategies for testing and debugging, appropriate design patterns and the implementation of abstraction, encapsulation, inheritance and polymorphism. Enumeration, delegates and recursion.

- **CSIL1511 / CSIL1531 / CSIL1551 / CSIL1561 (Previous codes BRS111 / BRS131 / BRC111)**
  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 / CSIL1541 (Previous codes BRS121 / BRS141, Prerequisite CSIL1511)**
  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 (Previous codes RIS153, RIS154)**
  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 (Previous code RIS114; With CSIL1511)**
  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 (Previous code RIS124; Prerequisite CSIS1614 or CSIS1644)**
  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.

- **CSIS1534 (Previous code RIS134; Equivalent CSIS1564; With CSIL1511)**
  Introduction to Programming Part 1
  This module provides an extended introduction to the world of computer programming and is aimed at students who do not intend to take CSIS modules in the second or third year of study. The module deals with aspects that include the origin and development of the computer, the basic working of a computer, computerised problem solving and an introduction to algorithms, control structures, classes, objects, properties and methods by using a high-level programming language.

- **CSIS1644 (Previous code RIS144; Prerequisite CSIS1534)**
  Introduction to Programming Part 2
  This module deals with the use of control structures, classes, objects, properties and methods to do computerised problem solving in a high-level programming language.

- **CSIS1664 (Previous code RIS164, Prerequisite CSIS1614 or CSIS1644)**
  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 (Previous code RIS182 / CSIS1682, Prerequisite CSIL1511)**
  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 (Previous code RIS214, Prerequisite CSIS1624 or 65% in CSIE1606)**
  Data Structures and Advanced Programming
  This module deals with advanced programming that requires an understanding of data structures and the professional implementation thereof.

- **CSIS2624 (Previous code RIS224, Equivalent CSIQ2624, Prerequisite CSIS1614 or CSIS1644)**
  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 (Previous code RIS294, Equivalent CSIQ2634, Prerequisite CSIS1624)**
  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 (Previous code RIS242, Equivalent CSIQ2642, Prerequisite CSIL1521)**
  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 (Previous code RIS264, Equivalent CSIQ2664, Prerequisite CSIS2614)**
  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 (Previous code RIS314, Equivalent CSIQ3714, Prerequisite CSIS2634)**
  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.

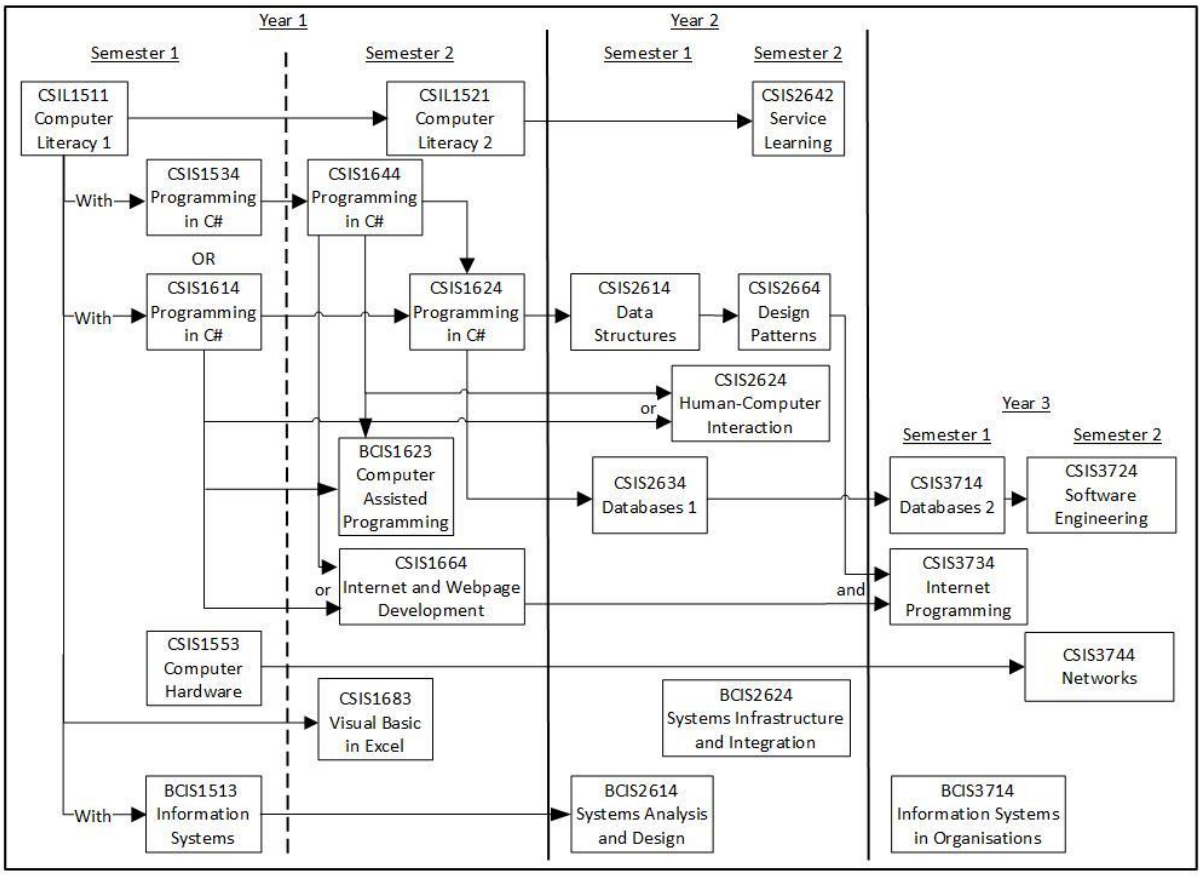
- **CSIS3724 (Previous code RIS324, Prerequisite CSIS3714)**
  Software Engineering
  This module provides the student with an introduction to Software Engineering. Aspects covered are requirement definition, program design, programming practice, programming languages, tests and debugging, documentation, maintenance, and aids.

- **CSIS3734 (Previous code RIS334, Equivalent CSIQ3734, Prerequisite CSIS1664 and CSIS2664)**
  Internet Programming
  This module deals with server-side Internet programming and web management.

- **CSIS3744 (Previous code RIS344, Prerequisite CSIS1553 or CSIE1606)**
  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.

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.



GENERAL INFORMATION

Communication

- Study material, logistical arrangements or other information can be provided during the theoretical or practical classes, on Blackboard, the CSI server, the notice boards in the Mathematical Sciences Building, in the module guide, and/or by e-mail. It is the responsibility of the student to ensure that he/she receives all the information in connection with a specific module. Ignorance is no excuse for missing a test or submission date. It is the student's responsibility to attend classes, read e-mail and check Blackboard and/or the CSI server regularly.
- No marks will be provided by telephone or e-mail. Students should check the notice boards, Blackboard and/or CSI server as arranged.
- Lecturers and student assistants can be visited by appointment or during their consultation hours. Students should always first consult the module guide before reverting queries to the assistant or lecturer. Students should at all times have the relevant module guide with them when consulting a lecturer or assistant.
- Assessment regulations are different for different modules and are specified in the relevant module guide. This module guide should be adhered to at all times.
- There are three categories of modules: Continuous assessment modules, modules with a compulsory examination and promotion modules.
    - For continuous assessment modules, the semester mark will also serve as the final mark. A final mark of 45% to 49% does not necessarily imply that a student will be granted a reassessment. Such cases will be dealt with ad hoc and a reassessment opportunity might be granted if the departmental management committee is of the opinion that it is justified.
    - A student will be exempted from the examination in promotion modules if a semester mark of at least 70% was achieved and a mark of at least 60% was achieved for each individual assignment/test.
    - For modules where the examination is compulsory or in case a student does not qualify for promotion, the semester mark will contribute 50% towards the final mark and the examination 50%.
- To be allowed to write the exam, a semester mark of at least 45% is required.
- To pass a module, a final mark of 50% or more is required, provided that the student obtained at least 40% in the examination.
- An additional examination may be granted if a student could not write the main examination on the scheduled date due to a medical condition or other special reason. Note that the student must apply for the additional examination at the Examination Section and submit sufficient evidence of the circumstances that prevented him/her from writing the main examination.
- An additional examination will automatically (i.e. no need for an application) be granted if a final mark of 45% to 49% is obtained, provided that a minimum mark of 30% was achieved in the examination.

Aegrotat test

An aegrotat test will be granted if the student submits valid evidence of special circumstances preventing him or her from writing a module test (i.e. not class tests or assignments) within 48 hours after the test. Only one aegrotat test will be granted per module per semester. The aegrotat test will be written at the end of the semester and will cover all the work of the entire semester.

Students will only qualify for an aegrotat test in the following circumstances:

1. In the event of absence of a module test due to illness. A valid medical certificate must be submitted to the lecturer within 48 hours after the test.
2. With the death of immediate family. The student is required to hand in a certified copy of the relevant death certificate to the lecturer within 48 hours after the test.

Please note the following conditions:

1. Absence from a class test or failure to submit an assignment does not justify access to the aegrotat test.
2. Should a student qualify for the aegrotat test and not write the test on the given date and time, no further tests will be set up.
3. No member of the Student Representative Council, House Committee or lecturer, except the lecturer that is responsible for the specific module, may give permission not to write a test or examination.

Continuation of studies

- Students are not allowed to register for a module if they have failed it more than once.
- Students will not be allowed to register if it will be impossible to obtain a three-year degree in five years.
- Students who have failed a module with a mark of less than 30% will not be allowed to register for that module again.
- Students will not be allowed to register for third year modules before they have passed all required first year modules.
- Students must pass enough modules to earn at least 64 credits per year to be allowed to register for the following year.

Computer laboratories

- The computer laboratories are under 24 hour video surveillance.
- Usage of the laboratories is restricted to students who are registered for modules offered by the Department of Computer Science and Informatics.
- The laboratories are for academic use only. No games or other non-academic software may be downloaded, installed or used.
- Eating and drinking in the laboratories are strictly prohibited.
- The labs are to be kept clean at all times.
- Noise in the laboratories will not be tolerated.
- Staff members and laboratory assistants on duty must be obeyed at all times.

Copying, Collaboration and Plagiarism

- Copying implies that programming code, text, images, etc. submitted as being the work of the submitting student is partially or wholly that of another person. Minor changes to hide the copying do not nullify the copying.
- Collaboration implies that the student received assistance from one or more persons (including students in the class, people outside the class, the lecturer, other CSI staff members, the student assistants, an Internet chat room, etc.) in completing an assignment.
- In all cases the assignment specifications will serve as a guideline on which type of assistance (if any) is allowed. Collaboration with other people is typically only allowed when the assignment specifications clearly indicate that it is a team or group assignment. In such cases the names of all group members must be listed in all submitted copies of the assignment.
- Plagiarism can be defined as the deliberate copying, writing or presenting as one's own the information, ideas or phrasing of another person without proper acknowledgment of the true source. Additionally, neglecting to paraphrase the original source will also be construed as plagiarism regardless of whether proper acknowledgement is given.
- Should the work of two or more individual students (for an individual assignment) or groups of students (for a group assignment) be identical or very similar, the possibility of copying and/or collaboration will be investigated.

Assignments where copying, collaboration or plagiarism can be proved will not be accepted. This will result in the student's module being marked as incomplete. The student will, however, be given an opportunity to resubmit the assignment (or a similar assignment) to the satisfaction of the lecturer to reverse the incomplete. A mark of 0 will be awarded for resubmitted assignments. This is in accordance with the university's Plagiarism Prevention Policy.

Illegal behaviour

The following is a non-exhaustive list of offences and the Department of Computer Science and Informatics reserves the right to amend or add to the list of offences at the discretion of the departmental management. Offences which arise and are not explicitly listed here will be subject to the same disciplinary measures as other offences of comparable nature.

- The following offences are regarded as Level 1 (minor) offences. Repeated transgression of these rules will be regarded as a Level 2 (serious) offence.
    - Eating and drinking in the laboratories.
    - Littering.
    - Making or causing unnecessary noise in the building. The academic nature of the environment should be respected at all times.
- The following offences are regarded as Level 2 (serious) offences. A first offence will be handled internally in the department. A second transgression will be reported to the university's disciplinary committee for further investigation and action.
    - Allowing non-CSI students into the laboratories.
    - Logging on for non-CSI students.
    - Failing to change your Blackboard or Novell password to something other than your student number or failing to keep your passwords secret.
    - Copying of module evaluations, written assignments, practical assignments or evaluations from another student.
    - Allowing other students to copy your work, sharing your work with other students or assisting other students to complete their assignments.
    - Collaboration on individual assignments (both written and practical).
    - Plagiarism as defined above.
    - Downloading, installing or using non-departmental software on the laboratory computers, e.g. games, music, torrents, etc.
- The following offences are regarded as Level 3 (very serious) offences. Students will immediately be reported to the university's disciplinary committee for further investigation and action. Students should take note that this could result in expulsion from the university.
    - Identity theft, e.g. logging into Blackboard using the credentials of another student.
    - Watching pornography.
    - Copying during examination sessions or final assessments.