University of Pretoria Yearbook 2021

BSc Computer Science (12134001)

Department	Computer Science
Minimum duration of study	3 years
Total credits	442
NQF level	07

Admission requirements

- The closing date is an administrative admission guideline for non-selection programmes. Once a non-selection programme is full and has reached the institutional targets, then that programme will be closed for further admissions, irrespective of the closing date. However, if the institutional targets have not been met by the closing date, then that programme will remain open for admissions until the institutional targets are met.
- The following persons will be considered for admission: Candidates who are in possession of a certificate that is deemed by the University to be equivalent to the required National Senior Certificate (NSC) with university endorsement; candidates who are graduates from another tertiary institution or have been granted the status of a graduate of such an institution, and candidates who are graduates of another faculty at the University of Pretoria.
- Life Orientation is excluded when calculating the APS.
- Grade 11 results are used for the conditional admission of prospective students.
- A valid qualification with admission to degree studies is required.
- Minimum subject and achievement requirements, as set out below, are required.
- All lectures at the University of Pretoria are presented in English only.

Transferring students

Candidates previously registered for the BSc – Extended programme

The Admissions Committee of the faculty considers applications of candidates who were previously registered for the BSc – Extended programme, on grounds of their NSC results as well as academic merit. Such students will only be considered for the four-year programme if they have passed all the prescribed modules and obtained a minimum of 65% in the Mathematics, Physics and Chemistry modules, respectively.

Candidates previously registered at UP or at another university

The faculty's Admissions Committee considers applications of candidates who have already completed the final NSC examination and/or were previously registered at UP or at another university, on grounds of their NSC results as well as academic merit. Candidates who were dismissed from other faculties or universities will not be considered.

Candidates previously registered at a teacher's college or university of technology

The faculty's Admissions Committee considers the application of these candidates on the grounds of their NSC results as well as academic merit.

Qualifications from countries other than South Africa

- Citizens from countries other than South Africa and South African citizens with foreign qualifications must comply with all the other admission requirements and the prerequisites for subjects/modules.
- In addition to meeting the admission requirements, it may be expected from candidates to write the **TOEFL, IELTS or SAT,** if required.
- Candidates must have completed the National Senior Certificate with admission to degree studies or a certificate of conditional exemption on the basis of a candidate's foreign qualifications, the so-called "Immigrant" or "Foreign Conditional Exemption". The only condition for the "Foreign Conditional Exemption" that is accepted is: 'completion of the degree course'. The exemption certificate is obtainable from Universities South Africa (USAf). Detailed information is available on the website at click here.

University of Pretoria website: click here

Minimum requirements Achievement level				
English Home Language or English First Additional Language		Mathematics		APS
NSC/IEB	AS Level	NSC/IEB	AS Level	
5	C	5	C	**30**

* Cambridge A level candidates who obtained at least a D in the required subjects, will be considered for admission.

* International Baccalaureate (IB) HL candidates who obtained at least a 4 in the required subjects, will be considered for admission.

Additional requirements

Please note that additional admission requirements may result from certain electives.

Candidates who do not comply with these requirements are advised to register for BSc IT, depending on whether they comply with the admission requirements the programme.

Promotion to next study year

General

a. A student must pass all the modules of the first year of study, before he or she is permitted to register for any module of the third year of study. Module prerequisites remain applicable. Exceptions to this rule will be considered by the relevant head of department and the Dean.
b. A student must pass all the modules of the second year of study, before he or she is permitted to register for any module of the fourth year of study (in the case of a four-year degree). Module prerequisites remain applicable. Exceptions to this rule will be considered by the relevant head of department and the Dean.
c. A new first-year student, who has failed in all the prescribed modules of the programme at the end of the first semester, will not be permitted to proceed to the second semester in the School of Information Technology.
d. A student who has not passed at least 70% of the credits of the current year of study after the November examinations will not be re-admitted to the School of Information Technology.
e. Students who fail a module for a second time, forfeit the privilege of registering for any modules of an advanced year of study.
f. Students whose academic progress is not acceptable can be suspended from further studies.

Procedure: Exclusion from and re-admission to further studies in the School of Information Technology

a. A student who is excluded from further studies in terms of the stipulations of the abovementioned regulations will be notified in writing by the Dean or admissions committee of the School of Information Technology at the end of the relevant semester.
b. A student who has been excluded from further studies may apply in writing to the admissions committee of the School of Information Technology on level 6 in the Engineering building I for re-admission.
c. Written applications for re-admission to the second semester must be submitted at least 7 days before lectures resume for the second semester.
d. Written applications for re-admission to the new academic year must be submitted before 12 January.
e. Late applications will be accepted only in exceptional circumstances after approval by the Dean.
f. Should a student not be re-admitted to further studies by the admissions committee of the School of Information Technology, he/she will be informed in writing.
g. A student who is not re-admitted by the admissions committee of the School of Information Technology has the right to appeal to the Appeals Committee: Admissions in the Administration building, room 3-13.
h. Any decision taken by the Appeals Committee: Admissions is final.
i. Should the student be re-admitted by the Admissions Committee, strict conditions will be set which the student must comply with in order to proceed with his/her studies.
j. A student, who is repeating his or her year, may be permitted by the Dean, on recommendation of the relevant head(s) of department, to register for modules of the following year of study in addition to the outstanding modules he or she has failed, providing that he or she complies with the prerequisites of these modules and no timetable clashes occur. In no semester may the total credits for which a student registers, exceed the normal number of credits per semester by more than 16 credits, except with special permission from the relevant head of department.

Pass with distinction

A degree (undergraduate) in the School of IT is conferred with distinction on a student who did not repeat any module of his/her final year, obtained a weighted average of at least 75% in all the prescribed modules for the final year, provided that a subminimum of 65% is obtained in each of these modules and provided that the degree is completed in the prescribed minimum period of time. Ad hoc cases will be considered by the Dean, in consultation with the relevant head of department.

Curriculum: Year 1

Minimum credits: 174

Students wishing to continue with Mathematics or Mathematical Statistics on year level 2 or 3 need to take WTW 114, WTW 124 and WTW 162. Students not wishing to continue with Mathematics or Mathematical Statistics on year level 2 or 3, need to take WTW 152, WTW 134, WTW 146 and WTW 148.

Students are required to choose a science elective as part of the BSc Computer Science first year. The choice is dependent on the Grade 12 Physical Science results. A student who achieved a level 5 in Physical Science in Grade 12 may choose between Physics (PHY 114 and PHY 124) and Chemistry (CMY 117 and CMY 127). A level 4 in Physical Science allows the student to choose Biological Science (MLB 111, BOT 161 and MBY 161) and Geology (GLY 155 and GLY 163). A student who does not have Physical Science in Grade 12 has a choice between Physics (PHY 131 and SCI 154) and Geography (ENV 101, GGY 156, GGY 168 and GMC 110).

Students have a choice between Mathematical Statistics (WST 111 and WST 121), Statistics (STK 110 and STK 120) and (STK 110 and STC 122) for the Data Science option to fulfil the statistics requirement for the degree programme.

Fundamental modules

Academic information management 111 (AIM 111) - Credits: 4.00
Academic information management 121 (AIM 121) - Credits: 4.00
Academic literacy for Information Technology 121 (ALL 121) - Credits: 6.00
Academic orientation 112 (UPO 112) - Credits: 0.00

Core modules

Program design: Introduction 110 (COS 110) - Credits: 16.00
Operating systems 122 (COS 122) - Credits: 16.00
Imperative programming 132 (COS 132) - Credits: 16.00
Introduction to computer science 151 (COS 151) - Credits: 8.00
Calculus 114 (WTW 114) - Credits: 16.00
Discrete structures 115 (WTW 115) - Credits: 8.00
Mathematics 124 (WTW 124) - Credits: 16.00
Mathematics 134 (WTW 134) - Credits: 16.00
Linear algebra 146 (WTW 146) - Credits: 8.00
Calculus 148 (WTW 148) - Credits: 8.00
Mathematical modelling 152 (WTW 152) - Credits: 8.00
Dynamical processes 162 (WTW 162) - Credits: 8.00

Elective modules

Plants and society 161 (BOT 161) - Credits: 8.00
General chemistry 117 (CMY 117) - Credits: 16.00
General chemistry 127 (CMY 127) - Credits: 16.00
Introduction to environmental sciences 101 (ENV 101) - Credits: 8.00
Aspects of human geography 156 (GGY 156) - Credits: 8.00
Introduction to physical geography 168 (GGY 168) - Credits: 12.00
Introduction to geology 155 (GLY 155) - Credits: 16.00
Earth history 163 (GLY 163) - Credits: 16.00

Cartography 110 (GMC 110) - Credits: 10.00
Introduction to microbiology 161 (MBY 161) - Credits: 8.00
Molecular and cell biology 111 (MLB 111) - Credits: 16.00
First course in physics 114 (PHY 114) - Credits: 16.00
First course in physics 124 (PHY 124) - Credits: 16.00
Physics for biology students 131 (PHY 131) - Credits: 16.00
Exploring the universe 154 (SCI 154) - Credits: 16.00
Statistics 122 (STC 122) - Credits: 13.00
Statistics 110 (STK 110) - Credits: 13.00
Statistics 120 (STK 120) - Credits: 13.00
Mathematical statistics 111 (WST 111) - Credits: 16.00
Mathematical statistics 121 (WST 121) - Credits: 16.00

Curriculum: Year 2

Minimum credits: 124

Students have a choice of electives (45 credits) from Computer Science (COS 314, COS 344 and COS 326); Information Science (IMY 310 and IMY 320); Data Science ((STK 210, STK 220 and WST 212) or (WST 211, WST 221 and WST 212) at year-level 2 depending on year level 1 Statistics choice) and (STK 353 and COS 314 at year level 3), Mathematics; Mathematical Statistics or Statistics; Physics and Chemistry. The module choices for Mathematics, Mathematical Statistics or Statistics, Physics and Chemistry must be done in consultation with the programme organiser and may require second year elective modules to be included in the degree programme.

Fundamental modules
Community-based project 202 (JCP 202) - Credits: 8.00

Core modules
Theoretical computer science 210 (COS 210) - Credits: 8.00
Data structures and algorithms 212 (COS 212) - Credits: 16.00
Software modelling 214 (COS 214) - Credits: 16.00
Netcentric computer systems 216 (COS 216) - Credits: 16.00
Introduction to database systems 221 (COS 221) - Credits: 16.00
Concurrent systems 226 (COS 226) - Credits: 16.00
Computer organisation and architecture 284 (COS 284) - Credits: 16.00
Discrete structures 285 (WTW 285) - Credits: 12.00

Elective modules
Physical chemistry 282 (CMY 282) - Credits: 12.00
Analytical chemistry 283 (CMY 283) - Credits: 12.00
Organic chemistry 284 (CMY 284) - Credits: 12.00
Inorganic chemistry 285 (CMY 285) - Credits: 12.00
Information science 210 (INL 210) - Credits: 20.00
Information science 220 (INL 220) - Credits: 20.00
Information science 260 (INL 260) - Credits: 20.00
Information science 270 (INL 270) - Credits: 20.00
Waves, thermodynamics and modern physics 255 (PHY 255) - Credits: 24.00
General physics 263 (PHY 263) - Credits: 24.00
Statistics 210 (STK 210) - Credits: 20.00
Statistics 220 (STK 220) - Credits: 20.00
Mathematical statistics 211 (WST 211) - Credits: 24.00
Applications in data science 212 (WST 212) - Credits: 12.00
Mathematical statistics 221 (WST 221) - Credits: 24.00
Linear algebra 211 (WTW 211) - Credits: 12.00
Calculus 218 (WTW 218) - Credits: 12.00
Linear algebra 221 (WTW 221) - Credits: 12.00
Techniques of analysis 224 (WTW 224) - Credits: 12.00
Vector analysis 248 (WTW 248) - Credits: 12.00
Differential equations 286 (WTW 286) - Credits: 12.00

Curriculum: Final year

Minimum credits: 144

Students have a choice of electives (45 credits) from Computer Science (COS 314, COS 344 and COS 326); Information Science (IMY 310 and IMY 320); Data Science ((STK 210, STK 220 and WST 212) or (WST 211, ST 221 and WST 212) at year-level 2 depending on year level 1 Statistics choice) and (STK 353 and COS 314 at year level 3), Mathematics; Mathematical Statistics or Statistics; Physics and Chemistry. The module choices for Mathematics, Mathematical Statistics or Statistics, Physics and Chemistry must be done in consultation with the programme organiser and may require second year elective modules to be included in the degree programme.

Core modules

Software engineering 301 (COS 301) - Credits: 27.00
Computer security and ethics 330 (COS 330) - Credits: 18.00
Computer networks 332 (COS 332) - Credits: 18.00
Programming languages 333 (COS 333) - Credits: 18.00
Compiler construction 341 (COS 341) - Credits: 18.00

Elective modules

Physical chemistry 382 (CMY 382) - Credits: 18.00
Analytical chemistry 383 (CMY 383) - Credits: 18.00
Organic chemistry 384 (CMY 384) - Credits: 18.00
Artificial intelligence 314 (COS 314) - Credits: 18.00
Database systems 326 (COS 326) - Credits: 18.00
Computer graphics 344 (COS 344) - Credits: 18.00
Information science: Information organisation 310 (INL 310) - Credits: 30.00
Information science: Information and knowledge management 320 (INL 320) - Credits: 30.00
Information science: Digital repositories 340 (INL 340) - Credits: 30.00
Information science: Socio-political aspects of information in global context 360 (INL 360) - Credits: 30.00
Information science 370 (INL 370) - Credits: 15.00
Information science: Competitive intelligence 380 (INL 380) - Credits: 30.00
Electronics, electromagnetism and quantum mechanics 356 (PHY 356) - Credits: 36.00
Statistical mechanics, solid state physics and modelling 364 (PHY 364) - Credits: 36.00
The science of data analytics 353 (STK 353) - Credits: 25.00
Stochastic processes 312 (WST 312) - Credits: 18.00
Time-series analysis 321 (WST 321) - Credits: 18.00
Actuarial statistics 322 (WST 322) - Credits: 18.00
Financial engineering 354 (WTW 354) - Credits: 18.00
Algebra 381 (WTW 381) - Credits: 18.00
Numerical analysis 383 (WTW 383) - Credits: 18.00
Geometry 389 (WTW 389) - Credits: 18.00

The information published here is subject to change and may be amended after the publication of this information. The General Regulations (G Regulations) apply to all faculties of the University of Pretoria. It is expected of students to familiarise themselves well with these regulations as well as with the information contained in the General Rules section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.