

2026 PROSPECTUS

PART 6

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

ISSN 0258-7343

CONTACT DETAILS

At time of publication, the contact details were as follows:

Admission enquiries

Tel: 012 382 5750/5780

E-mail address: admission@tut.ac.za

Contact Centre

Tel: 086 1102 421/012 382 5533

E-mail address: general@tut.ac.za

Enquiries relating to fees:

The Chief Financial Officer

Private Bag X680

PRETORIA 0001

Tel: 086 1102 422/012 382 5505/4213

The Registrar

Private Bag X680

PRETORIA 0001

Tel: 012 382 5180

ARCADIA CAMPUS

Private Bag X680

PRETORIA 0001

Tel: 012 382 6377

175 Nelson Mandela Drive

PRETORIA

GPS: (25°44'41.83"S 28°12'0.19"E)

ARTS CAMPUS

Private Bag X680

PRETORIA 0001

Tel: 012 382 6177

Cnr. Du Toit and Edmund Streets

PRETORIA

GPS: (25°44'26.16"S 28°11'45.99"E)

EMALAHLENI CAMPUS

The Campus Director

PO Box 3211

EMALAHLENI 1035

Tel: 012 382 3100/4/6

19 OR Tambo Street

EMALAHLENI

GPS: (25°52'44.40"S 29°14'09.89"E)

GA-RANKUWA CAMPUS

Private Bag X680

PRETORIA 0001

Tel: 012 382 0500/0840

2827, Zone 2, Botsi Street

GA-RANKUWA

GPS: (25°37'05.92"S 28°00'08.31"E)

MBOMBELA CAMPUS

The Campus Director

Private Bag X11312

MBOMBELA 1200

Tel: 012 382 3500/3621

Madiba Drive

MBOMBELA

GPS: (25°30'01.11"S 30°57'17.03"E)

POLOKWANE CAMPUS

The Campus Director

Private Bag X9496

POLOKWANE 0700

Tel: 012 382 0700

Cnr. Market and Excelsior Streets

POLOKWANE

GPS: (23°54'50.81"S 29°26'58.94"E)

PRETORIA CAMPUS

Private Bag X680

PRETORIA 0001

Tel: 012 382 5911

Staatsartillerie Road

PRETORIA WEST

GPS: (25°43'53.55"S 28°09'40.38"E)

SOSHANGUVE CAMPUS

Private Bag X680

PRETORIA 0001

Tel: 012 382 9000

2 Aubrey Matlala Road, Block K

SOSHANGUVE

GPS: (25°32'26.88"S 28°05'46.16"E)

PARTS OF THE PROSPECTUS

| | |
|--|---------------|
| Students' Rules and Regulations | Part 1 |
| Faculty of Arts and Design | Part 2 |
| Faculty of Economics and Finance | Part 3 |
| Faculty of Engineering and the Built Environment | Part 4 |
| Faculty of Humanities | Part 5 |
| Faculty of Information and Communication Technology | Part 6 |
| Faculty of Management Sciences | Part 7 |
| Faculty of Science | Part 8 |
| Students' Rules and Regulations: Student Fees | Part 9 |
| Tshwane School for Business and Society | Part 10 |

Please Note:

1. Although the information in this Prospectus has been compiled as accurately as possible, the Council accepts no responsibility for any inaccuracies in this publication. This Prospectus is valid for 2026 only.
2. Life Orientation and an achievement Level of 1 in a subject are not considered in the calculation of the Admission Point Score (APS).
3. Prospective students will not be admitted to any qualification without prior evaluation.
4. The indicated non-refundable administration fee and certified copies of the applicant's identity document, Senior Certificate/National Senior Certificate and all other relevant documents must accompany the completed application form or online application.
5. The closing dates for admissions are available on the University website.
6. A student must complete a qualification at the learning site where he/she was accepted and is registered. A transfer between sites will only be allowed if the student follows the following process:
 - A formal request must be submitted to the academic manager/Head of the Department on the current learning site before the second Friday in May (to be considered for transfer in July of the same year) or the second Friday in October (to be considered for a transfer in January of the following year). The request must contain the reasons for the transfer.
 - A committee will meet shortly after each of the closing dates for submissions to consider every request on merit, keeping in mind the availability of space and the adherence to enrolment quotas on respective learning sites. Students will be informed of the outcome.

Important:

TUT admission requirements for entry-level programmes adhere to national legislation, and therefore, the following are required:

- Bachelor's degrees: at least four subjects at performance level 4.
- Diplomas: at least four subjects at performance level 3.

Applicants must verify the specific requirements for each programme as indicated in the Prospectus.

ACCEPTANCE IS SUBJECT TO AVAILABLE CAPACITY ACCORDING TO THE STUDENT ENROLMENT PLAN (SEP)

Alternative and international qualifications (HIGSCE, IGCSE, NSSC A&O Level, IB Higher and Standard Level, etc.) are dealt with in a specific manner:

- While there is a legal imperative to submit the certificate of equivalence (issued by SAQA or the CHE), it is recommended that the application process be initiated while the application for the certificate is in process.
- The Tshwane University of Technology cannot obtain this certificate on the applicant's behalf.



CONVERSION OF ALTERNATIVE/EQUIVALENT RECOGNISED CERTIFICATES

The following table and accompanying information indicate how the University will evaluate the various certificates that may be offered as equivalent to the National Senior Certificate (SA). Where possible, the University will evaluate the listed qualifications as indicated. However, the University has the right to refer any application to the formal application processes through the Senate.

| APS | SC | | NSC | NC-V | HIGCSE | IGCSE/GCSE/ NSSC O-LEVEL | | A-LEVEL | IB-HL | IB-SL | SAT* |
|-----|----|----|----------------|---------------------------------------|--------|-----------------------------|-------|---------|-------|-------|--------|
| | HG | SG | | | | Gr 11 | Gr 12 | | | | |
| 10 | | | | | | | | A | 7 | | |
| 9 | | | | | | | | | | | |
| 8 | | | | | | | | B | 6 | | |
| 7 | A | | 7 (80 -100) | Outstanding competent (80-100%) | 1 | A | | C | 5 | 7 | 80-100 |
| 6 | B | A | 6 (70 -79) | 4-Highly competent (70-79%) | 2 | B | | D | 4 | 6 | 70-79 |
| 5 | C | B | 5 (60-69) | 3-Competent (60-69%) | 3 | C | A | E | 3 | 5 | 60-69 |
| 4 | D | C | 4 (50-59) | 3-Competent (50-59%) | | D | B | | 2 | 4 | 50-59 |
| 3 | E | D | 3 (40-49) | Not yet Competent (40-49%) | 4 | E | C | | 1 | 3 | 40-49 |
| 2 | F | E | 2 (30-39) | Not achieved (0-39%) | | F | D/E | | | 2 | 30-39 |
| 1 | | | 1 (0-29) | | | G | F/G | | | 1 | 0-29 |

NSC National Senior Certificate

NC-V National Certificate (Vocational)

IGCSE International General Certificate of Secondary Education

HIGCSE Higher International General Certificate of Secondary Education

SAT Senior Academic Test/Senior Academic Proficiency Test

NSSC Namibia Senior Secondary Certificate

O-LEVEL Ordinary level

A-LEVEL Advanced level

IB International Baccalaureate Schools (higher and standard levels)

Key to asterisks:

- * As from March 2005, a minimum score of 1500 is needed for admission to a Diploma, with a subminimum of not less than 460 for Critical Reading, Mathematics and Writing. In accordance with HESA requirements, a minimum score of 1600 is needed for admission to a degree, with a subminimum of not less than 500 for Critical Reading and Mathematics and 550 for Writing. The percentiles on the SAT certificate can be used to derive scores for Mathematics and English, as indicated in the table above. The student's college entrance certificate (such as the certificate issued by the ACE School of Tomorrow) or individual SAT subject tests should be used for the scores of any other subjects required.

RECOGNITION OF PRIOR LEARNING, EQUIVALENCE AND STATUS

Candidates may also apply at the Office of the Registrar for Recognition of Prior Learning (RPL) or for admission via the Senate's discretionary route. The specific relevant documentation will be requested from these applicants, and these cases will be handled on an individual basis. Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

CONTENTS

| | |
|---|-----------|
| INFORMATION PERTAINING TO THE EXECUTIVE DEAN'S OFFICE | 6 |
| SECTION A: DEPARTMENTS AND QUALIFICATIONS..... | 7 |
| 1. DEPARTMENT OF COMPUTER SCIENCE..... | 7 |
| 1.1 DIPLOMA IN COMPUTER SCIENCE | 7 |
| 1.2 DIPLOMA IN COMPUTER SCIENCE (Extended curriculum programme with foundation provision)..... | 11 |
| 1.3 ADVANCED DIPLOMA IN COMPUTER SCIENCE | 14 |
| 1.4 POSTGRADUATE DIPLOMA IN COMPUTER SCIENCE | 16 |
| 1.5 DIPLOMA IN MULTIMEDIA COMPUTING..... | 18 |
| 1.6 DIPLOMA IN MULTIMEDIA COMPUTING (Extended curriculum programme with foundation provision)..... | 21 |
| 1.7 ADVANCED DIPLOMA IN MULTIMEDIA COMPUTING | 25 |
| 1.8 POSTGRADUATE DIPLOMA IN MULTIMEDIA COMPUTING | 26 |
| 1.9 MASTER OF COMPUTING | 28 |
| 1.10 DOCTOR OF COMPUTING | 29 |
| 2. DEPARTMENT OF COMPUTER SYSTEMS ENGINEERING..... | 31 |
| INFORMATION PERTAINING TO THE PROGRAMMES OFFERED IN THE DEPARTMENT OF COMPUTER SYSTEMS ENGINEERING | 31 |
| 2.1 DIPLOMA IN COMPUTER SYSTEMS ENGINEERING | 36 |
| 2.2 DIPLOMA IN COMPUTER SYSTEMS ENGINEERING (Extended curriculum programme with foundation provision)..... | 40 |
| 2.3 ADVANCED DIPLOMA IN COMPUTER SYSTEMS ENGINEERING..... | 44 |
| 2.4 POSTGRADUATE DIPLOMA IN COMPUTER SYSTEMS ENGINEERING | 46 |
| 2.5 MASTER OF COMPUTING | 48 |
| 2.6 DOCTOR OF COMPUTING | 49 |
| 3. DEPARTMENT OF INFORMATICS..... | 50 |
| 3.1 DIPLOMA IN INFORMATICS..... | 50 |
| 3.2 DIPLOMA IN INFORMATICS (Extended curriculum programme with foundation provision)..... | 53 |
| 3.3 ADVANCED DIPLOMA IN INFORMATICS | 57 |
| 3.4 POSTGRADUATE DIPLOMA IN INFORMATICS | 58 |
| 3.5 MASTER OF COMPUTING | 60 |
| 3.6 DOCTOR OF COMPUTING | 61 |
| 4. DEPARTMENT OF INFORMATION TECHNOLOGY | 62 |
| 4.1 DIPLOMA IN INFORMATION TECHNOLOGY | 62 |
| 4.2 DIPLOMA IN INFORMATION TECHNOLOGY (Extended curriculum programme with foundation provision)..... | 65 |
| 4.3 ADVANCED DIPLOMA IN INFORMATION TECHNOLOGY..... | 69 |
| 4.4 POSTGRADUATE DIPLOMA IN INFORMATION TECHNOLOGY | 71 |
| 4.5 MASTER OF COMPUTING | 73 |
| 4.6 DOCTOR OF COMPUTING | 74 |
| SECTION B: MODULE INFORMATION (OVERVIEW OF SYLLABUS)..... | 76 |



FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

At the time of publication, the information was as follows:

| | |
|--|--|
| Executive Dean: | Dr EA van Wyk - BSc (Hons) (Computer Science) (Unisa), M Tech (Information Technology) (Tech Pta), PhD (Information Systems) (Unisa) |
| Assistant Dean (Industry Liaison, Special Projects, and WIL) | Prof PA Owolawi - PhD (Electronics Engineering) (UKZN) |
| Assistant Dean (Postgraduate Studies, Research and Innovation) | Dr AB Pretorius - BSc (Hons) (Information Systems) (Unisa), MBL (Unisa), D Tech (Business Information Systems) (TUT) |
| Assistant Dean (Teaching, Learning and Technology): | Dr MN Moeti - BSc (Hons) Computer Science (UL), M Tech (Business Information Systems) (TUT), DComputing (TUT) |
| Faculty Administrator: | Ms LJ Mafora |
| Telephone number: | 012 382-9230 |
| E-mail address: | maforalj@tut.ac.za |
| Office: | Building 12, Room 178E, Soshanguve South Campus |
| Assistant Registrar: | S Mokgatlhe |
| Office: | Building 7G, Room 11, Soshanguve South Campus |

VISION

To be a quality-driven locally relevant and internationally comparable university of technology ICT faculty at the cutting edge of ICT innovation.

MISSION

- Offering a portfolio of locally relevant, internationally recognised and career-focused ICT programmes.
- Producing well rounded ICT graduates who are attuned to the needs of the economy.
- Being an ICT research and innovation hub responsive to the national, regional and global challenges.
- Acting as an incubator for ICT postgraduate study in clearly defined areas of strength.
- Generating, integrating and applying ICT knowledge to stimulate socio-economic development.
- Partnering communities in ICT-enabled sustainable development.
- Being student-centred and quality-driven in all our endeavours.



SECTION A: DEPARTMENTS AND QUALIFICATIONS

1. DEPARTMENT OF COMPUTER SCIENCE

1.1 DIPLOMA IN COMPUTER SCIENCE

Dip (Computer Science) - NQF Level 6 (360 credits)

Qualification code: DPRS20

SAQA ID: 109017, CHE NUMBER: H/H16/E089CAN

Campus where offered: Soshanguve South, eMalahleni and Polokwane campuses

REMARKS

a. *Admission requirement(s) and selection criteria:*

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

• **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):

A Senior Certificate or an equivalent qualification with an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

Recommended subjects:

Computer Science and Physical Science.

Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26**. Applicants with a score of **23** will be considered for the extended programme. Applicants will be notified to make an appointment with the departmental secretary for the interview or test. This rule applies to all applicants, as well as to applicants who are already registered at other institutions.

• **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language) and 5 for Mathematics or Technical Mathematics or 7 for Mathematical Literacy.



Recommended subjects:

Information Technology.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26** (with Mathematics or Technical Mathematics) or **28** (with Mathematical Literacy). Applicants with a score of **23** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

Assessment procedure(s):

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% (APS of 4) for English (first additional language) and 60% for Mathematics or 80% (APS of 7) for Mathematical Literacy, and 50% for Life Orientation (excluded for APS calculation), and 50% (APS of 4) for any other three compulsory vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26** (with Mathematics) or **28** (with Mathematical Literacy). Applicants with a score of **23** (with Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

Assessment procedure(s):

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3 (NQF Level 4), with at least 50% for English (APS of 4) and 60% for Mathematics N3 (APS of 5).

- b. *Recognition of Prior Learning (RPL), equivalence and status:*
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- c. *Intake for the qualification:*
January only.
- d. *Presentation:*
Day classes. Classes and assessments take place during the week and on Saturdays.
- e. *Minimum duration:*
Three years.
- f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- g. *Work-Integrated Learning:*
See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. *Transfer between Learning Sites:*

A student must complete a qualification at the learning site where he/she was accepted and is registered. A transfer between sites will only be considered if the student follows the following process: A formal request must be submitted to the Academic manager/Head of the Department on the current learning site by the second Friday in October (to be considered for a transfer in January of the following year). The request must contain the reasons for the transfer.

i. *Personal equipment:*

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

FIRST YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|--|-------|--------|------------------------|
| 16P105X | Communication for Academic Purposes | (5) | (10) | |
| INF125D | Information Literacy (<i>block module</i>) | (5) | (3) | |
| LFS125X | Life Skills (<i>block module</i>) | (5) | (2) | |

FIRST SEMESTER

| | | | |
|---------|--|-----|------|
| CFA115D | Computing Fundamentals A | (5) | (15) |
| COH115D | Computational Mathematics | (5) | (15) |
| PPA115D | Principles of Programming A (<i>first- or second-semester module</i>) | (5) | (15) |

SECOND SEMESTER

| | | | | |
|---------|--|-----|------|-----------------------------|
| CFB115D | Computing Fundamentals B | (5) | (15) | Computing Fundamentals A |
| DCT115D | Discrete Structures | (5) | (15) | Computational Mathematics |
| PPB115D | Principles of Programming B (<i>first- or second-semester module</i>) | (5) | (15) | Principles of Programming A |
| WEB115D | Web Computing | (5) | (15) | Principles of Programming A |

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------|--|-------|--------|-----------------------------|
| FIRST SEMESTER | | | | |
| ADS216D | Advanced Discrete Structures | (6) | (15) | Discrete Structures |
| CAO216D | Computer Architecture and Organisation | (6) | (15) | |
| DTP216D | Database Principles | (6) | (15) | Principles of Programming B |
| OOP216D | Object-Oriented Programming | (6) | (15) | |

SECOND SEMESTER

| | | | | |
|---------|--------------------------------------|-----|------|-----------------------------|
| AOP216D | Advanced Object-Oriented Programming | (6) | (15) | Object-Oriented Programming |
|---------|--------------------------------------|-----|------|-----------------------------|



| | | | |
|---------|-----------------------------------|-----|------|
| ISC216D | Information Security | (6) | (15) |
| ORS216D | Operating Systems | (6) | (15) |
| SEF216D | Software Engineering Fundamentals | (6) | (15) |

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|----------------------|-----|------|--------------------------------------|
| INT316D | Internet Programming | (6) | (15) | Advanced Object-Oriented Programming |
| MOB316D | Mobile Computing | (6) | (15) | Advanced Object-Oriented Programming |
| SWP316D | Software Project | (6) | (15) | Advanced Object-Oriented Programming |

plus one of the following electives:

| | | | | |
|---------|---|-----|------|---------------------|
| DBP316D | Database Programming | (6) | (15) | Database Principles |
| DIS316D | Distributed Systems (module not currently offered) | (6) | (15) | |
| WEM316D | Web Server Management (module not currently offered) | (6) | (15) | |

SECOND SEMESTER

| | | | | |
|---------|--------------------------|-----|------|--|
| WOC316D | Work-Integrated Learning | (6) | (60) | Internet Programming Mobile Computing Software Project Web Server Management or Database Programming or Distributed Systems |
|---------|--------------------------|-----|------|--|

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**



1.2 DIPLOMA IN COMPUTER SCIENCE (Extended curriculum programme with foundation provision) Dip (Computer Science) - NQF Level 6 (360 credits) Qualification code: DPRSF0

SAQA ID: 109017, CHE NUMBER: H/H16/E089CAN

Campus where offered: Soshanguve South, eMalahleni and Polokwane campuses

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

• **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):

A Senior Certificate or an equivalent qualification with an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

Recommended subjects:

Computer Science and Physical Science.

Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23**. Applicants will be notified to make an appointment with the departmental secretary for the interview or test. This rule applies to all applicants, as well as to applicants who are already registered at other institutions.

• **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language) and 4 for Mathematics or Technical Mathematics or 6 for Mathematical Literacy.

Recommended subjects:

Information Technology.



Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

Assessment procedure(s):

Applicants who achieve the minimum APS of **23** will be considered. Applicants with a score of **21** (with Mathematics or Technical Mathematics) or **24** (with Mathematical Literacy) will be added to a waiting list.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 40% (APS of 3) for English (first additional language) and 50% for Mathematics (APS of 4) or 70% for Mathematical Literacy (APS of 6) and 50% for Life Orientation (excluded for APS calculation) and 50% (APS of 4) for any other three compulsory vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (with Mathematics) or **25** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

Assessment procedure(s):

Applicants who achieve the minimum APS of **23** will be considered. Applicants with a score of **21** (with Mathematics) or **24** (with Mathematical Literacy) will be added to a waiting list.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3 (NQF Level 4), with at least 40% (APS of 3) for English and 50% (APS of 4) for Mathematics N3.

- b. *Recognition of Prior Learning (RPL), equivalence and status:*
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- c. *Intake for the qualification:*
January only.
- d. *Presentation:*
Day classes. Classes and assessments take place during the week and on Saturdays.
- e. *Minimum duration:*
Four years.
- f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- g. *Work-Integrated Learning:*
See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).
- h. *Transfer between Learning Sites:*
A student must complete a qualification at the learning site where he/she was accepted and is registered. A transfer between sites will only be considered if the student follows the following process: A formal request must be submitted to the Academic manager/Head of the Department on the current learning site by the second Friday in October (to be considered for a transfer in January of the following year). The request must contain the reasons for the transfer.

i. *Personal equipment:*

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

FIRST YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------------------|--|-------|--------|------------------------|
| CAPF05X | Communication for Academic Purposes | (5) | (10) | |
| CFAF05D | Computing Fundamentals A | (5) | (15) | |
| COHF05D | Computational Mathematics | (5) | (15) | |
| INFF25D | Information Literacy (<i>block module</i>) | (5) | (3) | |
| LFS125X | Life Skills (<i>block module</i>) | (5) | (2) | |
| PPAF05D | Principles of Programming A | (5) | (15) | |
| TOTAL CREDITS FOR THE FIRST YEAR: | | | 60 | |

SECOND YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------------------------------------|--|-------|--------|-----------------------------|
| FIRST SEMESTER | | | | |
| CBBF15D | Computing Fundamentals B | (5) | (15) | Computing Fundamentals A |
| WEBF15D | Web Computing | (5) | (15) | Principles of Programming A |
| SECOND SEMESTER | | | | |
| DCTF15D | Discrete Structures | (5) | (15) | Computational Mathematics |
| PPBF15D | Principles of Programming B (<i>first- or second-semester module</i>) | (5) | (15) | Principles of Programming A |
| TOTAL CREDITS FOR THE SECOND YEAR: | | | 60 | |

THIRD YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------------------------|--|-------|--------|-----------------------------|
| FIRST SEMESTER | | | | |
| ADS216D | Advanced Discrete Structures | (6) | (15) | Discrete Structures |
| CAO216D | Computer Architecture and Organisation | (6) | (15) | |
| DTP216D | Database Principles | (6) | (15) | |
| OOP216D | Object-Oriented Programming | (6) | (15) | Principles of Programming B |
| SECOND SEMESTER | | | | |
| AOP216D | Advanced Object-Oriented Programming | (6) | (15) | Object-Oriented Programming |
| ISC216D | Information Security | (6) | (15) | |
| ORS216D | Operating Systems | (6) | (15) | |



| | | | |
|---------|-----------------------------------|-----|------|
| SEF216D | Software Engineering Fundamentals | (6) | (15) |
|---------|-----------------------------------|-----|------|

| | |
|-----------------------------------|-----|
| TOTAL CREDITS FOR THE THIRD YEAR: | 120 |
|-----------------------------------|-----|

FOURTH YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|----------------------|-----|------|--------------------------------------|
| INT316D | Internet Programming | (6) | (15) | Advanced Object-Oriented Programming |
| MOB316D | Mobile Computing | (6) | (15) | Advanced Object-Oriented Programming |
| SWP316D | Software Project | (6) | (15) | Advanced Object-Oriented Programming |

plus one of the following electives:

| | | | | |
|---------|---|-----|------|---------------------|
| DBP316D | Database Programming | (6) | (15) | Database Principles |
| DIS316D | Distributed Systems (module not currently offered) | (6) | (15) | |
| WEM316D | Web Server Management (module not currently offered) | (6) | (15) | |

SECOND SEMESTER

| | | | | |
|---------|--------------------------|-----|------|--|
| WOC316D | Work-Integrated Learning | (6) | (60) | Internet Programming Mobile Computing Software Project Web Server Management or Database Programming or Distributed Systems |
|---------|--------------------------|-----|------|--|

| | |
|------------------------------------|-----|
| TOTAL CREDITS FOR THE FOURTH YEAR: | 120 |
|------------------------------------|-----|

| | |
|--------------------------------------|-----|
| TOTAL CREDITS FOR THE QUALIFICATION: | 360 |
|--------------------------------------|-----|

1.3 ADVANCED DIPLOMA IN COMPUTER SCIENCE

AdvDip (Computer Science) - NQF Level 7 (120 credits)

Qualification code: ADRS20

SAQA ID: 115935, CHE NUMBER: H/H16/E167CAN

| | |
|-----------------------|---|
| Campus where offered: | Soshanguve South, eMalahleni and Polokwane campuses |
|-----------------------|---|

REMARKS

a. Admission requirement(s):

A National Diploma: Information Technology in the field of Technical Applications, or Software Development, or Web Application Development, **or** a Diploma in Computer Science, **or** a relevant bachelor's degree, **or** an equivalent qualification in Computer Science or Software Engineering at NQF Level 6 with a minimum of 360 credits. Prospective students are required to have knowledge of advanced JAVA programming.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in their previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Day classes offered on Saturdays over a period of two years.

f. Minimum duration:

A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Re-registration:

The option to re-register for Integrated Software Project is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.

i. Transfer between Learning Sites:

A student must complete a qualification at the learning site where he/she was accepted and is registered. A transfer between sites will only be considered if the student follows the following process: A formal request must be submitted to the Academic manager/Head of the Department on the current learning site by the second Friday in October (to be considered for a transfer in January of the following year). The request must contain the reasons for the transfer.

j. Personal equipment:

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|---|-------|--------|---|
| ISJ107V | Integrated Software Project | (7) | (15) | Data Structures and Algorithms Distributed Programming |
| ISJ117R | Integrated Software Project (re-registration) (<i>first- or second-semester module, see paragraph h</i>) | (7) | (0) | |



FIRST SEMESTER

| | | | | |
|---------|--------------------------------|-----|------|-------------------------|
| DTD117V | Data Structures and Algorithms | (7) | (15) | Distributed Programming |
| HMD117V | Human Computer Interaction | (7) | (15) | |
| SEC117V | Service-Oriented Computing | (7) | (15) | |
| SFG117V | Software Engineering | (7) | (15) | |

SECOND SEMESTER

| | | | |
|---------|------------------------------|-----|------|
| DSD117V | Distributed Programming | (7) | (15) |
| IDA117V | Introduction to Data Science | (7) | (15) |
| TCR117V | Theoretical Computer Science | (7) | (15) |

TOTAL CREDITS FOR THE QUALIFICATION: **120**

1.4 POSTGRADUATE DIPLOMA IN COMPUTER SCIENCE

PGDip (Computer Science) - NQF Level 8 (120 credits)

Qualification code: PDRS21

SAQA ID: 111271, CHE NUMBER: H/H16/E186CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

An Advanced Diploma in Computer Science, **or** a Baccalaureus Technologiae: Information Technology in the field of Software Development or Technical Applications or Web and Application Development, **or** a Bachelor's degree in Computer Science, **or** an equivalent qualification at NQF Level 7 with a minimum of 120 credits. Preference will be given to candidates who obtained an average of 60% in their previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is based on a personal interview with a departmental selection panel. Candidates are evaluated based on their previous qualification obtained and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Day classes offered on Saturdays over a period of two years.

f. Duration:

A minimum of one or two years (depending on the programme presentation).

- g. **Exclusion and readmission:**
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- h. **Re-registration:**
The option to re-register for the Research Project is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.
- i. **Personal equipment:**
Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULES) |
|---------|--|-------|--------|------------------------|
| RRS108G | Research Project | (8) | (30) | Research Methodologies |
| RRS118R | Research Project (re-registration) (semester module, see paragraph h) | (8) | (0) | |

FIRST SEMESTER

| | | | |
|---------|---------------------------|-----|------|
| MSI118G | Modelling and Simulations | (8) | (15) |
| RMR118G | Research Methodologies | (8) | (15) |

SECOND SEMESTER

| | | | |
|---------|-------------------------------------|-----|------|
| DSC118G | Data Science and Big Data Analytics | (8) | (15) |
|---------|-------------------------------------|-----|------|

plus three of the following electives:

FIRST SEMESTER

| | | | |
|---------|--------------------------|-----|------|
| NTT118G | New Technological Trends | (8) | (15) |
| OEN118G | Ontology Engineering | (8) | (15) |

SECOND SEMESTER

| | | | |
|---------|-----------------------------|-----|------|
| ACX118G | Algorithms and Complexity | (8) | (15) |
| FRD118G | Formal Aspects of Computing | (8) | (15) |

TOTAL CREDITS FOR THE QUALIFICATION: **120**



1.5 DIPLOMA IN MULTIMEDIA COMPUTING

Dip (Multimedia Computing) - NQF Level 6 (360 credits)

Qualification code: DPMC20

SAQA ID: 111914, CHE NUMBER: H/H16/E090CAN

Campus where offered:

Soshanguve South Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

• **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):

A Senior Certificate or an equivalent qualification with an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

Recommended subjects:

Computer Science and Physical Science.

Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26**. Applicants with a score of **23** will be considered for the extended programme. Applicants will be notified to make an appointment with the departmental secretary for the interview or test. This rule applies to all applicants, as well as to applicants who are already registered at other institutions.

• **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 5 for Mathematics or Technical Mathematics or 7 for Mathematical Literacy.

Recommended subjects:

Information Technology.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26** (with Mathematics or Technical Mathematics) or **28** (with Mathematical Literacy). Applicants with a score of **23** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

Assessment procedure(s):

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% (APS of 4) for English (first additional language) and 60% for Mathematics (APS of 5) or 80% for Mathematical Literacy (APS of 7) and 50% for Life Orientation (excluded for APS calculation), and 50% (APS of 4) for any other three compulsory vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26** (with Mathematics) or **28** (with Mathematical Literacy). Applicants with a score of **23** (with Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

Assessment procedure(s):

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3 (NQF Level 4), with at least 50% for English (APS of 4) and 60% for Mathematics N3 (APS of 5).

- b. *Recognition of Prior Learning (RPL), equivalence and status:*

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

- c. *Intake for the qualification:*

January only.

- d. *Presentation:*

Day classes. Classes and assessments take place during the week and on Saturdays.

- e. *Minimum duration:*

Three years.

- f. *Exclusion and readmission:*

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

- g. *WIL (Work-Integrated Learning):*

See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).



h. *Personal equipment:*

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

FIRST YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|--|-------|--------|------------------------|
| 16P105X | Communication for Academic Purposes | (5) | (10) | |
| INF125D | Information Literacy (<i>block module</i>) | (5) | (3) | |
| LFS125X | Life Skills (<i>block module</i>) | (5) | (2) | |

FIRST SEMESTER

| | | | |
|---------|--|-----|------|
| CFA115D | Computing Fundamentals A | (5) | (15) |
| COH115D | Computational Mathematics | (5) | (15) |
| PPA115D | Principles of Programming A (<i>first- or second-semester module</i>) | (5) | (15) |

SECOND SEMESTER

| | | | | |
|---------|--|-----|------|-----------------------------|
| CFB115D | Computing Fundamentals B | (5) | (15) | Computing Fundamentals A |
| DCT115D | Discrete Structures | (5) | (15) | Computational Mathematics |
| PPB115D | Principles of Programming B (<i>first- or second-semester module</i>) | (5) | (15) | Principles of Programming A |
| WEB115D | Web Computing | (5) | (15) | Principles of Programming A |

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|-----------------------------|-------|--------|-----------------------------|
| DTP216D | Database Principles | (6) | (15) | |
| MTE216D | Multimedia Technology | (6) | (15) | |
| OOP216D | Object-Oriented Programming | (6) | (15) | Principles of Programming B |
| TMO216D | 3D Modelling | (6) | (15) | |

SECOND SEMESTER

| | | | | |
|---------|--------------------------------------|-----|------|-----------------------------|
| AOP216D | Advanced Object-Oriented Programming | (6) | (15) | Object-Oriented Programming |
| GMP216D | Games Programming | (6) | (15) | Object-Oriented Programming |
| MUA216D | Multimedia Applications | (6) | (15) | |
| TAN216D | 3D Animation | (6) | (15) | 3D Modelling |

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|--------------------------------------|------------------------------------|-------|--------|---|
| FIRST SEMESTER | | | | |
| IVE316D | Interactive Virtual Environments | (6) | (15) | Games Programming 3D Animation |
| MGV316D | Motion Graphics and Visual Effects | (6) | (15) | |
| MMD316D | Multimedia for Mobile Devices | (6) | (15) | Advanced Object-Oriented Programming |
| SOD316D | Sound Design | (6) | (15) | |
| SECOND SEMESTER | | | | |
| WCM316D | WIL | (6) | (60) | Interactive Virtual Environments Motion Graphics and Visual Effects Multimedia for Mobile Devices Sound Design |
| TOTAL CREDITS FOR THE THIRD YEAR: | | | 120 | |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 360 | |

1.6 DIPLOMA IN MULTIMEDIA COMPUTING

(Extended curriculum programme with foundation provision)

Dip (Multimedia Computing) - NQF Level 6 (360 credits)

Qualification code: DPMCFO

SAQA ID: 111914, CHE NUMBER: H/H16/E090CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

• FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:

Admission requirement(s):

A Senior Certificate or an equivalent qualification with an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

Recommended subjects:

Computer Science and Physical Science.



Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23**. Applicants will be notified to make an appointment with the departmental secretary for the interview or test. This rule applies to all applicants, as well as to applicants who are already registered at other institutions.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language), 4 for Mathematics or Technical Mathematics or 6 for Mathematical Literacy.

Recommended subjects:

Information Technology.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

Assessment procedure(s):

Applicants who achieve the minimum APS of **23** will be considered. Applicants with a score of **21** (with Mathematics or Technical Mathematics) or **24** (with Mathematical Literacy) will be added to a waiting list.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 40% (APS of 3) for English (first additional language) and 50% for Mathematics (APS of 4) or 70% for Mathematical Literacy (APS of 6) and 50% for Life Orientation (excluded for APS calculation) and 50% (APS of 4) for any other three compulsory vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (with Mathematics) or **25** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

Assessment procedure(s):

Applicants who achieve the minimum APS of **23** will be considered. Applicants with a score of **21** (with Mathematics) or **24** (with Mathematical Literacy) will be added to a waiting list.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3 (NQF Level 4), with at least 40% (APS of 3) for English and 50% (APS of 4) for Mathematics N3.

- b. *Recognition of Prior Learning (RPL), equivalence and status:*
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- c. *Intake for the qualification:*
January only.
- d. *Presentation:*
Day classes. Classes and assessments take place during the week and on Saturdays.
- e. *Minimum duration:*
Four years.
- f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- g. *WIL (Work-Integrated Learning):*
See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).
- h. *Personal equipment:*
Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

FIRST YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------------------|--|-------|-----------|------------------------|
| CAPF05X | Communication for Academic Purposes | (5) | (10) | |
| CFAF05D | Computing Fundamentals A | (5) | (15) | |
| COHF05D | Computational Mathematics | (5) | (15) | |
| INFF25D | Information Literacy (<i>block module</i>) | (5) | (3) | |
| LFS125X | Life Skills (<i>block module</i>) | (5) | (2) | |
| PPAF05D | Principles of Programming A | (5) | (15) | |
| TOTAL CREDITS FOR THE FIRST YEAR: | | | 60 | |

SECOND YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------|--------------------------|-------|--------|-----------------------------|
| FIRST SEMESTER | | | | |
| CFBF15D | Computing Fundamentals B | (5) | (15) | Computing Fundamentals A |
| WEBF15D | Web Computing | (5) | (15) | Principles of Programming A |



SECOND SEMESTER

| | | | | |
|---------|---|-----|------|-----------------------------|
| DCTF15D | Discrete Structures | (5) | (15) | Computational Mathematics |
| PPBF15D | Principles of Programming B (first- or second-semester module) | (5) | (15) | Principles of Programming A |

TOTAL CREDITS FOR THE SECOND YEAR: **60**

THIRD YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|-----------------------------|-----|------|-----------------------------|
| DTP216D | Database Principles | (6) | (15) | Principles of Programming B |
| MTE216D | Multimedia Technology | (6) | (15) | |
| OOP216D | Object-Oriented Programming | (6) | (15) | |
| TMO216D | 3D Modelling | (6) | (15) | |

SECOND SEMESTER

| | | | | |
|---------|--------------------------------------|-----|------|-----------------------------|
| AOP216D | Advanced Object-Oriented Programming | (6) | (15) | Object-Oriented Programming |
| GMP216D | Games Programming | (6) | (15) | Object-Oriented Programming |
| MUA216D | Multimedia Applications | (6) | (15) | 3D Modelling |
| TAN216D | 3D Animation | (6) | (15) | |

TOTAL CREDITS FOR THE THIRD YEAR: **120**

FOURTH YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|------------------------------------|-----|------|--------------------------------------|
| IVE316D | Interactive Virtual Environments | (6) | (15) | Games Programming 3D Animation |
| MGV316D | Motion Graphics and Visual Effects | (6) | (15) | |
| MMD316D | Multimedia for Mobile Devices | (6) | (15) | Advanced Object-Oriented Programming |
| SOD316D | Sound Design | (6) | (15) | |

SECOND SEMESTER

| | | | | |
|---------|-----|-----|------|---|
| WCM316D | WIL | (6) | (60) | Interactive Virtual Environments Motion Graphics and Visual Effects Multimedia for Mobile Devices Sound Design |
|---------|-----|-----|------|---|

TOTAL CREDITS FOR THE FOURTH YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

1.7 ADVANCED DIPLOMA IN MULTIMEDIA COMPUTING

AdvDip (Multimedia Computing) - NQF Level 7 (120 credits)

Qualification code: ADMC20

SAQA ID: 111263, CHE NUMBER: H/H16/E166CAN

Campus where offered:

Soshanguve South Campus

REMARKS

a. Admission requirement(s):

A National Diploma: Information Technology in the field of Multimedia, **or** a Diploma in Multimedia Computing, **or** a relevant bachelor's degree, **or** an equivalent qualification in Multimedia Computing at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in their previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Day classes offered on Saturdays over a period of two years.

f. Minimum duration:

A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Re-registration:

The option to re-register for Multimedia Project is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.

i. Personal equipment:

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.



CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|--|-------|--------|---------------------------|
| MCP107V | Multimedia Project | (7) | (15) | Multimedia Project Design |
| MCP117R | Multimedia Project (re-registration) (first- or second-semester module, see paragraph h) | (7) | (0) | |

FIRST SEMESTER

| | | | |
|---------|----------------------------|-----|------|
| GMD117V | Games Engineering | (7) | (15) |
| HMD117V | Human Computer Interaction | (7) | (15) |
| INP117V | Internet Programming | (7) | (15) |

plus one of the following electives:

| | | | |
|---------|---|-----|------|
| CGH117V | Computer Graphics | (7) | (15) |
| ISE117V | Introduction to Software Engineering | (7) | (15) |

SECOND SEMESTER

| | | | |
|---------|---------------------------------|-----|------|
| GPR117V | Advanced Games Programming | (7) | (15) |
| IMD117V | Instructional Multimedia Design | (7) | (15) |
| MPD117V | Multimedia Project Design | (7) | (15) |

TOTAL CREDITS FOR THE QUALIFICATION: **120**

1.8 POSTGRADUATE DIPLOMA IN MULTIMEDIA COMPUTING

PGDip (Multimedia Computing) - NQF Level 8 (120 credits)

Qualification code: PDMC21

SAQA ID: 111269, CHE NUMBER: H/H16/E185CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

An Advanced Diploma in Multimedia Computing, **or** a Baccalaureus Technologiae: Information Technology in the field of Multimedia, **or** a bachelor's degree in the field of Multimedia, **or** an equivalent qualification at NQF Level 7 with a minimum of 120 credits. Preference will be given to candidates who obtained an average of 60% in their previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is based on a personal interview with a departmental selection panel. Candidates are evaluated based on their previous qualification obtained and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- c. **Recognition of Prior Learning (RPL), equivalence and status:**
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- d. **Intake for the qualification:**
January only.
- e. **Presentation:**
Day classes offered on Saturdays over a period of two years.
- f. **Duration:**
A minimum of one or two years (depending on the programme presentation).
- g. **Exclusion and readmission:**
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- h. **Re-registration:**
The option to re-register for Multimedia Research Project is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.
- i. **Personal equipment:**
Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|--|-------|--------|------------------------|
| MRP108G | Multimedia Research Project | (8) | (30) | Research Methodologies |
| MRP118R | Multimedia Research Project (re-registration) <i>(first-semester module, see paragraph h)</i> | (8) | (0) | |

FIRST SEMESTER

| | | | |
|---------|----------------------------|-----|------|
| RMC118G | Research Methodologies | (8) | (15) |
| VED118G | Virtual Environment Design | (8) | (15) |

SECOND SEMESTER

| | | | |
|---------|---------------------------------|-----|------|
| VEA118G | Virtual Environment Application | (8) | (15) |
|---------|---------------------------------|-----|------|

plus three of the following electives:

FIRST SEMESTER

| | | | | |
|---------|---|-----|------|-------------------------|
| AIG118G | Artificial Intelligence Games Programming | (8) | (15) | Artificial Intelligence |
|---------|---|-----|------|-------------------------|



NTT118G New Technological Trends (8) (15)

SECOND SEMESTER

ARI118G Artificial Intelligence (8) (15)

CGH118G Computer Graphics (*module not currently offered*) (8) (15)

FRD118G Formal Aspects of Computing (8) (15)

TOTAL CREDITS FOR THE QUALIFICATION: **120**

1.9 MASTER OF COMPUTING

MComputing - NQF Level 9 (180 credits)

Qualification code: MDC017

(Specialisation codes for admission and registration: MDMC17 / MDRS17)

SAQA ID: 96920, CHE NUMBER: H16/10793/HEQSF

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

An Honours degree, **or** a Postgraduate Diploma in Computer Science or Multimedia Computing or in a closely related field in Computing. Candidates should have achieved an average of 60% in their previous qualification, if not, special permission must be obtained from the Department. The previous qualification should relate to the intended field of study.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission to this programme is only granted after a successful interview with the Department. Admission is subject to selection. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Research. The topic should be chosen in consultation with the Department.

f. Duration:

A minimum of one year and a maximum of three years.

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Rules on postgraduate studies:

See Chapter 8 of Students' Rules and Regulations (Part 1 of the Prospectus).

CURRICULUM

The modules offered within the Master of Computing differ between departments. Please refer to the contents (page 5) to see which of the other departments within the faculty offer this programme.

Students register for one of the following specialisation options:

| CODE | MODULE | NQF-L | CREDIT |
|--------------------------------------|---|-------|------------|
| Multimedia (MDMC17) | | | |
| MMM109M | Dissertation: Multimedia | (9) | (180) |
| MMM109R | Dissertation: Multimedia (re-registration) | (9) | (0) |
| Computer Science (MDRS17) | | | |
| MCS109M | Dissertation: Computer Science | (9) | (180) |
| MCS109R | Dissertation: Computer Science (re-registration) | (9) | (0) |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 180 |

1.10 DOCTOR OF COMPUTING

DComputing - NQF Level 10 (360 credits)

Qualification code: DDCO01

(Specialisation codes for admission and registration: DDMC17 / DDRS17)

SAQA ID: 96754, CHE NUMBER: H16/10789/HEQSF

Campus where offered: Soshanguve South Campus

REMARKS

- a. **Admission requirement(s):**
A Master's degree in Computer Science or Multimedia Computing or in a closely related field in Computing. Candidates should have achieved an average of 60% in their previous qualification. If not, special permission must be obtained from the Department. The previous qualification should relate to the intended field of study.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).
- b. **Selection criteria:**
Admission to this programme is only granted after a successful interview with the Department. Admission is subject to selection. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.
- c. **Recognition of Prior Learning (RPL), equivalence and status:**
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- d. **Intake for the qualification:**
January and July.
- e. **Presentation:**
Research. The topic should be chosen in consultation with the Department.



- f. *Duration:*
A minimum of three years and a maximum of six years.
- g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- h. *Rules on postgraduate studies:*
See Chapter 8 of Students' Rules and Regulations (Part 1 of the Prospectus).

CURRICULUM

The modules offered within the Doctor of Computing differ between departments. Please refer to the contents (page 5) to see which of the other departments within the faculty offer this programme.

Students register for one of the following specialisation options:

| CODE | MODULE | NQF-L | CREDIT |
|--------------------------------------|---|-------|------------|
| Multimedia (DDMC17) | | | |
| MM1010O | Thesis: Multimedia | (10) | (360) |
| MM1010R | Thesis: Multimedia (re-registration) | (10) | (0) |
| Computer Science (DDRS17) | | | |
| CS1010O | Thesis: Computer Science | (10) | (360) |
| CS1010R | Thesis: Computer Science (re-registration) | (10) | (0) |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 360 |

2. DEPARTMENT OF COMPUTER SYSTEMS ENGINEERING

INFORMATION PERTAINING TO THE PROGRAMMES OFFERED IN THE DEPARTMENT OF COMPUTER SYSTEMS ENGINEERING

DIPLOMA IN COMPUTER SYSTEMS ENGINEERING

The purpose of the programme:

The Diploma in Computer Systems Engineering is designed to build the necessary knowledge, understanding, abilities and skills required for further learning towards becoming a competent Practicing Engineering Technician Professional pathway.

This programme consists of an underpinning of mathematics and science. Students' knowledge and understanding of mathematics and science will be of sufficient depth and breadth to underpin their computer systems engineering education, to enable appreciation of its scientific and engineering context, and to support their understanding of future developments. It is expected that this underpinning material will be taught in an engineering context and, where appropriate, a computer systems engineering context. This programme will have the following indicative science and mathematics modules: Mathematics 115, Mathematics 126, Mathematics 216; and basic natural science, which is embedded in some of the engineering fundamental modules, such as Electrical Principles 115 and Electronics 115.

The diploma is offered to students with no technical background and prepares them for work life. The diploma further exposes students to the state-of-the-art miniaturised and mobile computer systems and smart device technology, allowing them to acquire the complementary hardware and software knowledge and skills required for understanding and designing such systems. Students will typically complete practical experiences and projects, allowing an opportunity to delve into real-world scenarios in the field of Computer Systems Engineering as a registered learner technician with ECSA.

In addition to design-based and experiential industrial training component requirement, students will complete modules, such as: Computer Architecture and Organisation; Databases; Digital Process Control; Electrical Principles; Electronics; Digital Electronics; Logic Design, Embedded Systems; Network Systems; Operating Systems; Probability and Statistics; Project Construction; Programmable Logic Controllers; Programming; Software Engineering; and any three of the following: Artificial Intelligence, Mobile Robotics, Network Systems.

Critical cross-field outcomes:

This qualification standard specifies the following required knowledge areas: Exit Level Outcomes for the diploma programme, and the minimum credit distribution required per knowledge area.

The Exit Level Outcomes guide the curriculum content as well as pedagogical and assessment decisions. The programme has a coherent assembly of profession-specific and complementary knowledge areas, and meaningful integration of the required skills and values.

At each level (semester/year) there will be "integrative active learning activities". These are intended to develop a range of skills (analytical reasoning, inquiry and research, information literacy, problem-solving, etc.), and an integration of different knowledge areas. These learning activities will be practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance.

Students will have multiple opportunities throughout the programme to explore, develop and be assessed on the various competencies from the level of novice to the desired level of competence as the student progresses in the programme.

There is an increase in the level of cognitive, affective, and psychomotor complexity from the first year to the final year to ensure an effective preparation for the real world of professional practice, and lifelong learning.

The diploma will be grounded in learning activities that will facilitate the development of key cognitive and practical skills (inquiry and analysis, critical and creative thinking, written and oral communication, information literacy, teamwork and problem solving) required of an engineering student.



The curriculum is designed in such a way as to ensure a progressive and cumulative combination of the key knowledge types in specific subject areas, to deepen and extend the preceding knowledge, whilst adding a new element.

The programme consists of a coherent assembly of knowledge areas. The knowledge areas associated with engineering practice (as specified in the Engineering Qualification Standard E-02-PN) include mathematics, natural sciences, engineering sciences, design and synthesis, computing and IT, and relevant complementary studies. This assembly of knowledge areas provides a viable platform for further studies and lifelong learning and enables development in traditional or emerging fields.

Curriculum Design Principles

This programme will include a coherent assembly of fundamental engineering sciences, design and principles and applications, engineering practice and embedded issues of ethics, safety, communication, sustainability, etc. The diploma will have the following indicative content for the core principles and applications of Computer Systems Engineering:

Engineering Sciences:

Engineering Sciences consists of two categories, namely, the general and discipline-specific modules. The general modules are: Databases 215; Network Systems 125; Operating Systems 226; Programming 126 and Programming 216.

The discipline-specific modules are: Artificial Intelligence 226; Computer Architecture and Organisation 216; Electrical Principles 115; Electronics 115, Electronics 126; Embedded Systems 316; Digital Electronics 115, Digital Electronics 126, Digital Electronics 216; Digital Process Control 216, Digital Process Control 226; Logic Design 226; Mobile Robotics 226; Network Systems 226; Programmable Logic Controllers 226; and Software Engineering 316.

Engineering Design and Synthesis:

In Computer Systems Engineering, design and synthesis are the cumulative acquired theoretical and practical skills to produce a complete functioning system. It requires application of engineering sciences, with given tasks, and taking into account economic, engineering ethics and good practices. Modules related to design and synthesis will be demonstrated as a mini-project, with case studies completed in the Project Construction 175 and Project Design 376 modules.

Engineering Practice:

Engineering practice involves the application of engineering skills to solve defined engineering problems through acquired skills in the workshop practices and series of practical classes in engineering science and discipline-specific modules.

Essential Embedded Learning:

The acquired soft skills with their theoretical engineering science connect the students with work-related experience. These include sustainability aspects; safety, health, environmental and other professional issues such as ethics. Students will also develop general skills that will be of value in a wide range of entrepreneurial activities. These include the development of abilities within problem solving, communication, effective working with others, effective use of IT, report writing, information retrieval, presentational skills, project planning, self-learning, performance improvement, and awareness of the benefits of continuing professional development.

Computing and Information Technologies:

This aspect of the discipline focuses on the skills gained from computer training acquired during the programme, such as programming, word-processing, spreadsheet, simulation tools and other discipline-based software.

Complementary Studies:

This aspect of the discipline covers aspects outside of engineering sciences, basic sciences and mathematics. This will include the practice and contents such as the impact of technology on society, effective communication, and studies in humanities or social sciences that broaden the student's perspective in the understanding of the world.

Work-Integrated Learning (WIL):

The WIL component of the programme will be conducted in the third year, with a minimum duration of 600 hours. The credit value allocated to the WIL component is 60 credits and continuously assessed by the qualified professional engineer and academic staff members. The adopted standard is based on the *Engineering Council of South Africa (ECSA) document E-02-PN under subsection 6.1.*

Graduate attributes of the programme:

- **Graduate attribute 1: Problem-solving**
Apply engineering principles to systematically diagnose and solve broadly-defined engineering problems.
- **Graduate attribute 2: Application of Scientific and Engineering Knowledge**
Apply knowledge of mathematics, natural science and engineering sciences to the defined and applied engineering procedures, processes, systems and methodologies to solve broadly-defined engineering problems.
- **Graduate attribute 3: Engineering Design**
Perform procedural and non-procedural design of broadly-defined components, systems, works, products or processes to meet desired needs normally within applicable standards, codes of practice and legislation.
- **Graduate attribute 4: Investigation**
Conduct investigations of broadly-defined problems through locating, searching and selecting relevant data from codes, databases and literature, designing and conducting experiments, analysing and interpreting results to provide valid conclusions.
- **Graduate attribute 5: Engineering Methods, Skills, Tools, including Information Technology**
Use appropriate techniques, resources, and modern engineering tools, including information technology, prediction and modelling, for the solution of broadly-defined engineering problems, with an understanding of the limitations, restrictions, premises, assumptions and constraints.
- **Graduate attribute 6: Professional and Technical Communication**
Communicate effectively, both orally and in writing, with engineering audiences and the affected parties.
- **Graduate attribute 7: Impact of Engineering Activity**
Demonstrate knowledge and understanding of the impact of engineering activity on society, economy, industrial and physical environment, and address issues by analysis and evaluation.
- **Graduate attribute 8: Individual and Teamwork**
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects.
- **Graduate attribute 9: Independent Learning**
Engage in independent and life-long learning through well-developed learning skills.
- **Graduate attribute 10: Engineering Professionalism**
Comprehend and apply ethical principles and commit to professional ethics, responsibilities and norms of engineering technology practice.

ADVANCED DIPLOMA IN COMPUTER SYSTEMS ENGINEERING

The purpose of the programme:

The Advanced Diploma in Computer Systems Engineering is primarily an industry-oriented programme.

The programme provides students with a sound knowledge base in the field of Computer Systems Engineering. The programme is designed to empower students to be able to apply their knowledge and skills to a particular career or professional context, while equipping them to undertake more specialised and intensive learning. Qualifications leading to this programme tend to have a strong professional or career focus and holders of this programme are normally prepared to enter a specific niche in the Computer Systems Engineering, system integration, digital electronics and other allied industries.

The purpose of educational programmes designed to meet this qualification is to build the necessary knowledge, understanding, abilities and skills required for further learning towards becoming a competent practicing engineering technologist or certificated engineer. This programme provides:

1. Preparation for careers in engineering and areas that potentially benefit from engineering skills, for achieving technical proficiency and to make a contribution to the economy and national development.



2. The educational base required for registration as a Professional Engineering Technologist and/or Certificated Engineer with ECSA.
3. Entry to NQF level 8 programmes e.g. honours, post graduate diploma and bachelors programmes and then to proceed to masters programmes.

Since the programme is designed to address the skills shortage in the country, bridge the curriculum gap with respect to education, students are exposed to the work requirement after graduation, and to become relevant for future career challenges. The purpose-driven curriculum designed for the Advanced Diploma in Computer Systems Engineering is aligned with the ECSA Exit Level Outcomes (ELO) contained in the ECSA NQF 7 standard and all graduates of the programme must be competent in all outcomes. Computer systems engineers are often tasked to research, design, develop, and test computer systems and components such as processors, circuit boards, memory devices, networks, and routers. In addition students discover new directions in computer-related fields, which generate rapid advances in computer technology.

- **Graduate attribute 1: Problem-solving**
Apply engineering principles to systematically diagnose and solve broadly-defined engineering problems.
- **Graduate attribute 2: Application of Scientific and Engineering Knowledge**
Apply knowledge of mathematics, natural science and engineering sciences to the defined and applied engineering procedures, processes, systems and methodologies to solve broadly-defined engineering problems.
- **Graduate attribute 3: Engineering Design**
Perform procedural and non-procedural design of broadly-defined components, systems, works, products or processes to meet desired needs normally within applicable standards, codes of practice and legislation.
- **Graduate attribute 4: Investigation**
Conduct investigations of broadly-defined problems through locating, searching and selecting relevant data from codes, data-bases and literature, designing and conducting experiments, analysing and interpreting results to provide valid conclusions.
- **Graduate attribute 5: Engineering Methods, Skills, Tools, including Information Technology**
Use appropriate techniques, resources, and modern engineering tools, including information technology, prediction and modelling, for the solution of broadly-defined engineering problems, with an understanding of the limitations, restrictions, premises, assumptions and constraints.
- **Graduate attribute 6: Professional and Technical Communication**
Communicate effectively, both orally and in writing, with engineering audiences and the affected parties.
- **Graduate attribute 7: Impact of Engineering Activity**
Demonstrate knowledge and understanding of the impact of engineering activity on society, economy, industrial and physical environment, and address issues by analysis and evaluation.
- **Graduate attribute 8: Individual and Teamwork**
Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects.
- **Graduate attribute 9: Independent Learning**
Engage in independent and life-long learning through well-developed learning skills.
- **Graduate attribute 10: Engineering Professionalism**
Comprehend and apply ethical principles and commit to professional ethics, responsibilities and norms of engineering technology practice.

POSTGRADUATE DIPLOMA IN COMPUTER SYSTEMS ENGINEERING

The purpose of the programme:

Recent advancements in computer systems engineering are the base for the future industrial evolutions and the smart world. The feasibility of future developments strongly relies on the development of manpower in the field of computer systems engineering who will be able to show competence in hardware, software and interfacing systems.



The need to develop and train manpower that will be able to advance the field of computer systems engineering is imperative for the country and globally. Currently, the country has a shortage of postgraduate candidates, especially in the field of engineering. Since the demand for postgraduates in industry, governmental parastatals and the world at large has grown tremendously, the Department of Computer Systems Engineering took the initiative to design a Postgraduate Diploma in Computer Systems Engineering. This programme is designed to address the highly skilled shortage in the country and globally in the emerging digital market, and to develop the research and innovative skills of the students, empowering them in entrepreneurial and project management capabilities.

The programme is offered to students with a technical background in preparation for careers in industry and academic research. This program further exposes students to state-of-the-art miniaturised and mobile computer systems and smart device technology, allowing them to acquire the complementary hardware and software knowledge and skills required for understanding and designing such systems. In this degree program, students typically complete industrial research projects, giving them the chance to delve into real-world scenarios in the field of Computer Systems Engineering.

In addition to the industrial research project-based component requirement, students complete modules such as: Advanced Artificial Intelligent Systems, Advanced Embedded Systems Design, and Advanced Digital Signal Processing. There is a range of electives that address the industrial needs, such as Advanced Intelligent Industrial Systems, Advanced Computer Architecture and Organisation, Advanced Intelligent Electromechanical Systems, Advanced Computer Emerging Technologies and Advanced Computer Networks.

Graduates are often qualified for careers in consumer electronics, telecommunications, networking, system integration, consulting firms, Biomedical industries, government, the electronic gaming industry, artificial intelligence and the software industry. They can also find opportunities in the information technology division of a variety of businesses. Job titles could include testing senior technologist, senior systems analyst, hardware technologist, information technology consultant, digital programmer and research officer.

- **Graduate attribute 1: Problem-solving**

Apply engineering principles to systematically diagnose and solve broadly-defined engineering problems.

- **Graduate attribute 2: Application of Scientific and Engineering Knowledge**

Apply knowledge of mathematics, natural science and engineering sciences to the defined and applied engineering procedures, processes, systems and methodologies to solve broadly-defined engineering problems.

- **Graduate attribute 3: Engineering Design**

Perform procedural and non-procedural design of broadly-defined components, systems, works, products or processes to meet desired needs normally within applicable standards, codes of practice and legislation.

- **Graduate attribute 4: Investigation**

Conduct investigations of broadly-defined problems through locating, searching and selecting relevant data from codes, databases and literature, designing and conducting experiments, analysing and interpreting results to provide valid conclusions.

- **Graduate attribute 5: Engineering Methods, Skills, Tools, including Information Technology**

Use appropriate techniques, resources, and modern engineering tools, including information technology, prediction and modelling, for the solution of broadly-defined engineering problems, with an understanding of the limitations, restrictions, premises, assumptions and constraints.

- **Graduate attribute 6: Professional and Technical Communication**

Communicate effectively, both orally and in writing, with engineering audiences and the affected parties.

- **Graduate attribute 7: Impact of Engineering Activity**

Demonstrate knowledge and understanding of the impact of engineering activity on society, economy, industrial and physical environment, and address issues by analysis and evaluation.

- **Graduate attribute 8: Individual and Teamwork**

Demonstrate knowledge and understanding of engineering management principles and apply these to one's own work, as a member and leader in a team and to manage projects.

- **Graduate attribute 9: Independent Learning**

Engage in independent and life-long learning through well-developed learning skills.

- **Graduate attribute 10: Engineering Professionalism**

Comprehend and apply ethical principles and commit to professional ethics, responsibilities and norms of engineering technology practice.



- **Graduate attribute 11: Engineering Management**

Demonstrate knowledge and understanding of engineering management principles and economic decision-making.

2.1 DIPLOMA IN COMPUTER SYSTEMS ENGINEERING

Dip (Computer Systems Engineering) - NQF Level 6 (360 credits)

Qualification code: DPYE20

SAQA ID: 111837, CHE NUMBER: H/H16/E077CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. *Admission requirement(s) and selection criteria:*

• **APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):

A Senior Certificate or an equivalent qualification with a D symbol at Higher Grade or a C symbol at Standard Grade for English and a C symbol at Higher Grade or a B symbol at Standard Grade for Mathematics and Physical Science.

Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26**. Applicants with a score of **23** will be considered for the extended programme.

• **APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 5 for Mathematics or Technical Mathematics and 4 for Physical Sciences or Technical Sciences.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26** (with Mathematics or Technical Mathematics). Applicants with a score of **23** (with Mathematics or Technical Mathematics) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

- **APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) with a bachelor's at NQF Level 4 degree or a diploma endorsement, with at least 50% (APS of 4) for English (first additional language) and 60% for Mathematics, 50% (APS of 4) for Physical Science or Applied Engineering Technology, 50% for Life Orientation (excluded for APS calculation), and 50% (APS of 4) for any two compulsory vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26**. Applicants with a score of **23** will be considered for the extended programme.

- **APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3 (NQF Level 4), with at least 50% (APS of 4) for English and 60% (APS of 5) for Mathematics N3 and Engineering Sciences N3.

- b. Assessment procedure(s):*

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- c. Recognition of Prior Learning (RPL), equivalence and status:*

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

- d. Intake for the qualification:*

January only.

- e. Presentation:*

Day classes. Classes and assessments take place during the week and on Saturdays.

- f. Minimum duration:*

Three years.

- g. Exclusion and readmission:*

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

- h. Work-Integrated Learning 326:*

See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).

- i. Engineering Council of South Africa (ECSA):*

This programme is accredited by the Engineering Council of South Africa (ECSA), and students completing the qualification will be able to register with that Council. The Department or ECSA can be contacted for additional information and registration purposes.



j. *Re-registration:*

The option to re-register for a module is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.

k. *Personal equipment:*

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

FIRST YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------|---------------------------|-------|--------|------------------------|
| FIRST SEMESTER | | | | |
| CMS115D | Communication Science 165 | (5) | (10) | |
| DE1115D | Digital Electronics 115 | (5) | (10) | |
| EIP115D | Electrical Principles 115 | (5) | (10) | |
| EL1115D | Electronics 115 | (5) | (10) | |
| MT1115D | Mathematics 115 | (5) | (10) | |
| PG1115D | Programming 115 | (5) | (10) | |

SECOND SEMESTER

| | | | | |
|---------|--------------------------|-----|------|---------------------------|
| DE2116D | Digital Electronics 126 | (6) | (10) | Digital Electronics 115 |
| EL2116D | Electronics 126 | (6) | (10) | Electronics 115 |
| MT2116D | Mathematics 126 | (6) | (10) | Mathematics 115 |
| NWS115D | Network Systems 125 | (5) | (10) | |
| PCO115D | Project Construction 125 | (5) | (10) | Electrical Principles 115 |
| | | | | Electronics 115 |
| PG2116D | Programming 126 | (6) | (10) | Programming 115 |

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------|--|-------|--------|--|
| FIRST SEMESTER | | | | |
| CAG216D | Computer Architecture and Organisation 216 | (6) | (10) | Digital Electronics 115 Digital Electronics 126 |
| DAB215D | Databases 215 | (5) | (10) | |
| DEL216D | Digital Electronics 216 | (6) | (10) | Digital Electronics 115 Digital Electronics 126 |
| DP1216D | Digital Process Control 216 | (6) | (10) | Digital Electronics 115 Digital Electronics 126 |
| MHS216D | Mathematics 216 | (6) | (10) | Mathematics 115 Mathematics 126 |
| PGM216D | Programming 216 | (6) | (10) | Programming 115 Programming 126 |

SECOND SEMESTER

| | | | | |
|---------|---------------------------------------|-----|------|---|
| DP2216D | Digital Process Control 226 | (6) | (10) | Digital Process Control 216 Programming 216 |
| LOD216D | Logic Design 226 | (6) | (10) | Computer Architecture and Organisation 216 Digital Electronics 216 Programming 216 |
| OPS216D | Operating Systems 226 | (6) | (10) | Digital Process Control 216 Programming 216 |
| PLC216D | Programmable Logic Controllers 226 | (6) | (10) | Digital Process Control 216 Programming 216 |

plus two of the following electives:

| | | | | |
|---------|-----------------------------|-----|------|--|
| ARI216D | Artificial Intelligence 226 | (6) | (10) | Mathematics 216 Programming 216 |
| MRO216D | Mobile Robotics 226 | (6) | (10) | Computer Architecture and Organisation 216 Digital Electronics 216 Digital Process Control 216 Programming 216 |
| NWS216D | Network Systems 226 | (6) | (10) | Network Systems 125 |

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|------------------------------|-------|--------|---|
| WYE306D | Work-Integrated Learning 326 | (6) | (60) | Digital Process Control 226 Logic Design 226 Operating Systems 226 Programmable Logic Controllers 226 |

FIRST SEMESTER

| | | | | |
|---------|--|-----|------|--|
| EMS316D | Embedded Systems 316 | (6) | (10) | Digital Process Control 226 Logic Design 226 Programmable Logic Controllers 226 |
| PBS316D | Probability and Statistics 316 | (6) | (10) | Mathematics 115 |
| PD1315D | Project Design 365 | (5) | (10) | Digital Process Control 226 Logic Design 226 Programmable Logic Controllers 226 |
| PD1315R | Project Design 365 (re-registration) (<i>second-semester module, see paragraph j</i>) | (5) | (0) | |
| SFE316D | Software Engineering 316 | (6) | (10) | Databases 215 Programming 216 |

SECOND SEMESTER

On completion of all modules (except for Work-Integrated Learning 326 (WYE306D)).

| | | | | |
|---------|--------------------|-----|------|--|
| PD2316D | Project Design 376 | (6) | (20) | |
|---------|--------------------|-----|------|--|



PD2316R Project Design 376 (6) (0)
(re-registration) (*first-semester module, see paragraph j*)

TOTAL CREDITS FOR THE THIRD YEAR: 120

TOTAL CREDITS FOR THE QUALIFICATION: 360

2.2 DIPLOMA IN COMPUTER SYSTEMS ENGINEERING (Extended curriculum programme with foundation provision) Dip (Computer Systems Engineering) - NQF Level 6 (360 credits) **Qualification code: DPYEF0**

SAQA ID: 111837, CHE NUMBER: H/H16/E077CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s) and selection criteria:

• APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:

Admission requirement(s):

A Senior Certificate or an equivalent qualification with an E symbol at Higher Grade or a D symbol at Standard Grade for English and a D symbol at Higher Grade or a C symbol at Standard Grade for Mathematics and Physical Science.

Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least 23.

• APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language) and 4 for Mathematics or Technical Mathematics and 3 for Physical Sciences or Technical Sciences.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least 23 (with Mathematics or Technical Mathematics). Life Orientation is excluded for APS calculation.

Assessment procedure(s):

Applicants who achieve the minimum APS of **23** will be considered. Applicants with a score of **21** (with Mathematics or Technical Mathematics) will be added to a waiting list.

- **APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 40% (APS of 3) for English (first additional language) and 50% (APS of 4) for Mathematics and 40% (APS of 3) for Physical Science or Applied Engineering Technology and 50% for Life Orientation (excluded for APS calculation), and 50% (APS of 4) for any two compulsory vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (excluding Life Orientation).

- **APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3 (NQF Level 4), with at least 40% (APS of 3) for English and 50% (APS of 4) for Mathematics N3 and Engineering Sciences N3.

- b. *Assessment procedure(s):*

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- c. *Recognition of Prior Learning (RPL), equivalence and status:*

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

- d. *Intake for the qualification:*

January only.

- e. *Presentation:*

Day classes. Classes and assessments take place during the week and on Saturdays.

- f. *Minimum duration:*

Four years.

- g. *Exclusion and readmission:*

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

- h. *Work-Integrated Learning 326:*

See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).

- i. *Engineering Council of South Africa (ECSA):*

This programme is accredited by the Engineering Council of South Africa (ECSA), and students completing the qualification will be able to register with that Council. The Department or ECSA can be contacted for additional information and registration purposes.



j. *Re-registration:*

The option to re-register for a module is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.

k. *Personal equipment:*

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

FIRST YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|---------------------------|-------|--------|------------------------|
| CMSF05D | Communication Science 165 | (5) | (10) | |
| DE1F05D | Digital Electronics 115 | (5) | (10) | |
| EIPF05D | Electrical Principles 115 | (5) | (10) | |
| EL1F05D | Electronics 115 | (5) | (10) | |
| MT1F05D | Mathematics 115 | (5) | (10) | |
| PG1F05D | Programming 115 | (5) | (10) | |

TOTAL CREDITS FOR THE FIRST YEAR: **60**

SECOND YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|--------------------------|-------|--------|---------------------------|
| DE2F06D | Digital Electronics 126 | (6) | (10) | Digital Electronics 115 |
| EL2F06D | Electronics 126 | (6) | (10) | Electronics 115 |
| MT2F06D | Mathematics 126 | (6) | (10) | Mathematics 115 |
| NWSF05D | Network Systems 125 | (5) | (10) | |
| PCOF05D | Project Construction 125 | (5) | (10) | Electrical Principles 115 |
| | | | | Electronics 115 |
| PG2F06D | Programming 126 | (6) | (10) | Programming 115 |

TOTAL CREDITS FOR THE SECOND YEAR: **60**

THIRD YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------|--|-------|--------|--|
| FIRST SEMESTER | | | | |
| CAG216D | Computer Architecture and Organisation 216 | (6) | (10) | Digital Electronics 115 Digital Electronics 126 |
| DAB215D | Databases 215 | (5) | (10) | |
| DEL216D | Digital Electronics 216 | (6) | (10) | Digital Electronics 115 Digital Electronics 126 |
| DP1216D | Digital Process Control 216 | (6) | (10) | Digital Electronics 115 Digital Electronics 126 |
| MHS216D | Mathematics 216 | (6) | (10) | Mathematics 115 Mathematics 126 |
| PGM216D | Programming 216 | (6) | (10) | Programming 115 Programming 126 |

SECOND SEMESTER

| | | | | |
|---------|---------------------------------------|-----|------|---|
| DP2216D | Digital Process Control 226 | (6) | (10) | Digital Process Control 216 Programming 216 |
| LOD216D | Logic Design 226 | (6) | (10) | Computer Architecture and Organisation 216 Digital Electronics 216 Programming 216 |
| OPS216D | Operating Systems 226 | (6) | (10) | Digital Process Control 216 Programming 216 |
| PLC216D | Programmable Logic Controllers 226 | (6) | (10) | Digital Process Control 216 Programming 216 |

plus two of the following electives:

| | | | | |
|---------|-----------------------------|-----|------|--|
| ARI216D | Artificial Intelligence 226 | (6) | (10) | Mathematics 216 Programming 216 |
| MRO216D | Mobile Robotics 226 | (6) | (10) | Computer Architecture and Organisation 216 Digital Electronics 216 Digital Process Control 216 Programming 216 |
| NWS216D | Network Systems 226 | (6) | (10) | Network Systems 125 |

TOTAL CREDITS FOR THE THIRD YEAR: **120**

FOURTH YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|------------------------------|-------|--------|---|
| WYE306D | Work-Integrated Learning 326 | (6) | (60) | Digital Process Control 226 Logic Design 226 Operating Systems 226 Programmable Logic Controllers 226 |

FIRST SEMESTER

| | | | | |
|---------|--|-----|------|--|
| EMS316D | Embedded Systems 316 | (6) | (10) | Digital Process Control 226 Logic Design 226 Programmable Logic Controllers 226 |
| PBS316D | Probability and Statistics 316 | (6) | (10) | Mathematics 115 |
| PD1315D | Project Design 365 | (5) | (10) | Digital Process Control 226 Logic Design 226 Programmable Logic Controllers 226 |
| PD1315R | Project Design 365 (re-registration) (<i>second-semester module, see paragraph j</i>) | (5) | (0) | |
| SFE316D | Software Engineering 316 | (6) | (10) | Databases 215 Programming 216 |

SECOND SEMESTER

On completion of all modules (except for Work-Integrated Learning 326 (WYE306D)).

| | | | | |
|---------|--------------------|-----|------|--|
| PD2316D | Project Design 376 | (6) | (20) | |
|---------|--------------------|-----|------|--|



PD2316R Project Design 376 (6) (0)
(re-registration) (*first-semester
module, see paragraph j*)

TOTAL CREDITS FOR THE FOURTH YEAR: 120

TOTAL CREDITS FOR THE QUALIFICATION: 360

2.3 ADVANCED DIPLOMA IN COMPUTER SYSTEMS ENGINEERING

AdvDip (Computer Systems Engineering) - NQF Level 7 (140 credits)

Qualification code: ADYE20

SAQA ID: 111747, CHE NUMBER: H/H16/E133CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

A National Diploma: Engineering: Computer Systems, **or** a National Diploma: Information Technology in the field of Intelligent Industrial Systems, **or** a National Diploma: Engineering: Electrical (Electronics), **or** a Diploma in Computer Systems Engineering, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in their previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Day classes offered on Saturdays over a period of two years.

f. Minimum duration:

A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Re-registration:

The option to re-register for Engineering Project Design is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.

- i. **Engineering Council of South Africa (ECSA):**
This programme is accredited by the Engineering Council of South Africa (ECSA), and students completing the qualification will be able to register with that Council. The Department or ECSA can be contacted for additional information and registration purposes.
- j. **Personal equipment:**
Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|---|-------|--------|------------------------|
| EGD107V | Engineering Project Design | (7) | (30) | |
| EGD117R | Engineering Project Design (re-registration) (<i>first-semester module, see paragraph h</i>) | (7) | (0) | |

FIRST SEMESTER

| | | | | |
|---------|--------------------------------|-----|------|--|
| AIS117V | Artificial Intelligent Systems | (7) | (15) | |
| CMD116V | Computational Mathematics | (6) | (15) | |
| DSR117V | Digital Signal Processing | (7) | (15) | |
| EPM117V | Engineering Project Management | (7) | (10) | |

SECOND SEMESTER

| | | | | |
|---------|----------------------------------|-----|------|--|
| EBD117V | Embedded Systems Design | (7) | (15) | |
| EER117V | Engineering Ethics and Practices | (7) | (10) | |

plus any two of the following electives:

FIRST SEMESTER

| | | | | |
|---------|--|-----|------|-------------------------|
| CNT117V | Computer Networks | (7) | (15) | |
| IES117V | Intelligent Electro-Mechanical Systems | (7) | (15) | Embedded Systems Design |

SECOND SEMESTER

| | | | | |
|---------|---|-----|------|--------------------------------|
| CAO117V | Computer Architecture and Organisation | (7) | (15) | |
| CES117V | Computer Emerging Technologies (<i>first- or second-semester module</i>) | (7) | (15) | Artificial Intelligent Systems |
| IIS117V | Intelligent Industrial Systems | (7) | (15) | Artificial Intelligent Systems |
| SRG117V | Systems Resources Management | (7) | (15) | Computational Mathematics |

TOTAL CREDITS FOR THE QUALIFICATION: 140



2.4 POSTGRADUATE DIPLOMA IN COMPUTER SYSTEMS ENGINEERING

PGDip (Computer Systems Engineering) - NQF Level 8 (120 credits)

Qualification code: PDYE21

SAQA ID: 111238, CHE NUMBER: H/H16/E156CAN

Campus where offered:

Soshanguve South Campus

REMARKS

a. Admission requirement(s):

An Advanced Diploma in Computer Systems Engineering or Electronics, **or** a relevant Baccalaureus Technologiae: Computer Systems or Electronics or Information Technology in the field of Intelligent Industrial Systems, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 7 with a minimum of 120 credits. Preference will be given to candidates who obtained an average of 60% in their previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is subject to selection. Candidates are evaluated based on their previous qualification obtained and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Day classes offered on Saturdays over a period of two years.

f. Duration:

A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Re-registration:

The option to re-register for Industrial Research Project is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.

i. Personal equipment:

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT |
|---------|--|-------|--------|
| IDD108G | Industrial Research Project | (8) | (30) |
| IDD118R | Industrial Research Project (re-registration) (<i>first-semester module, see paragraph h</i>) | (8) | (0) |

FIRST SEMESTER

| | | | |
|---------|------------------------------------|-----|------|
| ESD118G | Advanced Embedded Systems Design | (8) | (15) |
| DSR118G | Advanced Digital Signal Processing | (8) | (15) |

SECOND SEMESTER

| | | | |
|---------|---|-----|------|
| AIS118G | Advanced Artificial Intelligent Systems | (8) | (15) |
|---------|---|-----|------|

plus any three of the following electives (a student may only choose a maximum of two modules per semester):

FIRST SEMESTER

| | | | |
|---------|---|-----|------|
| CAO118G | Advanced Computer Architecture and Organisation | (8) | (15) |
| IES118G | Advanced Intelligent Electro-Mechanical Systems | (8) | (15) |
| IIS118G | Advanced Intelligent Industrial Systems | (8) | (15) |

SECOND SEMESTER

| | | | |
|---------|---|-----|------|
| CES118G | Advanced Computer Emerging Technologies (<i>first- or second semester module</i>) | (8) | (15) |
| CNE118G | Advanced Computer Networks | (8) | (15) |

TOTAL CREDITS FOR THE QUALIFICATION: **120**



2.5 MASTER OF COMPUTING

MComputing - NQF Level 9 (180 credits)

Qualification code: MDCO17

(Specialisation code for admission and registration: MDYE17)

SAQA ID: 96920, CHE NUMBER: H16/10793/HEQSF

Campus where offered:

Soshanguve South Campus

REMARKS

a. Admission requirement(s):

An Honours degree, **or** a Postgraduate Diploma in Computer Systems Engineering or in a closely related field in Computing or Engineering. Candidates should have achieved an average of 60% in their previous qualification, if not, special permission must be obtained from the Department.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission to this programme is only granted after a successful interview with the Department. Admission is subject to selection. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Research. The topic should be chosen in consultation with the Department.

f. Duration:

A minimum of one year and a maximum of three years.

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Rules on postgraduate studies:

See Chapter 8 of Students' Rules and Regulations (Part 1 of the Prospectus).

CURRICULUM

The modules offered within the Master of Computing differ between departments. Please refer to the contents (page 5) to see which of the other departments within the faculty offer this programme.

| CODE | MODULE | NQF-L | CREDIT |
|--------------------------------------|--|-------|------------|
| MCY109M | Dissertation: Computer Systems Engineering | (9) | (180) |
| MCY109R | Dissertation: Computer Systems Engineering (re-registration) | (0) | (0) |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 180 |

2.6 DOCTOR OF COMPUTING

DComputing - NQF Level 10 (360 credits)

Qualification code: DDCO01

(Specialisation code for admission and registration: DDYE17)

SAQA ID: 96754, CHE NUMBER: H16/10789/HEQSF

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

A Master's degree in Computer Systems Engineering or in a closely related field in Computing or Engineering. Candidates should have achieved an average of 60% in their previous qualification, if not, special permission must be obtained from the Department.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission to this programme is only granted after a successful interview with the Department. Admission is subject to selection. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January and July.

e. Presentation:

Research. The topic should be chosen in consultation with the Department.

f. Duration:

A minimum of three years and a maximum of six years.

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Rules on postgraduate studies:

See Chapter 8 of Students' Rules and Regulations (Part 1 of the Prospectus).

CURRICULUM

The modules offered within the Doctor of Computing differ between departments. Please refer to the contents (page 5) to see which of the other departments within the faculty offer this programme.

| CODE | MODULE | NQF-L | CREDIT |
|--------------------------------------|--|-------|------------|
| CY1010O | Thesis: Computer Systems Engineering | (10) | (360) |
| CY1010R | Thesis: Computer Systems Engineering (re-registration) | (10) | (0) |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 360 |



3. DEPARTMENT OF INFORMATICS

3.1 DIPLOMA IN INFORMATICS

Dip (Informatics) - NQF Level 6 (360 credits)

Qualification code: DPIF20

SAQA ID: 103078, CHE NUMBER: H/H16/E061CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

• **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):

A Senior Certificate or an equivalent qualification with an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

Recommended subjects:

Computer Science and Physical Science.

Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26**. Applicants with a score of **23** will be considered for the extended programme. Applicants will be notified to make an appointment with the departmental secretary for the interview or test. This rule applies to all applicants, as well as to applicants who are already registered at other institutions.

• **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language) and 5 for Mathematics or Technical Mathematics or 7 for Mathematical Literacy.

Recommended subjects:

None.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26** (with Mathematics or Technical Mathematics) or **28** (with Mathematical Literacy). Applicants with a score of **23** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

Assessment procedure(s):

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% (APS of 4) for English (first additional language) and 60% (APS of 5) for Mathematics or 80% (APS of 7) for Mathematical Literacy, and 50% for Life Orientation (excluded for APS calculation), and 50% (APS of 4) for any other three compulsory vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26** (with Mathematics) or **28** (with Mathematical Literacy). Applicants with a score of **23** (with Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

Assessment procedure(s):

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3 (NQF Level 4), with at least 50% (APS of 4) for Mathematics N3.

- b. *Recognition of Prior Learning (RPL), equivalence and status:*
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- c. *Intake for the qualification:*
January only.
- d. *Presentation:*
Day classes. Classes and assessments take place during the week and on Saturdays.
- e. *Minimum duration:*
Three years.
- f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- g. *Work-Integrated Learning:*
See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).



h. *Personal equipment:*

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

FIRST YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|--|-------|--------|------------------------|
| 16E105X | Communication for Academic Purpose | (5) | (10) | |
| INF125D | Information Literacy (<i>block module</i>) | (5) | (3) | |
| LFS125X | Life Skills (<i>block module</i>) | (5) | (2) | |

FIRST SEMESTER

| | | | |
|---------|--|-----|------|
| CGA115D | Computing Fundamentals A | (5) | (15) |
| COH115D | Computational Mathematics | (5) | (15) |
| PPA115D | Principles of Programming A (<i>first- or second-semester module</i>) | (5) | (15) |

SECOND SEMESTER

| | | | | |
|---------|--|-----|------|-----------------------------|
| BCM115D | Business Cost Management | (5) | (15) | Computational Mathematics |
| BFS115D | Business Fundamentals | (5) | (15) | Computational Mathematics |
| CGB115D | Computing Fundamentals B | (5) | (15) | Computing Fundamentals A |
| PPB115D | Principles of Programming B (<i>first- or second-semester module</i>) | (5) | (15) | Principles of Programming A |

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------|---|-------|--------|---|
| FIRST SEMESTER | | | | |
| BUA216D | Business Analysis A | (6) | (15) | Computational Mathematics |
| DBA216D | Database Management Systems A | (6) | (15) | Computing Fundamentals B Principles of Programming B |
| SIS216D | Introduction to Strategic Information Systems | (6) | (15) | Business Fundamentals Computing Fundamentals B |
| SYA216D | System Analysis A | (6) | (15) | Computational Mathematics |

SECOND SEMESTER

| | | | | |
|---------|-------------------------------|-----|------|-------------------------------|
| BUB216D | Business Analysis B | (6) | (15) | Business Analysis A |
| DBB216D | Database Management Systems B | (6) | (15) | Database Management Systems A |
| ITP216D | IT Project Management A | (6) | (15) | Computational Mathematics |
| SYB216D | System Analysis B | (6) | (15) | System Analysis A |

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|---|-----|------|--|
| IEA316D | Introduction to Enterprise Architecture | (6) | (15) | Introduction to Strategic Information Systems |
| ISD316D | Information System Deployment | (6) | (15) | Business Analysis B Database Management Systems B IT Project Management A System Analysis B |
| ITP316D | IT Project Management B | (6) | (15) | IT Project Management A |
| PCT316D | Process Testing | (6) | (15) | Database Management Systems B |

SECOND SEMESTER**On completion of first-semester modules.**

| | | | |
|---------|--------------------------|-----|------|
| WII316D | Work-Integrated Learning | (6) | (60) |
|---------|--------------------------|-----|------|

| | | | |
|-----------------------------------|--|--|------------|
| TOTAL CREDITS FOR THE THIRD YEAR: | | | 120 |
|-----------------------------------|--|--|------------|

| | | | |
|--------------------------------------|--|--|------------|
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 360 |
|--------------------------------------|--|--|------------|

3.2 DIPLOMA IN INFORMATICS**(Extended curriculum programme with foundation provision)**

Dip (Informatics) - NQF Level 6 (360 credits)

Qualification code: DPIFF0

SAQA ID: 103078, CHE NUMBER: H/H16/E061CAN

Campus where offered: Soshanguve South Campus

REMARKS**a. Admission requirement(s) and selection criteria:**

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

• FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**Admission requirement(s):**

A Senior Certificate or an equivalent qualification with an E symbol at Higher Grade or a D symbol at Standard Grade for English and Mathematics.

Recommended subjects:

Computer Science and Physical Science.



Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23**. Applicants will be notified to make an appointment with the departmental secretary for the interview or test. This rule applies to all applicants, as well as to applicants who are already registered at other institutions.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language) and 4 for Mathematics or Technical Mathematics or 6 for Mathematical Literacy.

Recommended subjects:

None.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (with Mathematics) or **25** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

Assessment procedure(s):

Applicants who achieve the minimum APS of **23** will be considered. Applicants with a score of **21** (with Mathematics) or **24** (with Mathematical Literacy) will be added to a waiting list.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 40% (APS of 3) for English (first additional language) and 50% (APS of 4) for Mathematics or 70% (APS of 6) for Mathematical Literacy, 50% for Life Orientation (excluded for APS calculation), 50% (APS of 4) for any other three compulsory vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (with Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

Assessment procedure(s):

Applicants who achieve the minimum APS of **23** will be considered. Applicants with a score of **21** (with Mathematics) or **24** (with Mathematical Literacy) will be added to a waiting list.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3, with at least 60% (APS of 5 for Mathematics N3).

- b. *Recognition of Prior Learning (RPL), equivalence and status:*
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- c. *Intake for the qualification:*
January only.
- d. *Presentation:*
Day classes. Classes and assessments take place during the week and on Saturdays.
- e. *Minimum duration:*
Four years.
- f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- g. *Work-Integrated Learning:*
See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).
- h. *Personal equipment:*
Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

FIRST YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------------------|--|-------|-----------|------------------------|
| CGAF05D | Computing Fundamentals A | (5) | (15) | |
| COEF05X | Communication for Academic Purpose | (5) | (10) | |
| COHF05D | Computational Mathematics | (5) | (15) | |
| INFF25D | Information Literacy (<i>block module</i>) | (5) | (3) | |
| LFS125X | Life Skills (<i>block module</i>) | (5) | (2) | |
| PPAF05D | Principles of Programming A | (5) | (15) | |
| TOTAL CREDITS FOR THE FIRST YEAR: | | | 60 | |

SECOND YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------|--|-------|--------|-----------------------------|
| FIRST SEMESTER | | | | |
| CGBF15D | Computing Fundamentals B | (5) | (15) | Computing Fundamentals A |
| PPBF15D | Principles of Programming B (<i>first- or second-semester module</i>) | (5) | (15) | Principles of Programming A |



SECOND SEMESTER

| | | | | |
|---------|--------------------------|-----|------|---------------------------|
| BCMF15D | Business Cost Management | (5) | (15) | Computational Mathematics |
| BFSF15D | Business Fundamentals | (5) | (15) | Computational Mathematics |

TOTAL CREDITS FOR THE SECOND YEAR: **60**

THIRD YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|---|-----|------|---|
| BUA216D | Business Analysis A | (6) | (15) | Computational Mathematics |
| DBA216D | Database Management Systems A | (6) | (15) | Computing Fundamentals B Principles of Programming B |
| SIS216D | Introduction to Strategic Information Systems | (6) | (15) | Business Fundamentals Computing Fundamentals B |
| SYA216D | System Analysis A | (6) | (15) | Computational Mathematics |

SECOND SEMESTER

| | | | | |
|---------|-------------------------------|-----|------|-------------------------------|
| BUB216D | Business Analysis B | (6) | (15) | Business Analysis A |
| DBB216D | Database Management Systems B | (6) | (15) | Database Management Systems A |
| ITP216D | IT Project Management A | (6) | (15) | Computational Mathematics |
| SYB216D | System Analysis B | (6) | (15) | System Analysis A |

TOTAL CREDITS FOR THE THIRD YEAR: **120**

FOURTH YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|---|-----|------|--|
| IEA316D | Introduction to Enterprise Architecture | (6) | (15) | Introduction to Strategic Information Systems |
| ISD316D | Information System Deployment | (6) | (15) | Business Analysis B Database Management Systems B IT Project Management A System Analysis B |
| ITP316D | IT Project Management B | (6) | (15) | IT Project Management A |
| PCT316D | Process Testing | (6) | (15) | Database Management Systems B |

SECOND SEMESTER

On completion of first-semester modules.

| | | | | |
|---------|--------------------------|-----|------|--|
| WII316D | Work-Integrated Learning | (6) | (60) | |
|---------|--------------------------|-----|------|--|

TOTAL CREDITS FOR THE FOURTH YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

3.3 ADVANCED DIPLOMA IN INFORMATICS

AdvDip (Informatics) - NQF Level 7 (120 credits)

Qualification code: ADIF20

SAQA ID: 111463, CHE NUMBER: H/H16/E168CAN

Campus where offered:

Soshanguve South Campus

REMARKS

a. Admission requirement(s):

A National Diploma: Information Technology in the field of Business Applications, **or** a Diploma in Informatics, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in their previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Day classes offered on Saturdays over a period of two years.

f. Minimum duration:

A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Re-registration:

The option to re-register for Information System Research is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.

i. Personal equipment:

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.



CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|--------------------------------------|--|-------|------------|------------------------|
| FIRST SEMESTER | | | | |
| BAA117V | Business Analysis and Application | (7) | (15) | |
| ITM117V | Information and Technology Management | (7) | (15) | |
| KWM117V | Knowledge Management | (7) | (15) | |
| PIF117V | Principles of Research | (7) | (15) | |
| SECOND SEMESTER | | | | |
| IAR117V | Information Systems Architecture | (7) | (15) | |
| ISR117V | Information System Research | (7) | (15) | Principles of Research |
| ISR117R | Information System Research (re-registration) (<i>first-semester module - see paragraph h</i>) | (7) | (0) | |
| ITP117V | Information Technology Project Management | (7) | (15) | |
| SIS117V | Strategic Information Systems | (7) | (15) | |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 120 | |

3.4 POSTGRADUATE DIPLOMA IN INFORMATICS

PGDip (Informatics) - NQF Level 8 (120 credits)

Qualification code: PDIF21

SAQA ID: 111841, CHE NUMBER: H/H16/E174CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

An Advanced Diploma in Informatics, **or** a Baccalaureus Technologiae: Information Technology in the field of Business Applications or Knowledge Management or Information Management or Business Information Systems, **or** a Bachelor's degree in Informatics or in Information Systems, **or** an equivalent specialisation qualification at NQF Level 7 with a minimum of 120 credits. Preference will be given to candidates who obtained an average of 60% in their previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in their previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- c. **Recognition of Prior Learning (RPL), equivalence and status:**
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- d. **Intake for the qualification:**
January only.
- e. **Presentation:**
Day classes offered on Saturdays over a period of two years.
- f. **Duration:**
A minimum of one or two years (depending on the programme presentation).
- g. **Exclusion and readmission:**
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- h. **Re-registration:**
The option to re-register for Advanced Research Project is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.
- i. **Personal equipment:**
Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|--|-------|--------|------------------------|
| ARP108G | Advanced Research Project | (8) | (24) | Research Methodology |
| ARP118R | Advanced Research Project (re-registration) (<i>first-semester module, see paragraph h</i>) | (8) | (0) | |

FIRST SEMESTER

| | | | |
|---------|--|-----|------|
| BAA118G | Advanced Business Analysis and Application | (8) | (24) |
| ITP118G | Advanced IT Project Management | (8) | (24) |

SECOND SEMESTER

| | | | |
|---------|-------------------------------|-----|------|
| KWM118G | Advanced Knowledge Management | (8) | (24) |
| RIF118G | Research Methodology | (8) | (24) |

TOTAL CREDITS FOR THE QUALIFICATION: **120**



3.5 MASTER OF COMPUTING

MComputing - NQF Level 9 (180 credits)

Qualification code: MDCO17

(Specialisation code for admission and registration: MDIF17)

SAQA ID: 96920, CHE NUMBER: H16/10793/HEQSF

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

An Honours degree, **or** a Postgraduate Diploma in Informatics or in a closely related field in Computing. Candidates should have achieved an average of 60% in their previous qualification, if not, special permission must be obtained from the Department.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission to this programme is only granted after a successful interview with the Department. Admission is subject to selection. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Research. The topic should be chosen in consultation with the Department.

f. Duration:

A minimum of one year and a maximum of three years.

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Rules on postgraduate studies:

See Chapter 8 of Students' Rules and Regulations (Part 1 of the Prospectus).

CURRICULUM

The modules offered within the Master of Computing differ between departments. Please refer to the contents (page 5) to see which of the other departments within the faculty offer this programme.

| CODE | MODULE | NQF-L | CREDIT |
|--------------------------------------|--|-------|------------|
| MIN109M | Dissertation: Informatics | (9) | (180) |
| MIN109R | Dissertation: Informatics (re-registration) | (9) | (0) |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 180 |

3.6 DOCTOR OF COMPUTING

DComputing - NQF Level 10 (360 credits)

Qualification code: DDCO01

(Specialisation code for admission and registration: DDIF17)

SAQA ID: 96754, CHE NUMBER: H16/10789/HEQSF

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

A Master's degree in Informatics or in a closely related field in Computing. Candidates should have achieved an average of 60% in their previous qualification, if not, special permission must be obtained from the Department.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission to this programme is only granted after a successful interview with the Department. Admission is subject to selection. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January and July.

e. Presentation:

Research. The topic should be chosen in consultation with the Department.

f. Duration:

A minimum of three years and a maximum of six years.

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Rules on postgraduate studies:

See Chapter 8 of Students' Rules and Regulations (Part 1 of the Prospectus).

CURRICULUM

The modules offered within the Doctor of Computing differ between departments. Please refer to the contents (page 5) to see which of the other departments within the faculty offer this programme.

| CODE | MODULE | NQF-L | CREDIT |
|--------------------------------------|--|-------|------------|
| IN1010O | Thesis: Informatics | (10) | (360) |
| IN1010R | Thesis: Informatics (re-registration) | (10) | (0) |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 360 |



4. DEPARTMENT OF INFORMATION TECHNOLOGY

4.1 DIPLOMA IN INFORMATION TECHNOLOGY

Dip (Information Technology) - NQF Level 6 (360 credits)

Qualification code: DPIT20

SAQA ID: 111493, CHE NUMBER: H/H16/E088CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

• FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:

Admission requirement(s):

A Senior Certificate or an equivalent qualification with an E symbol at Higher Grade or a D symbol at Standard Grade for English, Mathematics and Physical Science.

Recommended subjects:

Computer Science.

Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26**. Applicants with a score of **23** will be considered for the extended programme. Applicants will be notified to make an appointment with the departmental secretary for the interview or test. This rule applies to all applicants, as well as to applicants who are already registered at other institutions.

• FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language) and 5 for Mathematics or Technical Mathematics or 7 for Mathematical Literacy and 3 for Physical Science or Technical Science.

Recommended subjects:

None.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26** (with Mathematics or Technical Mathematics) or **28** (with Mathematical Literacy). Applicants with a score of **23** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

Assessment procedure(s):

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 50% (APS of 4) for English (first additional language) and 60% for Mathematics (APS of 5) or 80% for Mathematical Literacy (APS of 7) and 50% for Life Orientation (excluded for APS calculation) and 40% (APS of 3) for Physical Science/Applied Engineering Technology at least 50% (APS of 4) in any two other vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **26** (with Mathematics) or **28** (with Mathematical Literacy). Applicants with a score of **23** (with Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation.

Assessment procedure(s):

No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3 (NQF Level 4), with at least 50% (APS of 4) for English and 60% (APS of 5) for Mathematics N3 and Engineering Sciences N3.

- b. *Recognition of Prior Learning (RPL), equivalence and status:*
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- c. *Intake for the qualification:*
January only.
- d. *Presentation:*
Day classes. Classes and assessments take place during the week and on Saturdays.
- e. *Minimum duration:*
Three years.
- f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- g. *Industrial Exposure 326R (Work-Integrated Learning):*
See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).



h. *Personal equipment:*

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

Key to asterisks:

- * Information does not correspond to SAQA registration certificate as per SAQA ID: 111493. (The deviations were approved by the Senate meeting of June 2023.)

FIRST YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|--|-------|--------|------------------------|
| 16E105X | Communication for Academic purpose | (5) | (10) | |
| INF125D | Information Literacy (<i>block module</i>) | (5) | (3) | |
| LFS125X | Life Skills (<i>block module</i>) | (5) | (2) | |

FIRST SEMESTER

| | | | |
|---------|---|-----|------|
| CHO115D | Computational Mathematics* | (5) | (15) |
| CN1115D | Computer Networks 115R | (5) | (15) |
| TRO115D | Introduction to Programming 115R (<i>first- or second-semester module</i>) | (5) | (15) |

SECOND SEMESTER

| | | | | |
|---------|---|-----|------|----------------------------------|
| CAT116D | Computer Architecture 125R | (6) | (15) | Computational Mathematics |
| CN2115D | Computer Networks 125R | (5) | (15) | Computer Networks 115R |
| DSM116D | Discrete Mathematics 115R | (6) | (15) | Computational Mathematics |
| PPG115D | Principles of Programming 125R (<i>first- or second-semester module</i>) | (5) | (15) | Introduction to Programming 115R |

TOTAL CREDITS FOR THE FIRST YEAR: **120**

SECOND YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|----------------------------------|-------|--------|--------------------------------|
| CN1216D | Computer Networks 215R | (6) | (15) | Computer Networks 125R |
| OOR216D | Object-Oriented Programming 216R | (6) | (15) | Principles of Programming 125R |
| OSY216D | Operating Systems 226R | (6) | (15) | Computer Architecture 125R |
| PS1216D | Computer Security 215R | (6) | (15) | Computer Networks 125R |

SECOND SEMESTER

| | | | | |
|---------|---|-----|------|----------------------------------|
| AOR216D | Advanced Object-Oriented Programming 226R | (6) | (15) | Object-Oriented Programming 216R |
| CN2216D | Computer Networks 226R | (6) | (15) | Computer Networks 215R |
| VMA216D | Virtual Machines 216R | (6) | (15) | Computer Security 215R |

plus one of following electives:

| | | | | |
|---------|---------------------------------------|-----|------|------------------------|
| PS2216D | Computer Security 226R | (6) | (15) | Computer Security 215R |
| WOR216D | Web Organisation 226R | (6) | (15) | |
| | <i>(module not currently offered)</i> | | | |

TOTAL CREDITS FOR THE SECOND YEAR: **120**

THIRD YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|-----------------------|-------------------------|-------|--------|------------------------|
| FIRST SEMESTER | | | | |
| CNT316D | Computer Networks 316R | (6) | (15) | Computer Networks 226R |
| NMG316D | Network Management 316R | (6) | (15) | |
| WNE316D | Wireless Networks 316R | (6) | (15) | Computer Networks 215R |

plus one of following electives:

| | | | | |
|---------|---------------------------------------|-----|------|------------------------|
| CSY316D | Computer Security 316R | (6) | (15) | Computer Security 226R |
| RAL316D | Resource Allocation 316R | (6) | (15) | Computer Networks 226R |
| | <i>(module not currently offered)</i> | | | |

FIRST OR SECOND SEMESTER

On completion of all modules.

| | | | | |
|---------|--------------------------|-----|------|--|
| IEX316D | Industrial Exposure 326R | (6) | (60) | |
|---------|--------------------------|-----|------|--|

TOTAL CREDITS FOR THE THIRD YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

4.2 DIPLOMA IN INFORMATION TECHNOLOGY

(Extended curriculum programme with foundation provision)

Dip (Information Technology) - NQF Level 6 (360 credits)

Qualification code: DPITF0

SAQA ID: 111493, CHE NUMBER: H/H16/E088CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s) and selection criteria:

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) and preference would be given to first-time entering students. Once a programme is full, a waiting list will be created to provide an opportunity for applicants to fill the places of those who did not register on time. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.



- **FOR APPLICANTS WITH A SENIOR CERTIFICATE OBTAINED BEFORE 2008:**

Admission requirement(s):

A Senior Certificate with an equivalent qualification with an E symbol at Higher Grade or a D symbol at Standard Grade for English, Mathematics and Physical Science.

Recommended subjects:

Computer Science.

Selection criteria:

Applicants are assessed by means of a formula for academic merit, based on scholastic performance. The formula for academic merit is as follows:

| SYMBOL | HG VALUE | SG VALUE |
|--------|----------|----------|
| A | 7 | 6 |
| B | 6 | 5 |
| C | 5 | 4 |
| D | 4 | 3 |
| E | 3 | 2 |
| F | 2 | |

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23**. Applicants will be notified to make an appointment with the departmental secretary for the interview or test. This rule applies to all applicants, as well as to applicants who are already registered at other institutions.

- **FOR APPLICANTS WITH A NATIONAL SENIOR CERTIFICATE OBTAINED IN OR AFTER 2008:**

Admission requirement(s):

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 3 for English (home language or first additional language) and 4 for Mathematics or Technical Mathematics or 6 for Mathematical Literacy and 3 for Physical Science or Technical Science.

Recommended subjects:

None.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (with Mathematics or Technical Mathematics) or **25** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

Assessment procedure(s):

Applicants who achieve the minimum APS of **23** will be considered. Applicants with a score of **21** (with Mathematics or Technical Mathematics) or **24** (with Mathematical Literacy) will be added to a waiting list.

- **FOR APPLICANTS WITH A NATIONAL CERTIFICATE (VOCATIONAL) AT NQF LEVEL 4:**

Admission requirement(s):

A National Certificate (Vocational) at NQF Level 4 with a bachelor's degree or a diploma endorsement, with at least 40% (APS of 3) for English (first additional language) and 50% (APS of 4) for Mathematics or 70% (APS of 6) for Mathematical Literacy, 50% for Life Orientation (excluded for APS calculation) and 40% (APS of 3) for Physical Science/Applied Engineering Technology and at least 50% (APS of 4) in any two other vocational subjects.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **23** (with Mathematics) or **25** (with Mathematical Literacy). Life Orientation is excluded for APS calculation.

Assessment procedure(s):

Applicants who achieve the minimum APS of **23** will be considered. Applicants with a score of **21** (with Mathematics) or **24** (with Mathematical Literacy) will be added to a waiting list.

- **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE AS PUBLISHED IN REPORT 191 (NATED), N3 (NQF LEVEL 4):**

Admission requirement(s):

A National Senior Certificate and a National N Certificate as published in Report 191 (Nated), N3 (NQF Level 4), with at least 40% (APS of 3) for English and 50% (APS of 4) for Mathematics N3 and Engineering Sciences N3.

- b. *Recognition of Prior Learning (RPL), equivalence and status:*
Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).
- c. *Intake for the qualification:*
January only.
- d. *Presentation:*
Day classes. Classes and assessments take place during the week and on Saturdays.
- e. *Minimum duration:*
Four years.
- f. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- g. *Industrial Exposure 326R (Work-Integrated Learning):*
See Chapter 5 of Students' Rules and Regulations (Part 1 of the Prospectus).
- h. *Personal equipment:*
Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM*Key to asterisks:*

- * Information does not correspond to SAQA registration certificate as per SAQA ID: 111493. (The deviations were approved by the Senate meeting of June 2023.)

FIRST YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|--|-------|--------|------------------------|
| CHOF05D | Computational Mathematics* | (5) | (15) | |
| CN1F05D | Computer Networks 115R | (5) | (15) | |
| COEF05X | Communication for Academic Purpose | (5) | (10) | |
| INFF25D | Information Literacy (<i>block module</i>) | (5) | (3) | |
| LFS125X | Life Skills (<i>block module</i>) | (5) | (2) | |



TROF05D Introduction to Programming 115R (5) (15)

TOTAL CREDITS FOR THE FIRST YEAR: 60

SECOND YEAR

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|--|-----|------|---------------------------|
| CATF16D | Computer Architecture 125R (first- or second-semester module) | (6) | (15) | Computational Mathematics |
|---------|--|-----|------|---------------------------|

| | | | | |
|---------|---------------------------|-----|------|---------------------------|
| DSMF16D | Discrete Mathematics 115R | (6) | (15) | Computational Mathematics |
|---------|---------------------------|-----|------|---------------------------|

SECOND SEMESTER

| | | | | |
|---------|--|-----|------|----------------------------------|
| CN2F15D | Computer Networks 125R | (5) | (15) | Computer Networks 115R |
| PPGF15D | Principles of Programming 125R (first- or second-semester module) | (5) | (15) | Introduction to Programming 115R |

TOTAL CREDITS FOR THE SECOND YEAR: 60

THIRD YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|-------------------------------------|-----|------|--------------------------------|
| CN1216D | Computer Networks 215R | (6) | (15) | Computer Networks 125R |
| OOR216D | Object-Oriented Programming 216R | (6) | (15) | Principles of Programming 125R |

| | | | | |
|---------|------------------------|-----|------|----------------------------|
| OSY216D | Operating Systems 226R | (6) | (15) | Computer Architecture 125R |
| PS1216D | Computer Security 215R | (6) | (15) | Computer Networks 125R |

SECOND SEMESTER

| | | | | |
|---------|--|-----|------|-------------------------------------|
| AOR216D | Advanced Object-Oriented Programming 226R | (6) | (15) | Object-Oriented Programming 216R |
| CN2216D | Computer Networks 226R | (6) | (15) | Computer Networks 215R |
| VMA216D | Virtual Machines 216R | (6) | (15) | Computer Security 215R |

plus one of following electives:

| | | | | |
|---------|---|-----|------|------------------------|
| PS2216D | Computer Security 226R | (6) | (15) | Computer Security 215R |
| WOR216D | Web Organisation 226R (module not currently offered) | (6) | (15) | |

TOTAL CREDITS FOR THE THIRD YEAR: 120

FOURTH YEAR

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|------|--------|-------|--------|------------------------|
|------|--------|-------|--------|------------------------|

FIRST SEMESTER

| | | | | |
|---------|------------------------|-----|------|------------------------|
| CNT316D | Computer Networks 316R | (6) | (15) | Computer Networks 226R |
|---------|------------------------|-----|------|------------------------|

| | | | | |
|---------|-------------------------|-----|------|--|
| NMG316D | Network Management 316R | (6) | (15) | |
|---------|-------------------------|-----|------|--|

| | | | | |
|---------|------------------------|-----|------|------------------------|
| WNE316D | Wireless Networks 316R | (6) | (15) | Computer Networks 215R |
|---------|------------------------|-----|------|------------------------|

plus one of following electives:

| | | | | |
|---------|--------------------------------|-----|------|------------------------|
| CSY316D | Computer Security 316R | (6) | (15) | Computer Security 226R |
| RAL316D | Resource Allocation 316R | (6) | (15) | Computer Networks 226R |
| | (module not currently offered) | | | |

FIRST OR SECOND SEMESTER

On completion of all modules.

IEX316D Industrial Exposure 326R (6) (60)

TOTAL CREDITS FOR THE FOURTH YEAR: **120**

TOTAL CREDITS FOR THE QUALIFICATION: **360**

4.3 ADVANCED DIPLOMA IN INFORMATION TECHNOLOGY

AdvDip (Information Technology) - NQF Level 7 (120 credits)

Qualification code: ADIT21

SAQA ID: 117676, CHE NUMBER: H/H16/E158CAN

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

A Diploma in Information Technology, **or** a National Diploma Information Technology in the field of Communication Networks or Support Services, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 6 with a minimum of 360 credits. Prospective students are required to have advanced knowledge of Communication/Computer Networks and Cyber/Computer Security.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in their previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Day classes offered on Saturdays over a period of two years.

f. Minimum duration:

A minimum of one or two years (depending on the programme presentation).



- g. *Exclusion and readmission:*
See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).
- h. *Re-registration:*
The option to re-register for Research Project IV is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.
- i. *Personal equipment:*
Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---|---|-------|------------|--|
| FIRST SEMESTER | | | | |
| NWG117V | Network Management IV | (7) | (15) | |
| NWP117V | Network Applications IV | (7) | (15) | |
| PIT117V | Principles of Research | (7) | (15) | |
| SAM117V | System Administration and Maintenance IV | (7) | (15) | |
| SECOND SEMESTER | | | | |
| RIT117V | Research Project IV | (7) | (15) | Principles of Research |
| RIT117R | Research Project IV (re-registration) (<i>first-semester module, see paragraph h</i>) | (7) | (0) | |
| WNE117V | Wireless Networks IV | (7) | (15) | |
| plus one of the following electives: | | | | |
| PNA117V | Computer Networks IVA | (7) | (15) | |
| SEA117V | Computer Security IVA | (7) | (15) | |
| plus one of the following electives: | | | | |
| PNB117V | Computer Networks IVB | (7) | (15) | Computer Networks IVA Computer Security IVA |
| SEB117V | Computer Security IVB | (7) | (15) | |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 120 | |

4.4 POSTGRADUATE DIPLOMA IN INFORMATION TECHNOLOGY

PGDip (Information Technology) - NQF Level 8 (120 credits)

Qualification code: PDIT21

SAQA ID: 110062, CHE NUMBER: H/H16/E171CAN

Campus where offered:

Soshanguve South Campus

REMARKS

a. Admission requirement(s):

An Advanced Diploma in Information Technology in the field of Computer Networks or Cyber Security, **or** a Baccalaureus Technologiae: Information Technology in the field of Communication Networks or Support Services, **or** a relevant bachelor's degree, **or** an equivalent qualification at NQF Level 7 with specialisation in Computer Networks or Cyber Security. Preference will be given to candidates who obtained an average of 60% in their previous qualification.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in their previous qualification and/or work experience.

Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Day classes offered on Saturdays over a period of two years.

f. Duration:

A minimum of one or two years (depending on the programme presentation).

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Re-registration:

The option to re-register for Network Research Project V is subject to a student's academic performance. The purpose of the re-registration option is to provide students with an opportunity to complete the final project only, and not to redo the whole module should they fail the module.



j. *Personal equipment:*

Access to a laptop or desktop computer is essential to participate in multimodal learning experiences as well as to complete assignments and projects. NSFAS students receive an allowance to acquire a laptop, and using this allowance for this purpose is critical for academic success. Students are encouraged to consult the faculty website where the minimum requirements for specific programmes are published.

CURRICULUM

ATTENDANCE (FIRST OR SECOND YEAR)

Modules are offered as determined by the Head of the Department.

| CODE | MODULE | NQF-L | CREDIT | PREREQUISITE MODULE(S) |
|---------|---|-------|--------|--------------------------|
| NWR108G | Network Research Project V | (8) | (15) | Principles of Research V |
| NWR118R | Network Research Project V (re-registration) (<i>first-semester module, see paragraph h</i>) | (8) | (0) | |

FIRST SEMESTER

| | | | | |
|---------|---|-----|------|--|
| PIT118G | Principles of Research V | (8) | (15) | |
| SCN118G | Social Engineering and New Trends in Networks | (8) | (15) | |

plus one of the following electives:

| | | | | |
|---------|-----------------------|-----|------|-----------------------|
| CN2118G | Computer Networks 502 | (8) | (15) | Computer Networks 501 |
| CRG118G | Cryptography 502 | (8) | (15) | Computer Security 501 |

SECOND SEMESTER

| | | | | |
|---------|---------------------|-----|------|--|
| DFO118G | Digital Forensics V | (8) | (15) | |
|---------|---------------------|-----|------|--|

plus one of the following electives:

| | | | | |
|---------|-----------------------|-----|------|--|
| CN1118G | Computer Networks 501 | (8) | (15) | |
| CSY118G | Computer Security 501 | (8) | (15) | |

plus one of the following electives:

| | | | | |
|---------|------------------------------------|-----|------|--|
| NWA118G | Network Management 501 | (8) | (15) | |
| SPG118G | Security Policy and Governance 501 | (8) | (15) | |

plus one of the following electives:

| | | | | |
|---------|-------------------------------|-----|------|-----------------------|
| EHA118G | Ethical Hacking 502 | (8) | (15) | Computer Security 501 |
| SDN118G | Software Defined Networks 502 | (8) | (15) | Computer Networks 501 |

TOTAL CREDITS FOR THE QUALIFICATION: 120



4.5 MASTER OF COMPUTING

MComputing - NQF Level 9 (180 credits)

Qualification code: MDCO17

(Specialisation code for admission and registration: MDIT17)

SAQA ID: 96920, CHE NUMBER: H16/10793/HEQSF

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

An Honours degree, **or** a Postgraduate Diploma in Information Technology in the fields of Communication Networks or Cyber Security or in a closely related field in Computing. Candidates should have achieved an average of 60% in their previous qualification, if not, special permission must be obtained from the Department.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission to this programme is only granted after a successful interview with the Department. Admission is subject to selection. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January only.

e. Presentation:

Research. The topic should be chosen in consultation with the Department.

f. Duration:

A minimum of one year and a maximum of three years.

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Rules on postgraduate studies:

See Chapter 8 of Students' Rules and Regulations (Part 1 of the Prospectus).

CURRICULUM

The modules offered within the Master of Computing differ between departments. Please refer to the contents (page 5) to see which of the other departments within the faculty offer this programme.

| CODE | MODULE | NQF-L | CREDIT |
|---------|--------------------------------------|-------|--------|
| MIT109M | Dissertation: Information Technology | (9) | (180) |



MIT109R Dissertation: Information (9) (0)
 Technology (re-registration)

TOTAL CREDITS FOR THE QUALIFICATION: **180**

4.6 DOCTOR OF COMPUTING

DComputing - NQF Level 10 (360 credits)

Qualification code: DDCO01

(Specialisation code for admission and registration: DDIT17)

SAQA ID: 96754, CHE NUMBER: H16/10789/HEQSF

Campus where offered: Soshanguve South Campus

REMARKS

a. Admission requirement(s):

A Master's degree in Information Technology in the fields of Communication Networks or Cyber Security or in a closely related field in Computing. Candidates should have achieved an average of 60% in their previous qualification, if not, special permission must be obtained from the Department.

Holders of any other equivalent South African or international qualification may also be considered, see Chapter 1 of Students' Rules and Regulations (Part 1 of the Prospectus).

b. Selection criteria:

Admission to this programme is only granted after a successful interview with the Department. Admission is subject to selection. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP) as well as supervisory capacity. Applicants will be informed of their status per an official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

c. Recognition of Prior Learning (RPL), equivalence and status:

Information on the rules and the process to follow is available in Chapter 30 of Students' Rules and Regulations (Part 1 of the Prospectus).

d. Intake for the qualification:

January and July.

e. Presentation:

Research. The topic should be chosen in consultation with the Department.

f. Duration:

A minimum of three years and a maximum of six years.

g. Exclusion and readmission:

See Chapter 2 of Students' Rules and Regulations (Part 1 of the Prospectus).

h. Rules on postgraduate studies:

See Chapter 8 of Students' Rules and Regulations (Part 1 of the Prospectus).

CURRICULUM

The modules offered within the Doctor of Computing differ between departments. Please refer to the contents (page 5) to see which of the other departments within the faculty offer this programme.

| CODE | MODULE | NQF-L | CREDIT |
|--------------------------------------|---|-------|------------|
| IT1010O | Thesis: Information Technology | (10) | (360) |
| IT1010R | Thesis: Information Technology (re-registration) | (10) | (0) |
| TOTAL CREDITS FOR THE QUALIFICATION: | | | 360 |



SECTION B: MODULE INFORMATION (OVERVIEW OF SYLLABUS)

The syllabus content is subject to change to accommodate industry changes. Please note that a more detailed syllabus is available at the relevant academic department or in the study guide that applies to a particular module. At the time of publication, the syllabus content was defined as follows:

A

ADVANCED ARTIFICIAL INTELLIGENT SYSTEMS (AIS118G)

1 X 3-HOUR PAPER

(Module custodian: Department of Computer Systems Engineering)

This module covers applied supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks), applied unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning), and applied best practices in machine learning (bias/variance theory; innovation process in machine learning and Artificial Intelligence). The student will be able to design supervised, unsupervised, and deep learning systems to solve diverse engineering problems. (Total notional time: 150 hours)

ADVANCED BUSINESS ANALYSIS AND APPLICATION (BAA118G)

1 X 3-HOUR PAPER

(Module custodian: Department of Informatics)

The student will be able to apply his/her knowledge of the Software Development Lifecycle (SDLC) and advanced systems analysis techniques to initiate, plan, design, and deploy information systems solutions within an organisation and be able to adapt to best practices in relation to information systems projects. (Total notional time: 240 hours)

ADVANCED COMPUTER ARCHITECTURE AND ORGANISATION (CAO118G)

1 X 3-HOUR PAPER

(Module custodian: Department of Computer Systems Engineering)

This module aims to provide an understanding of modern computer system architecture, computer subsystem hardware design, CPU control unit design, memory organisation, cache design, virtual memory, and algorithms. After successful completion of this module, the student must be able to design a prototype that consist of hardware and compiled algorithms. (Total notional time: 150 hours)

ADVANCED COMPUTER EMERGING TECHNOLOGIES (CES118G)

1 X 3-HOUR PAPER

(Module custodian: Department of Computer Systems Engineering)

This module will explore current breakthrough technologies and disruptive innovations that have emerged over the past few years and the new inventions that have yet to emerge as viable technologies in the field of Computer Systems Engineering. After successful completion of this module, the student must be able to understand computer engineering trends in a global context. (Total notional time: 150 hours)

ADVANCED COMPUTER NETWORKS (CNE118G)

1 X 3-HOUR PAPER

(Module custodian: Department of Computer Systems Engineering)

This module covers the theory and simulation of network nodes and network security. The mathematics of computer networks is implemented by using tools, such as Python, GNS, Cisco VIRL and NS3. After successful completion of this module, the student must be able to design and simulate complex networks using modern and advanced network simulators. (Total notional time: 150 hours)

ADVANCED DIGITAL SIGNAL PROCESSING (DSR118G)

1 X 3-HOUR PAPER

(Module custodian: Department of Computer Systems Engineering)

This module covers digital signal processing systems, time-domain signal processing, filter theory, frequency-domain transforms and processing, and various filters such as the Kalman Filter, and the Gaussian filter. After successful completion of this module, the student must be able to apply the knowledge of the module to real industrial problems such as image processing, sound, computer vision, etc. (Total notional time: 150 hours)

ADVANCED DISCRETE STRUCTURES (ADS216D)

1 X 3-HOUR PAPER

(Module custodian: Department of Computer Science)

This module is meant to help students develop the mathematical foundations necessary for more specialised modules in Computer Science, including data structures, algorithms, graphs and trees, and discrete probability. After completion of this module, students will have learnt the mathematical expertise required for an in-depth study of the science and technology of the computer age. (Total notional time: 150 hours)

ADVANCED EMBEDDED SYSTEMS DESIGN (ESD118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers recent and industry-inclined intelligent devices (microcontroller). The student will be able to use the most recent intelligent devices to solve real industrial problems. (Total notional time: 150 hours)

ADVANCED GAMES PROGRAMMING (GPR117V)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to provide an overview coverage of design, programming, and implementation of advanced 3D games on different platforms, including the mobile, web and computers platforms. (Total notional time: 150 hours)

ADVANCED INTELLIGENT ELECTRO-MECHANICAL SYSTEMS (IES118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers Advanced Computer-based Instrumentation Systems, Advanced Computer-Integrated Manufacturing Systems with PLC, Advanced Magnetic Circuits and Transformers, Design of Motors, Advanced DC Machines, Advanced AC Machines, Advanced Mechanical Systems and Intermediate Power Electronic Devices. After successful completion of this module, the student must be able to design a prototype that will consist of intelligent devices, electro-mechanical and API. (Total notional time: 150 hours)

ADVANCED INTELLIGENT INDUSTRIAL SYSTEMS (IIS118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers the Implementation of behaviour-based robotics, Mobile robot localisation, Mobile robot map building, Mobile robot SLAM and Implementation and applications using industry-standard software/hardware. After successful completion of this module, the student must be able to design a complete mobile robot with a defined application. (Total notional time: 150 hours)

ADVANCED IT PROJECT MANAGEMENT (ITP118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply advanced project management principles in an Information Systems environment. This module is aligned with the Project Management Body of Knowledge (PMBOK) and the standard for Portfolio Management guide. (Total notional time: 240 hours)

ADVANCED KNOWLEDGE MANAGEMENT (KWM118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

The student will be able to apply his/her knowledge of Knowledge Management (KM) in the different management disciplines throughout the various functional enterprise environments, apply the different organisational theories and the management of intellectual capital. Upon completion of the module, the student will be able to apply, explain, design, and deploy advanced KM solutions within an organisation. (Total notional time: 240 hours)

ADVANCED OBJECT-ORIENTED PROGRAMMING (AOP216D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module covers advanced concepts of object-oriented programming using the Java language. The module builds upon the knowledge and skills obtained in the "Object-oriented Programming" module offered in the first semester of the second year. The focus of this module is to introduce students to advanced object-oriented programming concepts in Java such as data structures (lists and queues), multithreading, database connectivity and client-server applications. The student will be able to apply his/her knowledge of these advanced programming concepts to the problems arising in the software industry. (Total notional time: 150 hours)

ADVANCED OBJECT-ORIENTED PROGRAMMING 226R (AOR216D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module covers advanced concepts of object-oriented programming such as data structures, multithreading, database connectivity and client-server applications. (Total notional time: 150 hours)



ADVANCED RESEARCH PROJECT (ARP108G/ARP118R)**PROJECT ASSESSMENT**

(Module custodian: Department of Informatics)

Upon completion of the module, the student will know research paradigms, the difference between positivist, non-positivist (interpretivist) and Design Science research approaches, describe and explain reasons for the choice of these approaches in any research project, but also for a particular proposed research project, and be able to design a research plan including research methods, data collection instruments and data analysis aligned with the chosen research approach. (Total notional time: 240 hours)

ALGORITHMS AND COMPLEXITY (ACX118G)**CONTINUOUS ASSESSMENT**

(Module custodian: Department of Computer Science)

The purpose of this module is to prepare students to acquire the central concepts and skills required to design and implement algorithms and conduct their computational complexity analysis for performance efficiency of implementation. (Total notional time: 150 hours)

ARTIFICIAL INTELLIGENCE (ARI118G)**CONTINUOUS ASSESSMENT**

(Module custodian: Department of Computer Science)

The focus of this module is to lay the foundation for the design of artificial intelligence systems on different computing platforms. (Total notional time: 150 hours)

ARTIFICIAL INTELLIGENCE 226 (ARI216D)**1 X 3-HOUR PAPER**

(Module custodian: Department of Computer Systems Engineering)

This module covers applied intermediate artificial intelligence and is concerned with the implementation of intermediate-level artificial intelligence concepts. The student will be introduced to autonomous agents, state-driven design, basic user interaction concepts, autonomous virtual world generation, pathfinding and basic network programming. After successful completion of this module, the student must be able to create and design autonomous agents in a virtual world that achieve specific given goals using intermediate artificial intelligence concepts. (Total notional time: 100 hours)

ARTIFICIAL INTELLIGENCE GAMES PROGRAMMING (AIG118G)**CONTINUOUS ASSESSMENT**

(Module custodian: Department of Computer Science)

The focus of this module is to lay the foundation for the implementation of artificial intelligence systems on different computing platforms. (Total notional time: 150 hours)

ARTIFICIAL INTELLIGENT SYSTEMS (AIS117V)**1 X 3-HOUR PAPER**

(Module custodian: Department of Computer Systems Engineering)

This module covers introductory on supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks), unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning) and best practices in machine learning (bias/variance theory; innovation process in machine learning and Artificial Intelligence (AI)). After successful completion of this module, the student must be able to design systems that are fully managed by AI. (Total notional time: 150 hours)

B**BUSINESS ANALYSIS A (BUA216D)****1 X 3-HOUR PAPER**

(Module custodian: Department of Informatics)

This module introduces the student to the concepts and principles of business analysis, communication skills, interaction skills, ethics and behaviour within an organisation, Organisational Culture and lastly individual perception, attitudes and personality. (Total notional time: 150 hours)

BUSINESS ANALYSIS B (BUB216D)**1 X 3-HOUR PAPER**

(Module custodian: Department of Informatics)

This module prepares the students with a basic understanding of business analysis concepts thus enabling them to possess a clear understanding of the business analysis environment, knowing the projects and how to increase their value. This entails building the Business Analysis foundation, time management, how to build relationships with the clients and within the organisation. (Total notional time: 150 hours)

BUSINESS ANALYSIS AND APPLICATION (BAA117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply business system models and applications to the IT environment. It is aligned with the Business Analysis Body of Knowledge (BABOK) intermediate level. (Total notional time: 150 hours)

BUSINESS COST MANAGEMENT (BCM115D, BCMF15D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply the concepts and applications of any accounting system (cost management) to the organisation structure or to a project. The student will be able to apply his/her knowledge of basic cost management concepts, such as budgets and expenses to any organisation's structure. (Total notional time: 150 hours)

BUSINESS FUNDAMENTALS (BFS115D, BFSF15D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply the concepts and principles of business, management and Organisational behaviour to the organisation or to a project. The student will be able to apply his/her knowledge of basic business and management theory and Organisational behaviour concepts to an organisation's structure. (Total notional time: 150 hours)

C**COMMUNICATION FOR ACADEMIC PURPOSE (16E105X, COEF05X)****1 X 3-HOUR PAPER****COMMUNICATION FOR ACADEMIC PURPOSES (16P105X, CAPF05X)****1 X 3-HOUR PAPER****(Module custodian: ICT First Years' and Foundation Unit)**

This module applies a variety of listening and note taking skills for academic and professional purposes, different reading strategies appropriate to the purpose for reading in both an academic and professional environment, composes a selection of written texts related to a specific field of study. Plan, draft, revise and edit written work for clarity, coherence, style and appropriateness. (Total notional time: 100 hours)

COMMUNICATION SCIENCE 165 (CMS115D, CMSF05D)**1 X 3-HOUR PAPER****(Module custodian: ICT First Years' and Foundation Unit)**

This module covers the discipline of communication as a whole and touches on adjusting to and thriving in a tertiary environment and is concerned with the life skills needed for study at a university, using a computer for writing, doing research, and techniques for presenting research. The student will be introduced to concepts of change and personal adjustment, goal setting and time management, interpersonal skills, and listening and study skills. (Total notional time: 100 hours)

COMPUTATIONAL MATHEMATICS (COH115D, COHF05D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Science)**

The focus of this module is to teach students mathematical reasoning which will be necessary to solve complex programming problems in other modules. The theoretical knowledge obtained from this module is expected to develop students to solve real-world computer systems challenges by applying logic from a mathematical perspective relating to computer applications. (Total notional time: 150 hours)

COMPUTATIONAL MATHEMATICS (CHO115D, CHOF05D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module prepares the student to apply the concepts and applications of any computer networks. The student will be able to apply his/her knowledge of basic network concepts, such as history of computer hardware, software, networking; Information storage and retrieval (IS&R); Information management applications; Information capture and representation, key security elements, scalability and network system performance and skills, such as Search, retrieval, linking, navigation of information. (Total notional time: 150 hours)

COMPUTATIONAL MATHEMATICS (CMD116V)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module prepares the student to apply computational mathematics principles and models to solve problems related to Computer Systems Engineering. The focus is directed towards Numerical Computing with an emphasis on the mathematical software as a tool to solve most of the engineering problems mathematically. After successful completion of this module, the student must be able to apply knowledge of Computational Mathematics to applied engineering procedures, processes, systems and methodologies to solve broadly-defined engineering problems and thus, the processes interpreted in mathematical form. (Total notional time: 150 hours)



COMPUTER ARCHITECTURE 125R (CAT116D, CATF16D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers microcontroller principles and their applications and is concerned with design, development, and construction of microcontroller applications. The student will be introduced to the architecture of a microcontroller, memory architectures, DMA transfers, basic I/O principles and devices, interrupts, and embedded application designs. (Total notional time: 150 hours)

COMPUTER ARCHITECTURE AND ORGANISATION (CAO117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers a single-core versus multi-core processors and architectures, on-chip interconnect networks, memory controller issues, program partitioning, and programming techniques. The student will be able to design circuitry and develop software to complete a functioning microcontroller application. (Total notional time: 150 hours)

COMPUTER ARCHITECTURE AND ORGANISATION (CAO216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

The focus of this module is to introduce students to microcontroller principles and their applications. The module covers the design, development, and construction of microcontroller applications. After completion, the student must be able to design circuitry and develop software to complete a functioning microcontroller application. (Total notional time: 150 hours)

COMPUTER ARCHITECTURE AND ORGANISATION 216 (CAG216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers microcontroller principles and their applications and is concerned with design, development, and construction of microcontroller applications. The student will be introduced to the architecture of a microcontroller, memory architectures, DMA transfers, basic I/O principles and devices, interrupts, and embedded application designs. (Total notional time: 100 hours)

COMPUTER EMERGING TECHNOLOGIES (CES117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers the current breakthrough technologies and disruptive innovations that have emerged over the past few years and the new inventions that are yet to emerge as viable technologies in the field of Computer Systems Engineering. After successful completion of this module, the student must be able to design a system with the components of emerging technologies in the field of computer systems engineering. (Total notional time: 150 hours)

COMPUTER GRAPHICS (CGH117V)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

The focus of this module is to introduce the student to the mathematics behind signal processing and its implementation on different platforms such as the web and mobile devices. (Total notional time: 150 hours)

COMPUTER GRAPHICS (CGH118G)**CONTINUOUS ASSESSMENT****(Module custodian: Department of Computer Science)**

The focus of this module is to introduce the student to the mathematics behind signal processing and its implementation on different platforms such as the web and mobile devices. (Total notional time: 150 hours)

COMPUTER NETWORKS (CNT117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers various aspects of network security concepts and strategies and is concerned with the relationship with the industry problems. The student is introduced to network security threats, security of network devices, authentication and authorisation, firewall technologies, implementation of intrusion prevention, and management of a secure network. After completion of this module, students will be able to design, manage, and maintain a secure network system by applying the knowledge gained throughout the module. (Total notional time: 150 hours)

COMPUTER NETWORKS IVA (PNA117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with the Internet and Computer networks in general, different protocols used to accomplish different communication tasks, network security and applications. The emphasis is on equipping the students to be competent problem solvers who can originate and recommend computer network strategies. (Total notional time: 150 hours)

COMPUTER NETWORKS IVB (PNB117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The purpose of this module is to provide students with the Internet and Computer networks in general. Ether-Channel, Spanning-tree and WAN technologies are covered. (Total notional time: 150 hours)

COMPUTER NETWORKS 115R (CN1115D, CN1F05D)**1 X 3-HOUR PAPER****(Module custodians: Departments of Information Technology, and End User Computing Unit)**

This module provides the fundamentals of computers; Key applications; the Evolution of computer networks and the Internet. The purpose of this module is to identify legal, ethical and security issues related to information technology. (Total notional time: 150 hours)

COMPUTER NETWORKS 125R (CN2115D, CN2F15D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module provides students with the necessary techniques to design and implement computer network solutions to simple problems using emerging technologies, distributed computing and common network applications. (Total notional time: 150 hours)

COMPUTER NETWORKS 215R (CN1216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The student will apply basic network concepts, such as network optimisation, routing protocol configuration, system migration and upgrading, problem diagnosis and troubleshooting, and system maintenance. (Total notional time: 150 hours)

COMPUTER NETWORKS 226R (CN2216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The module will contribute to knowledge and skills, such as VLAN design, VLAN and VTP configuration, VLAN interconnection, troubleshooting, and VLAN connectivity testing. (Total notional time: 150 hours)

COMPUTER NETWORKS 316R (CNT316D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module introduces network concepts such as Cloud services, Elasticity of resources, Virtualisation, WAN technologies and Cloud-based data storage and skills such as VPN configuration, virtualisation configuration, and virtualisation testing (virtualisation management) to students. (Total notional time: 150 hours)

COMPUTER NETWORKS 501 (CN1118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with the Internet and Computer networks in general, different WAN technologies used to accomplish different communication tasks, network security and applications. The emphasis is on equipping the students to be competent problem solvers who can originate and recommend computer network strategies. (Total notional time: 150 hours)

COMPUTER NETWORKS 502 (CN2118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with the necessary tools and techniques to design and implement networks. The emphasis is on equipping the students to be competent problem solvers who can originate and recommend computer network strategies. (Total notional time: 150 hours)

COMPUTER SECURITY IVA (SEA117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with knowledge of cyber security principles and tools used to protect network security, Client-side technologies used in applications and manage security applications using applicable tools. (Total notional time: 150 hours)

COMPUTER SECURITY IVB (SEB117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with knowledge of wireless and mobile device, network security, applications security tools and computer security risk mitigation. (Total notional time: 150 hours)



COMPUTER SECURITY 215R (PS1216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module covers concepts and applications of basic computer security. This module will contribute to knowledge of CIA (Confidentiality, Integrity, Availability), concepts of risk, threats, vulnerabilities, and attack vectors, authentication and authorisation, access control (mandatory vs. discretionary), concepts of trust and trustworthiness, ethics (responsible disclosure), and skills such as fundamentals of authentication servers configuration, configuration of firewalls and basic security tools testing. (Total notional time: 150 hours)

COMPUTER SECURITY 226R (PS2216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module covers browser security model, which includes the same-origin policy and threat models in web security. Thus, the student will be introduced to computer security concepts such as the basic concepts in information security, including security policies, security models, and security mechanisms; concepts related to applied cryptography; common vulnerabilities in computer programs, and the requirements and mechanisms for identification and authentication. (Total notional time: 150 hours)

COMPUTER SECURITY 316R (CSY316D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module introduces cyber security concepts and applications like cryptography, access control mechanisms, auditing, advanced network defence tools and strategies, etc. (Total notional time: 150 hours)

COMPUTER SECURITY 501 (CSY118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The emphasis of this module is on equipping the students to be competent problem solvers who can originate and recommend security strategies. (Total notional time: 150 hours)

COMPUTING FUNDAMENTALS A (CFA115D, CFAF05D)**1 X 3-HOUR PAPER****(Module custodians: Department of Computer Systems Engineering and End User Computing Unit)**

This module provides the fundamentals of computers; Key applications; Evolution of computer networks and the Internet. The purpose of this module is to identify legal, ethical and security issues related to information technology. (Total notional time: 150 hours)

COMPUTING FUNDAMENTALS A (CGA115D, CGAF05D)**1 X 3-HOUR PAPER****(Module custodian: End User Computing Unit)**

The focus of this module is to lay the foundation for the design and implementation of computer programming solutions on different platforms, including the web and mobile devices by enabling students to gain basic computer professional skills in the area of computer structure, operating systems, security and computer professional practice. The student will be able to apply his/her knowledge in the above-mentioned areas to produce solutions which are meant to solve problems arising in the software industry. (Total notional time: 150 hours)

COMPUTING FUNDAMENTALS B (CFB115D, CFBF15D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module provides the foundation for the design and implementation of computer programming solutions on different platforms. The focus of this module is to lay the foundation for the design and implementation of computer programming solutions on different platforms, including the web and mobile devices. The student will be able to apply his/her knowledge of concepts and principles relating to information systems, databases, systems analysis, system requirements, and IT project management. (Total notional time: 150 hours)

COMPUTING FUNDAMENTALS B (CGB115D, CGBF15D)**1 X 3-HOUR PAPER****(Module custodian: End User Computing Unit)**

This module prepares the student to apply programming and software engineering principles to provide solutions to a range of problems emanating in the IT industry. The focus of this module is to lay the foundation for the design and implementation of computer programming solutions on different platforms, including the web and mobile devices. The student will be able to apply his/her knowledge of concepts and principles relating to information systems, databases, systems analysis, system requirements, IT project justification and the internet (web). (Total notional time: 150 hours)

CRYPTOGRAPHY 502 (CRG118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The emphasis of this module is on equipping the students to be competent problem solvers who can originate and recommend Cryptography Terminologies. (Total notional time: 150 hours)

D**DATA SCIENCE AND BIG DATA ANALYTICS (DSC118G)****CONTINUOUS ASSESSMENT****(Module custodian: Department of Computer Science)**

The focus of this module is to train students in the intersection of subjects ranging from statistics, information and computer science, system design and social sciences. (Total notional time: 150 hours)

DATA STRUCTURES AND ALGORITHMS (DTD117V)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

The focus of this module is to introduce candidates to new types of data structures, such as trees, heaps, stacks and queues. (Total notional time: 150 hours)

DATABASE MANAGEMENT SYSTEMS A (DBA216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

In this module, students will gain an understanding of the process of handling database management so that they can use this knowledge to create a new object-oriented database. During the course of this module, students will also learn the various tools and techniques that can be used for Database Management. (Total notional time: 150 hours)

DATABASE MANAGEMENT SYSTEMS B (DBB216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

In this module, students will gain the ability to create and manipulate object-oriented databases. Candidates completing this module will be able to apply database management techniques, what is involved in the databases management process, and be able to use databases utilising various techniques (attention will be given to the various techniques of manipulating databases). During the course of this module, students will also learn how to use MySQL as a tool within the project to reach a successful solution of the problem and the various manipulations of data. (Total notional time: 150 hours)

DATABASE PRINCIPLES (DTP216D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

The focus of this module is to lay the foundation for the design and implementation of database programming solutions on different platforms, including the web and mobile devices. The student will be able to apply his/her knowledge of database concepts such as data insertion and data selection (data retrieval), database normalisation to solve database related problems arising in the software industry. (Total notional time: 150 hours)

DATABASE PROGRAMMING (DBP316D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module is aimed at preparing students to design and implement databases on different platforms using PL/SQL programming techniques in order to provide solutions to a range of business problems in the IT industry. The module builds upon theoretical knowledge and skills obtained in the "Database Systems" module offered in the second year, first semester. The student will be able to apply his/her knowledge of design and implementation of database programming solutions based on PL/SQL programming techniques. (Total notional time: 150 hours)

DATABASES 215 (DAB215D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module covers the world of database systems and their use in industry, and is concerned with the use and construction of databases as part of a solution to a problem. After successful completion of this module, the student must be able to display a firm grasp of database systems and their application as part of a solution to a problem. (Total notional time: 100 hours)

DIGITAL ELECTRONICS 115 (DE1115D, DE1F05D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers introductory digital electronics and is concerned with the building blocks of digital systems. After successful completion of this module, the student must be able to design, troubleshoot and build basic digital system circuits. (Total notional time: 100 hours)



DIGITAL ELECTRONICS 126 (DE2116D, DE2F06D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module introduces data storage, data transmission, data processing and control, and signal conversion and processing, through the implementation of basic digital electronic concepts. On completion of this module, students should be able to explain how the mentioned systems are built using basic digital electronic building blocks. (Total notional time: 100 hours)

DIGITAL ELECTRONICS 216 (DEL216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers introductory microcontroller concepts and is concerned with the basics of an 8-bit microcontroller. After successful completion of this module, the student must be able to design, program and debug a program, using assembler language for an 8-bit microcontroller. (Total notional time: 100 hours)

DIGITAL FORENSICS V (DFO118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with the internet and computer digital forensics, principles and methodologies of digital forensics, software and hardware digital forensics tools. The emphasis is on equipping the students to be competent problem solvers who can originate and recommend digital forensics strategies. (Total notional time: 150 hours)

DIGITAL PROCESS CONTROL 216 (DP1216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers introductory intelligent systems that encompass the integration of software and electronic systems and is concerned with the implementation of control systems. After successful completion of this module, the student must be able to apply a combination of hardware and software systems in a solution to a given problem. (Total notional time: 100 hours)

DIGITAL PROCESS CONTROL 226 (DP2216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers the theory of mobile robotics and is concerned with robotics and related technologies. The student will be introduced to the theory behind sensor integration using various sensors, applying a variety of algorithms and techniques to a robotic platform to solve problems. These include but are not limited to localisation, pathfinding, map generation, proportional integral derivative control, and navigation. After successful completion of this module, the student must be able to describe, explain and solve various robotic-related problems. (Total notional time: 100 hours)

DIGITAL SIGNAL PROCESSING (DSR117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers an introduction to analogue signals and LTI systems representation and transformation, analogue convolution and analogue filters, Laplace and Z-transform, Digital signals and sampling requirements, Basic types of digital signals, Quantisation error, Time-domain analysis, including Linear-time-invariant discrete system, Block Diagram for LTI discrete systems, Impulse response, Convolution sum, Difference equations, Frequency-domain analysis, and Filter design. After successful completion of this module, the student must be able to design signal processing systems and various filters with application in various engineering fields. (Total notional time: 150 hours)

DISCRETE MATHEMATICS 115R (DSM116D, DSMF16D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Science)**

This module focuses on the area of discrete structures including important material from areas, such as set theory, logic, methods of proofs, graph theory, combinatorics, and recursion. The material is pervasive in the areas of data structures and algorithms. (Total notional time: 150 hours)

DISCRETE STRUCTURES (DCT115D, DCTF15D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Science)**

The focus of this module is to teach students notations used in Discrete Structures related to Computer Science. The module will teach the rudiments of elementary mathematical reasoning, which will be necessary to solve complex programming problems in other modules. The student will be able to apply his/her knowledge of discrete structures, principles, algorithms, number theory and cryptography to the problems arising in the software industry. (Total notional time: 150 hours)

DISTRIBUTED PROGRAMMING (DSD117V)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

The focus of this module is to equip the student with the requisite skills to create automated applications that are distributed over distinct application servers using the JEE framework in the software industry. (Total notional time: 150 hours)

DISTRIBUTED SYSTEMS (DIS316D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Science)**

This module prepares the student to apply the concepts and applications of any computer network. The student will be able to apply his/her knowledge of basic network concepts such as LAN design, WAN design, troubleshooting, implementing networks and network connectivity. The technical knowledge obtained in this module, together with the communication skills and presentation skills will prepare the students for the workplace. Graduates should have the ability to make effective presentations to a range of audiences about technical problems and their solutions. (Total notional time: 150 hours)

E**ELECTRICAL PRINCIPLES 115 (EIP115D, EIPF05D)****1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers electrical principles and is concerned with the study and application of electricity, electronics and electromagnetism. The student will be introduced to basic principles of modern-day electrical engineering technology. After successful completion of this module, the student must be able to deal with the basic principles of electricity, such as the analysis of direct current circuits, the analysis of alternating current circuits, electromagnetism, magnetic circuits, inductors, capacitors, and some mechanical calculations. (Total notional time: 100 hours)

ELECTRONICS 115 (EL1115D, EL1F05D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers electronic components and their operations and is concerned with atomic theory, electrical charge, electrical voltage, current, resistance, series and parallel circuits, conductors, and insulators. After successful completion of this module, the student must be able to design basic power supplies and biasing circuits for BJT, FET transistors and operational amplifiers. (Total notional time: 100 hours)

ELECTRONICS 126 (EL2116D, EL2F06D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers the analysis and design of simple electronic circuits and is concerned with the modelling of electronic components and their application in circuit analysis and design. After successful completion of this module, the student must be able to design and analyse simple power supplies, basic filters, transistor amplifiers and calculate heat sink requirements for power circuits. (Total notional time: 100 hours)

EMBEDDED SYSTEMS 316 (EMS316D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers the implementation of software on an embedded system and is concerned with the model and design of the joint dynamics of software, networks, and physical processes. After successful completion of this module, the student must be able to model, design and implement an embedded system. (Total notional time: 100 hours)

EMBEDDED SYSTEMS DESIGN (EBD117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers embedded computers and networks, which monitor and control the physical processes, usually with feedback loops where these loops affect computations. After successful completion of this module, the student must be able to design broadly-defined embedded systems. (Total notional time: 150 hours)

ENGINEERING ETHICS AND PRACTICES (EER117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers introduction to ethical reasoning and engineering ethics, professional practice in engineering, ethics as design, professional responsibility of engineers, rights, and responsibilities regarding intellectual property. The student will understand what it takes to maintain continued competence and to keep abreast of up-to-date tools and techniques, understand the ECSA code of conduct, continuing professional development, and know what it takes to accept responsibility for own actions. (Total notional time: 100 hours)



ENGINEERING PROJECT DESIGN (EGD107V, EGD117R)**PROJECT ASSESSMENT**

(Module custodian: Department of Computer Systems Engineering)

This module is concerned with identifying a particular existing problem and solving it through the development and implementation of a software and hardware solution. The student will be introduced to project time management, system development and design lifecycle, circuit analysis and the use of modern tools available to hardware and software engineers. After successful completion of this module, the student must be able to solve problems by making responsible, safety-conscious decisions and using critical and creative thinking. (Total notional time: 300 hours)

ENGINEERING PROJECT MANAGEMENT (EPM117V)**1 X 3-HOUR PAPER**

(Module custodian: Department of Computer Systems Engineering)

This module covers engineering communication, project management, basic management accounting and engineering entrepreneurship. After successful completion of this module, the student must be able to execute engineering projects effectively, write quality technical reports and communicate all project information to peers, understand contract law and entrepreneurship within industrial digital transformation. (Total notional time: 100 hours)

ETHICAL HACKING 502 (EHA118G)**1 X 3-HOUR PAPER**

(Module custodian: Department of Information Technology)

The student will learn the basics of ethical and moral technology hacking. The module teaches the student how to find weak points and compositional errors in computer networks and systems. (Total notional time: 150 hours)

F**FORMAL ASPECTS OF COMPUTING (FRD118G)****CONTINUOUS ASSESSMENT**

(Module custodian: Department of Computer Science)

This module prepares the student to use formal methods as a tool in the development of a set of modelling notations that allow software architects to precisely specify the structure, behaviour, and properties of the critical aspects of a system. (Total notional time: 150 hours)

G**GAMES ENGINEERING (GMD117V)****1 X 4-HOUR COMPUTER-BASED**

(Module custodian: Department of Computer Science)

This module prepares the student to provide an overview coverage of advanced game design, programming, and implementation of 3D games on different platforms, including the mobile, web and computers platforms. (Total notional time: 150 hours)

GAMES PROGRAMMING (GMP216D)**1 X 4-HOUR COMPUTER-BASED**

(Module custodian: Department of Computer Science)

This module provides an overview coverage of game design, programming, and implementation of 3D games on different platforms, including the mobile, web and computer platforms. The focus of this module is to lay the foundation for the design and implementation of gaming solutions. (Total notional time: 150 hours)

H**HUMAN COMPUTER INTERACTION (HMD117V)****1 X 4-HOUR COMPUTER-BASED**

(Module custodian: Department of Computer Science)

This module prepares and equips the student with a practical know-how that helps to address the basic tactical and strategic principles of designing systems that interact with human beings. (Total notional time: 150 hours)

INDUSTRIAL RESEARCH PROJECT (IDD108G, IDD118R)**PROJECT ASSESSMENT****(Module custodian: Department of Computer Systems Engineering)**

This module is concerned with identifying a particular existing problem, researching the proposed solutions and solving it through the development and implementation of a novel software and hardware solution. The student will be expected to utilise knowledge from the various years of study, including project time management, system development and design lifecycle, circuit analysis and the use of modern tools available in hardware and software engineers. (Total notional time: 300 hours)

INFORMATION AND TECHNOLOGY MANAGEMENT (ITM117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module introduces the effective management of information systems with an emphasis on the interaction between strategic management and information systems. Students learn to master the principles, tools and techniques that are used in IS management solutions. Some practical implementations of different IT strategies are infused. (Total notional time: 150 hours)

INFORMATION LITERACY (INF125D, INFF25D)**CONTINUOUS ASSESSMENT****(Module custodian: Directorate of Library and Information Services)**

Introduction of information literacy. Development of a search strategy and application of a search string to search engines and academic databases. Evaluation of information sources. Ethical and legal use of information. Organisation and management of information. (Total notional time: 30 hours)

INFORMATION SECURITY (ISC216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module prepares the student to apply the concepts and applications of basic computer security. The module will contribute to knowledge of CIA (Confidentiality, Integrity, Availability), concepts of risk, threats, vulnerabilities, and attack vectors, authentication and authorisation, access control (mandatory vs. discretionary), the concept of trust and trustworthiness, ethics (responsible disclosure), and skills, such as fundamentals of authentication configuration of servers, configuration of firewalls and basic security tools testing. The technical knowledge obtained in this module together with the communication skills and presentation skills, will prepare the students for the workplace. (Total notional time: 150 hours)

INFORMATION SYSTEM DEPLOYMENT (ISD316D)**PROJECT ASSESSMENT****(Module custodian: Department of Informatics)**

The student will be able to apply his/her knowledge of basic cost management, business theory, project management and Organisational performance with business analysis, system analysis and database management to deploy an Information System. Upon completion of the module, the student will be able to research, identify, analyse, and design; propose expansion, test, maintain and deploy an Organisational IT system. (Total notional time: 150 hours)

INFORMATION SYSTEM RESEARCH (ISR117V/R)**PROJECT ASSESSMENT****(Module custodian: Department of Informatics)**

The student will learn how, and when, to use quantitative and qualitative techniques to investigate different research questions. The student will practice and apply these techniques by producing research questions, conducting literature reviews, data collection, analysis, and interpretation, including the use of specialist computer packages. (Total notional time: 150 hours)

INFORMATION SYSTEMS ARCHITECTURE (IAR117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

The student will be able to apply his/her knowledge of information systems architectural design approach for developing and managing the lifecycle of an enterprise architecture, and adopting best practices, such as The Open Groups Architecture Framework (TOGAF). (Total notional time: 150 hours)

INFORMATION TECHNOLOGY PROJECT MANAGEMENT (ITP117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares students to apply advanced project management principles in an Information Systems environment. This module is aligned with Project Management Body of Knowledge (PMBOK) and the standard for Program Management guides. (Total notional time: 150 hours)



INDUSTRIAL EXPOSURE 326R (IEX316D)**WORK-INTEGRATED LEARNING**

(Module custodian: Department of Information Technology)

Student to integrate the application of the concepts and principles learned through the theoretical learning of all the modules in the qualification. The student will be able to apply his/her knowledge of theory acquired in the qualification. (Total notional time: 600 hours)

INSTRUCTIONAL MULTIMEDIA DESIGN (IMD117V)**PROJECT ASSESSMENT**

(Module custodian: Department of Computer Science)

This module equips students with the required skills to design effective multimedia for e-learning environments. This module includes instructional design principles, including cognitive load theory, cognitive theory of multimedia learning and instructional design principles for multimedia. (Total notional time: 150 hours)

INTEGRATED SOFTWARE PROJECT (ISJ107V, ISJ117R)**PROJECT ASSESSMENT**

(Module custodian: Department of Computer Science)

This module presents students with the opportunity to apply and extend their practical knowledge acquired in other modules completed prior to this one by completing an industry-related Information Technology software project similar to projects found in a workplace environment, incorporating relevant current technologies. (Total notional time: 150 hours)

INTELLIGENT ELECTRO-MECHANICAL SYSTEMS (IES117V)**1 X 3-HOUR PAPER**

(Module custodian: Department of Computer Systems Engineering)

This module covers Computer-based Instrumentation systems, Computer-Integrated Manufacturing Systems with PLCs, Magnetic Circuits and Transformers, Overview of Motors, Mechanical Systems, and basic Power Electronic Devices. After successful completion of this module, the student must be able to adapt cross-discipline skills, particularly in the fields of robotics, automated manufacturing and electro-mechanical power systems to develop intelligent electro-mechanical systems. (Total notional time: 150 hours)

INTELLIGENT INDUSTRIAL SYSTEMS (IIS117V)**1 X 3-HOUR PAPER**

(Module custodian: Department of Computer Systems Engineering)

This module covers Review of Artificial Neural Networks, Industrial mobile robots, Coordinate Transformation Trajectory interpolation, Locomotion, Mobile robot kinematics and Case studies with Application of ROS. After successful completion of this module, the student must be able to apply a combination of Artificial Intelligence (AI), computer vision, and image processing with hardware and software systems in a solution to a given problem. (Total notional time: 150 hours)

INTERACTIVE VIRTUAL ENVIRONMENTS (IVE316D)**1 X 4-HOUR COMPUTER-BASED**

(Module custodian: Department of Computer Science)

This module provides an overview of planning, designing, and developing effective desktop, mobile, and browser-based interactive virtual environments. The focus of this module is to lay the foundation for the design and implementation of interactive virtual environment solutions on various platforms. (Total notional time: 150 hours)

INTERNET PROGRAMMING (INP117V)**1 X 4-HOUR COMPUTER-BASED**

(Module custodian: Department of Computer Science)

The focus of this module is to lay the foundation for the design and implementation of Internet applications using JEE components for a web container. Advanced programming concepts such as MVC design pattern, Servlets, Java Server Pages, Expression Language and Java Standard Tag Library (JSTL) are covered. (Total notional time: 150 hours)

INTERNET PROGRAMMING (INT316D)**1 X 4-HOUR COMPUTER-BASED**

(Module custodian: Department of Computer Science)

This module prepares the student to apply programming and software engineering principles to provide solutions to a range of problems emanating from the IT industry. The focus of this module is to lay the foundation for the design and implementation of Internet applications using JEE components for a web container. The student will be able to apply his/her knowledge of advanced programming concepts such as MVC design pattern, Servlets, Java Server Pages, Expression Language and Java Standard Tag Library (JSTL) to the problems arising in the software industry. (Total notional time: 150 hours)

INTRODUCTION TO DATA SCIENCE (IDA117V)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to manage vast amounts of data using a variety of modern computing technologies and infrastructure from different kinds of sources. (Total notional time: 150 hours)

INTRODUCTION TO ENTERPRISE ARCHITECTURE (IEA316D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply their individual knowledge and skills to identify the enterprise architecture of an organisation. The focus of this module is to introduce students to Enterprise Architecture contexts (Zachman), methodologies, frameworks (TOGAF) and handling of policies and procedures for an organisation). (Total notional time: 150 hours)

INTRODUCTION TO PROGRAMMING 115R (TRO115D, TROF05D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

The focus of this module is to introduce students to intermediate object oriented programming concepts, such as selection control structures, iteration control structures and manipulation of strings, characters and primitive arrays. (Total notional time: 150 hours)

INTRODUCTION TO SOFTWARE ENGINEERING (ISE117V)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

The focus of this module is to teach students principles of software engineering about systems analysis, and design of software solutions within the context of industry-based problems. (Total notional time: 150 hours)

INTRODUCTION TO STRATEGIC INFORMATION SYSTEMS (SIS216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply the concepts and principles to determine the actual output or results of an organisation measured against the intended outputs (goals and objectives), therefore, the strategic information systems. (Total notional time: 150 hours)

IT PROJECT MANAGEMENT A (ITP216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply their individual knowledge and skills to administer the management of a project related to the organisation and the Information System environment. The focus of this module is to expose the graduate to the fundamentals of project management. (Total notional time: 150 hours)

IT PROJECT MANAGEMENT B (ITP316D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply advanced individual knowledge and skill to administer the management of agile project related to the organisation and the Information System environment. The focus of this module is to expose the student to the strategies on time management through all the project phases. (Total notional time: 150 hours)

K**KNOWLEDGE MANAGEMENT (KWM117V)****1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply the concepts and principles of organisation-wide Knowledge Management (KM) deployment based on the knowledge sharing needs of an organisation. The student will be able to apply his/her knowledge of KM approaches to initiate, plan, design, and deploy KM solutions within an organisation and be able to adapt best practices in relation to KM. (Total notional time: 150 hours)

L**LIFE SKILLS (LFS125X)****CONTINUOUS ASSESSMENT****(Module custodian: Directorate of Student Development and Support)**

Personal, socio-emotional and academic skills development for students in higher education. This module includes 1. Intra- and interpersonal skills (e.g. emotional intelligence, relationships, and conflict management); 2. General study skills (e.g. time management, goal setting, learning styles); 3. Health and wellness (e.g. HIV/AIDS, GBV issues, substance abuse); 4. Student life and adjustment (e.g. identity development, adjusting to a higher education environment); and 5. Financial management. (Total notional time: 20 hours)



LOGIC DESIGN 226 (LOD216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers the design principles of logic circuits using a hardware descriptive language and is concerned with the building blocks in understanding logic design principles using a hardware descriptive language. After successful completion of this module, the student must be able to design basic logic circuits using relevant components (PALs, PLAs, FPGAs, CPLDs, development boards, etc.), tools (HDL compilers, programming suites, etc.) and methods (relevant optimisation methods, FSMs, etc.) to design logic circuits. (Total notional time: 100 hours)

M**MATHEMATICS 115 (MT1115D, MT1F05D)****1 X 3-HOUR PAPER****(Module custodian: Department of Mathematics and Statistics)**

This module covers basic mathematics and is concerned with introductory mathematical concepts, such as algebra, exponents, differentiation, integration, functions, matrices, vectors, and data handling. After successful completion of this module, the student must be able to find solutions to problems involving methods of basic mathematical calculation. (Total notional time: 100 hours)

MATHEMATICS 126 (MT2116D, MT2F06D)**1 X 3-HOUR PAPER****(Module custodian: Department of Mathematics and Statistics)**

This module covers intermediate-level mathematics and is concerned with differentiation of multi-variable functions, integration, numerical methods, first-order ordinary differential equations, and matrices and Gauss elimination. After successful completion of this module, the student must be able to find solutions to linear, non-linear and partial differentiation problems and applications. (Total notional time: 100 hours)

MATHEMATICS 216 (MHS216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Mathematics and Statistics)**

This module covers advanced concepts in pure and discrete mathematics and is concerned with principles relating to the field. After successful completion of this module, the student must be able to understand and implement principles of pure and discrete mathematics to solve practical problems relating to the field. (Total notional time: 100 hours)

MOBILE COMPUTING (MOB316D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to apply mobile computing principles to provide solutions to a range of problems emanating from the IT industry. The focus of this module is to lay the foundation for the design and implementation of mobile applications on the Google Android Operating System. The student will be able to apply his/her knowledge of basic programming concepts such as Android development platform, Android user interface design and programming; Multi-threading in Android, Android storage techniques; and Location-Based Services and notifications to the problems arising in the software industry. (Total notional time: 150 hours)

MOBILE ROBOTICS 226 (MRO216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers practical mobile robotics and is concerned with robotics and related technologies. After successful completion of this module, the student must be able to apply various techniques on a mobile robot using dedicated software such as ROS or Player/Stage to solve given problems. (Total notional time: 100 hours)

MODELLING AND SIMULATIONS (MSI118G)**CONTINUOUS ASSESSMENT****(Module custodian: Department of Computer Science)**

This module will improve the student's understanding of how models and simulations of real or theoretical systems work, how they are designed and implemented subject to inherent constraints and based on the assumptions of reality involved, what limitations they have, and what can be done to improve them. (Total notional time: 150 hours)

MOTION GRAPHICS AND VISUAL EFFECTS (MGV316D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to apply motion graphics principles to provide solutions to a range of problems emanating from the IT industry. The focus of this module is to lay the foundation for the design and implementation of motion graphics solutions on different platforms, including the web and mobile devices. The module builds upon the knowledge and skills obtained in the “3D modelling” module. (Total notional time: 150 hours)

MULTIMEDIA APPLICATIONS (MUA216D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to develop 2D animations to be incorporated on the Web, computer, and mobile applications. The focus of this module is to lay the foundation for the design and implementation of 2D animation applications. (Total notional time: 150 hours)

MULTIMEDIA FOR MOBILE DEVICES (MMD316D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to apply mobile computing principles to provide solutions to a range of problems emanating from the IT industry. The focus of this module is to lay the foundation for the design and implementation of mobile applications on the Google Android Operating System. The student will be able to apply his/her knowledge of basic programming concepts such as Android development platform, Android user interface design and programming, Multi-threading in Android, Android storage techniques; and Location-based Services and notifications to the problems arising in the software industry. (Total notional time: 150 hours)

MULTIMEDIA PROJECT (MCP107V, MCP117R)**PROJECT ASSESSMENT****(Module custodian: Department of Computer Science)**

This module prepares the student to apply the concepts and principles learned through the theoretical learning of all the modules in the qualification to provide solutions to a range of problems emanating from the multimedia IT industry. This module implements the design plan that was created in the Multimedia Project Design module. (Total notional time: 150 hours)

MULTIMEDIA PROJECT DESIGN (MPD117V)**PROJECT ASSESSMENT****(Module custodian: Department of Computer Science)**

This module prepares the student to make use of multimedia project design principles to provide solutions to a range of problems emanating from the IT industry. (Total notional time: 150 hours)

MULTIMEDIA RESEARCH PROJECT (MRP108G, MRP118R)**PROJECT ASSESSMENT****(Module custodian: Department of Computer Science)**

The focus of this module is to enable students to apply and implement the research principles acquired in the Research Methodologies module on a proposed research topic. (Total notional time: 300 hours)

MULTIMEDIA TECHNOLOGY (MTE216D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to be competent in all multimedia concepts and have a solid foundation in the planning process and design considerations, while covering industry-standard applications and emerging technologies. The focus of this module is to lay the foundation for the design and implementation of graphical editing tools as well as digital photography. The module builds the foundation for higher-level modules that deal with graphical solutions. (Total notional time: 150 hours)

N**NETWORK APPLICATIONS IV (NWP117V)****1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with knowledge on how to analyse web-based protocols, understanding the efficiency of web search, the deployment of web-based applications and of database-driven websites. (Total notional time: 150 hours)



NETWORK MANAGEMENT IV (NWG117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with knowledge of computer network management techniques, network management protocols and network management tools. (Total notional time: 150 hours)

NETWORK MANAGEMENT 316R (NMG316D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The student will be able to apply his/her knowledge of basic network concepts, such as network management issues, access control mechanisms, multiple LANs management, network troubleshooting, and skills, such as routing optimisation and network monitoring tools implementation. (Total notional time: 150 hours)

NETWORK MANAGEMENT 501 (NWA118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with an overview of network management, which includes an understanding of the building blocks of network management with its associated remote networking tools that can be applied to network infrastructures. (Total notional time: 150 hours)

NETWORK RESEARCH PROJECT V (NWR108G/NWR118R)**PROJECT ASSESSMENT****(Module custodian: Department of Information Technology)**

In this module, the student will learn how and when to use quantitative and qualitative techniques to investigate different research questions. The student will practice and apply these techniques by producing research questions, conducting literature reviews, data collection, analysis and interpretation, including the use of specialist computer packages. (Total notional time: 150 hours)

NETWORK SYSTEMS 125 (NWS115D, NWSF05D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module covers various networking concepts and strategies and is concerned with ensuring the student knows and can apply various networking concepts and strategies to industry-related problems. After successful completion of this module, the student must be able to make effective presentations to a range of audiences about technical problems and their solutions. (Total notional time: 100 hours)

NETWORK SYSTEMS 226 (NWS216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module covers various networking concepts and strategies and is concerned with ensuring the student knows and can apply various networking concepts and strategies to industry-related problems. After successful completion of this module, the student must be able to make effective presentations to a range of audiences about technical problems and their solutions. (Total notional time: 100 hours)

NEW TECHNOLOGICAL TRENDS (NTT118G)**CONTINUOUS ASSESSMENT****(Module custodian: Department of Computer Science)**

The purpose of this module is to expose students to the trends in the evolution and continuing developments in the field of Computing and its associated academic disciplines, including Computer Science, Information Systems, Information Technology and Multimedia Computing. (Total notional time: 150 hours)

O**OBJECT-ORIENTED PROGRAMMING (OOP216D)****1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module covers intermediate concepts of object-oriented programming using the Java language. The module builds upon the knowledge and skills obtained in the "Principles of Programming B" module offered in the second semester of the first year. Furthermore, it introduces students to intermediate object-oriented programming concepts in Java such as arrays of objects, inheritance, polymorphism, exception handling, files, and graphical user interface components. The student will be able to apply his/her knowledge of these advanced programming concepts to the problems arising in the software industry. (Total notional time: 150 hours)

OBJECT-ORIENTED PROGRAMMING 216R (OOR216D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module introduces intermediate concepts of object-oriented programming. The module builds upon the knowledge and skills obtained in the "Principles of Programming". (Total notional time: 150 hours)

ONTOLOGY ENGINEERING (OEN118G)**CONTINUOUS ASSESSMENT****(Module custodian: Department of Computer Science)**

The focus of this module is to lay the foundation for the design and implementation of ontology solutions on different platforms, including the web and mobile devices. (Total notional time: 150 hours)

OPERATING SYSTEMS 226 (OPS216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers base knowledge surrounding operating systems and is concerned with creating an in-depth understanding of operating systems that can then be further applied in the upcoming modules. After successful completion of this module, the student must be able to demonstrate a sound knowledge of operating systems, aiding them in developing OS specific applications and even operating systems themselves. (Total notional time: 100 hours)

OPERATING SYSTEMS (ORS216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module prepares the student to apply operating systems principles to a range of problems emanating from the IT industry. The focus of this module is to introduce students to operating systems principles and their applications. The module covers process management, inter-process communication and synchronisation, memory management, virtual memory, file system management, device management and security. After successful completion of this module, the student must be able to demonstrate a sound knowledge of operating systems aiding them in developing operating systems-specific applications and even operating systems themselves. (Total notional time: 150 hours)

OPERATING SYSTEMS 226R (OSY216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers principles of operating systems like process management, interprocess communication and synchronisation, memory management, virtual memory, file system management, device management and security. (Total notional time: 150 hours)

P**PRINCIPLES OF PROGRAMMING A (PPA115D, PPAF05D)****1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

The focus of this module is to introduce students to the basic Object-Oriented Programming (OOP) concepts in VB.NET, such as the importance of OOP in the software industry, identification of objects from problem statements, relationship between objects and classes, usage of predefined classes in programs, arithmetic operators, data types and their conversion. (Total notional time: 150 hours)

PRINCIPLES OF PROGRAMMING B (PPB115D, PPBF15D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module introduces students to intermediate object-oriented programming concepts in VB.NET, such as selection control structures, iteration control structures and manipulation of strings, characters and primitive arrays. (Total notional time: 150 hours)

PRINCIPLES OF PROGRAMMING 125R (PPG115D, PPGF15D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module builds on the knowledge and skills already obtained in the Introduction to Programming module. The main focus is to introduce students to intermediate object-oriented programming concepts, such as selection control structures, iteration control structures and manipulation of strings, characters and primitive arrays. (Total notional time: 150 hours)



PRINCIPLES OF RESEARCH (PIF117V, PIT117V)**CONTINUOUS ASSESSMENT**

(Module custodians: Departments of Informatics and Information Technology)

The purpose of this module is to prepare the student to investigate and analyse a research problem using introductory research methods and tools commonly used in computing and related research fields. The module will also enable participants to formulate and define research problems and questions, critically review the literature, research designs and reported research findings, evaluate and select appropriate research methods and data collection techniques for formulating ethical research proposals. (Total notional time: 150 hours)

PRINCIPLES OF RESEARCH V (PIT118G)**CONTINUOUS ASSESSMENT**

(Module custodian: Department of Information Technology)

The purpose of this module is to prepare the student to investigate and analyse a research problem using introductory research methods and tools that are commonly used in computing and related research fields. The module will also enable participants to formulate and define research problems and questions, critically review the literature, research designs and reported research findings, evaluate and select appropriate research methods and data collection techniques for formulating ethical research proposals. (Total notional time: 150 hours)

PROBABILITY AND STATISTICS 316 (PBS316D)**1 X 3-HOUR PAPER**

(Module custodian: Department of Mathematics and Statistics)

This module covers aspects of probability and statistics and is concerned with discrete probability, continuous probability, expectation, stochastic processes, sampling distributions, estimation, and hypothesis testing. After successful completion of this module, the student must be able to understand and implement probability and statistics and their various applications. (Total notional time: 100 hours)

PROCESS TESTING (PCT316D)**1 X 3-HOUR PAPER**

(Module custodian: Department of Informatics)

In this module, students will gain the fundamentals of process testing skills so that they can effectively use this knowledge to bridge the gap between business modelling and system deployment. Students who have completed this module will be able to conduct fundamental testing on Information systems, also within the Information Technology environment. (Total notional time: 150 hours)

PROGRAMMABLE LOGIC CONTROLLERS 226 (PLC216D)**1 X 3-HOUR PAPER**

(Module custodian: Department of Computer Systems Engineering)

This module is concerned with designing and implementing PLC-based systems. Various sensors, actuators and control methods are looked at and utilised practically. After successful completion of this module, the student must be able to identify and explain the main design characteristics, internal architecture, and operating principles of Programmable Logic Controllers and implement a PLC in designing a solution to a given problem. (Total notional time: 100 hours)

PROGRAMMING 115 (PG1115D, PG1F05D)**1 X 4-HOUR COMPUTER-BASED**

(Module custodian: Department of Computer Science)

This module covers introductory engineering programming principles and is concerned with the application of programming and software engineering principles to provide solutions to a range of problems emanating in the IT industry. After successful completion of this module, the student must be able to write a basic C++ program, evaluate C++ expressions using arithmetic operators, enable a program to make decisions, enable a program to repeat instructions, create and work with functions and manipulate collections of data. (Total notional time: 100 hours)

PROGRAMMING 126 (PG2116D, PG2F06D)**1 X 4-HOUR COMPUTER-BASED**

(Module custodian: Department of Computer Science)

This module covers intermediate engineering programming principles and is concerned with object-oriented programming concepts such as inheritance and polymorphism, producing documentation and implementing advanced solutions to problems arising in the software industry. After successful completion of this module, the student must be able to design and implement computer application/software that can solve various software and hardware-based problems. (Total notional time: 100 hours)

PROGRAMMING 216 (PGM216D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module covers intermediate/advanced engineering programming principles and is concerned with using the Rapid Application Development Tool (RAD) for problem-solving in a GUI environment. After successful completion of this module, the student must be able to solve intermediate/advanced level programming problems using intermediate/advanced level programming skills. (Total notional time: 100 hours)

PROJECT CONSTRUCTION 125 (PCO115D, PCOF05D)**PROJECT ASSESSMENT****(Module custodian: Department of Computer Systems Engineering)**

This module covers all aspects of constructing an electronic project and is concerned with design, research, manufacturing, and basic hand skills required to complete an electronic project. After successful completion of this module, the student must be able to successfully construct an electronic project using the necessary electronic knowledge, hand skills and safety procedures needed for completion. (Total notional time: 100 hours)

PROJECT DESIGN 365 (PD1315D/R)**PROJECT ASSESSMENT****(Module custodian: Department of Computer Systems Engineering)**

This module covers professional conduct, project design approach and design considerations and is concerned with personal and interpersonal skills, self-management, team dynamics and cultural diversity, legal issues in IT, computer-assisted design, knowledge of materials and construction, manufacturing tools and processes, environmental design skills, and an overview of current technology. After successful completion of this module, the student must be able to operate efficiently in a working environment and successfully research, plan, and design appropriate artefacts for the work environment. (Total notional time: 100 hours)

PROJECT DESIGN 376 (PD2316D/R)**PROJECT ASSESSMENT****(Module custodian: Department of Computer Systems Engineering)**

This module is concerned with identifying an existing problem and solving it through the development and implementation of a software and hardware solution. After successful completion of this module, the student must be able to solve problems by making responsible, safety-conscious decisions and using critical and creative thinking; Manage oneself and one's study activities responsibly and effectively by submitting the documents on time and budgeting your project time effectively; Research, collect, organise, and evaluate information to form a complete picture regarding the selected project; Communicate effectively using visual, mathematical and language skills when completing and submitting the project design documents; Exploring career opportunities by investigating possible employment options; Communication, including receiving advice from supervisors; Self-management by organising and managing oneself and one's activities responsibly and effectively. (Total notional time: 200 hours)

R**RESEARCH METHODOLOGIES (RMC118G, RMR118G)****CONTINUOUS ASSESSMENT****(Module custodian: Department of Computer Science)**

The focus of this module is to introduce a student to research methods, planning, management, ethics, legal, and professional issues, and also how to write scientific research articles and theses/dissertations. (Total notional time: 150 hours)

RESEARCH METHODOLOGY (RIF118G)**CONTINUOUS ASSESSMENT****(Module custodian: Department of Informatics)**

The student will understand, select and apply research methodologies, paradigms and techniques to Information Technology research projects. The student will be able to apply his/her knowledge of the most common Information Systems (IS) research strategies and techniques. (Total notional time: 240 hours)

RESEARCH PROJECT IV (RIT117V/R)**PROJECT ASSESSMENT****(Module custodian: Department of Information Technology)**

The module demonstrates research and writing skills according to the project topics and research problem, in line with the department's niche area. (Total notional time: 150 hours)

RESEARCH PROJECT (RRS108G, RRS118R)**PROJECT ASSESSMENT****(Module custodian: Department of Computer Science)**

The focus of this module is to enable students to apply and implement the research principles acquired in the Research Methodologies module on a proposed research topic. (Total notional time: 300 hours)



RESOURCE ALLOCATION 316R (RAL316D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The student will be able to apply his/her knowledge of resource allocation techniques, congestion control, end-to-end and network-assisted approaches, and skills, such as resource allocation planning and congestion control implementation. (Total notional time: 150 hours)

S**SECURITY POLICY AND GOVERNANCE 501 (SPG118G)****1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The focus of this module is to equip the student to implement computer security governance processes and procedures and recommend security strategies. (Total notional time: 150 hours)

SERVICE-ORIENTED COMPUTING (SEC117V)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

The focus of this module is to equip the student with the requisite skills to create secure web services using the JEE framework to integrate heterogeneous systems in the software industry. (Total notional time: 150 hours)

SOCIAL ENGINEERING AND NEW TRENDS IN NETWORKS (SCN118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with an overview of social engineering techniques and countermeasures as well as ethical, privacy and security issues in the online social network ecosystem. (Total notional time: 150 hours)

SOFTWARE DEFINED NETWORKS 502 (SDN118G)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The content of this module includes examining the structure and capabilities of commercial and open-source controllers, whereby detailed information on constructing and maintaining a software-defined network infrastructure is explained. (Total notional time: 150 hours)

SOFTWARE ENGINEERING (SFG117V)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module is aimed at taking the students through the areas of Software Engineering to equip them with the necessary knowledge, skills, technical abilities and exposure to technologies and methods applicable to the software development environment and activities. (Total notional time: 150 hours)

SOFTWARE ENGINEERING 316 (SFE316D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers advanced software development and is concerned with creating robust programming solutions for real-world problems. After successful completion of this module, the student must be able to create robust solutions for real-world problems utilising advanced software engineering concepts. (Total notional time: 100 hours)

SOFTWARE ENGINEERING FUNDAMENTALS (SEF216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Science)**

The purpose of the module is to prepare students to apply programming and software engineering principles to provide solutions to a range of problems emanating from the IT industry. The focus of this module is to teach students principles of software engineering with regard to systems analysis, and design of software solutions within the context of industry-based problems. Upon completion of this module, a student will be able to develop fault-free software that satisfies user requirements, delivered on time and within budget. (Total notional time: 150 hours)

SOFTWARE PROJECT (SWP316D)**PROJECT ASSESSMENT****(Module custodian: Department of Computer Science)**

This module presents students with the opportunity to apply and extend their practical knowledge acquired in other modules completed prior to this one by completing an industry-related Information Technology software project similar to projects found in a workplace environment. It will not only enable students to apply but also appreciate the usefulness of their skills and knowledge acquired thus far in this qualification. The final product of the project should be a three-tier system, with each tier residing/hosted in a separate machine. (Total notional time: 150 hours)

SOUND DESIGN (SOD316D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to apply audio design principles to provide solutions to a range of problems emanating from the IT industry. The focus of this module is to lay the foundation for the design and implementation of audible sound solutions on different platforms, including the web and mobile devices. (Total notional time: 150 hours)

STRATEGIC INFORMATION SYSTEMS (SIS117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

The student will be able to: Interpret information to be able to find how to sustain a competitive advantage; make use of basic competitive analysis techniques; demonstrate the strategic use of information systems and the impact thereof on the business and organisational strategies; identify the influence of IT in the design of business and business processes; argue and demonstrate how information requirements for specific businesses must be met to gain competitive advantage; and incorporate important and relevant aspects of information into strategic solutions such as ethics, funding, project management and emerging architectures in corporate IS solution design. (Total notional time: 150 hours)

SYSTEM ADMINISTRATION AND MAINTENANCE IV (SAM117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

The general purpose of this module is to provide students with knowledge for the deployment and maintenance of modern computer systems, with particular emphasis on the administration of user accounts. Do administrative tasks associated with network operating systems such as Windows and Linux, and how to use deployment tools and solutions such as hardware, applications and software and security updates. (Total notional time: 150 hours)

SYSTEM ANALYSIS A (SYA216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

This module prepares the student to apply the concepts and principles of a predictive system structured approach to system analysis and design. Upon completion of the module, the student will be able to identify and explain the structured approach concept and principles, and be able to design a system based on the Software Development Life Cycle (SDLC). (Total notional time: 150 hours)

SYSTEM ANALYSIS B (SYB216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Informatics)**

Upon completion of the module, the student will be able to identify and explain an object-oriented approach concept and principles, know the difference between object-oriented and structured approaches and be able to design a system based on a best practice modelling technique (such as UML). (Total notional time: 150 hours)

SYSTEMS RESOURCES MANAGEMENT (SRG117V)**1 X 3-HOUR PAPER****(Module custodian: Department of Computer Systems Engineering)**

This module covers the overview of systems resources management, relevant tools, standards, and/or engineering constraints and several techniques for managing system resources. After successful completion of this module, the student must be able to design with an optimum resource allocation. (Total notional time: 150 hours)

T**THEORETICAL COMPUTER SCIENCE (TCR117V)****1 X 4-HOUR PAPER****(Module custodian: Department of Computer Science)**

The focus of this module is to lay the foundation upon which many of the essential topics of computer science are built, such as the design of programming languages and compilers, data structures, algorithms, and natural language processing. Understanding of this module will enable reasoning about the computability of certain functions. (Total notional time: 150 hours)

3D ANIMATION (TAN216D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to produce 3D animations and video outputs to provide solutions to a wide range of disciplines. The focus of this module is to design and implement 3D animations on different platforms, including web, games, simulations, and virtual reality applications. (Total notional time: 150 hours)



3D MODELLING (TMO216D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module provides an overview of planning, designing, and developing effective 3D models using 3D modelling software. The focus of this module is to lay the foundation for the design, texturing and implementation of 3D models on different platforms, including 3D games and simulation environments. (Total notional time: 150 hours)

V**VIRTUAL ENVIRONMENT APPLICATION (VEA118G)****CONTINUOUS ASSESSMENT****(Module custodian: Department of Computer Science)**

This module is to teach students how to develop virtual environment applications effectively. This module will improve students' understanding of how virtual reality systems should be developed for integrated headsets and mobile platforms. (Total notional time: 150 hours)

VIRTUAL ENVIRONMENT DESIGN (VED118G)**CONTINUOUS ASSESSMENT****(Module custodian: Department of Computer Science)**

This module will improve the student's understanding of how virtual reality systems work, what limitations they have, and what can be done to improve them. (Total notional time: 150 hours)

VIRTUAL MACHINES 216R (VMA216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module prepares the student to apply the concepts and applications of any virtual technologies to the organisational structure or a project. The student will be able to apply his/her knowledge of virtualisation, isolation and emulation techniques, virtualisation tradeoffs, virtualisation managers across different platforms, and skills such as virtualisation implementation, virtualisation management, isolating and emulating a virtual environment. (Total notional time: 150 hours)

W**WEB COMPUTING (WEB115D, WEBF15D)****1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module prepares the student to apply programming and software engineering principles to provide solutions to a range of problems emanating from the IT industry. The focus of this module is to lay the foundation for the design and implementation of computer programming solutions on different platforms, including the web and mobile devices. The student will be able to apply his/her knowledge of basic programming concepts such as planning, designing, scripting and developing effective Web applications using client-side Web technologies, to the problems arising in the software industry. (Total notional time: 150 hours)

WEB ORGANISATION 226R (WOR216D)**1 X 3-HOUR PAPER****(Module custodian: Department of Information Technology)**

This module covers the browser security model, which includes the same-origin policy and threat models in web security. Thus, the student will be introduced to computer security concepts such as the basic concepts in information security, including security policies, security models, and security mechanisms; concepts related to applied cryptography; common vulnerabilities in computer programs, and the requirements and mechanisms for identification and authentication. (Total notional time: 150 hours)

WEB SERVER MANAGEMENT (WEM316D)**1 X 4-HOUR COMPUTER-BASED****(Module custodian: Department of Computer Science)**

This module focuses on introducing students to the understanding of installation, administering, updating and securing a web server. This module combines the concepts of Web server management with plenty of opportunities for hands-on practice to apply the concepts. Each lecture will introduce a networking or Web server topic, discuss it in the context of either Windows or Linux, and then provide steps for each operating system. (Total notional time: 150 hours)

WIL (WCM316D)**WORK-INTEGRATED LEARNING**

(Module custodian: Department of Computer Science)

This module prepares the student to integrate the application of the concepts and principles learned through the theoretical learning of all the modules in the qualification. The student will be able to apply his/her knowledge of theory acquired in the qualification. Upon completion of the module, the student will be able to analyse and behave professionally in the working environment. (Total notional time: 600 hours)

WIRELESS NETWORKS IV (WNE117V)**1 X 3-HOUR PAPER**

(Module custodian: Department of Information Technology)

The content of the module includes the illustration of how email and other traffic are routed using mobile IP and the implementation of a simple application that relies on mobile and wireless data communications. Software package support for mobile and wireless computing. Performance issues of wireless local area networks. (Total notional time: 150 hours)

WIRELESS NETWORKS 316R (WNE316D)**1 X 3-HOUR PAPER**

(Module custodian: Department of Information Technology)

This module prepares the student to apply the concepts and applications of any wireless technologies to the organisation's structure or to a project. The student will be able to apply his/her knowledge of mobile ad hoc networks, cellular network systems, wireless networks, multiplexing techniques, wireless sensor networks and skills, such as wireless LAN implementation, troubleshooting and connectivity testing. (Total notional time: 150 hours)

WORK-INTEGRATED LEARNING (WOC316D)**WORK-INTEGRATED LEARNING**

(Module custodian: Department of Computer Science)

This module prepares the student to integrate the application of the concepts and principles learned through the theoretical learning of all the modules in the qualification. The student will be able to apply his/her knowledge of theory acquired in the qualification. Upon completion of the module, the student will be able to analyse and behave professionally in the working environment. (Total notional time: 600 hours)

WORK-INTEGRATED LEARNING (WII316D)**WORK INTEGRATED LEARNING**

(Module custodian: Department of Informatics)

This module prepares the student to integrate the application of the concepts and principles learned through the theoretical learning of all the modules in the qualification. The student will be able to apply his/her knowledge of theory learned in the qualification. Upon completion of the module, the student will be able to analyse and behave professionally in the working environment. (Total notional time: 600 hours)

WORK-INTEGRATED LEARNING 326 (WYE306D)**WORK-INTEGRATED LEARNING**

(Module custodian: Department of Computer Systems Engineering)

This module covers integrating the student into a work environment and exposing him/her to a professional work environment. The student will be introduced to the professional world in an industry-related to the programme. (Total notional time: 600 hours)

