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:*

Please take note that all completed applications received within the published due dates will be ranked. After consideration of the Departmental Student Enrolment Plan, only the top ranking applicants will be selected. Once a programme is full, a waiting list will be in place to provide an opportunity for applicants to fill places of those who did not register on time. Applicants will be informed of their status per official letter from the Office of the Registrar, alternatively, they can check their application status on the TUT website, www.tut.ac.za.

- **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:
Swedish formula.

SYMBOL	HG VALUE	SG VALUE
A	5	4
B	4	3
C	3	2
D	2	1
E	1	

Applicants who score 9 or more points according to the formula for academic merit will be invited for an interview or a risk profile test.

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.

- **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.Candidates who successfully completed the National Diploma: Information Technology (Extended) might also be considered.

Assessment procedure(s):
No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

- **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 (home language or 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 Technical Mathematics) or **25** (with Mathematical Literacy) will be considered for the extended programme. Life Orientation is excluded for APS calculation. Candidates who successfully completed the National Diploma: Information Technology (Extended) might also be considered.

Assessment procedure(s):
No further assessment will be done. Applicants who achieve the minimum APS will be considered until the programme complement is full.

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

Admission requirement(s):
A National Senior Certificate and a National N Certificate as published in Nated 191: N3 (NQF Level 4) issued by both the Department of Higher Education (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), 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:
See Chapter 30 of Students' Rules and Regulations.

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.

g. *Industrial Exposure 326R (Work-Integrated Learning):*
See Chapter 5 of Students' Rules and Regulations.

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
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 (block module)	(5)	(3)	
LFS125X	Life Skills (block module)	(5)	(2)	
FIRST SEMESTER				
CN1115D	Computer Networks 115R	(5)	(15)	
DSM116D	Discrete Mathematics 115R	(6)	(15)	
TRO115D	Introduction to Programming 115R	(5)	(15)	
SECOND SEMESTER				
CAT116D	Computer Architecture 125R	(6)	(15)	Discrete Mathematics 115R
CN2115D	Computer Networks 125R	(5)	(15)	Computer Networks 115R
HSP115D	History of Computing and Information Models 115R	(5)	(15)	
PPG115D	Principles of Programming 125R	(5)	(15)	Introduction to Programming 115R
TOTAL CREDITS FOR THE SECOND 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				
CN1216D	Computer Networks 215R	(6)	(15)	Computer Networks 125R
OOR216D	Object-Orientated Programming 216R	(6)	(15)	Introduction to Programming 115R
OSY216D	Operating Systems 226R	(6)	(15)	Computer Architecture 125R
PS1216D	Computer Security 215R	(6)	(15)	Computer Networks 125R
TOTAL CREDITS FOR THE SEMESTER:			60	
SECOND SEMESTER				
AOR216D	Advanced Object-Oriented Programming 226R	(6)	(15)	Object-Orientated Programming 216R
CN2216D	Computer Networks 226R	(6)	(15)	Computer Networks 215R
VMA216D	Virtual Machines 216R	(6)	(15)	Computer Security 215R

	plus one of following modules:			
PS2216D	Computer Security 226R	(6)	(15)	Computer Security 215R
WOR216D	Web Organisation 226R	(6)	(15)	
TOTAL CREDITS FOR THE SEMESTER:			60	
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 modules:			
CSY316D	Computer Security 316R	(6)	(15)	Computer Security 226R
RAL316D	Resource Allocation 316R	(6)	(15)	Computer Networks 226R
TOTAL CREDITS FOR THE SEMESTER:			60	
SECOND SEMESTER **(On completion of all modules).**				
IEX316D	Industrial Exposure 326R	(6)	(60)	
TOTAL CREDITS FOR THE SEMESTER:			60	
TOTAL CREDITS FOR THE THIRD YEAR:			**120**	
TOTAL CREDITS FOR THE QUALIFICATION:			**360**	

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 Department or in the study guide that is applicable to a particular module. At time of publication, the syllabus content was defined as follows:

A

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-orientated programming such as data structures, multi-threading, database connectivity and client-server applications. (Total notional time: 150 hours)

C

COMMUNICATION FOR ACADEMIC PURPOSE (16E105X) **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)

COMPUTER ARCHITECTURE 125R (CAT116D) **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 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 NETWORKS 115R (CN1115D) **1 X 3-HOUR PAPER**

(Module custodian: 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)

COMPUTER NETWORKS 125R (CN2115D) **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 optimization, 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 of Cloud services, Elasticity of resources, Virtualization, WAN technologies and Cloud-based data storage and skills such as VPN configuration, Virtualization configuration, and Virtualization testing (Virtualization management) to students. (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), concept 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 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)

D

DISCRETE MATHEMATICS 115R (DSM116D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Computer Systems Engineering)

This module focuses on the area of discrete structures including important material from areas such as set theory, logic, methods of proofs, graph theory, combinatory, and recursion. The material is pervasive in the areas of data structures and algorithms. (Total notional time: 150 hours)

H

HISTORY OF COMPUTING AND INFORMATION MODELS 115R (HSP115D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Information Technology)

History of computing and Information Models 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)

I

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)

INFORMATION LITERACY (INF125D) **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)

INTRODUCTION TO PROGRAMMING 115R (TRO115D) **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)

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)

N

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 optimization and network monitoring tools implementation. (Total notional time: 150 hours)

O

OBJECT-ORIENTED PROGRAMMING 216R (OOR216D) **1 X 4-HOUR COMPUTER-BASED**

(Module custodian: Department of Computer Science)

This module introduces intermediate concepts of object-orientated programming. The module builds upon the knowledge and skills obtained in the "Principles of Programming". (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 125R (PPG115D) **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)

R

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)

V

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 to a project. The student will be able to apply his/her knowledge of Virtualization, isolation and emulation techniques, Virtualization tradeoffs, Virtualization managers across different platforms, and skills such as Virtualization implementation, Virtualization management and isolate and emulate a virtual environment. (Total notional time: 150 hours)

W

WEB ORGANISATION 226R (WOR216D) **1 X 3-HOUR PAPER**

(Module custodian: Department of Information Technology)

This module covers browser security model, which includes 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)

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 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)