

## DIPLOMA IN FIRE TECHNOLOGY

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

Qualification code: DPF119 / DPF121

SAQA ID: 100988, CHE NUMBER: H16/14273/HEQSF (contact), H/H16/E094CAN (distance education)

Campus where offered: Arcadia Campus and Distance Education

Please note that this programme is only offered to Fire Services working personnel.

### REMARKS

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

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

**Admission requirement(s):**

A Senior Certificate or an equivalent qualification and three years' relevant work experience, HAZMAT Awareness, Fire Fighter I, HAZMAT Operational, and Fire Fighter II certificates. Applicants must submit proof of employment in the form of an official letter from the employer.

• **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 and three years' relevant work experience, HAZMAT Awareness, Fire Fighter I, HAZMAT Operational, and Fire Fighter II certificates. Applicants must submit proof of employment in the form of an official letter from the employer.

• **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, (APS of 4) for English (home language or first additional language), 40% for Mathematics or 50% for Mathematical Literacy, 40% for Life Orientation (excluded for APS calculation) and 50% for any other two compulsory vocational subjects and three years' relevant work experience, HAZMAT Awareness, Fire Fighter I, HAZMAT Operational, and Fire Fighter II certificates. Applicants must submit proof of employment in the form of an official letter from the employer.

• **FOR APPLICANTS WITH A NATIONAL N CERTIFICATE/NATIONAL SENIOR CERTIFICATE AS PUBLISHED IN REPORT 191: N3 (NQF LEVEL 4):**

**Admission requirement(s):**

A National Senior Certificate or a National N Certificate with languages as published in Report 191: N3 (NQF Level 4) issued by both the Department of Higher Education and Training (DHET) and the Council for Quality Assurance in General and Further Education and Training (Umalusi), with at least 50% for English, 50% for Mathematics N3, 50% for Engineering Sciences N3 and any other two additional subjects and three years' relevant work experience, HAZMAT Awareness, Fire Fighter I, HAZMAT Operational, and Fire Fighter II certificates. Applicants must submit proof of employment in the form of an official letter from the employer.

b. *Selection criteria and assessment procedure(s):*

No further assessment will be done. Applicants who meet the minimum requirements might be considered. Acceptance is subject to available capacity according to the Student Enrolment Plan (SEP). 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](http://www.tut.ac.za).



- c. *Recognition of Prior Learning (RPL), equivalence and status:*  
See Chapter 30 of Students' Rules and Regulations.
- d. *Intake for the qualification:*  
January only.
- e. *Presentation:*
- Arcadia Campus: block-mode classes offered over a minimum of three years.
  - Distance education presented over a minimum of four years. Programme is presented as online block-mode classes with limited contact classes per module per semester at Cape Town or Durban service points.
- f. *Minimum duration:*  
A minimum of three or four years (depending on the programme offering).
- g. *Exclusion and readmission:*  
See Chapter 2 of Students' Rules and Regulations.
- h. *WIL in Fire Technology I and II:*  
See Chapter 5 of Students' Rules and Regulations.

## CURRICULUM

### OPTION 1: ARCADIA CAMPUS (DPF119)

#### FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
11P105X	Communication for Academic Purposes	(5)	(10)	
CPL105X	Computer Literacy	(5)	(10)	
GCH105D	General Chemistry I	(5)	(24)	
GPH105D	General Physics I	(5)	(24)	
INI125D	Information Literacy I (block module)	(5)	(2)	
LF1125X	Life Skills I (block module)	(5)	(2)	
MAS105X	Mathematics and Statistics I	(5)	(12)	

#### FIRST SEMESTER

FTE115D	Fire Technology I	(5)	(12)	
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#### SECOND SEMESTER

EMG115D	Emergency Management I	(5)	(12)	
FCO115D	Building Construction I	(5)	(12)	

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

#### SECOND YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
EXF216D	WIL in Fire Technology I (first- or second-semester module)	(6)	(30)	
FCH216D	Fire Chemistry II	(6)	(12)	General Chemistry I
FCO216D	Building Construction II	(6)	(12)	Building Construction I



FPH216D	Fire Physics II	(6)	(18)	General Physics I
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TOTAL CREDITS FOR THE SEMESTER:	72
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### SECOND SEMESTER

EMG216D	Emergency Management II	(6)	(12)	Emergency Management I
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FHY216D	Fire Hydraulics II	(6)	(18)	
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FTE216D	Fire Technology II	(6)	(18)	Fire Technology I
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TOTAL CREDITS FOR THE SEMESTER:	48
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TOTAL CREDITS FOR THE SECOND YEAR:	120
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### THIRD YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
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#### FIRST SEMESTER

EXF316D	WIL in Fire Technology II (first- or second-semester module)	(6)	(30)	WIL in Fire Technology I
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FCO316D	Building Construction III	(6)	(12)	Building Construction II
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FHY316D	Fire Hydraulics III	(6)	(15)	Fire Hydraulics II
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FTE316D	Fire Technology III	(6)	(24)	Fire Technology II
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TOTAL CREDITS FOR THE SEMESTER:	81
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#### SECOND SEMESTER

EMG316D	Emergency Management III	(6)	(12)	Emergency Management II
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FCH316D	Fire Chemistry III	(6)	(15)	Fire Chemistry II
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FPH316D	Fire Physics III	(6)	(12)	Fire Physics II
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TOTAL CREDITS FOR THE SEMESTER:	39
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TOTAL CREDITS FOR THE THIRD YEAR:	120
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TOTAL CREDITS FOR THE QUALIFICATION:	360
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### OPTION 2: DISTANCE EDUCATION (DPFI21)

#### FIRST YEAR

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
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11P105U	Communication for Academic Purposes	(5)	(10)	
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CPL105U	Computer Literacy	(5)	(10)	
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GPH105U	General Physics I	(5)	(24)	
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MAS105U	Mathematics and Statistics I	(5)	(12)	
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#### SECOND SEMESTER

EMG115U	Emergency Management I	(5)	(12)	
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TOTAL CREDITS FOR THE FIRST YEAR:	68
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**SECOND YEAR**

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
GCH105U	General Chemistry I	(5)	(24)	
INI125U	Information Literacy I (block module)	(5)	(2)	
LF1125U	Life Skills I (block module)	(5)	(2)	

**FIRST SEMESTER**

FTE115U	Fire Technology I	(5)	(12)	
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**SECOND SEMESTER**

FCO115U	Building Construction I	(5)	(12)	
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TOTAL CREDITS FOR THE SECOND YEAR: **52**

**THIRD YEAR**

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
<b>FIRST SEMESTER</b>				
EXF216U	WIL in Fire Technology I (first- or second-semester module)	(6)	(30)	
FCH216U	Fire Chemistry II	(6)	(12)	General Chemistry I
FCO216U	Building Construction II	(6)	(12)	Building Construction I
FPH216U	Fire Physics II	(6)	(18)	General Physics I

TOTAL CREDITS FOR THE SEMESTER: 72

**SECOND SEMESTER**

EMG216U	Emergency Management II	(6)	(12)	Emergency Management I
FHY216U	Fire Hydraulics II	(6)	(18)	
FTE216U	Fire Technology II	(6)	(18)	Fire Technology I

TOTAL CREDITS FOR THE SEMESTER: 48

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

**FOURTH YEAR**

CODE	MODULE	NQF-L	CREDIT	PREREQUISITE MODULE(S)
<b>FIRST SEMESTER</b>				
EXF316U	WIL in Fire Technology II (first- or second-semester module)	(6)	(30)	WIL in Fire Technology I
FCO316U	Building Construction III	(6)	(12)	Building Construction II
FHY316U	Fire Hydraulics III	(6)	(15)	Fire Hydraulics II
FTE316U	Fire Technology III	(6)	(24)	Fire Technology II

TOTAL CREDITS FOR THE SEMESTER: 81

**SECOND SEMESTER**

EMG316U	Emergency Management III	(6)	(12)	Emergency Management II
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FCH316U	Fire Chemistry III	(6)	(15)	Fire Chemistry II
FPH316U	Fire Physics III	(6)	(12)	Fire Physics II
TOTAL CREDITS FOR THE SEMESTER:			39	
TOTAL CREDITS FOR THE FOURTH 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:

### B

#### **BUILDING CONSTRUCTION I (FCO115D, FCO115U) 1 X 3-HOUR PAPER** (Module custodian: Department of Physics)

Identify unsafe conditions during building construction: building processes and site works, building drawings, foundation, earthwork and concrete, walls and partitions, fireplaces, floor structures and finishing, roofs, glazing and windows, doors, and stairs. (Total notional time: 120 hours)

#### **BUILDING CONSTRUCTION II (FCO216D, FCO216U) 1 X 3-HOUR PAPER** (Module custodian: Department of Physics)

Identify hazards: fire detection and alarm systems, water supply, fire pumps, automatic sprinkler systems, standpipe and hose systems, special extinguishing systems, and portable fire extinguishers. (Total notional time: 120 hours)

#### **BUILDING CONSTRUCTION III (FCO316D, FCO316U) 1 X 3-HOUR PAPER** (Module custodian: Department of Physics)

Fire safety and the National Building Regulations: preliminary plans and enquiries, classification and designation of occupancies, fire protection plan, fire performance, fire resistance of occupancy and division, separating elements, fire stability of structural elements or components. (Total notional time: 120 hours)

### C

#### **COMMUNICATION FOR ACADEMIC PURPOSES (11P105U, 11P105X) 1 X 3-HOUR PAPER** (Module custodian: Office of the Executive Dean)

A workable knowledge of English is an essential skill for any graduate who is required to conduct themselves successfully in a professional working environment. This module will equip students with the competencies required to compose a selection of written texts related to communicating both internally and externally within a professional environment. In addition, the module includes strategies that are essential for the effective communication in various situations, including small groups to avoid unproductive conflict, a multicultural context, etc. (Total notional time: 100 hours)

#### **COMPUTER LITERACY (CPL105U, CPL105X) CONTINUOUS ASSESSMENT** (Module custodian: End User Computing Unit)

This module provides students with foundational knowledge in computing fundamentals, essential digital skills in key applications based on MS Office Suite and network basics (i.e. MS Outlook and Internet). Online exams are mapped with End-User Computing: SAQA 49077 (61591) Core Element as well as Internet and Computing Core Certification (IC3). (Total notional time: 100 hours)



**E****EMERGENCY MANAGEMENT I (EMG115D, EMG115U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Physics)**

Introduction to management: planning, organising and delegating, motivation, control, ethics, corporate social responsibility and corporate governance. Introduction to entrepreneurship: business idea, feasibility studies, setting up a business. (Total notional time: 120 hours)

**EMERGENCY MANAGEMENT II (EMG216D, EMG216U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Physics)**

Communication theory, incident leadership, motivation and self-confidence, team health and safety, conflict management, incident command systems. (Total notional time: 120 hours)

**EMERGENCY MANAGEMENT III (EMG316D, EMG316U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Physics)**

Disaster and emergency management: size up and incident command system (ICS), ICS rightsizing for each event, incident rehabilitation, civil unrest, ICS vehicle fires. (Total notional time: 120 hours)

**F****FIRE CHEMISTRY II (FCH216D, FCH216U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Chemistry)**

Chemical hazardous materials, principles of chemical reactions, hazardous materials regulations, chemistry of common elements. (Total notional time: 120 hours)

**FIRE CHEMISTRY III (FCH316D, FCH316U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Chemistry)**

Corrosive materials, water reactive materials, toxic substances, oxidisers. (Total notional time: 150 hours)

**FIRE HYDRAULICS II (FHY216D, FHY216U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Physics)**

Fluid properties, pressure in fluids, hydrostatic forces, buoyancy, fluid flow, Bernoulli's equation. (Total notional time: 180 hours)

**FIRE HYDRAULICS III (FHY316D, FHY316U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Physics)**

Fluid flow types, control fluid volume principles and applications, conservation of mass flow and energy, application of extended Bernoulli's equation and draining of tanks, hydraulic power, fluid pumps. (Total notional time: 150 hours)

**FIRE PHYSICS II (FPH216D, FPH216U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Physics)**

Rotational kinematics and dynamics, waves and sound, electric forces and fields, electric circuits, magnetic forces and fields, electromagnetic induction, thermodynamics, nuclear physics. (Total notional time: 180 hours)

**FIRE PHYSICS III (FPH316D, FPH316U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Physics)**

Heat transfer, frames and structures, thermal expansion of materials, strength of materials, diffusion flames and fire plumes, refrigeration, thermodynamics, automatic fire detectors, radioactivity. (Total notional time: 120 hours)

**FIRE TECHNOLOGY I (FTE115D, FTE115U) 1 X 3-HOUR PAPER**  
**(Module custodian: Department of Physics)**

Overview of the firefighting career in South Africa, fire appliance maintenance, dash warning lights, vehicle systems, turntable ladder, dust explosion, ventilation, wildland firefighting, marine firefighting. (Total notional time: 120 hours)



**FIRE TECHNOLOGY II (FTE216D, FTE216U)****1 X 3-HOUR PAPER****(Module custodian: Department of Physics)**

Overview of the aviation environment, general aviation, airport environment, communication, aircraft familiarisation, emergency planning, general aviation incidents, incidents on and off airport property, training and incident management. (Total notional time: 180 hours)

**FIRE TECHNOLOGY III (FTE316D, FTE316U)****1 X 3-HOUR PAPER****(Module custodian: Department of Physics)**

Fire behaviour, fire extinguishment, safety on fire ground, incident command system (ICS), pre-fire planning, high rise building fires, occupational health and safety, fire department communication, managing customer service, overview of disaster management. (Total notional time: 240 hours)

**G****GENERAL CHEMISTRY I (GCH105D, GCH105U)****1 X 3-HOUR PAPER****(Module custodian: Department of Chemistry)**

The role and importance of chemistry in everyday life. Classification and properties of matter. Units of measurement. Atoms, molecules and ions. The modern view of atomic structure and the use of electron configurations in chemical bonding. The periodic table of elements. The use of IUPAC rules for naming inorganic compounds. Application of the mole concept in stoichiometric calculations. Reactions in aqueous solutions. Chemical equilibrium. Fundamental concepts in electrochemistry. Organic nomenclature. (Total notional time: 240 hours)

**GENERAL PHYSICS I (GPH105D, GPH105U)****1 X 3-HOUR PAPER****(Module custodian: Department of Physics)**

Basic mathematical concepts for physics and measurements. Motion in one dimension. Motion in a plane (projectile motion). Forces and Newton's Law of Motion. Equilibrium condition and torque. Work, energy and power. Linear momentum and impulse. Properties of static and dynamic fluids. Temperature and heat. Heat transfer. General properties of waves. Reflection. Refraction. Electrostatics. Electric circuits. Basic nuclear physics. (Total notional time: 240 hours)

**I****INFORMATION LITERACY I (INI125D, INI125U)****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. (Total notional time: 20 hours)

**L****LIFE SKILLS I (LFI125U, LFI125X)****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)

**M****MATHEMATICS AND STATISTICS I (MAS105U, MAS105X)****1 X 3-HOUR PAPER****(Module custodian: Department of Mathematics and Statistics)**

Numerical computations, mensuration, equations, functions, descriptive statistics, linear regression and curve fitting. (Total notional time: 120 hours)



**W****WIL IN FIRE TECHNOLOGY I (EXF216D, EXF216U)****WIL IN FIRE TECHNOLOGY II (EXF316D, EXF316U)*****(Module custodian: Department of Physics)*****WORK-INTEGRATED LEARNING****WORK-INTEGRATED LEARNING**

Training and experience necessary to achieve a specific position or rank. Students are evaluated in the critical tasks necessary to safely and adequately function in the required position. Practical training includes: human resource management, community and government relations, administration, inspection and investigation, emergency service delivery, communication and radio procedures, safety and facility management. (Total notional time: 300 hours)

