

NATIONAL DIPLOMA: BIOMEDICAL TECHNOLOGY

Qualification code: NDBM01 - NQF Level 6

Campus where offered: Arcadia Campus

Important notification to new applicants:

No new applications will be accepted as from 2020. Students who enrolled for this qualification for the first time in 2017 (or thereafter), should note that it will not be possible to continue with any Baccalaureus Technologiae as from 2020, since it is being replaced by qualifications aligned with the newly-implemented Higher Education Qualification Sub-Framework. Potential students are advised to consult the University's website for any new qualifications which might not be published in this Prospectus.

REMARKS

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

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

Admission requirement(s):

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

Selection criteria:

Prospective students will be selected for admission based on their performance in the Senior Certificate (40%), a TUT potential assessment (40%), as well as an interview (20%) with a departmental selection panel. The weight of each process is given in brackets.

• **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE 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), 4 for Life Sciences, 4 for Mathematics and 4 for Physical Sciences.

Selection criteria:

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **22**.

Assessment procedures:

- Applicants with a score of 26 and more will be invited for an interview. The APS will contribute 80% to the final admission score and the interview will contribute 20%.
- Applicants with a score of 22-25 will be invited to write the TUT potential assessment and an interview. The APS will contribute 40% to the final admission score, the potential assessment will contribute 40% and the interview will contribute 20%.

b. *Minimum duration:*

Three years.

c. *Presentation:*

Day classes.

d. *Intake for the qualification:*

January only.

e. *Exclusion and readmission:*

See Chapter 2 of Students' Rules and Regulations.



- f. *Recognition of Prior Learning (RPL), equivalence and status:*
See Chapter 30 of Students' Rules and Regulations.
- g. *Practicals:*
100% attendance is compulsory for all practical classes. Students must pass the practical component of a subject to obtain admission to sit for the examination.
- h. *Textbooks:*
Textbooks and other educational material will be required.
- i. *Personal protective equipment:*
Specific safety wear is compulsory in the practical laboratories.
- j. *Other requirements:*
Vaccination against Hepatitis B is compulsory.
- k. *Registration as a student medical technologist:*
- Registration with the Health Professions Council of South Africa (HPCSA) as a student medical technologist is compulsory.
 - International students will be allowed to register at the HPCSA only as student technologists for the duration of the relevant qualification. However, they will not be able to register with the HPCSA as medical technologists.
- l. *Professional registration as a medical technologist:*
Registration as a qualified medical technologist takes place four years after registration as a student medical technologist, provided that the candidate completes the first three academic years successfully. The candidate must also have worked in a laboratory approved by the HPCSA for at least 14 months and must have passed the Board Examination of the Society of Medical Laboratory Technologists of South Africa (SMLTSA).
- m. *Laboratory Practice III (Work-Integrated Learning):*
Students will not be permitted to register for Laboratory Practice III unless they have passed all the set subjects of the first five academic semesters. Laboratory Practice III must be undertaken in a laboratory accredited by the Health Professions Council of South Africa.
- n. *Subject credits:*
Subject credits are shown in brackets after each subject.
- Key to asterisks:
* Information does not correspond to information in Report 151.
(Deviations approved by the Senate in April 2010.)

CURRICULUM

FIRST YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
FIRST SEMESTER			
APY141T	Anatomy and Physiology I	(0,200)*	
CAL101T	Calculations and Statistics	(0,100)	
CHE141C	Chemistry IB	(0,125)	
IMT101T	Introduction to Medical Technology	(0,050)	
PHU161C	Physics IB	(0,100)	
TOTAL CREDITS FOR THE SEMESTER:		0,575	
SECOND SEMESTER			
BCH221T	Biochemistry II	(0,125)	Chemistry IB



BDT211T	Blood Transfusion Technology	(0,125)	Anatomy and Physiology I
CPG101T	Cellular Pathology I	(0,125)	Anatomy and Physiology I
MBI101T	Microbiology I	(0,125)	

TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE FIRST YEAR: **1,075**

SECOND YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
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FIRST SEMESTER

CPH111T	Chemical Pathology I	(0,125)	Biochemistry II
IML211T	Immunology II	(0,125)	Anatomy and Physiology I
MBI241B	Microbiology II	(0,125)	Microbiology I
PPT201T	Pathophysiology II	(0,125)	Anatomy and Physiology I

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

CPG221T	Cellular Pathology II	(0,125)	Cellular Pathology I
CPH241T	Chemical Pathology II	(0,125)	Chemical Pathology I
CSK101B	Computer Skills I*	(0,050)	
HAT221T	Haematology II	(0,125)	Blood Transfusion Technology

TOTAL CREDITS FOR THE SEMESTER: 0,425

TOTAL CREDITS FOR THE SECOND YEAR: **0,925**

THIRD YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
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FIRST SEMESTER

CPG301T	Cellular Pathology III	(0,125)	Cellular Pathology II
CPH311T	Chemical Pathology III	(0,125)	Chemical Pathology II
HAT321T	Haematology III	(0,125)	Haematology II
MBI321T	Microbiology III	(0,125)	Microbiology II

TOTAL CREDITS FOR THE SEMESTER: 0,500

SECOND SEMESTER

Students must pass all the above subjects in order to continue with the following subject:

EXP3LAP	Laboratory Practice III	(0,500)	
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TOTAL CREDITS FOR THE SEMESTER: 0,500

TOTAL CREDITS FOR THE THIRD YEAR: **1,000**

TOTAL CREDITS FOR THE QUALIFICATION: **3,000**



SUBJECT 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 subject. On 01 August 2018, the syllabus content was defined as follows:

A

ANATOMY AND PHYSIOLOGY I (APY141T) 1 X 3-HOUR PAPER **(Subject custodian: Department of Biomedical Sciences)**

The subject serves as an introduction to subjects following later in the qualification. The emphasis is on cell structure and tissues. All the systems in the body are discussed, with the emphasis on those aspects of importance to the qualification. (Total tuition time: ± 90 hours)

B

BIOCHEMISTRY II (BCH221T) 1 X 3-HOUR PAPER **(Subject custodian: Department of Biomedical Sciences)**

Nucleic acids, pH and buffers carbohydrates, amino acids and proteins, enzymes and lipids, DNA replication, transcription and protein synthesis. (Total tuition time: ± 90 hours)

BLOOD TRANSFUSION TECHNOLOGY (BDT211T) 1 X 3-HOUR PAPER **(Subject custodian: Department of Biomedical Sciences)**

Basic immunology and genetics, ABO, Rh, HLA and other systems, determination of ABO and Rh blood groups, government regulations, preparation of blood components and applicable laboratory tests. (Total tuition time: ± 90 hours)

C

CALCULATIONS AND STATISTICS (CAL101T) 1 X 3-HOUR PAPER **(Subject custodian: Department of Mathematics and Statistics)**

General mathematics: algebra, calculations with pocket calculators. Graphs. Reduction of data to linear form. Trigonometry. Statistical calculations: basic descriptive statistics, elementary probabilities, the normal probability division. (Total tuition time: ± 45 hours)

CELLULAR PATHOLOGY I (CPG101T) 1 X 3-HOUR PAPER **(Subject custodian: Department of Biomedical Sciences)**

Introduction to cellular pathology. Preparation techniques for histology: collection and fixation of tissues, embedding and sectioning of tissues, staining and mounting. (Total tuition time: ± 90 hours)

CELLULAR PATHOLOGY II (CPG221T) 1 X 3-HOUR PAPER **(Subject custodian: Department of Biomedical Sciences)**

Biological behaviour of cells and tissues. Concepts of tissue growth. Functional differentiation. Normal morphology of tissues. Preparatory techniques for cytology. Histology and cytology of the female genital tract. (Total tuition time: ± 90 hours)

CELLULAR PATHOLOGY III (CPG301T) 1 X 3-HOUR PAPER **(Subject custodian: Department of Biomedical Sciences)**

Histology and cytology of the respiratory tract, urinary tract, gastro-intestinal tract and serous cavities. Cytology of other sites: fine-needle aspiration and the central nervous system. Cytogenetics, techniques and application. (Total tuition time: ± 90 hours)

CHEMICAL PATHOLOGY I (CPH111T) 1 X 3-HOUR PAPER **(Subject custodian: Department of Biomedical Sciences)**

General laboratory information, Laboratory safety and regulations, Quality control, Water, electrolytes and minerals, Blood gases, pH and buffer systems, Renal function. (Total tuition time: ± 90 hours)



CHEMICAL PATHOLOGY II (CPH241T)**1 X 3-HOUR PAPER*****(Subject custodian: Department of Biomedical Sciences)***

Laboratory instruments, automation and maintenance. Amino acids and proteins. Immuno-chemical techniques. Carbohydrate metabolism. Lipid metabolism. CSF and other body fluids and prenatal testing. (Total tuition time: ± 90 hours)

CHEMICAL PATHOLOGY III (CPH311T)**1 X 3-HOUR PAPER*****(Subject custodian: Department of Biomedical Sciences)***

Enzymes, hepatic function, trace elements, tumour markers, endocrinology, pharmacology, molecular diagnostics. (Total tuition time: ± 90 hours)

CHEMISTRY IB (CHE141C)**1 X 3-HOUR PAPER*****(Subject custodian: Department of Chemistry)***

Inorganic chemistry: atoms, molecules, periodic table, mole concept, chemical calculations, chemistry and elements of groups 1A, 4A, 5A, 6A. Organic chemistry: introduction, alkanes, alkenes, aromates, alkanols, phenols, halogen compounds, alkanooates, alkynes, aldehydes, ketones and alkanooic acids. (Total tuition time: ± 90 hours)

COMPUTER SKILLS I (CSK101B)**CONTINUOUS ASSESSMENT*****(Subject custodian: End User Computing Unit)***

Students have to acquire theoretical knowledge (computing fundamentals) and practical skills as an end-user in operating systems and MS Office Suite applications (MS Word, MS Excel and MS PowerPoint) on an introductory level. Students will do online and computer based tests. The modules are mapped with SAQA and IC3 Essential Skills for Digital Literacy (international certification). (Total tuition time: ± 40 hours)

H**HAEMATOLOGY II (HAT221T)****1 X 3-HOUR PAPER*****(Subject custodian: Department of Biomedical Sciences)***

Origin and normal development of the haemopoietic elements, erythrocytes and leukocytes, platelet/megakaryocyte system and haemostasis. (Total tuition time: ± 90 hours)

HAEMATOLOGY III (HAT321T)**1 X 3-HOUR PAPER*****(Subject custodian: Department of Biomedical Sciences)***

Abnormal erythrocyte morphology and function, leucocytes and thrombocytes. Causes and laboratory findings of anaemia, leukaemias and coagulation defects. (Total tuition time: ± 90 hours)

I**IMMUNOLOGY II (IML211T)****1 X 3-HOUR PAPER*****(Subject custodian: Department of Biomedical Sciences)***

Specific and non-specific immunity. Antigens. Classification and characteristics of antibodies. Lymphoid organs of antibody production. Antigen-antibody reactions, including complement, precipitation, phagocytosis and agglutination. Cellular and humoral immunity. Serological techniques. Immunopathology. (Total tuition time: ± 90 hours)

INTRODUCTION TO MEDICAL TECHNOLOGY (IMT101T)**CONTINUOUS ASSESSMENT*****(Subject custodian: Department of Biomedical sciences)***

The field of medical technology. Introduction to medical laboratory practices, terminology and safety. (Total tuition time: ± 60 hours)

L**LABORATORY PRACTICE III (EXP3LAP)****WORK-INTEGRATED LEARNING*****(Subject custodian: Department of Biomedical Sciences)***

Performing, interpretation and integration of laboratory tests in the following disciplines of Blood Transfusion Technology (Immunohaematology), Chemical Pathology, Cytology, Haematology, Histology, Medical Microbiology and Virology. (Total tuition time: not available)



M**MICROBIOLOGY I (MBI101T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biotechnology and Food Technology)**

General introduction. Microscopy. Protista, mycota and monera. Eucaryotes, procaryotes and viruses. Microbial nutrition. Growth and culture media. Sterilisation and control of micro-organisms. Aseptic techniques and pure culture techniques. Basic terminology and principles of microbial metabolism. Practical microbiology. (Total tuition time: ± 66 hours)

MICROBIOLOGY II (MBI241B)**1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Enrichment culture techniques and long-term preservation of micro-organisms. Advanced composition and structure of prokaryotes. Introduction to the genetics of micro-organisms. Microbial metabolism. Identification of the more important groups of bacteria, using biochemical and serological tests. (Total tuition time: ± 90 hours)

MICROBIOLOGY III (MBI321T)**1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Medical mycology: classification of yeasts and moulds of medical importance, mycological procedures, pathogenesis and laboratory identification of medically important yeasts and moulds. Medical parasitology: classification of protozoa and helminths of medical importance, parasitological procedures, life cycles and pathogenicity of medically important parasites. Medical virology: general properties and classification of medically important viruses, culturing of viruses, the properties, isolation and culturing of medically important viruses. (Total tuition time: ± 90 hours)

P**PATHOPHYSIOLOGY II (PPT201T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

The disruption of the normal physiological functions of the body, and the processes that lead to disruption. To understand these processes, the individual sciences of histopathology, microbiology, haematology and chemical pathology are combined in an integral concept. (Total tuition time: ± 90 hours)

PHYSICS IB (PHU161C)**1 X 3-HOUR PAPER****(Subject custodian: Department of Physics)**

A general physics qualification with applications in the biological sciences: remedial mathematics, fundamental units, vectors and scalars, kinetics, mechanics, dynamics, momentum, work, energy and power, fluids, temperature and heat, gas laws, waves and sound, optics, electricity, magnetism, radioactivity. Practical: experiments related to the theory. (Total tuition time: ± 90 hours)

