

# ADVANCED DIPLOMA IN BIOTECHNOLOGY

## Qualification code: ADBI20 - NQF Level 7 (120 credits)

SAQA ID: 101555, CHE NUMBER: H/H16/E050CAN

Campus where offered: Arcadia Campus

### REMARKS

- a. *Admission requirement(s):*  
A Diploma in Biotechnology, or a National Diploma: Biotechnology, 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.
- b. *Selection criteria:*  
Admission is subject to selection. Prospective students will be evaluated based on the marks obtained in the 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 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:*  
Block-mode classes.
- f. *Minimum duration:*  
Two years.
- g. *Exclusion and readmission:*  
See Chapter 2 of Students' Rules and Regulations.

### CURRICULUM

#### ATTENDANCE 2021

CODE	MODULE	NQF-L	CREDIT
MLB107V	Advanced Molecular Biology	(7)	(48)

#### FIRST SEMESTER

QSM117V	Quality and Safety Management Systems	(7)	(12)
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TOTAL CREDITS FOR THE YEAR: 60

#### ATTENDANCE 2022

CODE	MODULE	NQF-L	CREDIT
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#### FIRST SEMESTER

EBT117V	Entrepreneurial Skills	(7)	(12)
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MBI117V	Medical Biotechnology	(7)	(12)
IPG117V	Introduction to Postgraduate Research	(7)	(12)

TOTAL CREDITS FOR THE SEMESTER: 36

## SECOND SEMESTER

EBI117V	Environmental Biotechnology	(7)	(12)
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IBI117V	Industrial Biotechnology	(7)	(12)
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TOTAL CREDITS FOR THE SEMESTER: 24

TOTAL CREDITS FOR THE YEAR: 60

TOTAL CREDITS FOR THE QUALIFICATION: 120

## 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 MOLECULAR BIOLOGY (MLB107V) 1 X 3-HOUR PAPER** (Module custodian: Department of Biotechnology and Food Technology)

This module prepares the student to understand the power and application of the different omics with regards to genetic data analysis, plasmid selection and design, cloning and the ethical issues relating to genetic modification. This module will contribute to the preparation of technologists that are interested in postgraduate studies in the field of Recombinant DNA Technology and require a sound understanding of the basic principles of Microbiology I, Microbiology II and Molecular Biology. The content will include (but not limited to): Sequencing, genome sequencing, bioinformatics, functional genomics, proteomics, systems biology, comparative genomics and metagenomics. The characteristics, types of plasmids and their application. The theory and practical execution of PCR, Theory and practical execution of cloning DNA into host cells and Benefits of genetic engineering and the comparison thereof to the ethical arguments against it. (Total tuition time: ± 480 hours)

### E

#### **ENTREPRENEURIAL SKILLS (EBT117V) 1 X 3-HOUR PAPER** (Module custodian: Department of Management and Entrepreneurship)

Entrepreneurship and Small-, Medium- and Micro Enterprises (SMMEs) in Perspective; basic business concepts and the Business Environment; the identification of feasible business ideas; the viability of a business idea; the business plan; and setting up a business. (Total tuition time: not available)

#### **ENVIRONMENTAL BIOTECHNOLOGY (EBI117V) 1 X 3-HOUR PAPER** (Module custodian: Department of Biotechnology and Food Technology)

This module prepares the student to understand the role of microorganisms and their products in the field of Environmental Biotechnology. It is therefore suitable for continuing specialisation by reiterating the deep and systematic understanding of the role of microorganisms in this setting, their products and how these products can be used to benefit humankind. The content will include (but not limited to): Microorganisms in nature, Biogeochemical cycling, Waste water treatment, Xenobiotic treatment using microorganisms, Bioleaching and Biosorption, Treatment of oil spills, Independence and Reliability, Professionalism (attention to safety principles), To interpret and execute instructions, and Drafting a report. (Total tuition time: ± 120 hours)

**I****INDUSTRIAL BIOTECHNOLOGY (IBI117V)****1 X 3-HOUR PAPER****(Module custodian: Department of Biotechnology and Food Technology)**

This module provides a platform for introducing students to relevant industrial biotechnological concepts, including (but not limited to) industrial enzymes, immobilisation technology, antibiotic production, ethanol production, microbial insecticides, the use of *Bacillus thuringiensis* as pesticide, genetically modified crops (transgenic crops), biodiversity and biosafety, the influence of biotechnology on industrial products, microbial transformations with industrial applications, as well as microbial polysaccharides. The content will include (but not limited to): Immobilisation technology, Industrial enzymes, Antibiotic production, Ethanol production, Microbial insecticides, *Bacillus thuringiensis* as pesticide, Transgenic crops, Biodiversity and Biosafety, Influence of biotechnology on industrial products, Microbial transformations with industrial application, Microbial polysaccharides, Independence and Reliability, Professionalism (attention to safety principles), and to interpret and execute instructions, and Drafting a report. (Total tuition time: ± 120 hours)

**INTRODUCTION TO POSTGRADUATE RESEARCH (IPG117V)****CONTINUOUS ASSESSMENT****(Module custodian: Department of Biotechnology and Food Technology)**

Introduction to research; research tools; basic research management; introduction to ethics and ISO; fundamentals of scientific writing skills; basic research design; and presentation skills. (Total tuition time: ± 120 hours)

**M****MEDICAL BIOTECHNOLOGY (MBI117V)****1 X 3-HOUR PAPER****(Module custodian: Department of Biomedical Sciences)**

Upon completion of the module, the student will be able to define, characterise, discuss and observe the use and manipulation of mammalian cell cultures for health and environmental purposes. Students will acquire knowledge that will enable them to grow, store, characterise, validate and manipulate mammalian cells as well as manage bio intellectual property. The content will include (but not limited to): Growth, storage, validation and characterisation of Mammalian cells, Genetic manipulation of mammalian cells and stem cells and Essential management of intellectual property. (Total tuition time: ± 120 hours)

**Q****QUALITY AND SAFETY MANAGEMENT SYSTEMS (QSM117V)****CONTINUOUS ASSESSMENT****(Module custodian: Department of Biotechnology and Food Technology)**

Overview of relevant ISO and SANAS standards; Occupational Health and Safety (OHSAS 18001); regulations and legislation; HACCP/Codex principles; and audit principles and practice. (Total tuition time: not available)

