NATIONAL DIPLOMA: FOOD TECHNOLOGY
(Extended curriculum programme with foundation provision)
Qualification code: NDFTF1 - NQF Level 6

Campus where offered: Arcadia Campus (day classes)
Last year of new intake: 2018
Teach-out (phase-out) date: 31 December 2023

Students registered for this qualification should complete their studies according to the teach-out date prescribed for the qualification, subject to the stipulations of Regulation 3.1.11 and 3.1.13 in the Students' Rules and Regulations.

Information on phased-out programmes can be obtained from the TUT website, www.tut.ac.za.

Key to asterisks:
* Information does not correspond to information in AA72.
(Deviations approved Senate in May 2012, June 2015 and September 2015.)

CURRICULUM
Consult the 2018 Faculty Prospectus for the full contents of the qualification.

SUBJECTS PRINTED IN BOLD ARE NOT FOR REGISTRATION PURPOSES.

FIRST YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
FPCLS01	Chemistry IB: Extended*	(0,170)	
FPMLB01	Microbiology I: Extended*	(0,236)	
FPMLS01	Mathematics IB: Extended*	(0,140)	
FPPLS01	Physics IB: Extended*	(0,150)	
FIRST SEMESTER			
FPENG05	Foundation English	(0,087)	
SECOND SEMESTER			
FPLSK02	Foundation Life Skills	(0,070)	
TOTAL CREDITS FOR THE FIRST YEAR:		**0,853**	

SECOND YEAR
After completion of all first-year subjects.

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
FIRST SEMESTER			
FPE101T	**Food Process Engineering I**		
FPE10YT	Food Process Engineering: Computer Skills I	(0,075)	
FTN111T	Food Technology I	(0,150)	
MBI241T	Microbiology II	(0,125)	
TOTAL CREDITS FOR THE SEMESTER:		0,350	
SECOND SEMESTER			
ACI201T	Analytical Chemistry: Biological II	(0,125)	

BCH221B	Biochemistry II	(0,125)	
FTN211T	Food Technology II	(0,125)	Food Technology I
TOTAL CREDITS FOR THE SEMESTER:		0,375	
TOTAL CREDITS FOR THE SECOND YEAR:		**0,725**	

THIRD YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
FIRST SEMESTER			
FBI301T	Food Biochemistry III	(0,125)	Biochemistry II
FQA101T	Food Quality Assurance I	(0,100)	Food Technology I
FTN301T	Food Technology III	(0,140)	Food Technology II
TOTAL CREDITS FOR THE SEMESTER:		0,365	
SECOND SEMESTER			
FDC301T	Food Production III	(0,125)	Food Biochemistry III Food Technology II Microbiology II
FMB311T	Food Microbiology III	(0,125)	Microbiology II
FPE101T	**Food Process Engineering I**		
FPE10XT	Food Process Engineering: Food Engineering I	(0,075)	Mathematics IB: Extended Physics IB: Extended
TOTAL CREDITS FOR THE SEMESTER:		0,325	
TOTAL CREDITS FOR THE THIRD YEAR:		**0,690**	

FOURTH YEAR
On completion of all subjects. If a student has one outstanding subject, that particular case will be reviewed and permission might be granted in collaboration with the specific employer.

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
FIRST OR SECOND SEMESTER			
EXP1FDT	Work-Integrated Learning I*	(0,366)	
EXP2FDT	Work-Integrated Learning II*	(0,366)	Work-Integrated Learning I
TOTAL CREDITS FOR THE FOURTH YEAR:		**0,732**	
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. At time of publication, the syllabus content was defined as follows:

A

ANALYTICAL CHEMISTRY: BIOLOGICAL II (ACI201T) **1 X 3-HOUR PAPER**
(Subject custodian: Department of Chemistry)
Chromatographic and spectrophotometric techniques and instrumentation. (Total tuition time: ± 65 hours)

B

BIOCHEMISTRY II (BCH221B) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biomedical Sciences)

Structures and properties of carbohydrates, lipids, proteins and nucleic acids. Buffers and pH. Vitamins and coenzymes. Principles of volumetric analyses and spectrophotometry, DNA replication, transcription and protein synthesis. (Total tuition time: ± 65 hours)

C

CHEMISTRY IB: EXTENDED (FPCLS01) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Chemistry)

Scientific methodology and its use in discovering chemistry. Numbers in chemistry. The use of SI units. Matter. Atomic structure. Compounds in chemistry. The mole concept and chemical calculations. The electronic structure of the atom and electronic configurations within the periodic table. Chemical bonding. The states of matter and the binding forces within matter. Basic concepts of the gas laws. Solutions in chemistry. Acids, bases and salts. Oxidation and reduction and the balancing of equations. Organic chemistry: introduction, alkanes, alkenes, aromates, alkanols, phenols, halogen compounds, alkanoates, alkynes, aldehydes, ketones and alkanoic acids. (Total tuition time: ± 160 hours)

F

FOOD BIOCHEMISTRY III (FBI301T) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

Study of the major chemical components of food, the chemical changes they undergo during processing and storage, and methods used to analyse them. (Total tuition time: ± 90 hours)

FOOD MICROBIOLOGY III (FMB311T) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

Importance of food microbiology, microbial and mycological spoilage of food, factors influencing microbial spoilage of foods, microbiological aspects of food preservation, microbial food poisoning and food-transmitted infection, the isolation and identification of pathogens from food products, the use of micro-organisms in the production of food, microbiology of the air. (Total tuition time: ± 84 hours)

FOOD PROCESS ENGINEERING: COMPUTER SKILLS I (FPE10YT) **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)

FOOD PROCESS ENGINEERING: FOOD ENGINEERING I (FPE10XT) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

Units and dimensions, energy and mass balance, combined energy and mass balances, steam tables, basics of heat transfer, heat exchangers, refrigeration, drying, application of mass and energy balances in food product development and industrial processing. (Total tuition time: ± 45 hours)

FOOD PRODUCTION III (FDC301T) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

The production function in perspective. Product development and process planning. Factory layout, hygiene and sanitation. Cost data for production decision-making purposes. Production planning and inventory control. Food product development project which includes all aspects from idea generation, development, consumer acceptance, analysis and labelling. (Total tuition time: ± 195 hours)

FOOD QUALITY ASSURANCE I (FQA101T) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

Introduction to quality, quality control and quality assurance, HACCP and microbiological control including biological, physical and chemical hazards, organisation and management, product specifications, good manufacturing practices, plant inspection, Kosher certification and Halaal foods, customer service, product and safety data sheets, complaint handling, packaging, labelling and shelf-life; ISO 9000 and ISO 14001. (Total tuition time: ± 90 hours)

FOOD TECHNOLOGY I (FTN111T) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

General introduction to food technology and the South African food industry. The use of the metric system and comprehensive report-writing methods. Constituents of food: properties and significance in food systems. Nutritive aspects of food constituents and the introduction to sensory evaluation. Principles of food packaging and general discussion of relevant food topics. Introductory course on the theory and practice of basic food preparation techniques (e.g. vegetable, meat and poultry processing, baking, creating foams and emulsions and sugar confectionary) will be the focus of the practical component. (Total tuition time: ± 90 hours)

FOOD TECHNOLOGY II (FTN211T) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

The scientific and technological aspects namely food processing unit operations, different food preservation methods, food legislation and nutritional tables of the following major food categories as processed in the food industry: fruits and vegetables, cereals, legumes and oil seeds. Theory of analytical methods of sensory evaluation. Dehydration using cabinet and freeze drying, hurdle technology (salami), baking technology and sensory evaluation (triangle and ranking tests) will be the focus of practicals. Factory tours and DVD sessions will be used as learning aids. (Total tuition time: ± 90 hours)

FOOD TECHNOLOGY III (FTN301T) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

The scientific and technological aspects namely food processing unit operations, different food preservation methods, food legislation and nutritional tables of the following major food categories as processed in the food industry: fats and oils, dairy products, meat, poultry and eggs, fish and seafood, beverages (wine, beer, coffee, tea and carbonated soft drinks), chocolate and sugar confectionery. Manufacturing of butter, mayonnaise, feta cheese as well as a variety of industry visits will be the focus of practicals. DVD sessions will be used as learning aids. (Total tuition time: ± 90 hours)

FOUNDATION ENGLISH (FPENG05) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Applied Languages)

Interpret, relate and reflect on all available and relevant resource material in proper English. Communicate orally in a comprehensible and clear manner in both general and subject-specific communication. Demonstrate intermediate-level of proficiency in written English. (Total tuition time: ± 160 hours)

FOUNDATION LIFE SKILLS (FPLSK02) **CONTINUOUS ASSESSMENT**

(Subject custodian: Department of Management and Entrepreneurship)

Campus ethics, learning styles and whole-brain thinking, self-image and assertive behaviour, time management, self-motivation, conflict management, sexuality and relationships, problem-solving skills, managing stress, the multicultural society, techniques for summarising and memorising, how to cope with assessments and assignments, creativity, and many more. The life-skills sessions are participative, with group discussions and personal application to optimise student's learning experience. (Total tuition time: ± 128 hours)

M

MATHEMATICS IB: EXTENDED (FPMLS01) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Mathematics and Statistics)

Arithmetic. Graphs. Functions. Basic algebra. Trigonometry. Differentiation. Mensuration. Basic statistics. (Total tuition time: ± 190 hours)

MICROBIOLOGY I: EXTENDED (FPMLB01) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

General microbiology, chemical and physical control, environmental microbiology, food microbiology, occupational microbiology and microbiology ecology. Practical microbiological techniques. (Total tuition time: ± 248 hours)

MICROBIOLOGY II (MBI241T) **1 X 3-HOUR PAPER**

(Subject custodian: Department of Biotechnology and Food Technology)

Advanced composition and structure of the eukaryotic cell. Metabolism for energy production - pathways for the production of ATP. Introduction to the genetics of micro-organisms, the genetic code, mutations and recombinant DNA technology. Taxonomy, principles and characteristics/schemes used. Bergey's manual - groups of bacteria (including bacteria that cause food-borne illnesses), their characteristics and importance. (Total tuition time: ± 90 hours)

P

PHYSICS IB: EXTENDED (FPPLS01) **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: ± 160 hours)

W

WORK-INTEGRATED LEARNING I (EXP1FDT) **WORK-INTEGRATED LEARNING**
WORK-INTEGRATED LEARNING II (EXP2FDT) **WORK-INTEGRATED LEARNING**

(Subject custodian: Department of Biotechnology and Food Technology)

The purpose of work-integrated learning is to expose the student to as many techniques and apparatus and as much industrial experience as possible in order to further prepare the student for the industry. The student must be exposed to many aspects relevant to the field of food technology and the food industry as a whole. All students must be subjected to at least two of the following areas relevant to the food industry: research and product development, production, processing, manufacturing and quality control and quality assurance (70%). Stock control and marketing can form a minor part (30%) of the training programme. (Total tuition time: six months)