DUT
DURBAN UNIVERSITY OF TECHNOLOGY

FACULTY OF APPLIED SCIENCES

2017 HANDBOOK
BIOTECHNOLOGY & FOOD TECHNOLOGY

HANDBOOK FOR 2017

FACULTY OF APPLIED SCIENCES

DEPARTMENT of BIOTECHNOLOGY and FOOD TECHNOLOGY

The above department offers two programmes

BIOTECHNOLOGY and
FOOD TECHNOLOGY

This handbook offers information on both programmes

IMPORTANT NOTICES

Your registration is in accordance with all current rules of the Institution. If, for whatever reason, you do not register consecutively for every year/semester of your programme, your existing registration contract with the Institution will cease. Your re-registration anytime thereafter will be at the discretion of the institution and, if permitted, will be in accordance with the rules applicable at that time.

The rules in this departmental handbook must be read in conjunction with the General Rules (G Rules) contained in the DUT General Handbook for Students as well as the relevant Study Guides.

With respect to an appeal, your attention is specifically drawn to Rules G1(8) and (9), and to the process of dealing with students issues.

STRATEGIC DIRECTION (2015-2019)

FACULTY OF APPLIED SCIENCES
[Educate. Engage. Innovate.]

VISION
Leading innovation through science and technology

MISSION STATEMENT
- Educate Students
- Generate new scientific knowledge
- Engage communities

VALUES
1. **Accountability:** We take ownership of all activities, resources and tasks required of us. We deliver on our promises and responsibilities.
2. **Integrity:** We adhere to moral standards and principles. We are transparent and consistent in all our actions, and lead by example.
3. **Dedication:** We are committed to achieving our goals and expectations.
4. **Professionalism:** We operate within clear boundaries with respect to our code of conduct.
5. **People Oriented:** We are committed to sustaining the morale and holistic development of staff and student. We value diversity in all forms.

DEPARTMENT OF BIOTECHNOLOGY AND FOOD TECHNOLOGY

VISION
A leader in Biotechnology and Food Science innovation for a sustainable future.

MISSION STATEMENT
Advancing scholarship in Biotechnology and Food Science.

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1. DEPARTMENT & FACULTY CONTACT DETAILS

All Department and Biotechnology Programme queries to:

Secretary:	Ms P Phillips
Tel No:	031 373 5321
Fax mail:	086 674 1059
Email:	phillipp@dut.ac.za
Location:	Steve Biko Campus, S9, Level 1

All Department and Food Technology Programme queries to:

Administrative Assistant:	Ms S Ranglal
Tel No:	031 373 6769
Fax mail:	086 743 5174
Email:	ranglals@dut.ac.za
Location:	Steve Biko Campus, S9, Level 1

All Faculty queries to:

Faculty Officer:	Ms G Shackleford
General Enquiries No:	031 373 2506
Facsimile No:	031 373 2175
Email:	dutfas@dut.ac.za
Location:	Block S4 Level 3, Steve Biko Campus

Faculty Assistant:	Ms J Nagan
General Enquiries No:	031 373 2717
Facsimile No:	031 373 2175
Email:	jessican@dut.ac.za
Location:	Block S4 Level 3, Steve Biko Campus

Executive Dean:	Prof S Singh
Executive Dean's Secretary:	Ms N Naidoo
Telephone No:	031 373 2720
Facsimile No:	031 373 2724
Email:	dutfas@dut.ac.za
Location:	Between Block S6 and S7, Level 4, Steve Biko Campus

2. DEPARTMENT STAFF

Head of Department / Full Professor	Prof K Permaul, Ph.D (UKZN)
Associate Professor	Prof T Kudanga, Ph.D (TUGRAZ)
Senior Lecturers	Dr FM Swalaha, D.Tech (DUT) Dr V Mohanlall, D.Tech (DUT) Dr OA Ijabadeniyi, Ph.D (UP) Dr EO Amonsou, Ph.D (UP) Dr JJ Mellem, D.Tech (DUT) Dr NP Mchunu, D.Tech (DUT) Ms S Juglal, M.Tech (MLST) Dr SK Pillai, D.Tech (DUT)
Lecturers	Ms S Beekrum, M.Tech (DUT)
Secretaries	Ms P Phillips, NHD (DUT) Ms S Ranglal
Senior Technicians	Ms R Brijlal, B.Tech (DUT) Ms S Govender, M.Tech (DUT)
Technicians	Mr V Dilraj, NHD (DUT) Ms S Govender, M.Tech (DUT) Ms P Naicker, B.Tech (DUT) Ms K Mellem, M.Tech (DUT) Ms SKS Mbamali, B.Tech (DUT) Ms RL Mohanlall, B.Tech (DUT)
Technical Assistant	Mr ZE Ncayiyana, B.Tech (DUT)
Laboratory Assistant	Mr A.A. Mudzanani B.Tech (TUT)

3. QUALIFICATIONS OFFERED BY THE DEPARTMENT

Programmes are offered in this Department which will, upon successful completion, lead to the award of the following qualifications:

- National Diploma (ND)
- Bachelor of Technology (B.Tech)
- Master of Applied Science (M.App.Sci.)
- Doctor of Philosophy (Ph.D)

Qualification	Qualification Code	Important dates	SAQA NLRD ID
A. BIOTECHNOLOGY			
National Diploma: Biotechnology	NDBIO2		72213
ND: Biotechnology (ECP)	NDBTF1	1st offered Jan 2013	72213
Bachelor of Technology: Biotechnology	BTBIO1		72115
Master of Applied Science in Biotechnology	MSBTC1	1st offered 2015	72168
Doctor of Philosophy in Biotechnology	DPBTC1	1st offered 2015	72090
B. FOOD TECHNOLOGY			
National Diploma: Food Technology	NDFDT2		72236
ND: Food Technology (ECP)	NDFTF1	1st offered Jan 2013	72236
Bachelor of Technology: Food Technology	BTFDT1		72137
Master of Applied Science in Food Science and Technology	MSFST1	1st offered 2015	72184
Doctor of Food Science and Technology	DFSCT1	1st offered 2015	72102

A. BIOTECHNOLOGY

4. NATIONAL DIPLOMA: BIOTECHNOLOGY (NDBIO2)

Purpose of Qualification

Persons achieving this qualification will be competent to apply theoretical and practical fundamental knowledge and skills in the fields of biotechnology, microbiology and biochemistry to the relevant biotechnology industries and research institutions. Graduates may apply for registration with the South African Council for Natural Scientific Professions as Certificated Natural Scientists.

4.1 PROGRAMME STRUCTURE (3 YEAR)

Code	Subject	Level of Study	Assessment Method	NATED Credits	Pre-requisite
MICR101*	Microbiology I	1a	Ex	0.150	
CHMB102*	Chemistry I	1a	Ex	0.150	
BIOD101	Biodiversity & Ecology I	1a	Ex	0.120	
QMTH101*	Quantitative Methods I	1a	Ex	0.080	
MICR202*	Microbiology II	1b	Ex	0.130	Microbiology I
BCHM202	Biochemistry II	1b	Ex	0.130	Chemistry I
ACBL201*	Analytical Chemistry: Biological II	1b	Ex	0.130	Chemistry I
SASH101	Sanitation, Safety & Hygiene I	1b	Ex	0.110	
MICR301#	Microbiology: Biological III	2a	Ex	0.125	Microbiology II
DIMR201	Disease and Immune Response II	2a	Ex	0.125	Microbiology I
MIBC301#	Microbial Biochemistry III	2a	Ex	0.125	Biochemistry II
FERT202	Fermentation Technology II	2a	Ex	0.125	Microbiology II
FMIC302*#	Food Microbiology III	2b	Ex	0.140	Microbiology II
ABIC301#	Analytical Biochemistry III	2b	Ex	0.125	Biochemistry II
PRTM101	Process Technology & Management I	2b	Ex	0.110	
BIOP301#	Bioprocessing III	2b	Ex	0.125	Fermentation Technology II
BIPR101	Biotechnology Industry Practice I	3	CA	0.5	ALL 16 SUBJECTS
BIPR201	Biotechnology Industry Practice II	3	CA	0.5	

KEY: Assessment: Ex= Final Examination; CA = Continuous Assessment

Numbers 1 to 3 indicates the year of study, "a"= Semester 1, "b"=Semester 2 (eg 2b=Second year, Semester 2)

A Pre-Req (prerequisite) means this subject must be passed prior to registration for the subsequent subject/module.

*These subjects are common to both the ND: Biotechnology and the ND: Food Technology.

#These subjects are final level subjects.

The subject content for each subject is found under section 16 of this handbook. This content must be read in conjunction with the relevant Study Guide.

4.2 PROGRAMME INFORMATION

4.2.1 Academic Integrity

Refer to the DUT General Rules pertaining to academic integrity G13(1)(o) - covering falsification of academic records, plagiarism and cheating. These will be enforced wherever necessary to safeguard the worthiness of our qualifications, and the integrity of the Faculty of Applied Sciences at DUT.

4.2.2 Code of Conduct for Students

A professional code of conduct pertaining to behaviour, appearance, personal hygiene and dress shall apply to all students registered with the Faculty of Applied Sciences, at all times. Refer to Programme Rule 4.3.8 below.

4.2.3 Attendance

Students are expected to achieve 100% attendance for all planned academic activities as these are designed to provide optimal support for the required competency. Students are expected to be punctual for all academic activities. Penalties may be invoked for late attendance. Refer to Programme Rule 4.3.9 below.

4.2.4 Work Integrated Learning (WIL)

This programme requires the student to undergo a twelve month period of work-integrated learning (WIL) during the third year of the diploma. All subjects must be passed in order to qualify for WIL placement in a suitable industry. Students must adhere to the requirements stated in the Department's WIL Study Guide. Refer to Programme Rule 4.3.7 below.

4.2.5 Assessment and Moderation

Students are expected to work steadily through the period of registration in order to achieve the highest results possible.

Assessment details are listed under each subject at the back of this handbook. Assessments could include a variety of testing methods including, but not limited to, written tests, oral tests, theoretical and/or practical examinations, group work and assignments.

Assignments must be handed personally to the lecturer who will record their receipt. Late submission will be penalised.

In the case of a continuous assessment subject (a subject which has no final examination/s or supplementary examination/s) opportunities for reassessment are provided for students who fail assessments. These are stipulated in the relevant study guide.

Moderation follows the DUT Assessment Policy stipulations.

Refer to Programme Rule 4.3.9 below.

4.2.6 Employment Opportunities

Biotechnologists or microbiologists work in the following industries or research labs: food and beverage, agriculture, medical and veterinary, forensic, pharmaceutical and water and waste management. Opportunities exist for graduates to pursue further educational qualifications.

4.3 PROGRAMME RULES

4.3.1 Minimum Admission Requirements

In addition to DUT Rule G7, the following minimum entrance requirements and selection criteria outlined in 4.3.2 apply for applicants with reference to:

4.3.1.1 Academic Achievement

In line with the above, applicants' school leaving academic achievement must comply with one of the following:

i) a National Senior Certificate (NSC) with endorsement for diploma/degree entry with the following subjects at the stated minimum ratings:

Compulsory Subjects	NSC Rating
English	4
Mathematics	4
Physical Science	4
Life Sciences (or Biology)	4

ii) a Senior Certificate matriculation exemption with the following subjects at the stated minimum ratings:

Compulsory Subjects	HG	SG
English	D	B
Mathematics	D	B
Physical Science	D	B
Life Sciences (or Biology)	D	B

iii) a National Certificate (Vocational) Level 4 with statutory requirements for a diploma entrance and the following subjects at the stated minimum ratings:

Compulsory Subjects	Minimum
English	50%
Mathematics	50%
Physical Science	60%
Life Sciences (or Biology)	60%

4.3.1.2 Admission Requirements based on Work Experience, Age and Maturity; and Recognition of Prior Learning

The DUT Rules G7(3), and G7(8) respectively, will apply. *(Approved by Senate Rules Comm wef 2014/10)*

4.3.1.3 **Admission of International Students**

The DUT's Admissions Policy for International Students and DUT Rules G4 and G7(5) will apply.

· International students must meet the equivalent programme minimum entrance requirements as stated above.

(Approved by Senate Rules Comm wef 2014/10)

4.3.1.4 **Admission of Students from other Institutions**

In addition to the relevant DUT Rules a transferring student will only be accepted if there are places available and the student has met the applicable entrance requirements of the university.

(Approved by Senate Rules Comm wef 2014/10)

4.3.2 Selection Criteria

In addition to the Minimum Admission Requirements (Rule 4.3.1), the following selection process will determine placement in the programme:

All applicants must apply through the Central Applications Office (CAO).

Initial shortlisting for selection is based on the applicant's academic performance in Grade 12 (Grade 11 or Grade 12 trial marks will be used for current matriculants).

Applicants who meet the above criteria may be:

a) invited to undergo placement testing
b) ranked based on performance

Provisional acceptance is given to selected applicants awaiting National Senior Certificate* (NSC) results. If the final Grade 12 NSC* results do not meet the minimum entrance requirements, this provisional acceptance will be withdrawn.

Final selection for placement will be based on results of the above ranking process, as well as available places (refer to DUT Rule G5) *(or SC / NC(V))

(Approved by Senate Rules Comm wef 2014/10)

4.3.3 Pass Requirements

In addition to the DUT Rules G12, G14 and G15, the following programme rule applies:

4.3.3.1 Notwithstanding DUT Rule G12(1) a sub-minimum of 40% is required for the practical component of all subjects in which the semester mark is made up of theory and practical components. These are indicated in Table 4.1Programme Structure. *(Approved by Senate Rules Comm wef 2014/10)*

4.3.4 Re-registration Rules

In addition to the DUT Rule G16, and all prerequisite subjects as identified in the Programme Structure (4.1), the following programme rules apply:-

4.3.4.1 **Promotion from Semester 1 to Semester 2:**

Students must pass a minimum of 2 subjects, one of which must be Chemistry1 or Microbiology 1

4.3.4.2 **Promotion from Semester 2 to Semester 3:**
Students must pass 2 second semester subjects.

4.3.4.3 **Promotion from Semester 3 to Semester 4:**
Students must pass 2 third semester subjects.

4.3.4.4 **Promotion from Semester 4 to Semester 5:**
Students must pass all of the preceding 16 subjects.
(Approved by Senate Rules Comm wef 2014/10)

4.3.5 Exclusion Rules

In addition to DUT Rule G17, a first semester student who fails three or more subjects with a final result of less than 40% in each subject is not permitted to reregister in this programme. Deregistration from any subjects is subject to the provision of DUT Rule G6. *(Approved by Senate Rules Comm wef 2014/10)*

4.3.6 Interruption of Studies

In accordance with DUT Rule G21A(b), the minimum duration for this programme will be 3 years of registered study and the maximum duration will be 5 years of registered study, including any periods of WIL. Should a student interrupt their studies by more than three (3) years, the student will need to apply to the department for permission to reregister and will need to prove currency of appropriate knowledge prior to being given permission to continue with registration. *(Approved by Senate Rules Comm wef 2014/10)*

4.3.7 Work Integrated Learning Rules

The DUT Rule G28 applies. *(Approved by Senate Rules Comm wef 2014/10)*

4.3.8 Code of Conduct

In addition to the Student Code of Conduct in the DUT General Handbook for Students, and the relevant requirements as stated in the appropriate Study Guides, the following rules apply:

4.3.8.1 **Conduct of Students in Practical Facilities**
Strict adherence to instructions issued by technical, supervisory or academic staff is required due to the need to ensure effective and safe practice in these facilities. Misconduct or disregard for instructions will be referred to the relevant disciplinary procedure.

4.3.8.2 **Uniforms**
Students must adhere to instructions issued by technical, supervisory or academic staff regarding the specific dress code required during practicals. Non-compliance will result in the student being denied access to the venue.
(Approved by Senate Rules Comm wef 2014/10)

4.3.9 Attendance and Assessment

4.3.9.1 A student who, for any valid reason (Refer to Programme Rule 4.3.9.2 below), is absent from a particular practical or test, must provide written proof of the reason for the absence to the lecturer concerned, within five (5) working days of returning to the institution in order to be considered for a special assessment.

4.3.9.2 The DUT Rule G13(3)(a) which refers to special examinations also refers to special assessments set within departments for students who have missed coursework assessments. In these cases the department will determine the validity of the student's reason for not taking the assessment, and the nature of the special assessment.
(Approved by Senate Rules Comm wef 2014/10)

4.3.10 Health and Safety

Students must adhere to all Health and Safety regulations both while at DUT and in WIL placements. Failure to do so will be treated as a breach of discipline. Refer to the appropriate Health and Safety policies.
(Approved by Senate Rules Comm wef 2014/10)

5. NATIONAL DIPLOMA: BIOTECHNOLOGY (EXTENDED CURRICULUM) (NDBTF1)

Purpose of Qualification

Persons achieving this qualification will be competent to apply theoretical and practical fundamental knowledge and skills in the fields of biotechnology, microbiology and biochemistry to the relevant biotechnology industries and research institutions. Graduates may apply for registration with the South African Council for Natural Scientific Professions as Certificated Natural Scientists.

This qualification is offered through a three year programme (refer to item 4 above), or through an augmented curriculum - offered over a minimum of four years of study - which is devised to enhance student development and to improve the student's chances of successful completion.

5.1 PROGRAMME STRUCTURE (4 YEAR)

Code	Subject	Year/Sem of Study	Assessment Method	NATED Credits	Pre-requisite
IIBTC101**	Introduction to Biotechnology I	1a	CA	TBA	
QMYH101	Quantitative Methods I	1a	Ex	0.080	
CHMB102	Chemistry I	1a	Ex	0.150	
ACBL201	Analytical Chemistry: Biological II	1b	Ex	0.130	Chemistry I
SASH101	Sanitation, Safety & Hygiene I	1b	Ex	0.110	
CSBT101**	Computer Skills I	1b	CA	TBA	
MICR 101	Microbiology I	2a	Ex	0.150	
BIOD101	Biodiversity & Ecology I	2a	Ex	0.120	
SCMT101**	The Scientific Method I	2a	CA	TBA	
MICR202	Microbiology II	2b	Ex	0.130	Microbiology I
BCHM202	Biochemistry II	2b	Ex	0.130	Chemistry I
BIST101**	Biostatistics I	2b	CA	TBA	
MICR301#	Microbiology: Biological III	3a	Ex	0.125	Microbiology II
DIMR201	Disease and Immune Response II	3a	Ex	0.125	Microbiology I
MIBC301#	Microbial Biochemistry III	3a	Ex	0.125	Biochemistry II
FERT202	Fermentation Technology II	3a	Ex	0.125	Microbiology II
FMIC302#	Food Microbiology III	3b	Ex	0.140	Microbiology II
ABIC301#	Analytical Biochemistry III	3b	Ex	0.125	Biochemistry II
PRTM101	Process Technology & Management I	3b	Ex	0.110	
BIOP301#	Bioprocessing III	3b	Ex	0.125	Fermentation Technology II
BIPR101	Biotechnology Industry Practice I	4	CA	0.5	ALL 20 SUBJECTS
BIPR201	Biotechnology Industry Practice II	4	CA	0.5	

KEY: Assessment: Ex= Final Examination; CA = Continuous Assessment

Numbers 1 to 4 indicates the year of study, "a"= Semester 1, "b"=Semester 2 (eg 2b=Second year, Semester 2)

A Pre-Req (prerequisite) means this subject must be passed prior to registration for the subsequent subject/module.

**These subjects are specific to either/both the ND(ECP): Biotechnology and the ND(ECP): Food Technology.

These subjects are final level subjects.

The subject content for each subject is found under section 16 of this handbook. This content must be read in conjunction with the relevant Study Guide.

5.2 PROGRAMME INFORMATION

Refer to 4.2 Programme Information under the ND: Biotechnology.

5.3 PROGRAMME RULES

Refer to 4.3 Programme Rules under the ND: Biotechnology and the following rules which apply specifically to ND: Biotechnology (ECP).

5.3.1 Minimum Admission Requirements

Refer to Rule 4.3.1 which is applicable to both the ND and ND(ECP).

5.3.2 Selection Criteria

Refer to Rule 4.3.2 which is applicable to both the ND and ND(ECP).
In addition to the above, on the basis of the selection process, successful applicants for study towards the National Diploma will be accepted into either the three (3) year, or four (4) year (Extended Curriculum) programme of study.

5.3.3 Pass Requirements

Refer to Rule 4.3.3 which is applicable to both the ND and ND(ECP).

5.3.4 Re-registration Rules

In addition to the DUT Rule G16, and all prerequisite subjects as identified in the Programme Structure (5.1), the following programme rules apply:-

5.3.4.1 **Promotion from Year 1 Semester 1 (ECP) to Year 1 Semester 2 (ECP):**
An ECP student is required to pass Chemistry 1 and one other subject in order to be permitted to register for the next semester.

5.3.4.2 **Promotion from Year 1 Semester 2 (ECP) to Year 2 Semester 1 (ECP):**
An ECP student is required to pass 2 subjects in order to be permitted to register for the next semester.

5.3.4.3 **Promotion from Year 2 Semester 1 (ECP) to Year 2 Semester 2 (ECP):**
An ECP student is required to pass 2 subjects in order to be permitted to register for the next semester.

5.3.4.4 **Promotion from Year 2 Semester 2 (ECP) to Year 3 Semester 1 (ECP):**
An ECP student is required to pass 2 subjects in order to be permitted to register for the next semester.

5.3.4.5 **Promotion from Year 3 Semester 1 (ECP) to Year 3 Semester 2 (ECP):**
An ECP student is required to pass 2 subjects in order to be permitted to register for the next semester.

5.3.4.6 **Promotion to Year 3 Semester 2 to Year 4 Semester 1:**
Students must pass all of the preceding 20 subjects.
(Approved by Senate Rules Comm wef 2014/10)

5.3.5 Exclusion Rules
Refer to Rule 4.3.5 which is applicable to both the ND and ND(ECP).

5.3.6 Interruption of Studies
In accordance with Rule G21A(b), the minimum duration for this programme will be 4 years of registered study and the maximum duration will be 5 years of registered study, including any periods of WIL. Should a student interrupt their studies by more than three (3) years, the student will need to apply to the department for permission to reregister and will need to prove currency of appropriate knowledge prior to being given permission to continue with registration. *(Approved by Senate Rules Comm wef 2014/10)*

5.3.7 Work Integrated Learning Rules
Refer to Rule 4.3.7 which is applicable to both the ND and ND(ECP).

5.3.8 Code of Conduct
Refer to Rule 4.3.8 which is applicable to both the ND and ND(ECP).

5.3.9 Attendance and Assessment
Refer to Rule 4.3.9 which is applicable to both the ND and ND(ECP).

5.3.10 Health and Safety
Refer to Rule 4.3.10 which is applicable to both the ND and ND(ECP).

6. BACHELOR OF TECHNOLOGY: BIOTECHNOLOGY (BTBIO1)

Purpose of Qualification

Students achieving this qualification will be competent to adopt a critical and innovative approach to contribute to the field of biotechnology. They will be able to pursue careers as senior technical managers and/or entrepreneurs in biotechnology industries.

6.1 PROGRAMME STRUCTURE

Code	Subjects	Assessment Method	NATED Credits
RMNS201	Research Methodology: Natural Sciences	CA	0.100
ENSB101	Entrepreneurial Skills I	Ex	0.100
INBT401	Industrial Biotechnology IV	Ex	0.125
ENBT401	Environmental Biotechnology IV	Ex	0.125
PLBT401	Plant Biotechnology IV	Ex	0.125
DNAT401	Recombinant DNA Technology IV	Ex	0.125
RESP411	Research Project IV	CA	0.300
RESP421	Research Project IV (Part-Time / D3 only)	CA	0.300

KEY: Assessment: Ex= Final Examination; CA = Continuous Assessment

NOTE : Research Methodology and Research Project must be done concurrently.

The subject content for each subject is found under section 17 of this handbook. This content must be read in conjunction with the relevant Study Guide.

6.2 PROGRAMME INFORMATION

B Tech students can register full-time and complete all subjects in one year, or part-time and complete their studies over two years. The appropriate sequence of registration for the part-time subjects is available from the department.

6.3 PROGRAMME RULES

6.3.1 Minimum Admission Requirements

In addition to Rule G7, applicants must be in possession of a ND: Biotechnology or equivalent with a minimum 60% in the final level subjects (refer to 4.1 Programme Structure) and minimum 60% overall aggregate. Part-time students must have adequate laboratory facilities at their places of employment to conduct their Research Project.

6.3.2 Pass Requirements

In addition to the DUT Rules (G12, G14 and G15), the following programme rules apply:

1) The final examination for each of the examinable subjects in the B Tech: Biotechnology consists of one three-hour written examination. The examination mark contributes 60% of the final mark. The remaining 40% is constituted by a course mark which is obtained by assessment of the work done by the student during the year. Theory tests, practical tests, assignments, projects and tutorials may be used to calculate the course mark.
2) The examinations for first semester subjects will be held in the May/June examination period; the examinations for the remaining subjects will be held in the October/November examination period.

3) For subjects assessed by means of continuous assessment, the pass mark is 50%. These comprise:
   - Research Project IV - assessed by the submission of a research proposal and presentation (20%), submission of a mini-dissertation (60%) and a final project presentation (20%).

   Part time students must complete this subject over two years.
   - Research Methodology - assessed by means of class tests and assignments

4) A student who is absent from a test or scheduled assessment must provide acceptable proof of the reason for absence to the lecturer concerned, upon returning to lectures.

6.3.3 Re-registration Rules

The DUT Rule G16 applies.

6.3.4 Exclusion Rules

The DUT Rules G17 and G23A(a)(4) apply.

6.3.5 Interruption of Studies

In accordance with Rule G23A(a), the minimum duration for this programme will be 1 year of registered study and the maximum duration will be 2 years of registered study, including any periods of WIL. Should a student interrupt their studies by more than three (3) years, the student will need to apply to the department for permission to reregister and will need to prove currency of appropriate knowledge prior to being given permission to continue with registration.

7. MASTER OF APPLIED SCIENCE IN BIOTECHNOLOGY (MSBTC1)

7. 1 PROGRAMME INFORMATION:

Students achieving this qualification will be able to conduct scientific research under minimal guidance in a chosen field, and to contribute to knowledge production in that field. The research problem, its justification, process and outcome are reported in a dissertation which complies with the generally-accepted norms for research at this level.

7.2 PROGRAMME RULES

7.2.1 Minimum Admission Requirements

In addition to Rule G7 and G24, an applicant must have a BT: Biotechnology (or equivalent).

7.2.2 Duration of Programme:

In accordance with G24(2)(a), the minimum duration of the MAppSci is one year and the maximum is three years.

7.2.3 Instructional Programme

This qualification is offered by means of a full research project (Refer to Rule G24).

7.2.4 Proposal

Students are required to submit and present a research proposal to the Department within 3 months of registration.

7.2.5 Progress Reports

Students must present a progress report to the Department at least once annually.

7.2.6 Publications:

Students are required to have ONE publication submitted to a SAPSE approved journal prior to completion of the degree.

8. DOCTOR OF PHILOSOPHY IN BIOTECHNOLOGY (DPBTC1)

8.1 PROGRAMME INFORMATION

Persons achieving this qualification will be competent scientific researchers who can work independently in developing and applying knowledge and skills to make an original contribution to the global knowledge or technology in the particular field chosen for study.

8.2 PROGRAMME RULES

8.2.1 Minimum Admission Requirements

In addition to Rule G7 and G24, an applicant must have a MAppSci (Biotechnology) (or equivalent).

8.2.2 Duration of Programme:

In accordance with G25(2)(a), the minimum duration of the Ph.D is two years and the maximum is four years.

8.2.3 Instructional Programme

This qualification is offered by means of a full research project (Refer to Rule G25).

8.2.4 Proposal

Students are required to submit and present a research proposal to the Department within 3 months of registration.

8.2.5 Progress Reports:

Students must present a progress reports to the Department at least once annually.

8.2.6 Publications:

Students are required to have ONE publication accepted and ONE publication submitted to a SAPSE approved journal prior to completion of the degree.

B. FOOD TECHNOLOGY

9. NATIONAL DIPLOMA: FOOD TECHNOLOGY (NDFDT2)

Purpose of Qualification

Graduates of this qualification will be able to perform and organise operations in laboratories and factories of food processing organisations in compliance with statutory requirements for ethics, safety and quality assurance. Supervisory, management and research skills are developed.

The diploma programme aims to develop the ability to critically evaluate and interpret experimental data. The student must be able to work independently in prioritizing, planning and executing work programmes. The student should be able to supervise the development, production and quality control of food manufacturing processes.

9.1 PROGRAMME STRUCTURE (3 YEAR)

Code	Subjects	Level of Study	Assessment Method	NATED Credits	Pre-requisite
MICR101*	Microbiology I	1a	Ex	0.148	
CHMB102*	Chemistry I	1a	Ex	0.148	
PHYS 103	Physics I	1a	Ex	0.125	
QMTH101*	Quantitative Methods I	1a	Ex	0.125	
MICR202*	Microbiology II	1b	Ex	0.125	Microbiology I
FCHM202	Food Chemistry II	1b	Ex	0.125	Chemistry I
ACBL201*	Analytical Chemistry: Biological II	1b	Ex	0.125	Chemistry I
FDTE102	Food Technology I	1b	Ex	0.150	
FDTE201	Food Technology II	2a	Ex	0.160	Food Tech I
FDIM101	Food Industry Management I	2a	Ex	0.080	
FDPE101	Food Process Engineering I	2a	Ex	0.150	
FCHM302#	Food Chemistry III	2a	Ex	0.140	Food Chemistry II
FMIC302*#	Food Microbiology III	2b	Ex	0.140	Microbiology II
FDTE301#	Food Technology III	2b	Ex	0.160	Food Technology II
FDQA101	Food Quality Assurance I	2b	Ex	0.100	
FDPE201	Food Process Engineering II	2b	Ex	0.125	Food Process Engineering I
FIPR101	Food Industry Practice I	3	CAs	0.5	ALL 16 SUBJECTS
FIPR201	Food Industry Practice II	3	CA	0.5	

KEY: Assessment: Ex= Final Examination; CA = Continuous Assessment

Numbers 1 to 3 indicates the year of study, "a"= Semester 1, "b"=Semester 2 (eg 2b=Second year, Semester 2)

A Pre-Req (prerequisite) means this subject must be passed prior to registration for the subsequent subject/module.

*These subjects are common to both the ND: Biotechnology and the ND: Food Technology.

#These subjects are final level subjects.

The subject content for each subject is found under section 16 of this handbook. This content must be read in conjunction with the relevant Study Guide.

9.2 PROGRAMME INFORMATION

9.2.1 Academic Integrity

Refer to the DUT General Rules pertaining to academic integrity G13 (1)(o) –covering falsification of academic records, plagiarism and cheating. These will be enforced wherever necessary to safeguard the worthiness of our qualifications, and the integrity of the Faculty of Applied Sciences at DUT.

9.2.2 Code of Conduct for Students

A professional code of conduct pertaining to behaviour, appearance, personal hygiene and dress shall apply to all students registered with the Faculty of Applied Sciences, at all times. Refer to Programme Rule 9.3.8 below.

9.2.3 Attendance

Students are expected to achieve 100% attendance for all planned academic activities as these are designed to provide optimal support for the required competency. Students are expected to be punctual for all academic activities. Penalties may be invoked for late attendance. Refer to Programme Rule 9.3.9 below.

9.2.4 Work Integrated Learning (WIL)

This programme requires the student to undergo a twelve month period of work-integrated learning (WIL) during the third year of the diploma. All subjects must be passed in order to qualify for WIL placement. Students must adhere to the requirements stated in the Department's WIL Study Guide. Refer to Programme Rule 9.3.7 below.

9.2.5 Assessment and Moderation

Students are expected to work steadily through the period of registration in order to achieve the highest results possible.

- Assessment details are listed under each subject at the back of this handbook.
- Assessments could include a variety of testing methods including, but not limited to, written tests, oral tests, theoretical and/or practical examinations, group work and assignments.
- Assignments must be handed personally to the lecturer who will record their receipt. Late submission will be penalised.
- In the case of a continuous assessment subject (a subject which has no final examination/s or supplementary examination/s) opportunities for reassessment are provided for students who fail assessments. These are stipulated in the relevant study guide.
- Moderation follows the DUT Assessment Policy stipulations.
  Refer to Programme Rule 9.3.9 below.

9.2.6 Employment Opportunities

Food Technologists work predominantly in a laboratory or industrial environment and may be employed as quality inspectors, laboratory analysts, researchers, product development technologists, packaging technologists, auditors of food factories and suppliers. Food technologists may eventually specialize in one of the following areas: quality assurance or control; product research and development, production management and quality management.

Promotion opportunities to supervisory or management positions are good, provided students are prepared to work hard, possess leadership ability and are willing to study further. Some food technologists travel extensively to inspect factories and food suppliers. Overtime and night-shift work are sometimes required by those involved in production and quality control. The National Diploma allows students to subsequently pursue a BT: Food Technology. Opportunities exist for graduates to pursue further educational qualifications.

9.3 PROGRAMME RULES

9.3.1 Minimum Admission Requirements

In addition to DUT Rule G7, the following minimum entrance requirements and the selection criteria outlined in 9.3.2 apply for applicants with reference to:-

9.3.1.1 Academic Achievement

In line with the above, applicants' school leaving academic achievement must comply with one of the following:

i) a National Senior Certificate (NSC) with endorsement for diploma/degree entry with the following subjects at the stated minimum ratings:

Compulsory Subjects	NSC Rating
English	4
Mathematics	4
Physical Science	4
Life Sciences (or Biology)	4

ii) a Senior Certificate matriculation exemption with the following subjects at the stated minimum ratings:

Compulsory Subjects	HG	SG
English	D	B
Mathematics	D	B
Physical Science	D	B
Life Sciences (or Biology)	D	B

iii) a National Certificate (Vocational) Level 4 with statutory requirements for a diploma entrance and the following subjects at the stated minimum ratings:

Compulsory Subjects	Minimum
English	50%
Mathematics	50%
Physical Science	60%
Life Sciences (or Biology)	60%

9.3.1.2 **Admission Requirements based on Work Experience, Age and Maturity; and Recognition of Prior Learning**

The DUT Rules G7(3), and G7(8) respectively, will apply.
(Approved by Senate Rules Comm wef 2014/10)

9.3.1.3 **Admission of International Students**

The DUT's Admissions Policy for International Students and DUT Rules G4 and G7(5) will apply.

International students must meet the equivalent programme minimum entrance requirements as stated above.
(Approved by Senate Rules Comm wef 2014/10)

9.3.1.4 **Admission of Students from other Institutions**

In addition to the relevant DUT Rules a transferring student will only be accepted if there are places available and the student has met the applicable entrance requirements of the university.
(Approved by Senate Rules Comm wef 2014/10)

9.3.2 Selection Criteria

In addition to the Minimum Admission Requirements (Rule 9.3.1), the following selection process will determine placement in the programme:

- All applicants must apply through the Central Applications Office (CAO).
- Initial shortlisting for selection is based on the applicant's academic performance in Grade 12 (Grade 11 or Grade 12 trial marks will be used for current matriculants).
- Applicants who meet the above criteria may be
  a) invited to undergo placement testing
  b) ranked based on performance
- Provisional acceptance is given to selected applicants awaiting National Senior Certificate* (NSC) results. If the final Grade 12 NSC* results do not meet the minimum entrance requirements, this provisional acceptance will be withdrawn.
- Final selection for placement will be based on results of the above ranking process, as well as available places (refer to DUT Rule G5) *(or SC / NC(V)) *(Approved by Senate Rules Comm wef 2014/10)*

9.3.3 Pass Requirements

In addition to the DUT Rules G12, G14 and G15, the following programme rule applies:

9.3.3.1 Notwithstanding DUT Rule G12(1) a sub-minimum of 40% is required for the practical component of all subjects in which the semester mark is made up of theory and practical components. These are indicated in Table 9.1 Programme Structure. *(Approved by Senate Rules Comm wef 2014/10)*

9.3.4 Re-registration Rules

In addition to the DUT Rule G16, and all prerequisite subjects as identified in the Programme Structure (9.1), the following programme rules apply:-

9.3.4.1 Promotion from Semester 1 to Semester 2: Students must pass at least 2 subjects, one of which must be Chemistry 1 or Microbiology 1

9.3.4.2 Promotion from Semester 2 to Semester 3: Students must pass two second semester subjects.

9.3.4.3 Promotion from Semester 3 to Semester 4: Students must pass two third semester subjects.

9.3.4.4 Promotion from Semester 4 to Semester 5: Students must pass all of the preceding 16 subjects.

(Approved by Senate Rules Comm wef 2014/10)

9.3.5 Exclusion Rules

In addition to DUT Rule G17, a first semester student who fails three or more subjects with a final result of less than 40% in each subject is not permitted to reregister in this programme. Deregistration from any subjects is subject to the provision of DUT Rule G6.

(Approved by Senate Rules Comm wef 2014/10)

9.3.6 Interruption of Studies

In accordance with DUT Rule G21A(b), the minimum duration for this programme will be 3 years of registered study and the maximum duration will be 5 years of registered study, including any periods of WIL. Should a student interrupt their studies by more than three (3) years, the student will need to apply to the department for permission to reregister and will need to prove currency of appropriate knowledge prior to being given permission to continue with registration.

(Approved by Senate Rules Comm wef 2014/10)

9.3.7 Work Integrated Learning Rules

The DUT Rule G28 applies.

(Approved by Senate Rules Comm wef 2014/10)

9.3.8 Code of Conduct

In addition to the Student Code of Conduct in the DUT General Handbook for Students, and the relevant requirements as stated in the appropriate Study Guides, the following rules apply:

9.3.8.1 **Conduct of Students in Practical Facilities**

Strict adherence to instructions issued by technical, supervisory or academic staff is required due to the need to ensure effective and safe practice in these facilities. Misconduct or disregard for instructions will be referred to the relevant disciplinary procedure.

(Approved by Senate Rules Comm wef 2014/10)

9.3.8.2 **Uniforms**

Students must adhere to instructions issued by technical, supervisory or academic staff regarding the specific dress code required during practicals. Non-compliance will result in the student being denied access to the venue.

(Approved by Senate Rules Comm wef 2014/10)

9.3.9 Attendance and Assessment

9.3.9.1 A student who, for any valid reason (Refer to Programme Rule 4.3.9.2 above), is absent from a particular practical or test, must provide written proof of the reason for the absence to the lecturer concerned, within five (5) working days of returning to the institution in order to be considered for a special assessment.

(Approved by Senate Rules Comm wef 2014/10)

9.3.9.2 The DUT Rule G13(3)(a) which refers to special examinations also refers to special assessments set within departments for students who have missed coursework assessments. In these cases the department will determine the validity of the student's reason for not taking the assessment, and the nature of the special assessment.

(Approved by Senate Rules Comm wef 2014/10)

9.3.10 Health and Safety

Students must adhere to all Health and Safety regulations both while at DUT and in WIL placements. Failure to do so will be treated as a breach of discipline. Refer to the appropriate Health and Safety policies.

(Approved by Senate Rules Comm wef 2014/10)

10. NATIONAL DIPLOMA: FOOD TECHNOLOGY (EXTENDED CURRICULUM (NDFTF1)

Purpose of Qualification

Graduates of this qualification will be able to perform and organise operations in laboratories and factories of Food Processing Organisations in compliance with statutory requirements for ethics, safety and quality assurance. Supervisory, management and research skills are developed.

The diploma programme aims to develop the ability to critically evaluate and interpret experimental data. The student must be able to work independently in prioritizing, planning and executing work programmes. The student should be able to supervise the development, production and quality control of food manufacturing processes.

This qualification is offered through a three year programme (refer to item 4 above), or through an augmented curriculum - offered over a minimum of four years of study - which is devised to enhance student development and to improve the student's chances of successful completion.

10.1 PROGRAMME STRUCTURE (4 YEAR)

Code	Subjects	Year/Sem of Study	Assessment Method	NATED Credits	Pre-requisite
CHMB102	Chemistry I	1a	Ex	0.148	
QMTH101	Quantitative Methods I	1a	Ex	0.125	
IFDT101**	Introduction to Food Technology	1a	CA	TBA	
ACBL201	Analytical Chemistry: Biological II	1b	Ex	0.125	Chemistry I
FCHM202	Food Chemistry II	1b	Ex	0.125	Chemistry I
CSFT101**	Computer Skills I	1b	CA	TBA	
MICR101	Microbiology I	2a	Ex	0.148	
PHYS 103	Physics I	2a	Ex	0.125	
SCMT101**	The Scientific Method I	2a	CA	TBA	
MICR202	Microbiology II	2b	Ex	0.125	Microbiology I
BIST101**	Biostatistics I	2b	CA	TBA	
FDTE102	Food Technology I	2b	Ex	0.150	
FDTE201	Food Technology II	3a	Ex	0.125	Food Technology I
FDIM101	Food Industry Management I	3a	Ex	0.125	
FDPE101	Food Process Engineering I	3a	Ex	0.125	
FCHM302#	Food Chemistry III	3a	Ex	0.125	Food Chemistry II
FMIC302#	Food Microbiology III	3b	Ex	0.140	Microbiology II
FDTE301#	Food Technology III	3b	Ex	0.125	Food Technology II
FDQA101	Food Quality Assurance I	3b	Ex	0.110	
FDPE201	Food Process Engineering II	3b	Ex	0.125	Food Process Engineering I
FIPR101	Food Industry Practice I	4	CAs		ALL 20 SUBJECTS
FIPR201	Food Industry Practice II	4	CA		

KEY: Assessment: Ex= Final Examination; CA = Continuous Assessment

Numbers 1 to 4 indicates the year of study, "a"= Semester 1, "b"=Semester 2 (eg 2b=Second year, Semester 2)

A Pre-Req (prerequisite) means this subject must be passed prior to registration for the subsequent subject/module.

**These subjects are specific to either/both the ND(ECP): Biotechnology and the ND(ECP): Food Technology.

#These subjects are final level subjects.

The subject content for each subject is found under section 16 of this handbook. This content must be read in conjunction with the relevant Study Guide.

10.2 PROGRAMME INFORMATION

Refer to 9.2 Programme Information under the ND: Food Technology.

10.3 PROGRAMME RULES

Refer to 9.3 Programme Rules under the ND: Food Technology and the following rules which apply specifically to ND: Food Technology (ECP).

10.3.1 Minimum Admission Requirements

Refer to Rule 9.3.1 which is applicable to both the ND and ND(ECP).

10.3.2 Selection Criteria

Refer to Rule 9.3.2 which is applicable to both the ND and ND(ECP).
In addition to the above, on the basis of the selection process, successful applicants for study towards the National Diploma will be accepted into either the three (3) year, or four (4) year (Extended Curriculum) programme of study

10.3.3 Pass Requirements

Refer to Rule 9.3.3 which is applicable to both the ND and ND(ECP).

10.3.4 Re-registration Rules

In addition to the DUT Rule G16, and all prerequisite subjects as identified in the Programme Structure (10.1), the following programme rules apply:-

10.3.4.1 **Promotion from Year 1 Semester 1 (ECP) to Year 1 Semester 2 (ECP):**
An ECP student is required to pass Chemistry 1 and one other subject in order to be permitted to register for the next semester.

10.3.4.2 **Promotion from Year 1 Semester 2 (ECP) to Year 2 Semester 1 (ECP):**
An ECP student is required to pass 2 subjects in order to be permitted to register for the next semester.

10.3.4.3 **Promotion from Year 2 Semester 1 (ECP) to Year 2 Semester 2 (ECP):**
An ECP student is required to pass 2 subjects in order to be permitted to register for the next semester.

10.3.4.4 **Promotion from Year 2 Semester 2 (ECP) to Year 3 Semester 1 (ECP):**
An ECP student is required to pass 2 subjects in order to be permitted to register for the next semester.

10.3.4.5 **Promotion from Year 3 Semester 1 (ECP) to Year 3 Semester 2 (ECP):**
An ECP student is required to pass 2 subjects in order to be permitted to register for the next semester.

10.3.4.6 **Promotion to Year 3 Semester 2 to Year 4 Semester 1:**
Students must pass all of the preceding 20 subjects.
(Approved by Senate Rules Comm wef 2014/10)

10.3.5 Exclusion Rules

Refer to Rule 9.3.5 which is applicable to both the ND and ND(ECP).

10.3.6 **Interruption of Studies**

In accordance with Rule G21A(b), the minimum duration for this programme will be 4 years of registered study and the maximum duration will be 5 years of registered study, including any periods of WIL. Should a student interrupt their studies by more than three (3) years, the student will need to apply to the department for permission to reregister and will need to prove currency of appropriate knowledge prior to being given permission to continue with registration. *(Approved by Senate Rules Comm wef 2014/10)*

10.3.7 **Work Integrated Learning Rules**

Refer to Rule 9.3.7 which is applicable to both the ND and ND(ECP).

10.3.8 **Code of Conduct**

Refer to Rule 9.3.8 which is applicable to both the ND and ND(ECP).

10.3.9 **Attendance and Assessment**

Refer to Rule 9.3.9 which is applicable to both the ND and ND(ECP).

10.3.10 **Health and Safety**

Refer to Rule 9.3.10 which is applicable to both the ND and ND(ECP).

11. BACHELOR OF TECHNOLOGY: FOOD TECHNOLOGY (BTFDT1)

Purpose of Qualification

Students achieving this qualification will be competent to adopt a critical and innovative approach to contribute to the field of food technology and to pursue careers as senior technical managers and/or entrepreneurs in food and related FMCG industries.

11.1 PROGRAMME STRUCTURE

Subject Code	Subject	NATED Credits	Assessment
RMNS 201	Research Methodology: Natural Sciences	0.040	CA
ENTP 202	Entrepreneurial Skills I	0.040	Ex
FDMA401	Food Microbial Assurance IV	0.168	Ex
FDTE402	Food Technology IV	0.168	Ex
FPDV401	Food Product Development IV	0.168	Ex
FANL402	Food Analysis IV	0.168	Ex
FCMP401	Food Components IV	0.168	Ex
FPRJ401	Food Project IV	0.168	CA
FPRJ421	Food Project IV - (Part-Time / D3 only)	0.168	CA

KEY: Assessment: Ex= Final Examination; CA = Continuous Assessment

NOTE : Research Methodology and Research Project must be done concurrently.

The subject content for each subject is found under section 17 of this handbook. This content must be read in conjunction with the relevant Study Guide.

11.2 PROGRAMME INFORMATION

B Tech students can register full-time and complete the subjects in one year, or part-time and complete their studies over two years. The appropriate sequence of registration for the subjects is available from the department.

11.3 PROGRAMME RULES

11.3.1 Minimum Admission Requirements

In addition to Rule G7, applicants must be in possession of a ND: Food Technology or equivalent with a minimum 60% in the final level subjects and minimum 60% overall aggregate.

Part-time students must have adequate laboratory facilities at their place of employment to conduct their Research Project.

11.3.2 Pass Requirements

In addition to the DUT Rules G12, G14 and G15, the following programme rules apply:

1) The final examination for each of the examinable subjects in the BT: Food Technology consists of one three-hour written examination. The examination mark contributes 60% of the final mark. The remaining 40% is constituted by a course mark which is obtained by assessment of the work done by the student during the year. Theory tests, practical tests, assignments, projects and tutorials may be used to calculate the course mark.
2) The examinations for first semester subjects will be held in the May/June examination period; the examinations for the remaining subjects will be held in the October/November examination period.

3) For subjects assessed by means of continuous assessment, the pass mark is 50%. These comprise:
   - Food Project IV - assessed by the submission of a research proposal and presentation (20%), submission of a mini-dissertation (60%) and a final project presentation (20%).

   Part time students must complete this subject over two years.
   - Research Methodology - assessed by means of class tests and assignments

4) A student who is absent from a test or scheduled assessment must provide acceptable proof of the reason for absence to the lecturer concerned, upon returning to lectures.

11.3.3 **Re-registration Rules**
The DUT Rule G16 applies.

11.3.4 **Exclusion Rules**
The DUT Rules G17 and G23A(a)(4) apply.

11.3.5 **Interruption of Studies**
In accordance with Rule G23A(a), the minimum duration for this programme will be 1 year of registered study and the maximum duration will be 2 years of registered study, including any periods of WIL. Should a student interrupt their studies by more than three (3) years, the student will need to apply to the department for permission to reregister and will need to prove currency of appropriate knowledge prior to being given permission to continue with registration.

12. MASTER OF APPLIED SCIENCE IN FOOD SCIENCE AND TECHNOLOGY (MSFST1)

12.1 PROGRAMME INFORMATION:
Students achieving this qualification will be able to conduct scientific research under minimal guidance in a chosen field, and to contribute to knowledge production in that field. The research problem, its justification, process and outcome are reported in a dissertation which complies with the generally-accepted norms for research at this level. BT: Biotechnology (or equivalent).

12.2 PROGRAMME RULES
12.2.1 **Minimum Admission Requirements**
In addition to Rule G7 and G24, an applicant must have a BT: Food Technology (or equivalent).

12.2.2 **Duration of Programme:**
In accordance with G24(2)(a), the minimum duration of the M App Sci (Food Science and Technology) is one year and the maximum is three years.

12.2.3 **Instructional Programme**
This qualification is offered by means of a full research project (Refer to Rule G24).

12.2.4 **Proposal:** Students are required to submit and present a research proposal to the Department within 3 months of registration.

12.2.5 **Progress Report:** Students must present a progress report to the Department prior to graduation.

12.2.6 **Publications:** Students are required to have ONE publication submitted to a SAPSE approved journal prior to completion of the degree.

13. DOCTOR OF FOOD SCIENCE AND TECHNOLOGY (DFSCT1)

13.1 PROGRAMME INFORMATION

Persons achieving this qualification will be competent scientific researchers who can work independently in developing and applying knowledge and skills to make an original contribution to the global knowledge or technology in the particular field chosen for study.

13.2 PROGRAMME RULES

13.2.1 **Minimum Admission Requirements**

In addition to Rule G7 and G24, an applicant must have a MAppSci (Food Science and Technology) (or equivalent).

13.2.2 **Duration of Programme**

In accordance with G25(2)(a), the minimum duration of the Doctor Food Science and Technology is two years and the maximum is four years.

13.2.3 **Instructional Programme**

This qualification is offered by means of a full research project (Refer to Rule G25).

13.2.4 **Proposal**

Students are required to submit and present a research proposal to the Department within 3 months of registration.

13.2.5 **Progress Report**

Students must present a progress report to the Department prior to graduation.

13.2.6 **Publications**

Students are required to have ONE publication accepted and ONE publication submitted to a SAPSE approved journal prior to completion of the degree.

14. SERVICED SUBJECTS

The following subjects are serviced between the programmes in this department:

Serviced Programme	Servicing Programme	Serviced Subject	Subject Code
Biotechnology	Food Technology	Biochemistry II Sanitation, Safety and Hygiene I	BCHE202 SASH101
Food Technology	Biotechnology	Microbiology I Microbiology II Food Microbiology III	MICR101 MICR202 FMIC302

The servicing department's rules apply to all serviced subjects. The following subjects are serviced externally to this department.

Programme	Servicing Department	Serviced Subject	Subject Code
ND: Biotechnology	Department of Statistics	Quantitative Methods I	QMTH101
	Department of Chemistry	Chemistry I Analytical Chemistry II	CHMB102 ACBL201
ND: Food Technology	Department of Statistics	Quantitative Methods I	QMTH101
	Department of Physics	Physics I	PHYS103
	Department of Chemistry	Chemistry I Analytical Chemistry II	CHMB102 ACBL201

15. SHORT COURSES

The Department offers the following short course/s:

Name	Approved for offering	Duration
Unilever Analyst Development Programme	2014 - 2017	40 hours
Principles of Food Science and Technology	2016 - 2018	40 hours

16. SUBJECT CONTENT

The information below must be read in conjunction with the relevant Study Guides. Subjects are arranged alphabetically in each section

ND: Biotechnology and ND: Food Technology (Common Subjects)

1	ACBL201*	Analytical Chemistry: Biological II
2	CHMB102*	Chemistry I
3	FMIC302*	Food Microbiology III
4	MICR101*	Microbiology I
5	MICR202*	Microbiology II
6	QMTH101	Quantitative Methods I

ND (ECP): Biotechnology and ND (ECP): Food Technology (Common Subjects)

1	IBTC101**	Introduction to Biotechnology I
2	IFDT101**	Introduction to Food Technology I
3	BIST101**	Biostatistics I
4	CSBT101**	Computer Skills I
5	SCMT101**	The Scientific Method I

ND: Biotechnology

1	ABIC301	Analytical Biochemistry III
2	BCHM202	Biochemistry II
3	BIOD101	Biodiversity & Ecology I
4	BIOP301	Bioprocessing III
5	BIPR101	Biotechnology Industry Practice I
6	BIPR201	Biotechnology Industry Practice II
7	DIMR201	Disease and Immune Response II
8	FERT202	Fermentation Technology II
9	MIBC301	Microbial Biochemistry III
10	MICR301	Microbiology: Biological III
11	PRTM101	Process Technology & Management I
12	SASH101	Sanitation, Safety & Hygiene I

ND: Food Technology

1	FCHM202	Food Chemistry II
2	FCHM302	Food Chemistry III
3	FDIM101	Food Industry Management I
4	FIPR101	Food Industry Practice I
5	FIPR201	Food Industry Practice II
6	FDPE101	Food Process Engineering I
7	FDPE201	Food Process Engineering II
8	FDQA101	Food Quality Assurance I
9	FDTE102	Food Technology I
10	FDTE201	Food Technology II
11	FDTE301	Food Technology III
12	PHYS 103	Physics I

SUBJECT CONTENT: ND: BIOTECHNOLOGY AND ND: FOOD TECHNOLOGY (Common Subjects)

ACBL201 - ANALYTICAL CHEMISTRY: BIOLOGICAL II (150418622)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT (Examinable)

Course Mark:
- Theory: 2 x theory test (25% each) : 50%
- Practical: 2 x practical test (25% each) : 50%

There can also be an assessment practical report or tutorial mark (computer tutorial). Students are informed of this during practical and lecture sessions.

Examination: 1 x 3 hour paper

Final Mark: Course Mark (40%) + Examination Mark (60%)

Syllabus: This course is designed to teach the underlying principles of wet chemical analysis and selected instrumentation commonly used in biotechnology and food industries. It involves the theoretical principles associated with these methods of analysis. Concentration and preparation of solutions, acids bases and salts, General principles of acid base balance and application of acid/base titrations in biotechnology industries, pH, Principles of precipitation titrations, application of titrations in biotechnology, Metal complexes in solution, redox reactions, Moisture analysis, Ashing procedures, Introduction to spectroscopy, Introduction to refractometry, Introduction to chromatography, Sampling and sample preparation

CHMB102 - CHEMISTRY I (150417112)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:
- Theory: 2 x 1 hour theory test (30% each) : 60%
- Practical : 40%

The Practical Mark will be calculated as follows 2 x three hour practical tests (40% each): 80%. Continuous assessment on two selected practicals (10% each): 20%.

Examination: 1 x 3 hour paper

Final Mark: Course Mark (40%) + Examination Mark (60%)

Syllabus: This course will equip students with grounding in chemistry that will develop a level of theoretical knowledge and practical and problem solving skills, and to present the physical and descriptive inorganic and organic aspects of chemistry. General chemistry makes up 70% of the syllabus: atomic structure and periodic table, ionic compounds, molecular elements and compounds, chemical equations and reactions, composition and stoichiometry, acid-base equilibria, reaction rates and equilibrium, solutions. Organic chemistry makes up 30% of the syllabus. The organization of organic chemistry, alkanes and cycloalkanes, unsaturated hydrocarbons, alcohols, phenols and ethers, aldehydes and ketones, carboxylic acids and esters, amines and amides. Laboratory exercises in selected topics from above.

FMIC302 - FOOD MICROBIOLOGY 3 (150311003)

Contact Time: Theory (4); Practical (3) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (25% each)	:	50%
	Practical: 1 x practical test (30% each)	:	30%
	Food Project	:	10%
	Practical Lab Books/Reports	:	10%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: To study the characteristics of genera of bacteria and fungi that are found in foods, their role in foods and food spoilage and in fermentation and development of foods. To explain methods of determining their presence and numbers in foods, factors that affect their growth and methods of preventing and controlling their presence in foods.

MICR101 - MICROBIOLOGY 1 (150304212)

Contact Time: Theory (4); Practical (3) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (25% each)	:	50%
	Practical: 1 x practical examination (20% each)	:	20%
	Practical Tests	:	20%
	Practical Laboratory Books/Reports	:	10%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: To give the student a basic knowledge and understanding of bacterial growth, physiology and control.

MICR202 - MICROBIOLOGY II (150312822)

Contact Time: Theory (4); Practical (3) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (25% each)	:	50%
	Practical: 1 x practical test (20% each)	:	20%
	Pre —and Post- Practical Tests	:	10%
	Practical Laboratory Books/Reports	:	20%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: The Microbiology II course serves to cement and expand the basic knowledge of microorganisms learned in the Microbiology I course. In particular, the use of antibiotics to control microbial growth and characteristics of viruses and fungi are studied in more detail and the biochemical activities of microorganisms will be studied so that we appreciate and understand our response to the various consequences of microbial activity. In this course, the varied activities of microorganisms will also be used as a means of identifying them.

QMTH101 - QUANTITATIVE METHODS 1 (160803412)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (50% each)	:	100%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: The aim of this course is to provide students with sound mathematical and

computer skills relevant to Biotechnology. The course is made of two components ie: statistics and computer skills. The statistics portion involves the process of statistical enquiry and making sense of data.

12.2 ECP SUBJECT CONTENT: ND (ECP): BIOTECHNOLOGY AND ND (ECP): FOOD TECHNOLOGY

IBTC101 - INTRODUCTION TO BIOTECHNOLOGY I

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Continuous:	Theory: 3 x theory test (16.67% each)	:	50%
	Practical: 1 x practical test (20% each)	:	20%
	Practical Reports	:	10%
	Project	:	20%

Syllabus: The aim of this course is to facilitate the development of a well-grounded understanding of biotechnological themes, such as broad principles of biotechnology, knowledge of the latest developments in the field of biotechnology as well as its applications in industry both globally and locally. In this course the student will be introduced to the multidisciplinary nature of biotechnology and the many fields that biotechnology impacts.

IFDT101- INTRODUCTION TO FOOD TECHNOLOGY I

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Continuous:	Theory: 2 x theory test (25% each)	:	50%
	Practical: practicals/industry visit (30%)	:	30%
	Assignments	:	10%
	Project	:	10%

Syllabus: This module is an introduction to food technology. This course serves as a foundational course for the Food Technology programme and is aimed at orientating students to the food technology discipline. It covers the basics in food processing and engineering, food chemistry food microbiology and sensory and nutrition.

BIST101 - BIOSTATISTICS I

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Continuous:	Theory: 3 x theory test (20% each)	:	60%
	Assignments: 2 x (20% each)	:	40%

Syllabus: The purpose of this module is to introduce students to the key concepts and calculations associated with biological systems. This course will supplement the calculation-based requirements for other courses in the program that require this. In this course, the student will: The student will: manipulate and convert numbers in various formats such as decimal and exponential and express them in a scientific manner; utilize manipulations above to demonstrate knowledge of producing dilutions, concentrations, percent and molar solutions; calculate magnification when using a microscope; calculate DNA concentrations using a spectrophotometer; demonstrate knowledge of growth and fermentation kinetics; apply descriptive and inferential statistics to interpret data; demonstrate knowledge of immunological and biochemical calculations associated with chemicals; choose type and draw appropriately formatted graphs and tables; and demonstrate knowledge of basic Excel operations.

CSBT 101 - COMPUTER SKILLS

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Continuous:	Theory: 1 x theory test (20% each)	:	20%
	Assignments (Practical): 3 x (20% each)	:	60%
	Seminar: 1 x (20%)	:	20%

Syllabus: This aim of this course is to provide an introduction to computer applications which will enable the student to use the computer in a working environment and academia.

SCMT101 - THE SCIENTIFIC METHOD 1

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

	Continuous: Theory: 3 x theory test (20% each)	:	60%
	Project: 1 x (20% each)	:	20%
	Assignment: 1 x (20% each)	:	20%

SYLLABUS: This course provides the basic groundwork for science students to scientific theory and scientific methods. Teaching the scientific method is a fundamental way for students to practice thinking critically and scientifically. By performing science experiments and analysing the resultant data, it is hoped that this training will stimulate creative thinking and scientifically. Equally important is the ability to write scientifically by following acceptable scientific writing protocols that aids in communication of results. The course also aims to introduce and cement basic study skills that are most probably poorly-implemented by these students.

16.3 SUBJECT CONTENT: ND: BIOTECHNOLOGY

ABIC301 - ANALYTICAL BIOCHEMISTRY III (150413203)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (25% each)	:	50%
	Practical Reports	:	40%
	Seminar: 1 x (10%)	:	10%

Examination: 1 x 3 hour paper

Final Mark: Course Mark (40%) + Examination Mark (60%)

SYLLABUS: The purpose of this subject is to develop knowledge and skills, values and attitudes appropriate to the use of sophisticated analytical instruments to carry out qualitative or quantitative analysis of biological material for the presence of biochemical or chemical compounds and report the results in a scientific manner. The subject is intended to give students a toolkit of core concepts they can use in the higher level research applications.

BCHM202 - BIOCHEMISTRY 2 (1504112222)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (25% each)	:	50%
	Practical Reports	:	30%
	Practical Test	:	10%
	Assignment/Work Ethics	:	10%

Examination: 1 x 3 hour paper

Final Mark: Course Mark (40%) + Examination Mark (60%)

Syllabus: This course mainly focuses on chemical structures of biomolecules and their functions. The sources of major food components and the reactions of these components with other agents are explained. The metabolic processes that produce energy after consuming foods are also covered. The purpose of this course is to introduce the student to the major types of biomolecules that are of importance to a cell, and learn to identify and analyse biomolecules. Structure and reactivity of carbohydrates, lipids, proteins, nucleic acids. Analysis of above including centrifugation, kjeldhal, ultra violet and visible spectroscopy and qualitative methods.

BIOD101 - BIODIVERSITY AND ECOLOGY 1 (150300912)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (25% each)	:	50%
	Practical Reports	:	10%
	Practical Theory Test	:	25%
	Skills Assessments	:	5%
	Pre-Practical Test	:	10%

Examination: 1 x 3 hour paper

Final Mark: Course Mark (40%) + Examination Mark (60%)

Syllabus: This course serves as an introduction to the dynamic field of biotechnology and will serve as the basis and foundation for future courses (Microbiology I, II, III, Bio-processing etc) emphasizing the application of the science to benefit humans and the environment. It deals with the diversity of living organisms and the interrelationships of organisms with each other and the physical environment.

BIOP301 - BIOPROCESSING 3 (150311503)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (25% each)	:	50%
	Practical Reports	:	12.5%
	Practical Test	:	12.5%
	Reports	:	12.5%
	Assignments	:	12.5%

Examination: 1 x 3 hour paper

Final Mark: Course Mark (40%) + Examination Mark (60%)

Syllabus: Bioprocessing III will discuss several applications of biotechnology in industry. Each application will be examined from the development, implementation and economic perspectives. Development will be looked at from the perspective of biotechnological development of microorganisms and associated processes to produce the associated product. Implementation will be discussed as applying developed microorganisms in industrial processes along with downstream processing of products and waste materials. Economic perspective will be discussed for each subsection as well as for the biotechnology industry as a whole.

BIPR 101- BIOTECHNOLOGY INDUSTRY PRACTICE I

Contact Time: Industry based

ASSESSMENT:

Continuous:	Work Ethic (1st report)	:	20%
	Work Ethic (2nd report)	:	30%
	Laboratory Skills (1st report)	:	20%
	Laboratory Skills (2nd report)	:	30%

A minimum of 50% must be obtained to pass the subject based on 2 continuous assessment reports.

Syllabus: A 12 month period of relevant laboratory practice must be undertaken by the student in an approved work integrated learning environment. During this time the student must demonstrate skills to solve problems by innovation in the relevant industry.

BIPR 201 - BIOTECHNOLOGY INDUSTRY PRACTICE II

Contact Time: Industry based

ASSESSMENT:

Continuous: Department and external examiners will assess the project as follows:

Proposal	:	10%
Oral Presentation	:	40%
Written Scientific Report	:	50%

A minimum of 50% must be obtained to pass the subject.

Syllabus: The student will conduct a mini-research project independently, present their findings at a public forum and write-up a scientific report on the same.

DIMR201- DISEASE AND IMMUNE RESPONSE 2 (90106022)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (25% each)	:	50%
	Practicals / Industry Visits	:	25%
	Tutorials	:	10%
	AIDS Awareness	:	10%
	Work Ethic	:	5%

Examination: 1 x 3 hour paper

Final Mark: Course Mark (40%) + Examination Mark (60%)

Syllabus: Demonstrate knowledge and skills in basic immunology and infectious diseases in South Africa and display a responsible attitude relevant to the above. Important infectious diseases of man, animals, plants, Control strategies including biocontrol, Immune system structure & function, Vaccination, Monoclonal & polyclonal antibodies, Diagnostic techniques (electrophoresis, PAGE, immunoassay, radioimmunoassay, serological techniques).

FERT202 - FERMENTATION TECHNOLOGY II (150306022)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (20% each)	:	40%
	Practical Test	:	20%
	Practical Reports	:	20%
	Tutorials	:	10%
	Project Presentations	:	10%

Examination: 1 x 3 hour paper
Final Mark: Course Mark (40%) + Examination Mark (60%)
Syllabus: The Biotechnology course focuses on the general isolation, morphology, growth and control of microorganisms. Fermentation Technology ties in all these aspects and demonstrates how microorganisms can be harnessed to demonstrate their real potential in producing value added products on a large scale.

MIBC301- MICROBIAL BIOCHEMISTRY 3 (150418803)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory: 2 x theory test (25% each)	:	50%
	Practical Reports	:	40%
	Tutorials	:	5%
	Project Presentations	:	5%

Examination: 1 x 3 hour paper
Final Mark: Course Mark (40%) + Examination Mark (60%)
Syllabus: This subject is aimed at equipping a student with the knowledge of metabolic pathways involved in the breakdown of different substrates, the energies and enzymes involved during these processes. The module further highlights the regulation of enzymes involved in the synthesis of products of industrial importance.

MICR301 - MICROBIOLOGY: BIOLOGICAL III (150305903)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (25% each)	:	50%
	Practical Reports, Laboratory Book, Pre- and Post-Prac Tests	:	35%
	Practical Test	:	10%
	Project	:	5%

Examination: 1 x 3 hour paper
Final Mark: Course Mark (40%) + Examination Mark (60%)
Syllabus: The present public interest in biotechnology, particularly in recent developments in genetic engineering, tends to emphasize the future value of biotechnology to society. The course therefore introduces the genetic processes that occur in a cell, explores the transfer of genetic material between organisms and introduces methods and techniques to create or modify cells at the genetic level. Finally, the safety and ethics of this technology is paramount and the satisfactory handling of these issues is crucial to its acceptance by the public.

PRTM101 - PROCESS TECHNOLOGY AND MANAGEMENT (150311312)

Contact Time: Theory (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (30% each)	:	60%
	Assignments x 2	:	30%
	Tutorial	:	10%

Examination: 1 x 3 hour paper
Final Mark: Course Mark (40%) + Examination Mark (60%)
Syllabus: The general aim of this instructional offering is to provide a sound knowledge of the theoretical aspect of Biotech Industrial Management.

SASH101 - SANITATION SAFETY AND HYGIENE I (150305812)

Contact Time: Theory (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (25% each)	:	50%
	Assignment x 1	:	25%
	Oral Presentation	:	25%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: This subject provides the student with a sound knowledge of the basic concepts of Sanitation, Safety and Hygiene, with special reference to the work place and various manufacturing industries.

16.4 SUBJECT CONTENT: NATIONAL DIPLOMA: FOOD TECHNOLOGY

FCHM 202 - FOOD CHEMISTRY II (100310822)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (25% each)	:	50%
	Practical Reports	:	30%
	Practical Test	:	10%
	Assignment	:	10%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: This course mainly focuses on chemical structures of biomolecules and their functions. The sources of major food components and the reactions of these components with other agents are explained. The metabolic processes that produce energy after consuming foods are also covered.

FCHM 202 - FOOD CHEMISTRY III (100310903)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (30% each)	:	60%
	Practical Reports	:	20%
	Practical Test	:	20%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: The major outcome of this subject is to enable students to understand foods as mechanistic, chemical systems. All the phenomena observed in preparing food can, in principle, be understood in classically chemical terms. Understanding how chemical systems behave enables us to better control them to meet our many needs. Students will enter the class with a basic knowledge of chemistry and leave understanding how it applies to food. As well as understanding the important chemical basis of food quality, successful students will develop a conceptual framework to understand unfamiliar phenomena in terms of food chemistry. Achievement of these outcomes requires both an accumulation of facts and the development of an analytical approach to food quality.

FDIM 101 - FOOD INDUSTRY MANAGEMENT I (100311012)

Contact Time: Theory (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (25% each)	:	50%
	Assignment	:	10%
	Seminar	:	20%
	Tutorials	:	20%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: The Food Technology course focuses on the application of food science for the production, preparation, processing, packaging, storage, distribution and use of wholesome food. Food Industry Management therefore introduces students to the importance of management in the proper operation of the food industry

FIPR 101 - FOOD TECHNOLOGY INDUSTRY PRACTICE I

Contact Time: Industry based

ASSESSMENT

	Continuous: Work Ethic (1st report)	:	20%
	Work Ethic (2nd report)	:	30%
	Laboratory Skills (1st report	:	20%
	Laboratory Skills (2nd report)	:	30%

A minimum of 50% must be obtained to pass the subject based on 2 continuous assessment reports.

Syllabus: A 12 month period of relevant laboratory practice must be undertaken by the student in an approved work integrated learning environment. During this time the student must demonstrate skills to solve problems by innovation in the relevant industry.

FIPR 201 - FOOD TECHNOLOGY INDUSTRY PRACTICE II

Contact Time: Industry based

ASSESSMENT:

Continuous: Department and external examiners will assess the project as follows:

	Proposal	:	10%
	Oral Presentation	:	40%
	Written Scientific Report	:	50%

A minimum of 50% must be obtained to pass the subject.

Syllabus: The student will conduct a mini-research project independently, present their findings at a public forum and write-up a scientific report on the same.

FDPE101 - FOOD PROCESS ENGINEERING I (81605812)

Contact Time: Theory (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (25% each)	:	50%
	Assignment	:	22.5%
	Seminar	:	22.5%
	Work Ethic	:	5%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: This subject discusses the basic engineering principles and shows how they are important in, and applicable to the food industry and food processes. As an introduction to food process engineering, this subject describes the scientific principles on which food processing is based and gives examples of the application of these principles in several food industries.

FDPE201 - FOOD PROCESS ENGINEERING II (81605922)

Contact Time: Theory (4) (Periods per week)

Syllabus: Environmental protection, safety, factory systems, materials handling, water and waste disposal, process control, automation and food plant design, loss control and accident management, sampling and data management, steam supply, compressed air and electricity.

FDQA101 - FOOD QUALITY ASSURANCE I (100311312)

Contact Time: Theory (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (25% each)	:	50%
	Assignment	:	20%
	Seminar	:	20%
	Work Ethic	:	10%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: This course provides a sound knowledge of the basic concepts and principles of quality control and quality assurance, sanitation, hygiene, and quality systems used in the food industry. This includes the application and understanding of good manufacturing practices, food safety and food quality systems used in the food industry to ensure the manufacture of safe and nutritious food.

FDTE 102 - FOOD TECHNOLOGY I (100311812)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (25% each)	:	50%
	Practical Component	:	35%
	Assignment	:	5%
	Seminar	:	5%
	Work Ethic	:	5%
Examination:	1 x 3 hour paper		
Final Mark:	Course Mark (40%) + Examination Mark (60%)		

Syllabus: Food Technology I is the subject that introduces students to the principles of food technology which is the use of information generated by food science in the selection, preservation, processing, packaging and distribution, as it affects the consumption of safe, nutritious and wholesome food. The general aim of this study is to provide a sound knowledge of the theoretical and practical aspects of food technology. It introduces students to basic preprocessing operations and selected processing operations of food products.

FDTE 201 - FOOD TECHNOLOGY II (100301822)

Contact Time: Theory (4); Practical (4) (Periods per week)

ASSESSMENT

Course Mark:	Theory x 2 tests (25% each)	:	50%
	Practical Reports	:	35%
	Assignment	:	2.5%
	Seminar	:	2.5%
	Work Ethic	:	5%
	Pre-Prac Test	:	5%
Examination:	1 x 3 hour paper		

Final Mark: Course Mark (40%) + Examination Mark (60%)
Syllabus: This subject introduces students to the scientific aspects of food processing including the basic concepts, applications and principles of various food processing operations.

FDTE 301 - FOOD TECHNOLOGY III (100301903)
Contact Time: Theory (4); Practical (4) (Periods per week)
ASSESSMENT
Course Mark: Theory x 2 tests (25% each) : 50%
Project* : 45%
Assignment : 05%
*Project consists of: proposal, display, presentation and final report/write up.
Examination: 1 x 3 hour paper
Final Mark: Course Mark (40%) + Examination Mark (60%)
Syllabus: The general aim of the subject is to provide a sound knowledge of the theoretical background of Food Technology. The subject prepares the student for entry in to the Food Industry with specific emphasis on product research and development

PHYS103 —PHYSICS (150710512)
Contact Time: Theory (4); Practical (4) (Periods per week)
ASSESSMENT
Course Mark: Theory x3 tests (average of the best 2 of 3 theory tests) : 65%
Practical : 35%
Examination: 1 x 3 hour paper
Final Mark: Course Mark (40%) + Examination Mark (60%)
Syllabus: Demonstrate knowledge of introductory principles of physics for topics as outlined in the indicative content.

16.5 SUBJECT CONTENT: BTECH: BIOTECHNOLOGY

ENTREPRENEURIAL SKILLS I (ENSB 101)
Entrepreneurship & entrepreneurs, the business plan, managing markets & finances, legal aspects, general management.

ENVIRONMENTAL BIOTECHNOLOGY IV (ENBT 401)
Environmental protection and waste disposal, Industrial wastewater treatment processes, Biodegradation and xenobiotic compounds, Bioleaching and biosorption, Soil bioremediation, Bioremediation of oil spills.

INDUSTRIAL BIOTECHNOLOGY IV (INBT 401)
Industrial enzymes: classes, production, applications, economic considerations, genetic modification. Processes, applications and economics for the production of industrially important products.

PLANT BIOTECHNOLOGY IV (PLBT 401)
Plant cell culture, Clonal propagation and transfer of tissue culture to soil, Genetic manipulations in tissue culture, Plant improvement, Microbial control of insects, Biofertiliser technology, Biological control.

RECOMBINANT DNA TECHNOLOGY IV (DNAT 401)
Gene organisation in prokaryotes and eukaryotes, Molecular basis of mutations, Phages and plasmids in bacterial recombination, Fungal genetics systems, Yeast genetic engineering.

RESEARCH METHODOLOGY: NATURAL SCIENCES (RMNS 201)
The nature of research, Formulating a research topic, Reading & critically reviewing literature, Research strategy, Research ethics, Sampling, Data analysis, Referencing, Writing & presenting for research, Proposal writing, Research statistics.

RESEARCH PROJECT IV (RESP 411)
The student must plan and conduct a research project in an appropriate field of Biotechnology, and report on the findings according to the guidelines provided by the department.

16.6 SUBJECT CONTENT: BTECH: FOOD TECHNOLOGY

ENTREPRENEURIAL SKILLS I (ENTP202)
Entrepreneurship & entrepreneurs, the business plan, managing markets & finances, legal aspects, general management.

FOOD ANALYSIS IV (FANL402)
Introduction to biochemical investigations, food adulteration, centrifugation, filtrations, HPLC/GC, CE, UV, IR, AA, radio-isotope techniques, immunochemical techniques and rapid methods in food analysis.

FOOD COMPONENTS IV (FCMP401)
Proteins, CHO, lipids, enzymes, ingredient function and selection, and miscellaneous additives.

FOOD MICROBIAL ASSURANCE IV (FDMA401)
Microbiological control of Food, Introduction to HACCP, Application of HACCP, Production and harvesting of plant foods, hygienic design of food operating areas, Production of animal products, Hygienic design and use of equipment, food processing, cleaning and disinfecting, knowledge required by personnel and public food safety culture.

FOOD PRODUCT DEVELOPMENT IV (FPDV401)
Marketing, food product development processes, management of food product development, engineering manufacturing, food safety and regulations, packaging, protection of intellectual property, role of suppliers, function of ingredients and functional foods.

FOOD PROJECT IV (FPRJ 401)
The student must plan and conduct a research project in some field of Food Technology, and report the findings according to the guidelines provided by the department.

FOOD TECHNOLOGY IV (FDTE402)
Concepts related to food contaminants, GMF's and organic foods, advances in food processing and production and the impact of various technologies, relate nanotechnology and nutrigenomics to food processing, the impact of technology on nutrition and nutrigenomics, advances in packaging technology.

RESEARCH METHODOLOGY: NATURAL SCIENCES (RMNS202)
The nature of research, Formulating a research topic, Reading and critically reviewing literature, research strategy, Research Ethics, Sampling, Data Analysis, Referencing, Writing and presenting for research, Proposal writing, Research Statistics.