DUT
DURBAN
UNIVERSITY OF
TECHNOLOGY

2016 HANDBOOK
CHEMISTRY

FACULTY OF
APPLIED
SCIENCES

HANDBOOK FOR 2016

FACULTY OF APPLIED SCIENCES

DEPARTMENT of CHEMISTRY

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. Innovate. Engage]

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 CHEMISTRY

VISION

A leading department that provides holistic and technologically advanced education and training for the chemical and allied industries.

MISSION STATEMENT

The mission of the department is aligned with that of the Durban University of Technology by

- empowering students with advanced knowledge and skills in chemistry.
- providing value-based education and opportunities to students to help them face the challenges of life.
- nurturing a scientific attitude, temperament, and culture among the students.
- promoting and conducting research and development with particular relevance to the needs of the chemical and allied industries, the health care sector and non-governmental organizations who act as watchdogs for environmental pollution.

CONTENTS

1. DEPARTMENTAL & FACULTY CONTACT DETAILS

All departmental queries to:

Secretary:	Ms K Ferguson
Tel No:	(031) 373 2300 / 2311
Fax to Email No:	0866740608
Location of Department:	S10 Level 3, Steve Biko Campus

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:	Mr S Masuku
General Enquiries No:	031 373 3036
Facsimile No:	031 373 2175
Email:	spha@dut.ac.za
Location:	Block S4 Level 3, Steve Biko Campus

Executive Dean:	Prof S Singh
Executive Dean's Secretary:	Mrs 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. DEPARTMENTAL STAFF

Head of Department/ Professor	Prof K Bisetty, BSc (Hons) (UDW), UHDE (UDW) NH Dip (MLST), MSc (UN), PhD (UN)
Professor	Prof N Deenadayalu, BSc (Hons) (UN), MSc (UN), PhD (UN)
Associate Professors	Prof GG Redhi, BSc (Hons) (Unisa), HED (Unisa), NHDip (MLST), MSc (UN), PhD (UN) Prof RM Gengan, BSc (Hons) (UDW), HED (UNISA), MDipTech (MLST), PhD (UN)
Senior Lecturers	Mr MH Mabaso, NHDip (TN), HDE (UN), MSc (ETSD) Dr P Mdluli, BSc (Hons) (UKZN), MSc (UKZN), PhD(UKZN)
Lecturers	Mr LM Madikizela, MTech (DUT) Mr JT Msukwini*, BSc (Hons) (Fort Hare), MTech (DIT) Ms P Ntola, MTech (DUT) Dr V Paul, MTech (MLST), BTech: BusAdmin (DUT), PhD (DUT) Dr K Ramluckan, NHDip (TN), MTech (DIT), PhD (DUT
Secretary	Ms K Ferguson, NC:Secretarial
Senior Technicians	Mr SR Chetty, NHDip (MLST) Mr N Ramnarayan, NDip (MLST)
Technicians	Ms NM Xhakaza, BTech (MLST), MTech (DUT) Ms D Naicker, BTech (MLST) Mr R Ramkrepal, BTech (MLST) Dr T Singh, MTech (DIT), PhD (UKZN) Mr G Nursayhe Ms NP Cele, BTech (MLST), MTech (DUT)
Technical Assistant	Mr S Mjola, NDip (DUT)
Laboratory Assistants	Mr P Mthembu Mr TN Cele Ms NN Mpungose, NDip (DUT)

* Seconded to the Co-operative Education Unit

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 (BT)
- Master of Applied Science in Chemistry
- Doctor of Philosophy in Chemistry

Qualification	Qualification Code	Important dates	SAQA NLRD ID
ND: Analytical Chemistry	NDACH2		72210
ND: Analytical Chemistry (ECP)	NDANF1	1st Offered in Jan 2013	72210
BT: Chemistry	BTCHM1		72117
MAppSci (Chemistry)	MSCMS1		96824
PhD Chemistry	DSCMS1		96807

4. DIPLOMA: ANALYTICAL CHEMISTRY

Purpose of Qualification

Graduates of the Dip: Analytical Chemistry are able to apply the advanced scientific principles and techniques of quantitative and qualitative analysis, quality control of raw materials and finished products, and research and development. Students benefit from the practical hands-on laboratory skills component with state-of-the-art equipment as well as direct exposure to the work situation.

This course is designed to meet the human resource needs of the chemical and allied industries and tertiary educational institutions, by providing nationally and internationally recognised tertiary education and training to students. This qualification allows entry to the BT: Chemistry degree.

4.1 PROGRAMME STRUCTURE (3 YEAR)

Code	Subjects	Assessment	Semester of Study	NATED Credits	Prerequisite Subjects	Corequisite Subjects
CHEM102	Chemistry I	Ex	1a	0.125		
MATH101	Mathematics I	CA	1a	0.083		
PHSA102	Physics I	Ex	1a	0.083		
CSCC101	Communication Skills I	CA	1a	0.083		
CSKI103	Computer Skills I	CA	1a	0.083		
ACHM103	Analytical Chemistry I	Ex	1b	0.125	Chemistry I	
INCH201	Inorganic Chemistry II	Ex	1b	0.100	Chemistry I	
ORCH201	Organic Chemistry II	Ex	1b	0.100	Chemistry I	
PHCH201	Physical Chemistry II	Ex	1b	0.100	Chemistry I	Mathematics I
ACHM204	Analytical Chemistry II	Ex	2a	0.100	Analytical Chemistry I	Analytical Chemistry Practical II
ACPR201	Analytical Chemistry: Practical II	Ex	2a	0.100	Analytical Chemistry I	
INCH301#	Inorganic Chemistry III	Ex	2a	0.139	Inorganic Chemistry II	
ORCH302#	Organic Chemistry III	Ex	2a	0.139	Organic Chemistry II	
PHCH301#	Physical Chemistry III	Ex	2a	0.139	Physical Chemistry II	
ACHM313#	Analytical Chemistry III (Module I)	Ex	2b	0.100	Analytical Chemistry II	
ACHM323#	Analytical Chemistry III (Module II)	Ex	2b	0.100	Analytical Chemistry II	
ACPR312#	Analytical Chemistry: Practical III(Mod I)	CA	2b	0.100	Analytical Chemistry II Analytical Chemistry Practical II	
ACPR322#	Analytical Chemistry: Practical III(Mod II)	CA	2b	0.100	Analytical Chemistry II Analytical Chemistry Practical II	
CQAS201	Chemical Quality Assurance	Ex	2b	0.100	Analytical Chemistry I	
EXAN101	Chemical Industry Practical (Experiential Learning)	CA	3	0.500	Analytical Chemistry III Analytical Chemistry: Practical III	
CMPJ301#	Chemistry Project III	CA	3	0.500	Analytical Chemistry III Analytical Chemistry: Practical III Experiential Learning	

KEY:

* Assessment: Ex = examinable; CA = Continuous Assessment

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

These subjects are final level subjects.

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

A Co-Req (corequisite) means these subjects must be registered and passed simultaneously.

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)

Work Integrated Learning (WIL) comprises twelve month of experiential learning under the supervision of a qualified Chemist/Analyst. This is made up of two separate components, namely, Chemical Industry Practical (CIP) and Chemistry Project III (CP3). These components are treated as separate entities and are assessed separately.

During the first six months the student will be registered at DUT for CIP and carry out a variety of different techniques and procedures, which will be identified by the industrial supervisor in consultation with a mentor from DUT. At least one instrumental technique specified in the Experiential Learning (CIP) manual should be undertaken at the workplace. The student will be required to keep a record of his/her daily activities and at the end of the semester, compile a report (or portfolio) which is assessed by the industrial supervisor and DUT mentor.

During the second six months the student is required to register at DUT for Chemistry Project III, whilst working in industry. In addition to his/her normal duties, the student will be required to complete a project on some topic of relevance to the company and compile a written report. The project should include at least one instrumental technique that the student has used in CIP. At the end of the semester the student will be required to present his/her findings by means of an oral, poster presentation and a written report at DUT.

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

Employment may be found in a laboratory or production process as well as chemical and laboratory sales. Industries such as detergent, petroleum, plastics, food, pharmaceuticals, mining, water treatment, metallurgy and educational institutions employ graduates from this course. Graduates may work in a practical application such as quality control and testing, or a theoretical field such as research and development, with chemists and other technologists or technicians. Quality control and assurance is a field with a growing demand for these graduates. Opportunities exist for graduates to pursue further educational qualifications. Graduates may apply for associate membership of South African Chemical Institute (SACI).

4.2.7 Medical Conditions

Students must please note that the following medical conditions may preclude employment in some chemical industries: asthma, diabetes, allergies (skin), poor eyesight and colour blindness, epilepsy and hearing problems.

4.3 PROGRAMME RULES

4.3.1 Minimum Admission Requirements

In addition to DUT Rule G7, the following minimum entrance requirements and the 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 Subject	NSC Rating
English	4
Mathematics	4
Physical Science	4
One 20 credit subject	3

ii) a Senior Certificate is matriculation exemption with the following subjects

at the stated minimum ratings

Compulsory Subjects	HG	SG
Mathematics	D	B
Physical Science	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 *(Approved by Senate wef 2013/08)*

Compulsory Subjects	Minimum
English	50%
Mathematics	50%
Physical Sciences (or recognised equivalent)	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 will be:

a) invited to undergo placement testing

b) ranked based on performance according to the table below:-

Assessment	Weighting
Academic Achievement • Average percentage of all compulsory subjects (refer to 4.3.1.1 above)	70%
Placement Testing	30%

- 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

4.3.3.1 In addition to 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 4.1 Programme Structure. *(Approved by Senate Rules Comm wef 2014/10)*

4.3.4 Re-registration Rules

In addition to the DUT Rule G16, the following programme rules apply:-

4.3.4.1 Promotion from Semester 1 to Semester 2:
Students must pass 3 subjects, one of which must be Chemistry I.

4.3.4.2 Promotion from Semester 2 to Semester 3 and 4:
Students will only be allowed to carry one subject from either S1 or S2 into the second year of study provided the pre-requisites for the subjects are met.

4.3.4.3 Promotion from Semester 3 and 4 to Semester 5 and 6
Students will only be allowed to carry one subject from either S3 or S4 into the third year of study provided the pre-requisites are met.

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. *(Approved by Senate Rules Comm wef 2014/10)*

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. *(Approved by Senate Rules Comm wef 2014/10)*

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: ANALYTICAL CHEMISTRY (ECP) (NDANF1)

Purpose of Qualification

Graduates of the National Diploma in Analytical Chemistry are able to apply the advanced scientific principles and techniques of quantitative and qualitative analysis, quality control of raw materials and finished products, and research and development. Students benefit from the practical hands-on laboratory skills component with state-of-the-art equipment as well as direct exposure to the work situation.

This course is designed to meet the human resource needs of the chemical and allied industries and tertiary educational institutions, by providing nationally and internationally recognized tertiary education and training to students. This qualification allows entry to the BT: Chemistry degree.

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. ECP students and students registered for the three year programme join classes for higher level subjects.

5.1 PROGRAMME STRUCTURE (4 YEAR)

Code	Subject Offering	Semester / Annual	Assessment Method	NATED Credits	Prerequisite Subjects	Corequisite Subjects
CHMA101	Chemistry I (Augmented)	1	CA	0.130		
MTMA101	Mathematics I (Augmented)	1	CA	0.080		
PHYA101	Physics I (Augmented)	1	CA	0.080		
CMSA101	Communication Skills I (Augmented)	1	CA	0.080		
CMPA101	Computer Skills I (Augmented)	1	CA	0.080		
ACHA101	Analytical Chemistry I (Augmented)	2	CA	0.190	Chemistry I	
INCA 201	Inorganic Chemistry II (Augmented)	2	CA	0.080	Chemistry I	
OCHA 201	Organic Chemistry II (Augmented)	2	CA	0.080	Chemistry I	
PCHA 201	Physical Chemistry II (Augmented)	2	CA	0.080	Chemistry I & Mathematics I	
ACHM204	Analytical Chemistry II	3a	Ex	0.100	Analytical Chemistry I	Analytical Chemistry Practical II
ACPR201	Analytical Chemistry: Practical II	3a	Ex	0.100	Analytical Chemistry I	
INCH301#	Inorganic Chemistry III	3a	Ex	0.139	Inorganic Chemistry II	
ORCH302#	Organic Chemistry III	3a	Ex	0.139	Organic Chemistry II	
PHCH301#	Physical Chemistry III	3a	Ex	0.139	Physical Chemistry II	
ACHM313#	Analytical Chemistry III (Module I)	3b	Ex	0.100	Analytical Chemistry II	~~Analytical Chemistry Practical III~~
ACHM323#	Analytical Chemistry III (Module II)	3b	Ex	0.100	Analytical Chemistry II	~~Analytical Chemistry Practical III~~
ACPR312#	Analytical Chemistry: Practical III(Mod I)	3b	CA	0.100	Analytical Chemistry II Analytical Chemistry II Practical II	
ACPR322#	Analytical Chemistry: Practical III(Mod II)	3b	CA	0.100	Analytical Chemistry II Analytical Chemistry II Practical II	
CQAS201	Chemical Quality Assurance	3b	Ex	0.100	Analytical Chemistry I	
EXAN101	Chemical Industry Practical (Experiential Learning)	4	CA	0.500	Analytical Chemistry III + Analytical Chemistry: Practical III	
CMPJ301	Chemistry Project III	4	CA	0.500	Analytical Chemistry III + Analytical Chemistry: Practical III + Experiential Learning	

KEY:

* Assessment: Ex = examinable; CA = Continuous Assessment

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

These subjects are final level subjects.

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

A Co-Req (corequisite) means these subjects must be registered and passed simultaneously.

5.2 PROGRAMME INFORMATION

Refer to 4.2 Programme Information under the ND: Analytical Chemistry.

5.3 PROGRAMME RULES

Refer to 4.3 Programme Rules under the ND: Analytical Chemistry and the following rules which apply specifically to ND: Analytical Chemistry (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, the following programme rules apply:-
No student will be allowed to re-register for the ND: Analytical Chemistry (ECP), unless he/she passes the subjects, as set out below, within the time specified.

5.3.4.1 Promotion from Year 1 (ECP) to Year 2 (ECP):
Promotion from Year 1 to Year 2: ECP students must pass 3 subjects, one of which must be Chemistry 1. *(Approved by Senate Rules Comm wef 2014/10)*
Students will only be allowed to carry one subject from either S1 or S2 into the second year of study provided the pre-requisites for the subjects are met.

5.3.4.2 Promotion from Year 2 to Year 3: Students must pass all Year 2 subjects.
Students will join the main-stream ND: Analytical Chemistry (for Semesters 3 to 6) from the beginning of Year 3 onwards.

5.3.4.3 Promotion from Semester 3 and 4 to Semester 5 and 6.
Students will only be allowed to carry one subject from either S3 or S4 into S5 and S6 provided the pre-requisites are met.

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 IN CHEMISTRY (BTCHM1)

Purpose of Qualification

This degree (BTech) is designed the meet the human resource needs of the chemical and allied industries and tertiary educational institutions, by providing nationally and internationally recognized tertiary education and training to learners. This course provides advanced training to produce graduates who will become important members of a team involved in the chemical and processing industries. Graduates can obtain employment as chemical laboratory technologists/chemists in quality control, research and development or teaching laboratories. This course allows entry to the MAppSci (Chemistry) degree.

6.1 PROGRAMME STRUCTURE

Code	Subjects	*Assessment	Year of Study	Part time Option	NATED Credits
ACHM412	Analytical Chemistry IV Module 1	Ex	1a	2a	0.100
ACHM422	Analytical Chemistry IV Module 2	Ex	1b	2b	0.100
INCH411	Inorganic Chemistry IV Module 1	Ex	1a	1a	0.100
INCH421	Inorganic Chemistry IV Module 2	Ex	1a	1b	0.100
ORCH411	Organic Chemistry IV Module 1	Ex	1a	1a	0.100
ORCH421	Organic Chemistry IV Module 2	Ex	1a	1b	0.100
PHCH411	Physical Chemistry IV Module 1	Ex	1a	1a	0.100
PHCH421	Physical Chemistry IV Module 2	Ex	1a	1b	0.100
CPRJ412	Chemistry Project IV Module 1	CA	1a	2a	0.100
CPRJ422	Chemistry Project IV Module 2	CA	1b	2b	0.100

KEY: * Assessment: Ex = examinable; CA = Continuous Assessment

6.2 PROGRAMME INFORMATION

Each of the five BTech subjects has been divided into two modules. Students can register full-time and complete the modules in one year or part-time as in the table above. Although the maximum duration for a BTech is two years (G23A(a)(4)), students may need additional time to complete the practical and project work to the required standard.

6.3 PROGRAMME RULES

6.3.1 Minimum Admission Requirements

Applicants must have a ND: Analytical Chemistry or equivalent qualification.
Applicants must have obtained an average of at least 60% in all final level subjects, with a minimum of 55% for these subjects, at the National Diploma level or equivalent.

6.3.2 Selection Criteria

Entry into the BTech programme is not automatic. A limited number of places are available to students and selection will be on the basis of academic performance as determined by a ranking system.

6.3.3 Pass Requirements

In addition to the DUT Rules G12, G14 and G15, unless otherwise specified, where practicals are constituted as part of the course mark, a sub-minimum of 40% is applicable to the practical mark.

6.3.4 Re-registration Rules

The programme may be completed in a minimum of one year of full time study or two years of part-time study.
Part-time students must have passed at least 75% of the modules before proceeding to the second year.

6.3.5 Exclusion Rules

In addition to the DUT Rules G17 and G23A(a)(4), students will only be allowed to register twice for any fourth level subject or module.

6.3.6 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. Should a student interrupt their studies by more than three (3) years, the student will need to apply to the department for permission to re-register and will need to prove currency of appropriate knowledge prior to being given permission to continue with registration.

7. MASTER OF APPLIED SCIENCE IN CHEMISTRY (MSCMS1)

Purpose of Qualification

This degree, MAppSci (Chemistry), is designed to follow on from the BTech: Chemistry degree. It is an advanced course aimed at supplementing the in-depth education in the different aspects of chemistry and modern instrumental analysis, offered by the study for the degree of BTech. The main objective of this course is to provide an opportunity for students to apply fundamental principles of chemistry to the solution of problems in Chemistry and Applied Chemistry.

This will include the ability to make an informed decision on the choice of method or instrument for solving a given problem, the communication of ideas and results of scientific investigations and the use of scientific literature.

7.1 PROGRAMME STRUCTURE

Subject	Subject Description	Period of Study	Assessment Method	NATED Credits
RPSC501	Research Dissertation Full Registration	Annual	Research Project	1.000
RPSC511	Research Dissertation Successive Registration			

7.2 PROGRAMME INFORMATION

The curriculum consists of a research project and dissertation.

7.3 PROGRAMME RULES

7.3.1 Minimum Admission Requirements

In addition to Rule G24 (1) applicants must be in possession of a BT: Chemistry degree or equivalent qualification.

7.3.2 Duration

As per Rule G24 (2).

8. DOCTOR OF PHILOSOPHY IN CHEMISTRY (DSCMS1)

Purpose of Qualification

As for the MAppSci (Chemistry), with the added requirement that the research must be original and results must make a contribution to science or technology so that an acceptable and positive solution to the investigation is achieved.

8.1 PROGRAMME STRUCTURE

Subject	Subject Description	Period of Study	Assessment Method	NATED Credits
ADPD701	Research Thesis Full Registration	Annual	Research Project	1.000
ADPD711	Research Thesis Successive Registration			

8.2 PROGRAMME INFORMATION

The curriculum consists of a research project and dissertation.

8.3 PROGRAMME RULES

8.3.1 Minimum Admission Requirements

In addition to Rule G25 (1) applicants must be in possession of an MAppSci (Chemistry) degree or equivalent qualification.

8.3.2 Duration

As per Rule G25 (2).

9. SERVICED SUBJECTS

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

Servicing Department	Serviced Subject	Subject Code
Department of Mathematics	Mathematics I	MATH101
Department of Physics	Physics I	PHSA102
Department of English And Communication	Communication Skills I	CSKI103
Department of Information Technology	Computer Skills I	CSCC101

The following subjects are serviced from this department:

SERVICED PROGRAMME	SUBJECT NAME	SUBJECT CODE
ND: Biomedical Technology	Chemistry IB	CHMB102
ND: Biotechnology	Chemistry IB	CHMB102
	Analytical Chemistry 2 Biological	ACBL201
ND: Chemical Engineering	Chemistry IA	CHEM102
	Organic Chemistry II	ORCH201
	Inorganic Chemistry II	INCH201
	Physical Chemistry II	PHCH201
ND: Chiropractic	Chemistry I (Annual)	CHHC102
ND: Clinical Technology	Chemistry IB	CHMB102
ND: Dental Technology	Physics and Chemistry I	PHCD121
ND: Emergency Medical Care and Rescue	Basic Science I (Annual)	BSCN101
ND: Environmental Health	Physics and Chemistry I (Annual)	PHCM111
ND: Food and Nutrition	Physical Science I (Annual)	PSCN101
ND: Food Technology	Chemistry IB	CHMB102
	Analytical Chemistry 2 Biological	ACBL201
ND: Homeopathy	Chemistry I (Annual)	CHHC102
ND: Pulp & Paper Technology	Chemistry IA	CHEM102
	Physical Chemistry II	PHCH201
ND: Somatology	Science I (Annual)	SCIE101

10. SHORT COURSES

The following short courses are currently offered by the Department.

10.1 Basic Gas Chromatography
Duration: 3 days

For further details please contact:
Dr K Ramluckan,
Chemistry Department,
Phone 0313732374
Email : shanr@dut.ac.za

10.2 General Laboratory Practice

For further details please contact:
Dr K Ramluckan,
Chemistry Department,
Phone 0313732374
Email : shanr@dut.ac.za

11. SUBJECT CONTENT:

The following must be read in conjunction with the appropriate study guides.

11.1 NATIONAL DIPLOMA: ANALYTICAL CHEMISTRY (NDACH2) and NATIONAL DIPLOMA: ANALYTICAL CHEMISTRY (ECP) (NDANF1)

Unless otherwise specified, where practicals are constituted as part of the course mark, a sub-minimum of 40% is applicable to the practical mark.

CHEM102 - CHEMISTRY 1 (150417112)
OR CHMA101 - CHEMISTRY 1 (AUGMENTED) (150417112) (ECP)
(NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
CONTACT TIME (Periods per week)
Theory (4); Tutorial (1); Practical (3)
ASSESSMENT
Course Mark

Theory: 2 x 1 hour tests (30% each):	Total 60%
Practicals: 2 x 3 hour tests (15% each):	Total 30%
Computer Tutorials and Practical reports:	Total 10%

Final Mark
Examination: 1 x 3 hour paper
Final mark: Course mark (40%) + Examination mark (60%)
SYLLABUS: Introduction: matter, measurement and molecules; stoichiometry,

aqueous reactions and solution stoichiometry; acid-base equilibria; electronic structure of atoms; periodic properties of elements; chemical bonding; organic chemistry nomenclature and properties: alkanes and cycloalkanes; unsaturated hydrocarbons; alcohols, phenols & ethers; aldehydes and ketones; carboxylic acids; and esters; amines and amides.

CSKI103 - COMMUNICATION SKILLS I (129900612)
OR CMSA101 - COMMUNICATION SKILLS (AUGMENTED) (129900612) (ECP)
(NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
CONTACT TIME (Periods per week)
Theory (2); Tutorial (1)
ASSESSMENT: Continuous Assessment

1 x 1 hour Theory test:	33.3%
1 x Oral Presentation:	33.3%
1 x Written Project:	33.3%

SYLLABUS: Communication theory; oral presentation; technical writing skills; group communication skills.

CSCC101 - COMPUTER SKILLS I (60205512)
OR CMPA101 - COMPUTER SKILLS (AUGMENTED) (60205512) (ECP)
(NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
CONTACT TIME (Periods per week)
Theory and demonstration of practical (2); Computer laboratory practical session (2).
ASSESSMENT: Continuous assessment.

Theory Test:	25%
Practical evaluation presentations (or a test):	25%
Word processing:	25%
Spreadsheets:	25%

The practical tests will be set in the students' practical time. (Each group will have their own test).
A make-up theory test will be set at the end of the semester. This would be for students who missed the theory test.
SYLLABUS: Computer hardware; software; computer utilization; Practical work will use MS Office.

MATH101 - MATHEMATICS I (160404012)
OR MTMA101 - MATHEMATICS I (AUGMENTED) (160404012) (ECP)
(NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
CONTACT TIME (Periods per week)
Theory (4); Tutorials (2)
ASSESSMENT: Continuous assessment
Best 3 out of 4 short (30 minute) tests and/or assignments: 20%
2 x 1.5 hour Major tests (moderated). One for each section: 80%
Pass mark = 50%, with a sub-minimum of 40% for each major test.
Note:
1. Students who obtain a final result between 45% and 49% will be eligible to write a 3 hour make-up test covering the whole syllabus, at the end of the semester, with the students who missed a control (major) test with a valid reason which, if passed, will result in a mark of 50% being allocated.
2. Students who get at least 50% but who fail due to the test sub-minimum also qualify for this test.
3. Students who miss a major test & are allowed to write the make-up test on the work covered in the missed test, DO NOT qualify for the above.

SYLLABUS: Basic mathematics - revision of school work; algebra; trigonometry; statistics calculus; integration.

PHSA102 - PHYSICS I (150710512)
OR PHYA101 - PHYSICS I (AUGMENTED) (150710512) (ECP) (NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
CONTACT TIME (Periods per week)
Theory (3); Tutorial (1); Practical (3).
ASSESSMENT
Course mark

Theory: Best 2 out of 3 theory tests (I hour each):	65%
Practicals: Practicals (15%) & Test (85%):	30%
Tutorial Tests:	5%

Final Mark
Examination: 1 X 3 Hour theory examination
Final mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Introduction to physics; vectors and scalars; motion with constant acceleration; newton's laws of motion ; application of newton's laws; work, energy and power; elasticity, stress and strain; static fluids; temperature measurement; thermal expansion; heat and calorimetry; electrostatics; direct current circuits; magnetism; wave motion; general optics; structure of the atom and the nucleus; radioactivity.

ACHM103 - ANALYTICAL CHEMISTRY I (150413512)
OR ACHA101 - ANALYTICAL CHEMISTRY I (AUGMENTED) (150413512) (ECP) (NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
Prerequisite: CHEM102
CONTACT TIME (Periods per week)
Theory (4); Tutorials (1); Practical (6).
ASSESSMENT
Course mark:

Theory: 2 x 1 hour Tests (20% each):		40%
Assignment:		10%
Practical:	1 x 1 hour Theory of Practical Test:	15%
	1 x 3 hour Practical test:	15%
	Practical write-ups:	20%

Final Mark
Examination: 1 x 3 Hour Theory Examination
Final mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Introduction; elementary statistics; laboratory practice and safety; titrimetric analysis; sampling and sample handling; redox titrations; introduction to instrumental analysis; basic report writing

INCH201 - INORGANIC CHEMISTRY II (150416822)
OR INCA201 - INORGANIC CHEMISTRY II (AUGMENTED) (150416822) (ECP) (NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
Prerequisite: CHEM102
CONTACT TIME (Periods per week)
Theory (2); Tutorial (1); Practical (2).
ASSESSMENT
Course mark

Theory: 2 x 1 hour tests - 25% each:	50%
Theory of Practical:	10%
Practicals:	40%

Final Mark
Examination : 1 x 3 hour theory paper
Final mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Chemical bonding; solution chemistry; descriptive chemistry of hydrogen and selected elements in Groups 1, 2, 13, 14, 15, 16 and 17.

ORCH201 - ORGANIC CHEMISTRY II (150413822)
OR OCHA201 - ORGANIC CHEMISTRY II (AUGMENTED) (150413822) (ECP) (NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
Prerequisite: CHEM102
CONTACT TIME (Periods per week)
Theory (2); Tutorial (1); Practical (2).
ASSESSMENT
Course mark

Theory : 2 x 1hour tests - 25% each:	50%
Assignment:	10%
Practical mark:	40%

Final Mark
Examination: 1 x 3 hour paper
Final mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Acids and bases in organic chemistry; aliphatic hydrocarbons; radical reactions; ionic reactions; alcohols and ethers; aromatic compounds; electrophilic and nucleophilic substitution; aldehydes and ketones; carboxylic acids and derivatives; amines and amides.

PHCH201 - PHYSICAL CHEMISTRY II (150413722)
OR PHCA201 - PHYSICAL CHEMISTRY II (AUGMENTED) (150413722) (ECP) (NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
Prerequisite: CHEM102
Corequisite: MATH101
CONTACT TIME (Periods per week)
Theory (2); Tutorial (1); Practical (3).
ASSESSMENT
Course Mark

Theory: 2 x 1 Hour tests - 25% each:	50%
Theory of Practical:	10%
Practical Reports:	40%

Final Mark
Examination: 1 x 3 hour paper
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Gases; liquids; chemical equilibrium; colligative properties of solutions; electrochemistry; reaction kinetics; colloids.

ACHM204 - ANALYTICAL CHEMISTRY II (150416622)
Corequisite: ACPR201
CONTACT TIME (Periods per week)
Theory (4); Tutorial (1).
ASSESSMENT
Course mark

Theory: 2 x 1 hour theory tests:	90%
Assignments:	10%

Final Mark
Examination: 1 x 3 hour theory paper
Final Mark: Course Mark (40%) + Examination mark (60%)
SYLLABUS: Principles of analytical chemistry; introduction; basic statistics; sampling and sample handling; methods of analysis; gravimetric analysis; titrimetric analysis; instrumental techniques.

ACPR201 - ANALYTICAL CHEMISTRY PRACTICAL: II (150400622)
CONTACT TIME (Periods per week)
Practical (9).
ASSESSMENT
Continuous assessment

1)	Wet Chemistry Practicals:	
	2 Practical Tests (including theory of prac.l sections)	40%
	Continuous Assessment (pre-labs and prac reports):	25%
	Total (Wet Chemistry):	65 %
2)	Instrumental Practicals:	
	1 Theory of Practical Test:	20%
	Continuous Assessment (pre-labs and prac reports):	15%
	Total (Instrumental Analysis):	35 %

SYLLABUS: Wet chemistry; gravimetric analysis; titrimetric analysis. Instrumental analysis;

ORCH302 - ORGANIC CHEMISTRY III (150414103)
CONTACT TIME (Periods per week)
Theory (2); Practical (3).
ASSESSMENT (per module)
Course Mark
Theory: 2 x 1 hour tests (25 % each): 50%
Theory of Practical: 10%
Practical mark: 40%
Final Mark
Examination: 2 x 1½ hour papers
Final mark: Course mark (40%) + Examination Mark (60%)
SYLLABUS:
Paper 1 - acids and bases in organic chemistry; conformation of molecules; stereochemistry; elimination and substitution reactions; polymers; carbenes; aromatic compounds; aldehydes and ketones; dicarbonyl compounds.
Paper 2 ; lipids; amino acids and proteins; spectroscopy.

PHCH301 - PHYSICAL CHEMISTRY III (150414303)
CONTACT TIME (Periods per week)
Theory (2); Practical (3).
ASSESSMENT (per module)
Course mark
Theory : 2 theory tests: 50%
Assignment: 10%
Practical mark: 40%
Final Mark
Examination : 1 x 3 hour theory paper
Final Mark : Course mark (40%) + Examination Mark (60%)
SYLLABUS: Paper 1; electrochemistry; solid state.
Paper 2 - Quantum mechanics and spectroscopy; changes of phase; kinetics; surface Chemistry.

INCH301 - INORGANIC CHEMISTRY III (150414203)
CONTACT TIME (Periods per week)
Theory (2); Practical (3).
ASSESSMENT (per module)
Course mark
Theory: 2 theory tests: 50%
Assignment: 10%
Practical mark: 40%
Final Mark
Examination : 2 X 1½ hour theory papers
Final mark: Course Mark 40% + Examination Mark 60%
SYLLABUS: Paper 1 - Theories of Bonding; Co-ordination Chemistry and Crystal Field Theory;
Paper 2 - Descriptive Chemistry of 1st Transition Series, Associated Elements and Nuclear Chemistry

CQAS201 - CHEMICAL QUALITY ASSURANCE (150416722)
Prerequisite: ACHM103
CONTACT TIME (Periods per week)
Theory (4); Tutorial (1).
ASSESSMENT
Course mark
Theory: Tests: 2 x 1 hour tests (weighted 40% each): 80%
Assignment: 20%
Final Mark
Examination : 1 x 3 hour theory paper
Final Mark: Course Mark (40%) + Examination mark (60%)
SYLLABUS: Quality Assurance Systems; Laboratory Accreditation; Advanced Statistical Treatment of Data in Analytical Chemistry; Sample preparation.

ACHM303 - ANALYTICAL CHEMISTRY III comprises ACHM313 and ACHM323 in a 50%:50% weighting.

ACHM313 - ANALYTICAL CHEMISTRY III MODULE 1
Prerequisite: ACHM204
Corequisite: ACPR302.
CONTACT TIME (Periods per week)
Theory (4).
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests: 85%
Project: 15%
Final Mark
Examinations: 2 x 1½ hour theory examinations
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Atomic spectroscopy; molecular spectroscopy.

ACHM323 - ANALYTICAL CHEMISTRY III MODULE 2
Prerequisite: ACHM204
Corequisite: ACPR302.
CONTACT TIME (Periods per week)
Theory (4).
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests: 85%
Assignment: 15%
Final Mark
Examinations: 2 x 1½ hour theory examinations
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Chromatographic methods; electro-analytical techniques; thermal analysis.

ACPR302 - ANALYTICAL CHEMISTRY: PRACTICAL III comprises ACPR312 and ACPR322 in a 50%:50% weighting.

ACPR312 - ANALYTICAL CHEMISTRY: PRACTICAL III MODULE 1
CONTACT TIME (Periods per week)
Practical (6)
ASSESSMENT: Continuous assessment

Comprehensive Reports:	40%
Practical Tests:	50%
Project:	10%

SYLLABUS: Atomic spectroscopy; molecular spectroscopy.

ACPR322 - ANALYTICAL CHEMISTRY: PRACTICAL III MODULE 2
CONTACT TIME (Periods per week)
Practical (6)
ASSESSMENT: Continuous assessment

Comprehensive Reports:	40%
Practical Tests:	50%
Project:	10%

SYLLABUS: Chromatographic methods; electroanalytical techniques; thermal analysis.

WORK-INTEGRATED LEARNING

EXAN101 LEARNING
Prerequisites: ACHM313, ACHM323, ACPR312 and ACPR322
DURATION: 6 months in industry
ASSESSMENT

Laboratory Work:	50%
Written Report:	30%
Performance Appraisal:	20%

CMPJ301 PROJECT III
Prerequisite: EXAN101
DURATION: 6 months in industry Or 8 hrs per week
ASSESSMENT

Written Report:	50%
Oral Presentation:	25%
Poster Presentation:	25%

11.2 BACHELOR OF TECHNOLOGY IN CHEMISTRY

Unless otherwise specified, where practicals are constituted as part of the course mark, a sub-minimum of 40% is applicable to the practical mark.

ACHM402 - ANALYTICAL CHEMISTRY IV comprises ACHM412 and ACHM422 in a 50%:50% weighting

ACHM412 - ANALYTICAL CHEMISTRY IV: MODULE 1
CONTACT TIME (Periods per week)
Theory (3). Practical (3)
ASSESSMENT
Course Mark
Theory: minimum 2 x tests/assignments: 70%
Practical: 30%
Final Mark
Examinations: 1 x 3 hour theory examination
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Atomic spectroscopy; Electro-analysis; Separation methods

ACHM422 - ANALYTICAL CHEMISTRY IV: MODULE 2
CONTACT TIME (Periods per week)
Theory (3). Practical (3)
ASSESSMENT
Course Mark
Theory: minimum 2 x tests/assignments: 70%
Practical: 30%
Final Mark
Examinations: 1 x 3 hour theory examination
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Hyphenated Techniques; Thermal analysis: X-ray methods, Analysis of complex samples. Sample preparation methodology.

INCH401 - INORGANIC CHEMISTRY IV comprises INCH411 and INCH421in a 50%:50% weighting.

INCH411 - INORGANIC CHEMISTRY IV MODULE 1
CONTACT TIME (Periods per week)
Theory (2); Practical (1).
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests/assignments: 70%
Practical: 30%
Final Mark
Examinations: 1 x 2 hour theory examination
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: 2nd and 3rd transition series; Lanthanoids and actinoids selected elements; Introduction to solid state chemistry.

INCH421 - INORGANIC CHEMISTRY IV MODULE 2
CONTACT TIME (Periods per week)
Theory (2); Practical (1).
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests/assignments: 70%
Practical: 30%
Final Mark
Examinations: 1 x 2 hour theory examination
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Electronic spectra of transition metals complexes; Instrumental methods in Inorganic chemistry selected techniques; Introduction to Catalysis

ORCH401 - ORGANIC CHEMISTRY IV comprises ORCH411 and ORCH421 in a 50%:50% weighting.

ORCH411 - ORGANIC CHEMISTRY IV MODULE 1
CONTACT TIME (Periods per week)
Theory (2); Practical (1).
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests/assignments: 70%
Practical: 30%
Final Mark
Examinations: 1 x 2 hour theory examination
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Retrosynthesis; Industrial Organic Chemistry.

ORCH421 - ORGANIC CHEMISTRY IV MODULE 2
CONTACT TIME (Periods per week)
Theory (2); Practical (1).
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests/assignments: 70%
Practical: 30%
Final Mark
Examinations: 1 x 2 hour theory examination
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Natural Product Chemistry; Spectroscopy.

PHCH401 - PHYSICAL CHEMISTRY IV comprises PHCH411 and PHCH421in a 50%:50% weighting.

PHCH411 - PHYSICAL CHEMISTRY IV MODULE 1
CONTACT TIME (Periods per week)
Theory (2) Practical (1).
ASSESSMENT
Course Mark

Theory: 2 x 1 hour tests/assignments:	70%
Practical:	30%

Final Mark
Examinations: 1 x 2 hour theory examination
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Thermodynamics; Electrochemistry.

PHCH421 - PHYSICAL CHEMISTRY IV MODULE 2
CONTACT TIME (Periods per week)
Theory (3); Practical (1).
ASSESSMENT
Course Mark

Theory: 2 x 1 hour tests/assignments:	70%
Practical:	30%

Final Mark
Examinations: 1 x 2 hour theory examination
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS Kinetics; Surface Chemistry.

CPRJ412 - CHEMISTRY PROJECT IV (MODULE 1) (1504152060)
RESEARCH METHODOLOGY: LEARNING OUTCOMES:
Use strategies for identifying a problem which needs investigation / research. Use a reference to find an article in a journal. Perform a literature search on a selected project through a library and via the internet. Apply statistical tests of significance, determine confidence limits, perform linear regression and calculate correlation coefficients on given data. Use the research articles obtained to write a research project proposal. Make an oral presentation to an audience comprising staff, students and an external assessor.

ACTIVITIES:
Formal lectures: 2 per week (5 weeks) which includes:
Visits to the library for formal presentation on literature search by subject librarian and for practice in finding information in the literature under the guidance of the instructor. Writing abstracts under supervision. Lectures presented on statistics. Oral presentation of project proposal to staff, students and an assessor.

ASSESSMENT: Continuous assessment

One theory test	30%
Written proposal	40%
Project proposal presentation	30%

CPRJ422 - CHEMISTRY PROJECT IV (MODULE 2)
RESEARCH PROJECT: LEARNING OUTCOMES

Conduct a scientific project, Write a scientific research report based on the format: title, abstract, introduction, materials and methods, results, discussion, conclusion, references, acknowledgements.

Make an oral presentation to an audience comprising staff, students and an external assessor.

ACTIVITIES:

Visits to the library for formal presentation on literature search by subject librarian and for practice in finding information in the literature under the guidance of the instructor. Writing abstracts under supervision. Practice in oral presentation of the proposal to peers.

Experimental: 12 hours per week for 10 weeks

Write-up and typing of Project Report (mini thesis).

Oral presentation of project report to staff, students and an assessor.

ASSESSMENT: Continuous assessment

Project Written Report (mini thesis)	60%
Project Oral Report presentation	40%