DUT
DURBAN
UNIVERSITY OF
TECHNOLOGY

2018 HANDBOOK
CHEMISTRY

FACULTY OF
APPLIED
SCIENCES

HANDBOOK FOR 2018

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

MISSION

- Advancing future chemists for industry and research

VISION

- Making chemistry fun through science, technology and innovation
- Values
- Trust - (We always speak the truth. We are people of integrity)
- Respect - (We listen to the opinion of others. We treat others with dignity. Our individuality is valued. We subscribe to the spirit of Ubuntu)
- Communication - (We seek to understand others better. We follow through and meet deadlines. We eliminate confusion and promote clarity)
- Passion - (We love chemistry. Chemistry is fun. Our teaching and learning methods are exciting. We take pride in what we do)
- **Teamwork**
  (Our productivity and outputs reflect our team spirit. Our enthusiasm is infectious)
- **Accountability**
  (We do what we say. We are responsible and reliable. We take initiative. We give credit where credit is due. Our success is a result of what we do)
- **Excellence**
  (We lead, others follow. Whatever we do, we do it right first time. Quality matters. We pride ourselves in academic excellence and innovative research)

"We Are Chemistry"

CONTENTS

1. DEPARTMENTAL & FACULTY CONTACT DETAILS

All departmental queries to:

Secretary:	Ms K Ferguson
Tel No:	(031) 373 2300 / 2374
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:	fas@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
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Location:	Block S4 Level 3, Steve Biko Campus
Executive Dean:	Prof S Singh
Executive Dean's Secretary:	Mrs NK Naidoo
Telephone No:	031 373 2720
Facsimile No:	031 373 2724
Email:	fas@dut.ac.za
Location:	Between Block S6 and S7, Level 4 Steve Biko Campus

2. DEPARTMENTAL STAFF

Head of Department*	Dr K Ramluckan, NHDip (TN), MTech (DIT), PhD (DUT) (*Acting)
Professor	Prof K Bisetty, BSc (Hons) (UDW), UHDE (UDW) NHDip (MLST), MSc (UN), PhD (UN) 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	Dr P Mdluli, BSc (Hons) (UZ), MSc (UKZN), PhD (UZ)
	Dr MH Mabaso, NHDip (TN), HDE (UN), MSc (ETSD), PhD (DUT)
	Dr V Paul, MTech (MLST), BTech: BusAdmin (DUT), PhD (DUT)
Lecturers	Dr LM Madikizela, MTech (DUT), PhD (WITS)
	Ms P Ntola, MTech (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 Majola, NDip (DUT) Mr ZI Miya, BSc (Hons) (UKZN)
Laboratory Assistants	Mr AP Mthembu Mr TN Cele, NDip (DUT), BTech (DUT) Ms NN Mpungose, NDip (DUT) Mr S Sithole, NDip (DUT)

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:

- Diploma (D)
- National Diploma (ND)
- Bachelor of Technology (BT)
- Master of Applied Science in Chemistry (MAppSci)
- Doctor of Philosophy in Chemistry (PhD)

Qualification	Qualification Code	Important Dates		SAQA NLRD ID
		Ist Offered	Phased Out *	
Diploma in Analytical Chemistry	DIACH1	Jan 2017		98010
ND: Analytical Chemistry	NDACH2		Dec 2016	72210
ND: Analytical Chemistry (ECP)	NDANF1	Jan 2013	Dec 2016	72210
BT: Chemistry	BTCHM1			72117
MAppSci (Chemistry)	MSCMS1			96824
PhD Chemistry (Chemistry)	DPCMS1			96807

** The phased out period is 5 years from the stipulated date. No first time entry students will be allowed to register for phased out qualifications.*

4. DIPLOMA IN ANALYTICAL CHEMISTRY (DIACH1)

Purpose of Qualification

The Diploma in Analytical Chemistry represents a level of qualification that recognizes the ability to gain and apply a range of specialized knowledge, skills and understanding designed to meet the needs of various chemical industries. Graduates of the diploma would be able to display competence in the application of knowledge in a broad range of varied work activities associated with a career in the Chemical and Allied Industries involving detergents, petroleum, plastics, food, pharmaceuticals, mining, water treatment, metallurgy and, in addition, educational institutions may employ graduates from this course. Graduates are required for specific practical applications such as quality control and testing or theoretical fields such as research and development. Quality control and assurance is an especially important field where industries need to verify their standards of operation and quality of manufactured materials.

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. Students who are successful in this programme may progress to the Advanced Diploma in Chemistry followed by an Honours in Chemistry in order to gain access to postgraduate study towards a Masters or Doctoral qualification.

Apart from the formal course and practical work at DUT's Chemistry laboratories, the course also includes nine months Work Integrated Learning (WIL) component in an industrial setting where skills and knowledge acquired at university are integrated and applied under real-life working conditions.

4.1 PROGRAMME STRUCTURE (3 YEAR)

Code	Subject Offering	Seme-ster	Compulsory /Elective	Assessment Method	SAQA Credits	NQF Level	Prerequisite Subjects	Co-req Subjects
GINC101	GENERAL AND INORGANIC CHEMISTRY	1a	C	Ex	16	5		
MTHC101	MATHEMATICS I	1a	C	CA	16	5		
PHIC101	PHYSICS I	1a	C	Ex	16	5		
CSTN101	Cornerstone 101 (IGE)	1a	C	CA	12	5		
CPUS101	COMPUTER SKILLS I	1a	C	CA	8	5		
OPCH101	ORGANIC AND PHYSICAL CHEMISTRY	1b	C	Ex	16	5		
ANCH101	ANALYTICAL CHEMISTRY I	1b	C	Ex	20	6	GENERAL AND INORGANIC CHEMISTRY	
CCNS101	COMMUNICATION SKILLS	1b	C	CA	8	5		
ITCH101 CLDV101 VWKP101 SERS101	Choice of 2 of the following electives (IGE): • Introduction to Technopreneurship • Cultural Diversity • Values in the Workplace • Sustainable Earth Studies	1b 1b	E E	CA CA	8 8	5 5		
ANCH201	ANALYTICAL CHEMISTRY II	2a	C	Ex	24	6	ANALYTICAL CHEMISTRY I	
APIC101	APPLIED INORGANIC CHEMISTRY	2a	C	Ex	12	6	GENERAL AND INORGANIC CHEMISTRY	
APOC101	APPLIED ORGANIC CHEMISTRY	2a	C	Ex	12	6	ORGANIC AND PHYSICAL CHEMISTRY	
APPC101	APPLIED PHYSICAL CHEMISTRY	2a	C	Ex	12	6	ORGANIC AND PHYSICAL CHEMISTRY	MATHE-MATICS I
LDSH101 CLHR101	Choice of 1 of the following electives (IGE): • Leadership • Constitutional Law & Human Rights	2a	E	CA	8	5		
ACCH301	ANALYTICAL CHEMISTRY III: CHROMATOGRAPHY#	2b	C	Ex	12	6	ANALYTICAL CHEMISTRY II	
ACAS301	ANALYTICAL CHEMISTRY III: ATOMIC SPECTROSCOPY#	2b	C	Ex	12	6	ANALYTICAL CHEMISTRY II	
ACMS301	ANALYTICAL CHEMISTRY III: MOLECULAR SPECTROSCOPY#	2b	C	Ex	12	6	ANALYTICAL CHEMISTRY II	
ACEC301	ANALYTICAL CHEMISTRY III: ELECTROANALYTICAL CHEMISTRY#	2b	C	Ex	12	6	ANALYTICAL CHEMISTRY II	
CQLA101	CHEMICAL QUALITY ASSURANCE	2b	C	Ex	16	6	ANALYTICAL CHEMISTRY I	
EXLN101	EXPERIENTIAL LEARNING I (WIL)# (3 month theory subject)	3Tm1	C	CA	12	6	ANALYTICAL CHEMISTRY III: CHROMATOGRAPHY ATOMIC SPECTROSCOPY MOLECULAR SPECTROSCOPY ELECTROANALYTICAL CHEMISTRY	
CHPJ101	CHEMISTRY PROJECT I (WIL)# (3 month theory subject)	3Tm1	C	CA	36	6	ANALYTICAL CHEMISTRY III: CHROMATOGRAPHY ATOMIC SPECTROSCOPY MOLECULAR SPECTROSCOPY ELECTROANALYTICAL CHEMISTRY	
CENG101	Community Engagement (FGE) (3 month theory subject)	3Tm1	C	CA	12	6		
EXLN201	EXPERIENTIAL LEARNING II (WIL)# (9 month industry subject)	3Tm2	C	CA	48	6	EXPERIENTIAL LEARNING I	
CHPJ201	CHEMISTRY PROJECT II (WIL)# (9 month industry subject)	3Tim2	C	CA	12	6	CHEMISTRY PROJECT I	

KEY:
* Assessment: Ex = examinable; CA = Continuous Assessment
**Numbers 1 to 3 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.
FGE=Faculty General Education Module, IGE=Institutional General Education Module

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 attend 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 applied for late or poor attendance.

4.2.4 Work Integrated Learning (WIL)

The final year is focused on Work Integrated Learning (WIL) (Table 4.1 Programme Structure refers). It is divided into an initial 3month period at DUT undertaking theoretical subjects, and a further 9 month period in industry, as detailed hereunder:-

During the initial 3 month period at DUT, students will be required to register at the beginning of Term 1 in the first semester for:-

- Experiential Learning I - where the student will acquire the needed soft skills for WIL.
- Chemistry Project I - where the student will be acquainted with research methods/techniques of undertaking literature surveys in preparation for Chemistry Project II in industry.
- Community Engagement and Development Module (FGE) - where the student will be given an appropriate assignment based on the subject material. (This module is independent of the WIL component.)

During the remaining 9 months, students will be required to register at the beginning of Term 2 in the first semester for:-

- Experiential Learning II - where the student will be placed in industry and trained in appropriate instrumental techniques.

- Chemistry Project II – where the student will undertake a project under the supervision of both a DUT mentor and an appropriately qualified Chemist/Analyst. The project will be based on a topic of relevance to the company and will be done in addition to the normal duties required by the company during the WIL period. The student will be required to present his/her findings by means of an oral, poster presentation and a written report at DUT at the end of the 9 month period. The report will include at least one instrumental technique that the student has familiarised themselves with previously in Chemistry Project 1.

WIL forms part of and is integral to the exit level outcomes of the Diploma in Analytical Chemistry. As highlighted in the CHE WIL Good Practice Guidelines (2010) assessment will occur throughout the WIL period. Assessment and evaluation of the WIL component will be performed by university staff, workplace mentors and external examiners. Logbooks, assignment reports, projects, presentations or any other agreed evidence portfolios will be used to assess and evaluate student learning.

4.2.5 Assessment and Moderation

Students are expected to work steadily through the period during which they are registered 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 submitted by the due date. Late submission will be penalised, unless a valid reason is provided.
- 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

There is a demand for graduates in this field and industries are supportive of graduates pursuing further educational qualifications.

Graduates may also apply for associate membership of the South African Chemical Institute (SACI). SACI is associated with the South African Council for Natural Scientific Professions (SACNASP). The following link refers:
http://www.sacnasp.org.za/about-us/voluntary-associations.html

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, or any medical conditions that may cause endangerment in the laboratories.

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 Rule 4.3.2 will apply for applicants with reference to:-

4.3.1.1 Academic Achievement

In line with the above, the applicants' school leaving academic achievement must comply with one of the following subjects at the stated minimum ratings as outlined in the table below:

(i) A National Senior Certificate (NSC) with endorsement for a diploma/degree:

(ii) A Senior Certificate (SC) with the following subjects:

(iii) A National Certificate Vocational (NCV) Level 4 with statutory requirements for a diploma:

Compulsory Subjects	NSC	SC		NCV
	Rating	HG	SG	
Mathematics	4	D	B	60%
English	4	D	B	50%
Physical Science	3	E	C	50%

4.3.2 Selection Criteria

In addition to the Minimum Admission Requirements (Rule 4.3.1), the following selection process will determine acceptance into 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).

Selection will be based on the ranking of applicants who meet the minimum requirements.

4.3.3 Pass Requirements

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.

4.3.4 Promotion to a Higher Level/Progression Rules

In addition to the DUT Rule G16, and all prerequisite and co-requisite subjects as identified in the Table 4.1 Programme Structure, 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 General and Inorganic Chemistry

4.3.4.2 Promotion from Semester 2 to Semester 3
Students must pass 3 subjects, two of which must be Organic and Physical Chemistry & Analytical Chemistry I

4.3.4.3 Promotion from Semester 3 to Semester 4
Students must pass 3 subjects, one of which must be Analytical Chemistry II

4.3.4.4 Promotion from Semester 4 to Semester 5
Students must pass ALL Analytical Chemistry III modules

4.3.4.5 Promotion from Semester 5 to Semester 6
Students must pass Experiential Learning I

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 of the failed subjects is not permitted to reregister in this programme. Deregistration from any subjects is subject to the provision of DUT Rule G6.

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.

4.3.7 Work Integrated Learning Rules

The DUT Rule G28 applies.

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 Dress Code and Conduct of Students in Practical Laboratory Facilities

Strict adherence to instructions issued by technical, laboratory or academic staff is required due to the need to ensure effective and safe practice in these facilities. Students must adhere to the dress code required during practical sessions. Misconduct or disregard for instructions will result in the student being denied access to the laboratory venue.

4.3.9 Attendance and Assessment

4.3.9.1 A student who, for any valid reason, is absent from planned academic activity 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.

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.

4.3.11 General Education Modules

Students must comply with the university's General Education requirement. This includes the following standalone General Education modules which comprise of:

- 1 Compulsory DUT Cornerstone 101 module
- 1 Compulsory Faculty General Education module
- 3 Elective Institutional General Education modules (Students will select electives modules as indicated in Table 4.1 Programme Structure)

5. NATIONAL DIPLOMA: ANALYTICAL CHEMISTRY (NDACH2)

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.

5.1 PROGRAMME STRUCTURE (3 YEAR)

Code	Subjects	Assess-ment	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.

5.2 PROGRAMME INFORMATION

5.2.1 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.

5.2.2 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 5.3.8 below.

5.2.3 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 5.3.9 below.

5.2.4 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 5.3.7 below.

5.2.5 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 5.3.9 below.

5.2.6 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).

5.2.7 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.

5.3 PROGRAMME RULES

5.3.1 Minimum Admission Requirements

In addition to DUT Rule G7, the following minimum entrance requirements and the selection criteria outlined in 5.3.2 apply for applicants with reference to:-

5.3.1.1 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%

5.3.1.2 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)*

5.3.1.3 Admission of International Students

a. The DUT's Admissions Policy for International Students and DUT Rules G4 and G7(5) will apply.
b. International students must meet the equivalent programme minimum entrance requirements as stated above.
(Approved by Senate Rules Comm wef 2014/10)

5.3.1.4 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)*

5.3.2 Selection Criteria

In addition to the Minimum Admission Requirements (Rule 5.3.1), 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)*

5.3.3 Pass Requirements

5.3.3.1 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)*

5.3.4 Re-registration Rules

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

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

5.3.4.2 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.

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 the third year of study provided the pre-requisites are met.

5.3.5 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)*

5.3.6 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)*

5.3.7 Work Integrated Learning Rules

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

5.3.8 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:

5.3.8.1 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)*

5.3.8.2 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)*

5.3.9 Attendance and Assessment

5.3.9.1 A student who, for any valid reason (Refer to Programme Rule 5.3.9.2 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)*

5.3.9.2 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)*

5.3.10 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)

6. 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.

6.1 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	
ACHM323#	Analytical Chemistry III (Module II)	3b	Ex	0.100	Analytical Chemistry II	
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.

6.2 PROGRAMME INFORMATION

Refer to 5.2 Programme Information under the ND: Analytical Chemistry.

6.3 PROGRAMME RULES

Refer to 5.3 Programme Rules under the ND: Analytical Chemistry and the following rules which apply specifically to ND: Analytical Chemistry (ECP).

6.3.1 Minimum Admission Requirements

Refer to Rule 5.3.1 which is applicable to both the ND and ND(ECP).

6.3.2 Selection Criteria

Refer to Rule 5.3.2 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.

6.3.3 Pass Requirements

Refer to Rule 5.3.3 which is applicable to both the ND and ND(ECP).

6.3.4 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.

6.3.4.1 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 I. *(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 prerequisites for the subjects are met.

6.3.4.2 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.

6.3.4.3 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.

6.3.5 Exclusion Rules

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

6.3.6 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)*

6.3.7 Work Integrated Learning Rules

Refer to Rule 5.3.7 which is applicable to both the ND and ND(ECP).

6.3.8 Code of Conduct

Refer to Rule 5.3.8 which is applicable to both the ND and ND(ECP).

6.3.9 Attendance and Assessment

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

6.3.10 Health and Safety

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

7. BACHELOR OF TECHNOLOGY IN CHEMISTRY (BTCHM1)

Purpose of Qualification

The BTech degree 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.

7.1 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

7.2 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.

7.3 PROGRAMME RULES

7.3.1 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.

7.3.2 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.

7.3.3 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.

7.3.4 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.

7.3.5 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.

7.3.6 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.

8. MASTER OF APPLIED SCIENCE IN CHEMISTRY (MSCMS1)

Purpose of Qualification

The MAppSci (Chemistry) degree, 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.

8.1 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			

8.2 PROGRAMME INFORMATION

The curriculum consists of a research project and dissertation.

8.3 PROGRAMME RULES

8.4 Minimum Admission Requirements

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

8.5 Duration

As per Rule G24 (2).

9. DOCTOR OF PHILOSOPHY IN CHEMISTRY (DPCMS1)

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.

9.1 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			

9.2 PROGRAMME INFORMATION

The curriculum consists of a research project and dissertation.

9.3 PROGRAMME RULES

9.3.1 Minimum Admission Requirements

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

9.3.2 Duration

As per Rule G25 (2).

10. 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
Bachelor of Engineering Technology in Chemical Engineering	Engineering Chemistry IA	ENCA101
	Engineering Chemistry IB	ENCB101
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: Radiography	Radiation Science	RSCI101
	Chemistry	CSTY101
ND: Somatology	Science I (Annual)	SCIE101
	Science II	SCIE201
ND: Textile Technology	Textile Science II	TXSC211

11. SHORT COURSES

The following short courses are currently offered by the Department.

- General Laboratory Practice (3 days)
- Basic Gas Chromatography (3 days)
- Advanced Gas Chromatography (5 days)
- Basic Atomic Absorption Spectroscopy (3 days)
- Advanced Atomic Absorption Spectroscopy (5 days)

For further details please contact:
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or
Selisha Ramduth
Email: selishar@dut.ac.za

12. SUBJECT CONTENT:

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

12.1 DIPLOMA: ANALYTICAL CHEMISTRY (DIACH1)

CPUS101 - COMPUTER SKILLS 1

CONTACT TIME (Periods per week)

Theory and demonstration of practical (3)

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: Introductory theory on Information and communications technology, MS Word, MS Excel, MS PowerPoint, Introduction to Internet search engine/s, Introduction to e-Mail

CSTN101 – CORNERSTONE 101

CONTACT TIME (Periods per week)

Theory (3); small group activity & independent study

ASSESSMENT

Continuous Assessment

A weekly blog written by each student	20%
Tutorial attendance (forfeited if student attends less than 80% of tutorials)	10%
Visual artefact	15%
Written report	30%
Oral presentation	5%
Peer assessment.	10%

SYLLABUS: • The module content will be developed around the concept of journeys, across time, across space, and across human relationships; the first use of the concept will take the journey of the uMngeni River (which is close to all DUT campuses) as a metaphor.

The module will start with the analysis of a particular issue or metaphor (one critical event or development will be and analysed; the event in focus will be selected on the basis of its connections to the theme of journeys and its relevance to the issues of ethics, diversity and critical citizenry).

The final section of the module will identify and integrate learning from earlier sections, and examine implications for further learning. At each stage of the module, students will be required to engage in activities that involve reflection and build communicative practices. There will be a concluding section in which students will identify their learning and examine the implications for their roles as students and as citizens.

GINC101- GENERAL AND INORGANIC CHEMISTRY

CONTACT TIME (Periods per week)

Theory (4); Practical (1 X 3 hr)

ASSESSMENT

Course Mark

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

Final Mark

Examination: 1 x 3 hour paper

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

SYLLABUS: Atomic structure and periodic table, types of bonding, reactions and stoichiometry, types of reactions, properties of s and p block elements.

MTHC101 - MATHEMATICS I

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: Algebraic functions, determinants of 2x2 and 3x3 'square' matrices, algebraic fraction into partial fractions, trig operations, algebraic functions and inverse functions, simple statistical examples, hyperbolic functions, simple algebraic, trig and hyperbolic functions

PHIC101 - PHYSICS I

CONTACT TIME (Periods per week)

Theory (4); Tutorial (2)

ASSESSMENT

Course Mark

Theory: Best 2 out of 3 theory tests (1 hour each):	65%
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: Units and Vectors, Kinematics in One Dimension, Forces and Newton's Laws of Motion, Work and Energy, Impulse and Momentum, Elasticity, Fluids, Temperature & Heat, Electrostatics, Electric Circuits, The Reflection of Light: Mirrors, The Refraction of Light: Lenses and other media.

ANCH101 - ANALYTICAL CHEMISTRY I

CONTACT TIME (Periods per week)

Theory (4); Practical (2 x 3 hr)

ASSESSMENT

Course Mark

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

Final Mark

Examination: 1 x 3 hour paper

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

SYLLABUS: Introduction to Analytical Chemistry, elementary statistics, laboratory Practice and Safety, titrimetric Analysis, sampling and sample handling, gravimetric analysis, introduction to instrumental analysis, basic report writing.

CCNS101 - COMMUNICATION SKILLS I

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.

CLDV101 – CULTURAL DIVERSITY
CONTACT TIME (Periods per week)
Theory (2); small group activity & independent study
ASSESSMENT
Continuous Assessment

Assignments	20%
Oral presentation	40%
Portfolio	40%

SYLLABUS: • The module will be introduced by defining culture and establishing the salience of culture in the local and global context. There is also some attention paid to diverse cultural groups in the SA and global context. The core content focuses on aspects of social responsibility and gives strong attention to issues of anti-discriminatory and anti- oppressive practices. Social justice is unpacked and the effect of marginalization on oppressed groups discussed. Consciousness raising and social action and dialoguing across differences is used to interweave the introductory and main aspects of the module. It forms an appropriate way to conclude the module as it requires students to engage in activities that involve reflection and personal commitment to anti- oppressive practices.

ITCH101 – INTRODUCTION TO TECHNOPRENEURSHIP
CONTACT TIME (Periods per week)
Theory (2); small group activity and independent study
ASSESSMENT
Continuous Assessment

Tests	50%
Individual Participation/Graduate Attributes	10%
Group Written Assignment	20%
Group Oral Presentation to Panel	20%

SYLLABUS: • Small Business and Entrepreneurship – the language, differences, need and statistics. Supporting organisations and policies; The entrepreneurial profile; Creativity, innovation, self-awareness and Technopreneurship; Introduction to business structures; Introduction to business functions (Marketing, Finance, HR & Operations); Introduction to the Feasibility Study and Business Plan.

OPCH101- ORGANIC AND PHYSICAL CHEMISTRY
CONTACT TIME (Periods per week)
Theory (4); Practical (1 x 3 hr)
ASSESSMENT
Course Mark

Theory: 2 x 1 hour tests:	60%
Practical: Test and Practical report:	40%

Final Mark
Examination: 1 x 3 hour paper
Final mark: Course mark (40%) + Examination mark (60%)
SYLLABUS: Rates of reactions, equilibrium, acids, bases and neutralisation reactions. Thermodynamics and electrochemistry. Organic chemistry involving saturated and

unsaturated hydrocarbons, alcohols and phenols, ethers, aldehydes and ketones, carboxylic acids and esters, amines and amide

SERS101 – SUSTAINABLE EARTH STUDIES

CONTACT TIME (Periods per week)

Theory (2); small group activity & independent study

ASSESSMENT

Continuous Assessment

Tests	30%
Essay	30%
Report	40%

SYLLABUS:

Introduction and significance

- Understanding the relevance, meaning and purpose of earth studies to personal and professional life.

The Biosphere in space

- Core concepts of the earth as a nurturing complete system
- Locating the earth as a living planet in the solar system, galaxy and space
- Describing the earth using mapping and cartography systems
- Establishing position on the earth's surface (lines of meridians and latitude, co-ordinates and GPS systems)

Earth systems (Abiotic or non-living component)

- Overview of the nature and significance of earths structure (lithosphere), atmosphere and water systems (hydrosphere) using relevant global and local examples
- Bio-element recycling of major minerals and elements

Ecology (Biotic or living component)

- Core concepts of ecology, primary production and transfer of energy
- Connected webs of human, animal and plant communities
- Global and local examples

Biodiversity

- Nature, importance and characteristics of biodiversity (the variety and distribution of life)
- Ecosystem and species biodiversity
- Biodiversity and its link to human wellbeing-
- Biodiversity of Durban - local wildlife and plants on our doorstep
- Biodiversity under threat - Climate Change, Species extinctions,
- Habitat degradation
- Overview of Global and local Responses to Biodiversity
  (Rio +20, COP 17, Local Agenda 21, DMOSS)
- Pressing issues in biodiversity conservation in KZN
  (Rhino poaching (Ezimvelo), cycad trading, alien plant invasions, unsustainable harvesting of muti plants)

VWKP101 – VALUES IN THE WORKPLACE
CONTACT TIME (Periods per week)
Theory (2); small group activity & independent study
ASSESSMENT
Continuous Assessment

Two assignments	40%
One oral presentation	20%
Reflection	10%
Peer Assessment	10%

SYLLABUS: •
The module will begin with a reflection on personal values and move to a discussion on how they intersect with values in the workplace. Small group discussions will be formed around how to build positive values in the workplace and the vital themes of ethics, respect, interconnectedness, honesty, creativity and human diversity will form the basis for building "sacred spaces at work." This will set the tone to unpack issues around leadership values and ethics and ethical decision making. The final section of the module will integrate all these aspects and students will be required to identify the implications of what they have learnt to develop social responsibility and their roles as citizens.

ANCH201- ANALYTICAL CHEMISTRY II
CONTACT TIME (Periods per week)
Theory (4); Practical (2 x 3 hr)
ASSESSMENT
Course Mark

Theory: 2 x 1 hour tests:	60%
Practical: Test and Practical report:	40%

Final Mark
Examination: 1 x 3 hour paper
Final mark: Course mark (40%) + Examination mark (60%)
SYLLABUS: Advanced titrimetric analysis, sampling and sample handling, gravimetric analysis, introduction to instrumental analysis

APIC101- APPLIED INORGANIC CHEMISTRY
CONTACT TIME (Periods per week)
Theory (3); Practical (4 sessions per semester)
ASSESSMENT
Course Mark

Theory: 2 x 1 hour tests:	60%
Practical: Test and Practical report:	40%

Final Mark
Examination: 1 x 3 hour paper
Final mark: Course mark (40%) + Examination mark (60%)
SYLLABUS: Theories of bonding; coordination chemistry; crystal field theory; descriptive chemistry of first transition series, associated elements and nuclear chemistry.

APOC101- APPLIED ORGANIC CHEMISTRY

CONTACT TIME (Periods per week)

Theory (3); Practical (4 sessions per semester)

ASSESSMENT

Course Mark

Theory: 2 x 1 hour tests:	60%
Practical: Test and Practical report:	40%

Final Mark

Examination: 1 x 3 hour paper

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

SYLLABUS: Acids and Bases in Organic Chemistry; Conformation of Molecules; Stereochemistry; Elimination and Substitution Reactions; Polymers; Aromatic Compounds; Aldehydes and Ketones; Dicarbonyl Compounds; Carbohydrates; Lipids; Amino Acids and Proteins; Spectroscopy.

APPC101- APPLIED PHYSICAL CHEMISTRY

CONTACT TIME (Periods per week)

Theory (3); Practical (4 sessions per semester)

ASSESSMENT

Course Mark

Theory: 2 x 1 hour tests:	60%
Practical: Test and Practical report:	40%

Final Mark

Examination: 1 x 3 hour paper

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

SYLLABUS: Thermodynamics, Chemical Kinetics, Change of Phase, Surface Chemistry, Electrochemistry

CLHR101 – CONSTITUTIONAL LAW AND HUMAN RIGHTS

CONTACT TIME (Periods per week)

Theory (2); small group activity & independent study

ASSESSMENT

Continuous Assessment

Tests	50%
A written group assignment on Constitutional Law	20%
A written individual assignment on Human Rights	20%
One oral presentation	10%

SYLLABUS:

Introduction; Basic Features of the Constitution; Constitutional History of South Africa; Constitutional principles; The Constitution as the Supreme Law and Source of Law; Organs of State; Traditional leaders; The role of the Constitutional Court; State Institutions supporting Constitutional Democracy.; Human Rights.; Introduction to The Bill of Rights; Bearers and Holders of Rights; Limitation of Rights; Application of the Substantive Provisions of the Bill of Rights to Human Rights issues in South Africa; Suitable relief for enforcement of Human Rights / Remedies for violation of Human

Rights; Substantive provisions of the Bill of Rights; Case Studies & Practical Examples on Human Rights Issues.

LDSH101 – LEADERSHIP

CONTACT TIME (Periods per week)

Theory (2); small group activity & independent study

ASSESSMENT

Continuous Assessment

Participation in classes and in activities Related to the community project.	25%
A written report (5 000 words) that reflects on the Experience of leadership in the community project	35%
Oral presentation in class seminars	10%
A weekly blog written by each student	20%
Mentor's report	10%

SYLLABUS:

Negotiation of ground rules; Developing of questions and goals for learning; Existing experience of leadership; Basic concepts and theories of leadership; Preparing for community engagement; Case studies of leadership – engagement with leaders from different contexts; Involvement in a specific community or workplace project; Applying theory in analysing the experience of leadership; Reflection on self and setting of goals; Evaluation

ACAS301- ANALYTICAL CHEM III: ATOMIC SPECTROSCOPY

CONTACT TIME (Periods per week)

Theory (3); Practical (4 sessions per semester)

ASSESSMENT

Course Mark

Theory: 2 x 1 hour tests:	60%
Practical: Test and Practical report:	40%

Final Mark

Examination: 1 x 3 hour paper

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

SYLLABUS: Flame emission and atomic absorption spectrometry; Emission spectrometry and X-ray methods

ACCH301- ANALYTICAL CHEM III: CHROMATOGRAPHY

CONTACT TIME (Periods per week)

Theory (3); Practical (8 sessions per semester)

ASSESSMENT

Course Mark

Theory: 2 x 1 hour tests:	60%
Practical: Test and Practical report:	40%

Final Mark

Examination: 1 x 3 hour paper

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

SYLLABUS: Introduction to analytical separations, Gas chromatography, High performance liquid chromatography.

ACEC301– ANALYTICAL CHEM III: ELECTROANALYTICAL
CONTACT TIME (Periods per week)
Theory (3); Practical (4 sessions per semester)
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests: 60%
Practical: Test and Practical report: 40%
Final Mark
Examination: 1 x 3 hour paper
Final mark: Course mark (40%) + Examination mark (60%)
SYLLABUS: Potentiometry, Polarography, Electrogravimetry and coulometry, Thermal methods of analysis.

ACMS301 ANALYTICAL CHEM III: MOLECULAR SPECTROSCOPY
CONTACT TIME (Periods per week)
Theory (3); Practical (4 sessions per semester)
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests: 60%
Practical: Test and Practical report: 40%
Final Mark
Examination: 1 x 3 hour paper
Final mark: Course mark (40%) + Examination mark (60%)
SYLLABUS: Introduction to absorption and emission spectrometry, Molecular spectroscopy (UV, Visible and IR).

CQLA101- CHEMICAL QUALITY ASSURANCE
CONTACT TIME (Periods per week)
Theory (4); Practical (2)
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 dimensions, selected codes of practice, basic statistics and SPC, good laboratory practice.

EXLN101- EXPERIENTIAL LEARNING I (WIL)
(3 month theory subject)
ASSESSMENT
Continuous Assessment
One Assignment on Soft Skills for WIL 100%
SYLLABUS: Report writing skills, CVs, Basic Statistics using Spread Sheets, Power Point Slides & Interpersonal skills.

CHPJ101- CHEMISTRY PROJECT I (WIL)
(3 month theory subject)
ASSESSMENT
Continuous Assessment
Two Assignments:
Assignment 1: Research Methodology 50%
Assignment 2: Research Proposal (Industrial Based Topic) 50%
SYLLABUS: Research Methodology and topics related to industry

CENG101 – COMMUNITY ENGAGEMENT
CONTACT TIME (Periods per week)
Theory (3); small group activity & independent study
ASSESSMENT
Continuous Assessment
Reflective Journal (individual) 40%
Creative presentation (group) 10%
Practical project (group) 50%
SYLLABUS:
Introduction to the Applied Sciences, Community Engagement and Community Development
(1 WEEK)
This topic includes the multidisciplinary and multi-sectoral nature of community development and engagement; integration in line with the humanistic philosophy and ecosystems theory
Conceptual Framework (3 WEEKS)
Conceptualization of CE in its various forms; DUT conceptualisation of CE; purposes of and rationale for CE in the South African context (including the NDP); active and participatory citizenry; service and social action; social Negotiation of ground rules; Developing of questions and goals for learning; Existing experience of leadership; Basic concepts and theories justice, change and transformation; students as change agents.
Ethics, principles and values for CE (Rules of and for Engagement) (2 WEEKS)
This section includes: humanistic philosophy and Ubuntu; ethics and ethical conduct in relationship with communities; values that guide CE practice in the South African context; principles that guide CE practice in the South African context.

The Approaches and Process of CE (2 WEEKS)

This topic includes dimensions of community (social, political, economic, cultural, physical) and community issues; reciprocity and partnerships; the integrated and holistic approach to education and life-relating discipline\faculty based knowledge to real issues; stages (phases) of the CE process.

Skills and Attributes for CE (2 WEEKS)

This section includes critical thinking; problem solving**;** communication skills (written and verbal-interviewing, active listening)**;** interaction and human relationships; discipline specific skills**;** attributes (from character, love for self and humanity, creativity, curiosity for knowledge - discipline\faculty and self)

Challenges and Benefits of CE (1WEEK)

Covers Community, institution, faculty and students perspectives

EXLN201- EXPERIENTIAL LEARNING II (WIL)

(9 month industry subject)

ASSESSMENT

Continuous Assessment

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

CHPJ201- CHEMISTRY PROJECT II (WIL)

(9 month industry subject)

ASSESSMENT

Continuous Assessment

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

12.2 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 1 (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:
- 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.
- Students who get at least 50% but who fail due to the test sub-minimum also qualify for this test.
- 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: I 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 I hour Tests (20% each):	40%
Assignment:	10%
Practical: I x I hour Theory of Practical Test:	15%
I x 3 hour Practical test:	15%
Practical write-ups:	20%

Final Mark
Examination: I 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 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 Co-requisite: ACPR302.
CONTACT TIME (Periods per week)
Theory (4).
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests: 85%
Assignment / Tutorials: 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 / Tutorials:	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%

E&OE