CHEMISTRY

DUT
DURBAN UNIVERSITY OF TECHNOLOGY
INYUVESI YASETHEKWINI YEZOBUCHWEPHESHE

FACULTY OF APPLIED SCIENCES

2025 HAND BOOK

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 (2020-2030)

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 chemistry for a sustainable future through innovative curriculum, engagement, research, and entrepreneurship.

VISION

- A recognized chemistry partner for sustainable societal solutions.

VALUES

- **Excellence** - Whatever we do, we do it right the first time. Quality matters. We pride ourselves in academic excellence and innovative research.
- **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.
- **Teamwork -** We communicate, show etiquette by our word, action, and behavior.
- **Professionalism -** We uphold high standards for our profession. We show respect, compassion, and transparency in all we do.
- **Integrity** – We are honest and do not tolerate plagiarism.

"Creating Sustainable Bonds"

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STRATEGIC DIRECTION (2020 - 2030)

1. DEPARTMENTAL & FACULTY CONTACT DETAILS

All departmental queries to:

Secretary:	TBC
Tel No:	(031) 373 2300 / 2374
Fax to Email No:	0866740608
Email:	N/A
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:	Ms NP Chiliza
General Enquiries No:	031 373 2717
Facsimile No:	031 373 2715
Email:	nonhlanhlaN3@dut.ac.za
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	Prof N Deenadayalu, BSc (Hons) (UN), MSc (UN), PhD (UN)
Professors	Prof K Bisetty, BSc (Hons) (UDW), UHDE (UDW) NHDip (MLST), MSc (UN), PhD (UN)
Senior Lecturers	Dr TH Mokhothu, BSc (Hons) (UFS), MSc (UFS), PhD (UFS)
	Dr V Paul, MTech (MLST), BTech: Bus Admin (DUT), PhD (DUT)
	Dr MI Sabela, BTech (DUT), MTech (DUT), PhD (DUT)
	Dr TR Makhanya, BTech (DUT), M Tech (DUT), PhD (DUT)
	Dr S Ncube, BSc (Hon), MSc (Cum laude), PhD (Wits)
Lecturers	Dr SS Ndlela, BSc (Hons) (UKZN), MSc (UKZN), PhD (UKZN)
	Dr B Kabane, PhD (DUT)
Junior Lecturer	Ms H Lubanyana, BSc (Hons) (UKZN), MSc (UKZN)
NGap Lecturers	zN Duma, MSc (UKZN)
GOOT Lecturers	Dr LD Mthembu BTech (MUT), MAppSc (DUT),
	PPhD (DUT)
	Dr SF Shange PhD (DUT)
Secretary	TBC
Senior Technicians	CT Gwamanda, BTech (TUT) Mr. N Ramnarayan, NDip (MLST)
Technicians	Ms NM Xhakaza, BTech (MLST), MTech (DUT)

Ms D Naicker, BTech (MLST)

Mr R Ramkrepal, BTech (MLST)

Ms NP Cele, BTech (MLST), MTech (DUT)

Ms SS Zunngu, BTech (DUT), MAppSci (DUT)

Mr SL Majola, NDip (DUT), BTech (DUT)

Mr ZI Miya, BSc (Hons) (UKZN)

Mr S Sithole, NDip (DUT), BTech (DUT)

Mr TN Cele, NDip (DUT), BTech (DUT)

Laboratory Assistants Ms NN Mpungose, NDip (DUT), BTech (DUT)

Mr A Shabangu, BTech (DUT)

Mr T Khuzwayo, NDip (DUT)

Honorary Emeritus Professors Prof KG Moodley

Prof GG Redhi

Prof RM Gengan

3. QUALIFICATIONS OFFERED BY THE DEPARTMENT

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

- Diploma in Analytical Chemistry (D)
- Degree of Bachelor of Applied Science in Industrial Chemistry (BAppSc)
- Advanced Diploma in Chemistry (AdvDip)
- Postgraduate Diploma in Chemistry (PGDip)
- Master of Applied Science in Chemistry (MAppSc)
- Doctor of Philosophy in Chemistry (PhD)

Qualification	Qualification Code	Important Dates			SAQA NLRD ID
		Ist Offered	Phased Out Year*	Final Year Offered	
Diploma in Analytical Chemistry	DIACH1	Jan 2017			98010
Degree of Bachelor of Applied Science in Industrial Chemistry	BASIC1	Jan 2024			119966
Advanced Diploma in Chemistry	ADCHE1	Jan 2020	2023		111354
	ADCHE2	Jan 2023			111354
Postgraduate Diploma in Chemistry	PDGCH1	Jan 2021			117947
MAppSc (Chemistry)	MSCMS1				96824
PhD Chemistry (Chemistry)	DPCMS1				96807

* *The phased out period for 3 year programmes is 5 years from the phased out year (inclusive). The phased out period for 1 year programmes is 2 years from the phased out year (inclusive). No first time entry students will be allowed to register for phased out qualifications. DUT RULE G29 applies.*

4. DIPLOMA IN ANALYTICAL CHEMISTRY (DIACH1)

Purpose of Qualification

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. 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.

The 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 a Postgraduate Diploma in Chemistry in order to gain access to 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 the university, are integrated, and applied under real-life working conditions.

4.1 PROGRAMME STRUCTURE (3 YEAR)(DIACH1)

Code	Module	Semester	Compulsory /Elective	Assessment Method	SAQA Credits	NQF Level	Prerequisite Modules	Co-req Modules
Year 1: Semester 1								
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		
Year 1: Semester 2								
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	EE	CA CA	8 8	5 5		
Year 2: Semester 1								
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	Mathematics I
LDSH101 CLHR101	Choice of 1 of the following electives (IGE): ·Leadership ·Constitutional Law & Human Rights	2a	E	CA	8	5		
Year 2: Semester 2								
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	
Year 3: Semester and 2								
EXLN101	Experiential Learning I (Theory)#	3 a/b	C	CA	12	6	Analytical Chemistry III: Chromatography Atomic Spectroscopy, Molecular Spectroscopy, Electroanalytical Chemistry	

CHPJ101	Chemistry Project I (Theory)#	3	a/b	C	CA	36	6	Analytical Chemistry III: Chromatography Atomic Spectroscopy, Molecular Spectroscopy, Electroanalytical Chemistry	
ASCE101	Community Engagement and Development (FGE)	3	a/b	C	CA	12	6		
EXLN201	Experiential Learning II (Prac)#	3		C	CA	48	6		
CHPJ201	Chemistry Project II (Prac)#	3		C	CA	12	6		

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 modules are final level subjects.

A Pre-Req (prerequisite) means this module must be passed prior to registration for the subsequent module. A Co-Req (corequisite) means these modules 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 behavior, 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). Students will be required to register simultaneously in either January or July of each year for both the theory and practical modules, and prior to starting placement in industry.

Registration:

Students will register for the following semesterised theoretical modules in either January or July each year:

Theoretical Semester Modules:

- Experiential Learning I (EXLN101) 12 SAQA Credits

- Chemistry Project I (CHPJ101) 36 SAQA Credits
- Community Engagement and Development (ASCE101) 12 SAQA Credits

Students will only register for the following practical modules only when placed in industry:

Practical Modules:

- Experiential Learning II (WIL) (EXLN201) 48 SAQA Credits
- Chemistry Project II (WIL) (CHPJ201)12 SAQA Credits

The theoretical lectures for Community Engagement and Development (ASCE101) and Experiential Learning I (EXLN101) will be conducted during the two weeks, following registration in January/July. Lectures for Chemistry Project I (CHPJ101) will thereafter be offered on one day per week for thirteen weeks each, during the first and second semester.

Students will complete the two practical modules over the remaining period for the year in industry. Registrations for students who have not completed practical modules will be rolled over to the following year.

- 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.)
- 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 presentation and a written report at DUT at the end of the period. (Approved by Senate Rules comm. 14/11/18)

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 supervisors and 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 module in 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 penalized, unless a valid reason is provided.
- In the case of a continuous assessment module (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:

- A National Senior Certificate (NSC) with endorsement for a

diploma/degree:

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

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

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

- Applicants that also obtained the Higher Certificate in Applied Sciences with Applied Science option (option 1). Applied Science (Chemistry and Statistics for the Applied Sciences) will be considered.

4.3.1.2 Selection Criteria

i) First Time Entering Applicants

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.

ii) Applicants entering via Articulation

Applicants holding a Higher Certificate in Applied Sciences who apply to articulate into the Diploma, will be selected for entry using a ranking system based on their aggregate marks. The number of students accepted into the programme will be capped at a maximum of 10 students. (Approved at Faculty Boardon the 20 October 2021).

4.3.2 Pass Requirements

In addition to rule G12(1) a sub-minimum of 40% is required for the practical component of all modules in which the semester mark is made up of theory and practical components. These are indicated in Table 4.1 Programme Structure.

4.3.3 Promotion to a Higher Level/Progression Rules

4.3.3.1 Promotion from Year 1 to Year 2:

The DUT Rule G16 applies.

4.3.3.2 Promotion from Year 2 to Year 3:

In addition to DUT General Rule G16, students must pass all Analytical Chemistry III modules to proceed to Year 3 (WIL). (Approved at Senate meeting on the 3 September 2019).

Students are permitted to carry only two modules from the preceding years into Year 3.
Students who are carrying two modules and who are also registered for the WIL theoretical modules will not be placed in industry. (Approved at Senate meeting on the 8 March 2023).

4.3.5 Exclusion Rules

In addition to DUT Rule G17, a first semester student who fails three or more modules with a final result of less than 40% in each of the failed modules is not permitted to reregister in this programme. Deregistration from any modules 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. BACHELOR OF APPLIED SCIENCE IN INDUSTRIAL CHEMISTRY: (BASIC1)

Purpose of Qualification

The purpose of this qualification is to equip graduates with the necessary theoretical and scientific knowledge of relevant disciplines and fields of study to be used in an academic or specialized context. The Bachelor of Applied Science in Industrial Chemistry aims to provide a unique blend of practical applications and theory which immerses students into a wide range of the fastest growing technological fields in South Africa. The theoretical underpinnings of this qualification have a core discipline of the chemical sciences. Thorough grounding in the knowledge, scientific theory, principles and skills of this qualification will be inculcated into the student. Students achieving this qualification will be able to conduct basic research, formulate appropriate responses, develop and improve systems and policy, and combine a wide range of industrial chemistry related scientific knowledge, skills and experience within specialized areas of the chemical sector. The programme structure is given in Table 5.1.

5.1 PROGRAMME STRUCTURE (3 YEAR) (BASIC1)

Module Code	Name of Module	Study Period	NQF Level	Module Credits	C/E*	Pre-Req	Co-Req	Exam **
Year 1: Semester 1								
CMSK101	Computer Skills 1	1a	5	8	C	Nil	Nil	No
CSTN101	Cornerstone 101	1a	5	12	C	Nil	Nil	No
ASES101	FGE – Applied Sciences for Sustainable Development	1a	6	12	C	Nil	Nil	No
ICHM101	Industrial Chemistry 1A***	1a	5	16	C	Nil	Nil	Yes
MTTS101	Mathematics 1A	1a	5	12	C	Nil	Nil	No
PYCI101	Physics 1	1a	5	12	C	Nil	Nil	No
Year 1: Semester 2								
APLS102	Applied Statistics	1b	5	12	C	Nil	Nil	No
KZNM101	IGE – KwaZulu-Natal's Maritime Heritage	1b	5	8	E	Nil	Nil	No
ITCH101	IGE - Introduction to Technopreneurship	1b	5	8	E	Nil	Nil	No
ICHM102	Industrial Chemistry 1B***	1b	5	12	C	Industrial Chemistry 1A	Nil	Yes
MTTS102	Mathematics 1B	1b	5	12	C	Mathematics 1A	Nil	No
Year 2: Semester 1								
CHIP201	Chemical Industrial Processes 2A	2a	6	16	C	Nil	Nil	Yes
CHPF201	Chemical Process Fundamentals	2a	6	16	C	Nil	Nil	Yes
IOCM201	Inorganic Chemistry Methods 2***	2a	6	12	C	Nil	Nil	Yes
OCMD201	Organic Chemistry Methods 2***	2a	6	12	C	Nil	Nil	Yes
PYCM201	Physical Chemistry Methods 2***	2a	6	12	C	Nil	Nil	Yes
Year 2: Semester 2								
CHIP202	Chemical Industrial Processes 2B	2b	6	16	C	Chemistry Industry Processes 2A	Nil	Yes
RASS101	FGE - Role of Applied Science in Society	2b	6	12	C	Nil	Nil	No
WKPR101	IGE - Work Preparedness	2b	6	8	C	Nil	Nil	No
INSA202	Instrumental Analysis***	2b	6	16	C	Nil	Nil	Yes
WACH202	Wet Analytical Chemistry Methods***	2b	6	12	C	Nil	Nil	Yes
Year 3: Semester 1								
PACH301#	Applied Analytical Chemistry***	3a	7	32	C	Nil	Nil	Yes
IOCM301#	Inorganic Chemistry Methods 3***	3a	7	20	C	Inorganic Chemistry Methods 2	Nil	Yes
OCHD301#	Organic Chemistry Methods 3***	3a	7	20	C	Organic Chemistry Methods 2	Nil	Yes
Year 3: Semester 2								
PYCM302#	Physical Chemistry Methods 3***	3b	7	20	C	Physical Chemistry Methods 2	Nil	Yes
CHRP302#	Research Project***	3b	7	32	C	Applied Analytical Chemistry	Nil	No

KEY:
Total credits for Graduation (minimum): 380
*C = Compulsory; E = Elective;
** Modules with NO for exams are "Continuously Evaluated"
*** Modules have a practical component
# Final Level Module

Year of Study: Numbers indicates the year of study, Semester of Study: "a" = Semester 1, "b" =Semester 2 (eg 1b=Year 1, Semester 2)

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.

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.

5.2.4 Work Integrated Learning

The degree does not have a WIL component.

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 module 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 module (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.

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 Rules G7 and G23B, applicants must be in possession of one of the following minimum admission requirements for entry into this programme:

Compulsory Subjects	NSC	SC		NCV
	Rating	HG	SG	
English	4	D	B	60%
Physical Science	4	D	B	70%
Mathematics	4	D	B	60%

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).
- In addition to Rule G5, acceptance into the programme is limited by the approved enrolment plan and laboratory constraints.
- Applicants will be ranked from the highest to lowest based on the average percentage of the subjects listed in the above table
- NSC Selections: For those applicants who have completed matric prior to the year of application, the initial shortlisting for selection is based on the applicant's academic performance in Grade 12 in English, Physical Science and Mathematics. For applicants completing matric in the year of application, Grade 11 or Grade

12 trial marks in English, Physical Science and Mathematics will be used for shortlisting and selection.

- NCV Selections: For NCV applicants, shortlisting will be based on the applicants' academic performance in English, Physical Science and Mathematics.
- Provisional / conditional acceptance is given to selected applicants awaiting National Senior Certificate (NSC) and National Certificate Vocational (NCV) results. If the final Grade 12 NSC or NCV results do not meet the minimum entrance requirements, this provisional / conditional acceptance will be automatically withdrawn.

5.3.3 Duration of Programme

- DUT Rules G23B(2) (G23B) apply (3)
- The programme will be offered on a full-time basis over 3 years.

5.3.4 Promotion to a Higher Level/ Progression Rules

- The DUT Rule G16 applies.
- A student will be permitted to re-register, provided they have passed a minimum of 75% of the module credits allocated to each year. (See below 6. Exclusion Rules).
- At the end of any year, if the student has not met the progression rules, he/ she may appeal to re-register, provided that he/she can complete the qualification within the maximum duration of the programme as per General Rule G23B(3).

5.3.5 Exclusion Rules

- In addition to DUT Rule G17, a first-year student who fails three or more modules with an average of less than 40% in each of the failed module is not permitted to re-register in this programme. De-registration from any modules is subject to the provision of DUT Rule G6A(2).
- Students who are excluded based on the above rule, will be permitted to submit an appeal to the Head of Department, in the first instance. Where the appeal is unsuccessful, students will be permitted a second level appeal to the Dean's Office. Appeals may be approved conditionally.
  Where the appeal is successful, either in the first or second instance, the student will be permitted to register. Where the appeal is rejected the student will not be permitted to continue with the programme.
- In addition to Rule G6B, students who interrupt their studies by more than two years may be required to undergo an assessment to prove currency of appropriate knowledge prior to being granted permission to continue with registration.

5.3.6 Assessment Rules

- The DUT Rule G12 applies.
- In addition to rule G12(1), a sub-minimum of 40% is required for the practical component of all chemistry subjects in which the semester mark is made up of both theory and practical components. (See modules with a *** in the Programme Structure above) *(Approved at the Senate meeting on the 30 August 2023).*

6. ADVANCED DIPLOMA IN CHEMISTRY (ADCHE1 AND ADCHE2)

Purpose of Qualification

The Advanced Diploma in Chemistry represents a level of qualification that recognizes the ability to gain and apply a range of new knowledge, skills and understanding designed not only to meet the needs of various chemical industries, but also to provide the most appropriate preparation for further study. The curriculum therefore builds upon and advances the fundamental areas of study in chemistry: organic, physical, inorganic and analytical chemistry, along with a rich set of research- focused and instrumentation intensive laboratory experiences aligned with those areas. Graduates can obtain employment as chemical laboratory technologists/chemists in quality control, research and development or teaching laboratories. This course allows entry into the Postgraduate Diploma in Chemistry.

6.1(A) PROGRAMME STRUCTURE (ADCHE1)

Code	Module	Study Level	NQF Level	Module Credits	C/E	Pre-Req	Co-Req	Stream	Exam
FULL-TIME OPTION (1 YEAR)									
INOC401	Inorganic Chemistry IV	Ia	7	20	C	Nil	Nil	N/A	Yes
ORGC401	Organic Chemistry IV	Ia	7	20	C	Nil	Nil	N/A	Yes
ANAC401	Analytical Chemistry IV	Ia	7	32	C	Nil	Nil	N/A	Yes
PHYC401	Physical Chemistry IV	Ib	7	20	C	Nil	Nil	N/A	Yes
CHEP401	Chemistry Project IV	Ib	7	32	C	Nil	Nil	N/A	No (CA)

PART TIME -TIME OPTION (2 YEARS): YEAR 1									
INOC401	Inorganic Chemistry IV	Ia	7	20	C	Nil	Nil	N/A	Yes
ORGC401	Organic Chemistry IV	Ia	7	20	C	Nil	Nil	N/A	Yes
PHYC401	Physical Chemistry IV	Ib	7	20	C	Nil	Nil	N/A	Yes
PART TIME -TIME OPTION (2 YEARS): YEAR 1									
ANAC401	Analytical Chemistry IV	Ia	7	32	C	Nil	Nil	N/A	Yes
CHEP401	Chemistry Project IV	Ib	7	32	C	Nil	Nil	N/A	No (CA)
	Minimum Total Credits to Graduate			124					

Key: Ia = first semester; Ib = second semester; C = Compulsory; E = Elective

6.1(B) PROGRAMME STRUCTURE (ADCHE2)

Code	Module	Study Level	NQF Level	Module Credits	C/E	Pre-Req	Co-Req	Stream	Exam
FULL-TIME OPTION (1 YEAR)									
RMSC401	Research Methodology & Statistics	Ia	7	12	C	Nil	Nil	N/A	No (CA)
ORGC401	Organic Chemistry IV	Ia	7	20	C	Nil	Nil	N/A	Yes
ANAC401	Analytical Chemistry IV	Ia	7	32	C	Nil	Nil	N/A	Yes
PHYC401	Physical Chemistry IV	Ib	7	20	C	Nil	Nil	N/A	Yes
INOC401	Inorganic Chemistry IV	Ib	7	20	C	Nil	Nil	N/A	Yes
CHEP401	Chemistry Project IV	Ib	7	20	C	Research Methodology & Statistics	Nil	N/A	No (CA)

PART TIME -TIME OPTION (2 YEARS): YEAR 1									
ORGC401	Organic Chemistry IV	Ia	7	20	C	Nil	Nil	N/A	Yes
PHYC401	Physical Chemistry IV	Ib	7	20	C	Nil	Nil	N/A	Yes
INOC401	Inorganic Chemistry IV	Ib	7	20	C	Nil	Nil	N/A	Yes
PART TIME -TIME OPTION (2 YEARS): YEAR 1									
ANAC401	Analytical Chemistry IV	Ia	7	32	C	Nil	Nil	N/A	Yes
RMSC401	Research Methodology & Statistics	Ia	7	12	C	Nil	Nil	N/A	No
CHEP401	Chemistry Project IV	Ib	7	20	C	Research Methodology & Statistics	Nil	N/A	No (CA)
	Minimum Total Credits to Graduate			124					

KEY:
Ia = first semester; Ib = second semester; C = Compulsory; E = Elective

6.2 PROGRAMME INFORMATION

6.2.1 Duration of Programme

In accordance with DUT Rules G21C(2) and G21C(3), the duration of the programme is as follows:
The minimum duration is one year of full-time study.

6.3 PROGRAMME RULES

6.3.1 Minimum Admission Requirements

In addition to DUT rules G7 and G21C(1), applicants must be in possession of the following minimum admission entry requirements into this programme:

- National Diploma in Analytical Chemistry; or
- Diploma in Analytical Chemistry; or
- A recognized equivalent qualification at NQF Level 6.

6.3.2 Selection Criteria

Entry into the Advanced Diploma in Chemistry 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, based on their performance in all S3 and S4 modules.

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 Promotion to a Higher Level/Progression Rules

- **Qualification Code: ADCHE1**

  The DUT Rule G16 applies. *(Approved at the Senate meeting on the 3 September 2019).*

- **Qualification Code: ADCHE1**

  In accordance with DUT Rule G16, students must pass the prerequisite module to move to the next semester of the qualification. Students must pass Research Methodology & Statistics in the first semester in order to enroll for the Chemistry Project IV in semester 2.

6.3.5 Exclusion Rules

DUT Rules G17 and G21C(3) apply.

6.3.6 Interruption of Studies

The DUT Rule G6B pertaining to interruption of studies will apply.

7. POSTGRADUATE DIPLOMA IN CHEMISTRY (PGDCH1)

Purpose of Qualification

The Postgraduate Diploma in Chemistry (PGDCH1) serves the purpose of allowing for specialisation in Chemistry. It extends and deepens knowledge and skills attained in the Advanced Diploma, whilst focusing on enabling working professionals to apply critical thinking in more complex and contemporary fields of study. In addition, the Postgraduate Diploma in Chemistry prepares students for further research-based postgraduate study with an all-inclusive supervised research component leading to research outputs. This qualification allows entry into the M AppSc degree in Chemistry.

7.1 PROGRAMME STRUCTURE (1 YEAR) (PGDCH1)

Code	Module	Study Level	NQF Level	HEQSF Credits	Compulsory/ Elective	Pre-Requisite	Assessment
INCH801	Inorganic Chemistry V	1a	8	20	C	N/A	EX
ORCH801	Organic Chemistry V	1a	8	20	C	N/A	EX
ANCH801	Analytical Chemistry V	1a	8	20	C	N/A	EX
SCGY801	Scientific Methodology	1a	8	8	C	N/A	CA*
PHCH802	Physical Chemistry V	1b	8	20	C	N/A	EX
CHPR802	Chemistry Project V	1b	8	32	C	Scientific Methodology	CA*
	Minimum Total Credits to Graduate			120			

KEY:
Total number of credits for Graduation 120
*CA = Modules are Continuously Assessed
Study level: 1a = Year1, Semester1 and 1b = Year 1, Semester 2
A Pre-Req (prerequisite) means this module must be passed prior to registration for the subsequent module.

7.2 PROGRAMME INFORMATION

7.2.1 Duration of Programme

Students will register full-time and complete the modules in one year as in Table 9.1. The DUT Rules G22B(2) and G22B(3) apply.

7.3 PROGRAMME RULES

7.3.1 Minimum Admission Requirements

In addition to DUT rules G7 and G22B, applicants must be in possession of the following minimum admission entry requirements into this programme:

7.3.1.1 Advanced Diploma in Chemistry.

7.3.1.2 or a recognized equivalent qualification at NQF Level 7.

7.3.2 Selection Criteria

In addition to the Minimum Admission Requirements, final selection will be based on the following:

i) Applicants who meet the minimum requirements will be ranked based on academic performance.

ii) The number of available places in the programme. (Refer to DUT Rule G5).

iii) 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.

7.3.3 Promotion to a Higher Level/Progression Rules

The DUT Rule G16 applies.

7.3.4 Exclusion Rules

The DUT Rules G17 and G22B (3) apply.

7.3.5 Interruption of Studies

The DUT Rule G6 (2) applies.

(Approved at the Senate meeting on the 11 March 2021).

8. MASTER OF APPLIED SCIENCE IN CHEMISTRY (MSCMS1)

Purpose of Qualification

The purpose of the Masters qualification is aimed at the different areas of chemistry research coupled with high-end instrumental analysis. The Masters candidate is required to demonstrate the ability to make an informed decision on the appropriate methodology, choice of analytical instruments and to communicate ideas and results scientifically.

8.1 PROGRAMME STRUCTURE (1 YEAR) (MSCMS1)

Code	Module	Period of Study	Assessment Method	SAQA Credits
RTCM511	Research Dissertation (1st Reg)	Annual	Research Project	180
RTCM521	Research Dissertation (2nd Reg)			
RTCM531	Research Dissertation (3rd Reg)			
RTCM541	Research Dissertation (4th Reg)			

8.2 PROGRAMME INFORMATION

The curriculum consists of a research project and dissertation.

8.3 PROGRAMME RULES

8.3.1 Postgraduate Publications Requirements for Completion of the Degree

Master's students are required to have: -

- ONE publication submitted to a DHET approved journal prior to completion of the degree.

8.3.2 Minimum Admission Requirements

In addition to Rule G24(1) applicants must be in possession of a Postgraduate Diploma in Chemistry or equivalent cognate qualification at NQF Level 8.

The DUT General Rule G10A will apply for candidates applying for admission via Conferment of Status and Rule G10B will apply for candidates applying for Advanced Standing via Recognition of Prior Learning (RPL).
(Approved at the Senate meeting on the 8 March 2023).

8.3.3 Duration of Programme

The DUT Rule G24 (2) applies.

9. DOCTOR OF PHILOSOPHY IN CHEMISTRY (DPCMS1)

Purpose of Qualification

The purpose of the doctoral qualification is to develop new knowledge and research that is novel, innovative and technologically driven. The doctoral candidate is required to demonstrate high level research capability and to make a significant and original academic contribution to solving societal problems.

9.1 PROGRAMME STRUCTURE (2 YEARS) (DPCMS1)

Code	Module	Period of Study	Assessment Method	SAQA Credits
RTCM611	Research Thesis (1st Reg)	Annual	Research Project	360
RTCM621	Research Thesis (2nd Reg)			
RTCM631	Research Thesis (3rd Reg)			
RTCM641	Research Thesis (4th Reg)			
RTCM651	Research Thesis (5th Reg)			

9.2 PROGRAMME INFORMATION

The curriculum consists of a research project and dissertation.

9.3 PROGRAMME RULES

9.3.1 Postgraduate Publications Requirements for Completion of the Degree

Doctoral students are required to have: -

- ONE publication accepted by a DHET approved journal; and
- ONE publication submitted to a DHET approved journal, prior to completion of the degree

9.3.2 Minimum Admission Requirements

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

9.3.3 Duration of Programme

The DUT Rule G25 (2) applies.

10. SERVICED MODULES

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

SERVICED DEPARTMENT	SERVICE MODULE	MODULE CODE
Department of Mathematics	Mathematics 1	MATH101
Department of Physics	Physics 1	PHSA102
Department of English and Communication	Communication	CSK1103
Department of Information Technology	Computer Skills 1	CSCC101
Centre for General Education	Cornerstone 101	CSTN101
Dept. of Media, Language and Communication	Cultural Diversity	CLDV101
Department of Entrepreneurial Studies	Introduction to Technopreneurship	ITCH101
Department of Horticulture	Sustainable Earth Studies	SERS101
Department of Human Resources Management	Values in the Workplace	VWKP101
Department of Applied Law	Constitutional Law & Human Rights	CLHR101
Centre for General Education	Leadership	LDSH101
Department of Food and Nutrition	Community Engagement & Development	ASCE101
Department of Mathematics	Mathematics 1A and 1B	SMTA101
Department of Physics	Physics 1	PYC1101
Department of Maritime Studies	Applied Sciences for Sustainable Development	ASES101
Department of Statistics	Applied Statistics	APLS102
Centre of GENED	Kwazulu Natals Maritime Heritage	KZNM101
Centre of GENED	Introduction to Technoprenuership	ITCH101
Department of Chemical Engineering	Chemical Industrial Process & Chemical Process fundamentals	CHPF201 &CHPF201
Department of Biotechnology and Food Science	Role of Applied Science in Society	RASS101
Centre of GENED	Work Preparedness	WKPR101

The following modules are serviced from this department:

SERVICED PROGRAMME	MODULE NAME	MODULE CODE
Bachelor of Health Science in Biomedical Technology	Chemistry	CMTR101
Bachelor of Health Science: Medical Care	Chemistry	CMTR101
Bachelor of Applied Science in Biotechnology	Chemistry I	CSRY101
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
	Engineering Chemistry IIA	ENCM201
Bachelor of Health Science in Clinical Technology	Chemistry	CMTR101
ND: Dental Technology	Physics and Chemistry I	PHCD121
ND: Emergency Medical Care and Rescue	Basic Science I (Annual)	BSCN101
ND: Environmental Health	Physics & Chemistry I (Annual)	PHCM111
Bachelor of Health Science in Environmental Health	Chemistry I	CHMT101
ND: Food and Consumer Science Diploma in Consumer Sciences in Food and Nutrition	Physical Science I (Annual) Chemistry I	PSCN101 APSC 101
Diploma in Consumer Sciences in Food and Nutrition	Chemistry I	APSC 101
Bachelor of Applied Science in Food Technology	Chemistry I	CSRY101
Bachelor of Health Science in Homeopathy	Chemistry I	CHHC101
Bachelor of Health Science in Chiropractic	Chemistry I	CHHC103
Higher Certificate in Applied Sciences	Chemistry I	CHEM102
ND: Pulp & Paper Technology	Chemistry IA	CHEM102
	Physical Chemistry II	PHCH201
Diploma: Pulp & Paper Technology	Chemistry A	CHME101
	Chemistry B	CHME102
	Chemistry C	CHME103
Bachelor of Health Sciences: Radiotherapy Nuclear Medicine Diagnostic Sonography Diagnostic Radiography	Chemistry	CSTY101
ND: Somatology	Science I : Chemistry	SCCH101
ND: Somatology	Science II	SCCS201
Diploma in Textile Technology	Chemistry I	CHSY101
Bachelor of Applied Sciences: Textile Science	Chemistry	CHEM101
Bachelor of Health Sciences in Dental Technology	Chemistry	CHMS101

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)
- Laboratory Personnel Management (12 weeks)
-

For further details, please contact:

Centre for Continuing Professional Education (CCPE)
Philiswa Charity Dlamini
Phone : 031 3736016 / 7
Email : philiswad@dut.ac.za
Selisha Ramduth
Email : selishar@dut.ac.za

12. MODULE CONTENT

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

12.1 DEGREE OF BACHELOR OF APPLIED SCIENCE IN INDUSTRIAL CHEMISTRY (BASIC1)

MTTS101 - MATHEMATICS 1A

CONTACT TIME (Periods per week) Theory

ASSESSMENT

Continuous Assessment

Contact Learning:	40%
Groups Discussion:	10%
Self- Study, Direct Learning:	25%
Self- Study, Individual Managed Learning:	25%

Learning takes place in formal lectures, tutorials, and lab/software-based exercises.

SYLLABUS: Perform, analyse and apply operations in basic algebra including logarithms, exponents and hyperbolic functions. Apply, solve, manipulate, and explore relationships in trigonometry. Identify, manipulate, and use complex numbers.

PYCI101 – PHYSICS 1

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)

ASSESSMENT

Continuous Assessment

Lecture/ Presentation, Brainstorming:	35%
Practicals:	10%
Group Discussions:	5%
Self-Study, direct learning:	25%
Self- Study, Individual Management	25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorials/ Oral Presentations

SYLLABUS: Understand and apply the concepts and introductory principles of physics related to Mechanics, Properties of matter, Electrostatics, DC Electricity, Magnetism and Physical and Geometrical Optics.

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.

CMSK101 - COMPUTER SKILLS 1

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)

ASSESSMENT

Continuous Assessment

Assessment 1 Theory (Online MCQ):	30%
Assessment 2 Word Processors (online MCQ test):	25%
Assessment 3 Excel Spreadsheets (online MCQ test):	25%
Assessment 4: Project & presentation or group project	20%

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

ICHM101 – INDUSTRIAL CHEMISTRY 1A

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming:	35%
Practicals:	10%
Group Discussions:	5%
Self-Study, direct learning:	25%
Self- Study, Individual Management	25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Comprehend and apply the concepts and principles of general and inorganic chemistry applicable to industrial chemistry. Perform safe laboratory manipulations and to handle glassware and equipment. Communicate scientific information appropriately both orally and through written work.

KZNM101- KWAZULU-NATAL'S MARTIME HERITAGE

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Continuous Assessment

Formal Lectures and Assessments:	40%
Self- Study- Directed Learning:	30%
Self- Study- Individual managed learning	30%

The practical tests will be set in the students' practical time. (Each group will have their own test).

Assessment 1- 30% class tests, research assignment, or poster assignment.

Assessment 2- 30% - class tests, research assignment, or poster assignment Assessment 3 – 40% class tests, research assignment, or poster assignment

SYLLABUS: Socio-economic issues, Environmental issues, Landmarks and historical shipwrecks, The present maritime services offered and industries located in KZN The future of KZN's maritime industry including the planned dugout port and the Durban to Gauteng Freight Corridor, Ship types including, but not limited to, container, tankers, bulk carriers, general cargoes, etc. Cargo types including, but not limited to, containerised cargoes, coal, oil cargoes, chemical cargoes, automobiles, etc.

RASS101 – ROLE OF APPLIED SCIENCE IN SOCIETY

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Continuous Assessment

Written Assignment or Poster:	25%
Presentations:	25%
Tests:	25%
Project:	25%

SYLLABUS: Discuss the scientific approach and its ethical implication for society. Explain the relevance of the scientific approach to contemporary issues in society. Describe and critique the different modes of scientific communication.

MTTS102 – MATHEMATICS 1B

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Continuous Assessment

Contact- lecture presentation:	40%:
Group Discussions:	10%
Self-Study, direct learning:	25%
Self- Study, Individual Management	25%

SYLLABUS: Define and apply matrices. Represent functions as power series Apply basic and more advanced differentiation rules/ techniques to partially differentiate simple algebraic and trig functions. Identify and solve first order differential equations.

IDCH102 – INDUSTRIAL CHEMISTRY 1B

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming:	35%
Practicals:	10%
Group Discussions:	5%
Self-Study, direct learning:	25%
Self- Study, Individual Management	25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Comprehend and apply the concepts and principles of organic and physical chemistry applicable to industrial chemistry. Perform safe laboratory manipulations and to handle glassware and equipment. Communicate scientific information appropriately both orally and through written work.

ITCH101 – INTRODUCTION TO TECHNOPRENEURSHIP

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Continuous Assessment

Tests:	50%
Individual Participation/ Graduate Attributes:	10%
Group written assignment:	20%
Group Oral Presentation to Panel:	20%

SYLLABUS: Apply their intellectual and practical skills, including written and oral communicative competence in language, numeracy and technology applications to explore the topic of Technopreneurship. Identify innovation and creative initiative in terms of their personal goal, development, and self-awareness.

Course Mark

APLS102– APPLIED STATISTICS

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Continuous Assessment

Contact- Learning/ presentation:	40%
Self- Study- Directed Learning:	30%
Self- Study- Individual managed learning	30%

The practical tests will be set in the students' practical time. (Each group will have their own test).

Assessment 1- 25% minor test comprising of multiple-choice questions and short answer.

Assessment 2- 20% - assignment

Assessment 3 – 15% group project

Assessment 4 – 40% Major test

SYLLABUS: Analyze data sets and summarize their main characteristics with visual methods. Determine and apply the most appropriate statistical analysis and reporting procedures for a specific statistical problem. Apply probability theory, regression and correlation analysis, statistical estimation and hypothesis testing to draw valid inferences from the data and to make predictions.

CHIP201 – CHEMICAL INDUSTRIAL PROCESSES 2A

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Contact Learning- Lecture/ Presentation:	40%

Group Discussions:	10%
Self-Study, direct learning:	25%
Self- Study, Individual Management	25%

This is an examination module weighted as below:

Test 1- 40%

Test 2- 40%

Project 20%

SYLLABUS: perform heat transfer calculations for planar, radial, and spherical systems. Perform design and thermal performance calculations for double- pipe and shell-and-tube heat exchangers using LMTD approach. Perform mass transfer calculations for steady state molecular diffusion, convective mass transfer and mass transfer across an interface. Comprehend the application of chemistry on an industrial scale.

IOCM201 – INORGANIC CHEMISTRY METHODS 2

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming:	35%
Practicals:	10%
Group Discussions:	5%
Self-Study, direct learning:	25%
Self- Study, Individual Management	25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Comprehend and apply the fundamental principles of inorganic chemistry. Perform safe laboratory manipulation and handling of the inorganic techniques/ apparatus used in the synthesis of the inorganic compounds. Communicate scientific information appropriately both orally and through written work. Interpret data or other scientific information using graphs, tables, figures and symbols.

CHPF201 – CHEMICAL PROCESS FUNDAMENTALS

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming:	40%
Group Discussions:	10%
Self-Study, direct learning:	25%

Self- Study, Individual Management 25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Test 1- 40%

Test 2- 40%

Assignment 1 – 20%

Final Examination- 100%

SYLLABUS: Formulate and solve steady state overall of the following: material balances, energy balance and combined material and energy balances. Utilize basic engineering units in both SI and imperial systems in solving problems and be able to interconvert between unit systems. Develop problem solving skills which will enable them to determine the physical properties and the behavior of gases and liquids.

OCMD201 – ORGANIC CHEMISTRY METHODS 2

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming: 35%

Practicals: 10%

Group Discussions: 5%

Self-Study, direct learning: 25%

Self- Study, Individual Management 25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Apply rules and guidelines for synthesizing organic compounds. Perform safe laboratory manipulation and handling of the organic techniques/ apparatus used in synthesis and natural products. Communicate scientific information appropriately both orally and through written work.

CHIP202 – CHEMICAL INDUSTRIAL PROCESSES 2B

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming: 40%

Group Discussions: 10%

Self-Study, direct learning: 25%

Self- Study, Individual Management 25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Test 1- 50%

Test 2- 50%

SYLLABUS: Introduction to Distillation Operations, Vapor- Liquid Equilibria, Distillation of Binary Mixtures, Distillation Operation Basics, Gas Absorption, Liquid Extraction.

PYCM201– PHYSICAL CHEMISTRY METHODS 2

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming: 35%

Practicals: 10%

Group Discussions: 5%

Self-Study, direct learning: 25%

Self- Study, Individual Management 25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Comprehend and apply the concepts and principles of general and physical chemistry methods in chemical industry. Perform safe laboratory manipulations and to handle glassware and physical chemistry equipment. Communicate scientific information appropriately both orally and through written work.

INSA202 – INSTRUMENTAL ANALYSIS

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming: 35%

Practicals: 10%

Group Discussions: 5%

Self-Study, direct learning: 25%

Self- Study, Individual Management 25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

Assessment 1- 60%- practical reports

Assessment 2- 40% - theory of practical test

SYLLABUS: Electro analytical techniques, thermo analytical techniques, characterizations techniques, Separation methods, atomic spectroscopy and molecular spectroscopy.

WACH202 – WET ANALYTICAL CHEMISTRY METHODS

CONTACT TIME (Periods per week) Theory and demonstration of practical (3) **ASSESSMENT**

Course Mark

Lecture/ Presentation, Brainstorming:	35%
Practicals:	10%
Group Discussions:	5%
Self-Study, direct learning:	25%
Self- Study, Individual Management	25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Measurements and Stoichiometry, Titrimetric Analysis, Advanced Titrimetric Analysis, Gravimmetric Analysis.

WKPR101 – WORK PREPAREDNESS

CONTACT TIME (Periods per week) Theory and demonstration of practical (3) **ASSESSMENT**

Continuous Assessment

Course Mark

Written Tests:	60%
Assignment (Individual):	30%
Tutorials:	10%

SYLLABUS: Describe the types of business within the industry of their choice using appropriate terminology and simple quantitative terms. Search for, apply for, and be interviewed for a potential job or WIL placement. Identify and develop non-technical skills to manage their own time, health and safety in the workplace.

CHRP302– RESEARCH PROJECT

CONTACT TIME (Periods per week)

Theory and demonstration of practical (3) **ASSESSMENT**

Continuous Assessment

Course Mark

Contact- Research Methodology: 30%
Self- Study: 70%

SYLLABUS: Formulating a research topic, Scientific research, sampling and Data Analysis, Sampling Data, Writing and presenting skills, research methodology.

PYCM302– PHYSICAL CHEMISTRY METHODS 3

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming: 35%
Practicals: 10%
Group Discussions: 5%
Self-Study, direct learning: 25%
Self- Study, Individual Management 25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Thermodynamics, Physical Equilibria, Chemical Equilibria, Chemical Kinetics, Quantum Chemistry, Solid Surfaces.

IOCM301 – INORGANIC CHEMISTRY METHODS 3

CONTACT TIME (Periods per week) Theory and demonstration of practical (3)
ASSESSMENT

Course Mark

Lecture/ Presentation, Brainstorming: 35%
Practicals: 10%
Group Discussions: 5%
Self-Study, direct learning: 25%
Self- Study, Individual Management 25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Heterogeneous Catalysts, Homogenous Catalysts, Organometallic chemistry, Chemistry of Lanthanides and Actinides.

ASES101 – APPLIED SCIENCES FOR SUSTAINABLE DEVELOPMENT

CONTACT TIME (Periods per week) Theory and demonstration of practical (3) **ASSESSMENT**

Continuous Assessment

Course Mark

Formal lecturers and assessments: 40%

Directed learning: 30%

Self- Managed leaning 30%

The practical tests will be set in the students' practical time. (Each group will have their own test).

SYLLABUS: Introduction to sustainable development, Environmental Sustainability, food security practicals.

OCHD301 – ORGANIC CHEMISTRY METHODS 3

CONTACT TIME (Periods per week) Theory and demonstration of practical (3) **ASSESSMENT**

Course Mark

Lecture/ Presentation, Brainstorming: 35%

Practicals:

10%

Group Discussions:

5%

Self-Study, direct learning: 25%

Self- Study, Individual Management 25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Retrosynthesis for synthesizing organic compounds, apply spectroscopic techniques to characterize organic compounds.

PACH301 – APPLIED ANALYTICAL CHEMISTRY

CONTACT TIME (Periods per week) Theory and demonstration of practical (3) **ASSESSMENT**

Course Mark

Lecture/ Presentation, Brainstorming: 35%

Practicals: 10%

Group Discussions:

5%

Self-Study, direct learning: 25%
Self- Study, Individual Management 25%

The practical tests will be set in the students' practical time. (Each group will have their own test).

This is an examination module weighted as below:

Assessment 1- 35%- written test

Assessment 2- 35% - written test

Assessment 3 – 20% practical reports

Assessment 4 – 10% Assignments/ Tutorial/ Oral Presentations

SYLLABUS: Electro analytical techniques, thermo analytical techniques, separation techniques, spectroscopic techniques.

12.2 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.

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-MATHEMATICS1

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 1.5hour 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: Communicatio 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

Course Mark

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. Colligative properties and electrochemistry. Organic chemistry involving saturated anunsaturated 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 example

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:	20%
Peer Assessment:	20%

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 2 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 2 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 2 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 2 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); Tutorial (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)

ASSESSMENT

Continuous Assessment

Test	15%
Test 2	25%
Assignment on a soft skills topic	30%
EXLN Class Performance Rubic	30%

The Rubic mark is calculated in % after summing up the ratings as per spreadsheet – (Refer to the Chemistry WIL manual for the spreadsheet).

SYLLABUS: Report writing skills, CVs, Basic Statistics using Spread Sheets, Power Point Slides & Interpersonal skills.

CHPJ101- CHEMISTRY PROJECT I (WIL)

ASSESSMENT

Continuous Assessment

Assignment 1	33%
Assignment 2	34%
Assignment 3	33%

If the student opts to improve his/her mark by doing an additional assignment, an average of the mark for the Assignment 2 and the "make up" Assignment will be

counted as the mark for Assignment 2. Assignment difficulty: 3>1> Make-up > 2.)
SYLLABUS: Research Methodology and topics related to industry

ASCE101 – COMMUNITY ENGAGEMENT AND DEVELOPMENT

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

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

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)

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

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

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

Covers Community, institution, faculty and student's perspectives.

EXLN201- EXPERIENTIAL LEARNING II (WIL)

ASSESSMENT

Continuous Assessment

Laboratory Work:	50%
Performance Appraisal:	50%

CHPJ201- CHEMISTRY PROJECT II (WIL)

ASSESSMENT

Continuous Assessment

Written Report:	50%
Oral Presentation:	50%

12.3 ADVANCED DIPLOMA IN CHEMISTRY (ADCHE1 & ADCHE2)

ANAC401 – ANALYTICAL CHEMISTRY IV

CONTACT TIME (Periods per week)

Theory and demonstration of practical (11)

ASSESSMENT

Course Mark

60% theory + 40% practicals sub-minimum of 40%

Examination: 3 hour written examination

Final Mark: 40% course mark + 60% exam mark

SYLLABUS: ICP-VGA/ETA, X-Rays, ICP-MS, NIR/MIR, Raman, Pulse Methods and CV, Thermal Methods, LC/GC-MS

ORGC401-ORGANIC CHEMISTRY IV

CONTACT TIME (Periods per week)

Theory and demonstration of practical (7)

ASSESSMENT

Course Mark

Theory Test:	60%
Practical evaluation/test:	30 %
Assignment, portfolios, presentations:	10%

Examination: 3 hour written examination

Final Mark: 40% course mark + 60% exam mark

SYLLABUS: Infra-Red, Mass Spectroscopy and Nuclear Magnetic Resonance Spectroscopy, Alkaloids, Terpenes, Pericyclic Chemistry, Enolates and Retrosynthesis

INOC401- INORGANIC CHEMISTRY IV
CONTACT TIME (Periods per week)
Theory and demonstration of practical (7)
ASSESSMENT
Course Mark

Theory Test:	60%
Practical evaluation/test:	30 %
Assignment, portfolios, presentations:	10%

Examination: 3 hour written examination
Final Mark: 40% course mark + 60% exam mark

SYLLABUS: Catalysts Heterogeneous and Homogenous Catalysts: Ziegler-Natta and Vanadium pentoxide; Organometallics; Metallurgy: Platinum group metals, First Transition series metals and Coinage metals

PHYC401- PHYSICAL CHEMISTRY IV
CONTACT TIME (Periods per week)
Theory and demonstration of practical (7)
ASSESSMENT
Course Mark

Theory Test:	60%
Practical evaluation/test:	30 %
Assignment, portfolios, presentations:	10%

Examination: 3 hour written examination
Final Mark: 40% course mark + 60% exam mark

SYLLABUS: Advanced thermodynamics: Entropy and Free Energy, Thermochemistry; Advanced electrochemistry: Faradaic Processes, Electrochemical Equations, Liquid- junction Potentials; Advanced chemical kinetics: Reaction Rates, Complex Reactions, Enzyme Catalysis; Advanced surface chemistry: Surface Tension: Young and Laplace Equations; Spreading Dynamics and Adsorption Isotherms

CHEP401- CHEMISTRY PROJECT IV (ADCHE1)
CONTACT TIME (Periods per week)
Theory (2/w term 2)
ASSESSMENT
Continuous Assessment
Research Proposal: written report and oral presentation 3 0 %
Research Project: written report and oral presentation 70%
SYLLABUS: Guidelines for research proposals and preparation of a research proposal, literature review, critical evaluation of literature papers, project management skills in chemistry, laboratory skills, analyses of results, problem solving

in relation to the project, outline of industry standards, particularly within the laboratory, Mathematical and Information Technology skills used in the operation of statistical packages, writing of a research report based on the research project, oral presentation of the research project and Harvard method for referencing.

RMSC401 RESEARCH METHODOLOGY & STATISTICS (ADCHE 2)
CONTACT TIME (Periods per week)
Theory (2/w term 1)
ASSESSMENT
Continuous Assessment
Research Proposal: written report and oral presentation 100%
SYLLABUS: Guidelines for research proposals and preparation of a research proposal, literature review, and critical evaluation of literature papers.

12.2 POSTGRADUATE DIPLOMA IN CHEMISTRY (PDGCH1)

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

ANCH801 – ANALYTICAL CHEMISTRY V

CONTACT TIME (Periods per week)
Theory (3). Practical (3)
ASSESSMENT
Course Mark
Theory: Minimum 2 x tests 60%
Practical: 40%
Final Mark
Examinations: 1 x 3 hour theory examination
Final Mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Atomic Spectroscopy, Chromatography, Thermal Methods, Kinetic Methods, Electrochemistry, Molecular Spectroscopy and Microscopic techniques.

CHRP802 - CHEMISTRY PROJECT V

ASSESSMENT
CONTINUOUS ASSESSMENT
Course Mark
Oral Presentation 40%
Written Report 60%
Final Mark
Continuous assessment: Minimum mark of 50% is required to pass this module.

SYLLABUS: The following are to be done in conjunction with the supervisor:

1. Research methodology
1.1 Reference styles and tools
1.2 Statistical packages
1.3 Plagiarism – to run the Turnitin program
2. Critical evaluation of literature papers
3. Writing of a research report based on the research project
4. Oral presentation of the research project

INCH801 – INORGANIC CHEMISTRY V

CONTACT TIME (Periods per week)

Theory (3) Practical (3)

ASSESSMENT

Course Mark

Theory: Minimum 2 x tests	60%
Practical:	40%

Final Mark

Examinations: 1 x 3 hour theory examination

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

SYLLABUS: Second and third row transition elements; Chemistry of Lanthanides and Actinides; Spectroscopy: Tanabe-Sugano diagrams, Symmetry groups and infrared; Chemistry of materials; Green chemistry; Techniques of characterization; Nano chemistry and nanotechnology; Synthesis of organometallic-ionic liquid catalysts.

ORCH801 - ORGANIC CHEMISTRY V

CONTACT TIME (Periods per week)

Theory (3). Practical (3)

ASSESSMENT

Course Mark

Theory: Minimum 2 x tests	60%
Practical:	40%

Final Mark

Examinations: 1 x 3 hour theory examination

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

SYLLABUS: Coupling reactions; Multi-component reactions; Heterocyclic chemistry; Stereochemistry; Green Chemistry; Retrosynthesis of poly-functional molecules; 2 D-NMR spectroscopy (COSY, HMBC, NOESY, HSQC, DEPT, TOCSY); Poly-functional organic molecules by MS.

PHCH802 – PHYSICAL CHEMISTRY V

CONTACT TIME (Periods per week)

Theory (3). Practical (3)

ASSESSMENT

Course Mark

Theory: Minimum 2 x tests	60%
Practical:	40%

Final Mark

Examinations: 1 x 3 hour theory examination

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

SYLLABUS: Advanced phase separation technology; Introduction to computational theory and calculations in the application of advanced thermodynamics; Electrochemical methods to understand, evaluate and solve corrosion chemistry problems; Electroplating theory and techniques; Fractionation and application of biomass components; Nanotechnology based electrochemical application; Photovoltaic cells theory and applications; Solid state chemistry and crystallography; Development of biosensors.

SCGY801 - SCIENTIFIC METHODOLOGY

CONTACT TIME (Periods per week)

Theory (1)

ASSESSMENT

Course Mark

One Assignment (literature review)	20%
1 x Test (Statistics)	20%
1 x Proposal writing skills evaluation (proposal report)	20%
1 x Oral presentation (proposal)	40%

Final Mark

A final mark of 50% is required to pass the module

SYLLABUS: The nature of scientific methodology; Formulating a research topic; Scientific research strategy. The use of statistics for experimental and data analysis design. Guidelines for research proposals and preparation of a research proposal. Literature review stating the aims and significance of the proposed research in conjunction with relevant literature papers.

E&OE