2019 HANDBOOK
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"
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I. 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
Email: spha@dut.ac.za
Location: Block S4 Level 3, Steve Biko Campus

Executive Dean:
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, NH Dip (TN), MTech (DIT), PhD (DUT)

**Professor**
- Prof K Bisetty, BSc (Hons) (UDW), UHDE (UDW)
- NH Dip (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), NH Dip (MLST), MSc (UN), PhD (UN)

**Senior Lecturers**
- Dr P Mdluli, BSc (Hons) (UZ), MSc (UKZN), PhD (UZ)
- Dr MH Mabaso, NH Dip (TN), HDE (UN), MSc (ETS), PhD (DUT)
- Dr LM Madikizela, MTech (DUT), PhD (WITS)
- Dr TH Mokhothu, BSc (Hons) (UFS), MSc (UFS), PhD (UFS)
- Dr V Paul, MTech (MLST), B Tech: Bus Admin (DUT), PhD (DUT)

**Lecturers**
- Mr TR Makhanya, B Tech (DUT), MTech (DUT)
- Ms P Ntola, MTech (DUT)
- Dr MI Sabela, B Tech (DUT), MTech (DUT), PhD (DUT)
- Dr MM Mahlambi, BSc (Uniswa), MSc (UJ), PhD (UJ) ***

**Secretary**
- Ms K Ferguson, NC: Secretarial

**Senior Technicians**
- Mr SR Chetty, NH Dip (MLST) ***
- Mr N Ramnarayan, NDip (MLST)

**Technicians**
- Ms NM Xhakaza, B Tech (MLST), MTech (DUT)
- Ms D Naicker, B Tech (MLST)
- Mr R Ramkrepal, B Tech (MLST)
- Mr G Nursayhe
- Ms NP Cele, B Tech (MLST), MTech (DUT)
- Ms SS Zungu, B Tech (DUT), MAppSci (DUT) ***

**Technical Assistant**
- Mr SL Majola, NDip (DUT), B Tech (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)

*Contract
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)

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<td>72210</td>
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* 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)

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject Offering</th>
<th>Semester</th>
<th>Compulsory/Elective</th>
<th>Assessment Method</th>
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</table>
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). 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 simultaneously for the following semesterised theoretical and annual practical 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 (CENG101)
12 SAQA Credits

Practical Annual 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 (CENG101) 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 subject 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 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.sacnas.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:

<table>
<thead>
<tr>
<th>Compulsory Subjects</th>
<th>NSC Rating</th>
<th>SC HG</th>
<th>SC SG</th>
<th>NCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>4</td>
<td>D</td>
<td>B</td>
<td>60%</td>
</tr>
<tr>
<td>English</td>
<td>4</td>
<td>D</td>
<td>B</td>
<td>50%</td>
</tr>
<tr>
<td>Physical Science</td>
<td>3</td>
<td>E</td>
<td>C</td>
<td>50%</td>
</tr>
</tbody>
</table>

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 Semesters 5 and 6
Students must pass ALL Analytical Chemistry III modules

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 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)

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

**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 in 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

<table>
<thead>
<tr>
<th>Compulsory Subject</th>
<th>NSC Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Physical Science</td>
<td>4</td>
</tr>
<tr>
<td>One 20 credit subject</td>
<td>3</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Compulsory Subjects</th>
<th>HG</th>
<th>SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>D</td>
<td>B</td>
</tr>
<tr>
<td>Physical Science</td>
<td>D</td>
<td>B</td>
</tr>
</tbody>
</table>

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)*

<table>
<thead>
<tr>
<th>Compulsory Subjects</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>50%</td>
</tr>
<tr>
<td>Mathematics</td>
<td>50%</td>
</tr>
<tr>
<td>Physical Sciences (or recognised equivalent)</td>
<td>60%</td>
</tr>
</tbody>
</table>

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:-

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Achievement</td>
<td>70%</td>
</tr>
<tr>
<td>• Average percentage of all compulsory subjects (refer to 4.3.1.1 above)</td>
<td></td>
</tr>
<tr>
<td>Placement Testing</td>
<td>30%</td>
</tr>
</tbody>
</table>

- 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) (NDANFI)
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.
### PROGRAMME STRUCTURE (4 YEAR)

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

**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 pre-requisites 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 mainstream 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 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 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Subjects</th>
<th>*Assessment</th>
<th>Year of Study</th>
<th>NATED Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACHM412</td>
<td>Analytical Chemistry IV Module 1</td>
<td>Ex</td>
<td>1a</td>
<td>0.100</td>
</tr>
<tr>
<td>ACHM422</td>
<td>Analytical Chemistry IV Module 2</td>
<td>Ex</td>
<td>1b</td>
<td>0.100</td>
</tr>
<tr>
<td>INCH411</td>
<td>Inorganic Chemistry IV Module 1</td>
<td>Ex</td>
<td>1a</td>
<td>0.100</td>
</tr>
<tr>
<td>INCH421</td>
<td>Inorganic Chemistry IV Module 2</td>
<td>Ex</td>
<td>1a</td>
<td>0.100</td>
</tr>
<tr>
<td>ORCH411</td>
<td>Organic Chemistry IV Module 1</td>
<td>Ex</td>
<td>1a</td>
<td>0.100</td>
</tr>
<tr>
<td>ORCH421</td>
<td>Organic Chemistry IV Module 2</td>
<td>Ex</td>
<td>1a</td>
<td>0.100</td>
</tr>
<tr>
<td>PHCH411</td>
<td>Physical Chemistry IV Module 1</td>
<td>Ex</td>
<td>1a</td>
<td>0.100</td>
</tr>
<tr>
<td>PHCH421</td>
<td>Physical Chemistry IV Module 2</td>
<td>Ex</td>
<td>1a</td>
<td>0.100</td>
</tr>
<tr>
<td>CPRJ412</td>
<td>Chemistry Project IV Module 1</td>
<td>CA</td>
<td>1a</td>
<td>0.100</td>
</tr>
<tr>
<td>CPRJ422</td>
<td>Chemistry Project IV Module 2</td>
<td>CA</td>
<td>1b</td>
<td>0.100</td>
</tr>
</tbody>
</table>

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

7.2 Programme Information
Each of the five BTech subjects has been divided into two modules. Students will register full-time and complete the modules in one year as in the table above. The maximum duration for the BTech qualification is two years (G23A(a)(4)) The last registration for BTech will be January 2019 as the programme is being phased out.
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.

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.
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

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject Description</th>
<th>Period of Study</th>
<th>Assessment Method</th>
<th>NATED Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPSC501</td>
<td>Research Dissertation Full Registration</td>
<td>Annual</td>
<td>Research Project</td>
<td>1.000</td>
</tr>
<tr>
<td>RPSC511</td>
<td>Research Dissertation Successive Registration</td>
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</tr>
</tbody>
</table>

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 (DPCMSI)

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

<table>
<thead>
<tr>
<th>Subject</th>
<th>Subject Description</th>
<th>Period of Study</th>
<th>Assessment Method</th>
<th>NATED Credits</th>
</tr>
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<tbody>
<tr>
<td>ADPD701</td>
<td>Research Thesis Full Registration</td>
<td>Annual</td>
<td>Research Project</td>
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<tr>
<td>ADPD711</td>
<td>Research Thesis Successive Registration</td>
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<td></td>
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</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Servicing Department</th>
<th>Serviced Subject</th>
<th>Subject Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Mathematics</td>
<td>Mathematics I</td>
<td>MATH101</td>
</tr>
<tr>
<td>Department of Physics</td>
<td>Physics I</td>
<td>PHSA102</td>
</tr>
<tr>
<td>Department of English and Communication</td>
<td>Communication Skills I</td>
<td>CSK1103</td>
</tr>
<tr>
<td>Department of Information Technology</td>
<td>Computer Skills I</td>
<td>CSCC101</td>
</tr>
</tbody>
</table>
The following subjects are serviced from this department:

<table>
<thead>
<tr>
<th>SERVICED PROGRAMME</th>
<th>SUBJECT NAME</th>
<th>SUBJECT CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Health Science in Biomedical Technology</td>
<td>Chemistry</td>
<td>CMTR101</td>
</tr>
<tr>
<td>ND: Biotechnology</td>
<td>Chemistry IB</td>
<td>CHMB102</td>
</tr>
<tr>
<td></td>
<td>Analytical Chemistry 2 Biological</td>
<td>ACBL201</td>
</tr>
<tr>
<td>Bachelor of Applied Science in Biotechnology</td>
<td>Chemistry I</td>
<td>CSRY101</td>
</tr>
<tr>
<td>ND: Chemical Engineering</td>
<td>Chemistry IA</td>
<td>CHEM102</td>
</tr>
<tr>
<td></td>
<td>Organic Chemistry II</td>
<td>ORCH201</td>
</tr>
<tr>
<td></td>
<td>Inorganic Chemistry II</td>
<td>INCH201</td>
</tr>
<tr>
<td></td>
<td>Physical Chemistry II</td>
<td>PHCH201</td>
</tr>
<tr>
<td>Bachelor of Engineering Technology in Chemical Engineering</td>
<td>Engineering Chemistry IA</td>
<td>ENCA101</td>
</tr>
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<td></td>
<td>Engineering Chemistry IB</td>
<td>ENCB101</td>
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<tr>
<td></td>
<td>Engineering Chemistry IIA</td>
<td>ENCM201</td>
</tr>
<tr>
<td>ND: Chiropractic</td>
<td>Chemistry I (Annual)</td>
<td>CHHC102</td>
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<tr>
<td>Bachelor of Health Science in Clinical Technology</td>
<td>Chemistry</td>
<td>CMTR101</td>
</tr>
<tr>
<td>ND: Dental Technology</td>
<td>Physics and Chemistry I</td>
<td>PHCD121</td>
</tr>
<tr>
<td>ND: Emergency Medical Care and Rescue</td>
<td>Basic Science I (Annual)</td>
<td>BSCN101</td>
</tr>
<tr>
<td>ND: Environmental Health</td>
<td>Physics and Chemistry I (Annual)</td>
<td>PHCM111</td>
</tr>
<tr>
<td>Bachelor of Health Science in Environmental Health</td>
<td>Chemistry I</td>
<td>CHMT101</td>
</tr>
<tr>
<td>ND: Food and Consumer Science</td>
<td>Physical Science I (Annual)</td>
<td>PSCN101</td>
</tr>
<tr>
<td>ND: Food Technology</td>
<td>Chemistry IB</td>
<td>CHMB102</td>
</tr>
<tr>
<td></td>
<td>Analytical Chemistry 2 Biological</td>
<td>ACBL201</td>
</tr>
<tr>
<td>Bachelor of Applied Science in Food Technology</td>
<td>Chemistry I</td>
<td>CSRY101</td>
</tr>
<tr>
<td>Bachelor of Health Science in Homeopathy</td>
<td>Chemistry I (Annual)</td>
<td>CHHC103</td>
</tr>
<tr>
<td>ND: Pulp &amp; Paper Technology</td>
<td>Chemistry IA</td>
<td>CHEM102</td>
</tr>
<tr>
<td></td>
<td>Physical Chemistry II</td>
<td>PHCH201</td>
</tr>
<tr>
<td>ND: Radiography</td>
<td>Radiation Science</td>
<td>RSCI101</td>
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<tr>
<td></td>
<td>Chemistry</td>
<td>CSTY101</td>
</tr>
</tbody>
</table>
### II. 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:
Centre for Continuing Professional Education (CCPE)
Philiswa Charity Dlamini
Phone: 031 3736016 / 7
Email: philiswad@dut.ac.za

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 I**

**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 uMgeni 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.

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**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%)


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**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Tests</td>
<td>30%</td>
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<tr>
<td>Essay</td>
<td>30%</td>
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<tr>
<td>Report</td>
<td>40%</td>
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</tbody>
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**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, coordinates 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)
**VWKPI01 – 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 (5000 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); 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)

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)

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

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 students perspectives

**EXLN201- EXPERIENTIAL LEARNING II (WIL)**

**ASSESSMENT**
**Continuous Assessment**
Laboratory Work: 60%
Performance Appraisal: 40%

**CHPJ201- CHEMISTRY PROJECT II (WIL)**
**ASSESSMENT**
**Continuous Assessment**
Written Report: 50%
Oral Presentation: 50%

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 I (150417112)
OR CHMA101 - CHEMISTRY I (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 (1 hour each): 65%
Practicals: Practicals (15%) & Test (85%): 30%
Tutorial Tests: 5%

Final Mark
Examination: 1 X 3 Hour theory examination
Final mark: Course Mark (40%) + Examination Mark (60%)

SYLLABUS: Introduction to physics; vectors and scalars; motion with constant acceleration; newton’s laws of motion; application of newton’s laws; work, energy and power; elasticity, stress and strain; static fluids; temperature measurement; thermal expansion; heat and calorimetry; electrostatics; direct current circuits; magnetism; wave motion; general optics; structure of the atom and the nucleus; radioactivity.

ACHM103 - ANALYTICAL CHEMISTRY I (150413512)
OR ACHA101 - ANALYTICAL CHEMISTRY I (AUGMENTED) (150413512) (ECP) (NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)

Prerequisite: CHEM102

CONTACT TIME (Periods per week)
Theory (4); Tutorials (1); Practical (6).

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

Final Mark
Examination: 1 x 3 Hour Theory Examination
Final mark: Course Mark (40%) + Examination Mark (60%)

SYLLABUS: Introduction; elementary statistics; laboratory practice and safety; titrimetric analysis; sampling and sample handling; redox titrations; introduction to instrumental analysis; basic report writing
INCH201 - INORGANIC CHEMISTRY II (150416822)
OR INCA201 - INORGANIC CHEMISTRY II (AUGMENTED) (150416822)
(ECP) (NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
Prerequisite: CHEM102
CONTACT TIME (Periods per week)
Theory (2); Tutorial (1); Practical (2).
ASSESSMENT
Course Mark
Theory: 2 x 1 hour tests - 25% each: 50%
Theory of Practical: 10%
Practicals: 40%
Final Mark
Examination: 1 x 3 hour theory paper
Final mark: Course Mark (40%) + Examination Mark (60%)
SYLLABUS: Chemical bonding; solution chemistry; descriptive chemistry of hydrogen and selected elements in Groups 1, 2, 13, 14, 15, 16 and 17.

ORCH201 - ORGANIC CHEMISTRY II (150413822)
OR OCHA201 - ORGANIC CHEMISTRY II (AUGMENTED) (150413822)
(ECP) (NB. This is a continuous assessment subject for ECP students only. As such, there will be no examination and the course mark will be the final mark.)
Prerequisite: CHEM102
CONTACT TIME (Periods per week)
Theory (2); Tutorial (1); Practical (2).
ASSESSMENT
Course Mark
Theory: 2 x 1 hour 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 EXAM101 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%

12.3 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%)


INCH401 - INORGANIC CHEMISTRY IV comprises INCH411 and INCH421 in 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 PHCH421 in 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