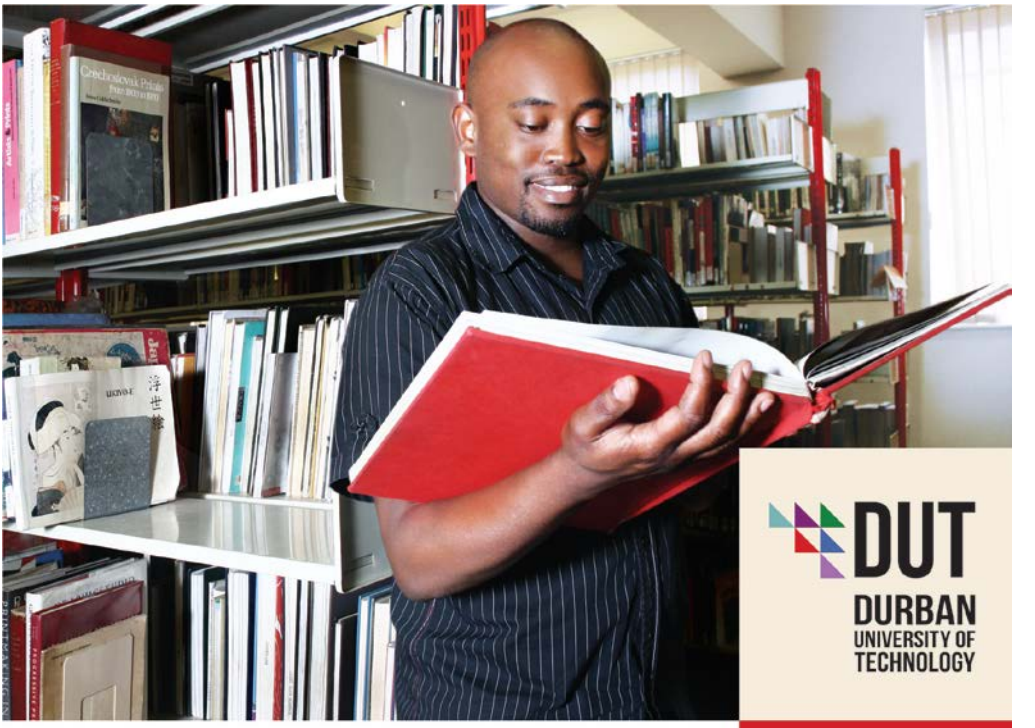

DUT
DURBAN UNIVERSITY OF TECHNOLOGY

2017 HANDBOOK
SCHOOL OF EDUCATION

FACULTY OF ARTS & DESIGN

HANDBOOK FOR 2017

FACULTY OF ARTS AND DESIGN

SCHOOL OF EDUCATION

MISSION of SCHOOL OF EDUCATION

Promotion of quality teaching, learning and research in educational institutions by:

- Empowering students with knowledge, skills and values relevant to their careers.
- Encouraging innovative teaching and learning in education.
- Promoting active research in education to benefit communities and societies.

The School of Education will achieve this by:

- Considering pre-service and in-service education and training as parts of the same professional development continuum;
- Delivering professional education and training of the highest quality, in accordance with relevant South African legislation and the requirements for expressed development needs of educators;
- Engaging in educational research, with particular reference to problems experienced in KwaZulu-Natal educational institutions;
- Providing or facilitating advice and assistance in response to any requests from the educational community in South Africa and its neighbours
- Exemplifying the principles of equity and transparency in all dealings with students and the broad educational community.

What is a University of Technology?

A university of technology is characterised by being research informed rather than research driven where the focus is on strategic and applied research that can be translated into professional practice. Furthermore, research output is commercialised thus providing a source of income for the institution. Learning programmes, in which the emphasis on technological capability is as important as cognitive skills, are developed around graduate profiles as defined by industry and the professions.

CONTENTS

IMPORTANT NOTICE

The departmental rules in this handbook must be read in conjunction with the University of Technology's General Rules contained in the current General Handbook for Students.

NOTE TO ALL REGISTERED STUDENTS

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.

1. CONTACT DETAILS

All School queries to:

Secretary:	Ms Upasna Rampersadh
Tel No:	033 8458927
Fax No:	033 8458936
Location of Department:	Indumiso Campus, PMB

All Faculty queries to:

Faculty officer:	Mr Pragasen Reddy
Tel No:	031 3736522
Fax No:	031 3736518
Location of Faculty:	City Campus, Durban Office

Executive Dean:	Dr Rene Smith- Acting Executive Dean
Tel No:	031 3736516
Fax No:	031 3736518
Location of Executive: Deans Office	City Campus, Durban

2. **STAFFING**	**Name and Qualification**
Acting Head of School	Dr MA Thamae, BSc; PGCE (NUL); BSc (Hons); MSc Chemistry converted to PhD (RU)
Professor	Professor S Mago, PGDHET [Univ. of Fort Hare MBA [Zimbabwe Open Univ.], BSc [Hons] [Univ. of Zimbabwe] PhD [Univ. of Fort Hare]
Senior Lecturers	Dr JP Abraham, BSc (Univ. of Kerala); MSc (Sardar Patel Univ.); M Phil (Univ. of Kerala); PhD (Univ. of Kerala)
	Dr N H Gcabashe, JSTC; BA; BEd, MA (UniZulu); D Ed (Potchefstroom).
	Dr D Mzindle, STD (Indumiso College), BA, (UniZulu), B.Ed;(UNP) M. Ed (UKZN); D. Ed (UNIZULU)
Lecturers	Dr T Chamane, STD (Indumiso College); FDE (Natal Technikon); ABET (UNISA); BEd (Hons) (UKZN); MEd (UKZN) PhD in Education [Unisa]
	Mr E Conradie, HDE (TN); FDE (NCE); BEd (Hons) (UNP); M Ed (UKZN)
	Mrs A Hiralaal, BA Degree; ND in Business HED; B Ed (Hons); B Com (Hons); M Ed (UKZN)
	Mr R Holmes, HDE (UN); NTD (PMB.T.); NCT (Olifants); B. Ed (Hons) (UNP); MEd UKZN
	Ms E Khonyane, B.Ed.; BA UED (Fort-Hare)
	Dr MSA Maeko, ND Technical Education (TUT); B Tech Technical Education (TUT); B Ed- Hons Management and Policy (WSU); M Ed in Technology Education [TUT]; PhD in Technology Education (TUT).
	Mr S Maharaj, ND: Electrical; BTech Electrical Engineering (DUT)
	Mr C Makwara, B Comm Hons: Education (UZ); MBA Midlands State University (ZIM)
	Mr J Mangundu, BSC; MSC: Information Systems (Midlands State University - Zimbabwe)
	Dr DE Mkhize, STD (Esikhawini College); B PAED (Univ. of Zululand); BEd (Hons) (Univ. of Zululand); MEd (Univ. of Zululand) DED (Univ. of Zululand)

	Mr K Naidoo, BEd; B.Sc. (UDW); NHD: Post SchEd (ML Sultan); M.Ed (UKZN)
	Mr P C Balachandran Pillai, B Ed; B Sc; M Sc (India)
	Mr DTS Sotsaka, Dip Architectural Drawing [Intec College] STD (Indumiso); N6 Diploma: Civil (Soshanguve Tech); B Tech (TSA) BEd [Hons]; UKZN MEd [UKZN]
	Mrs VZ Shilenge, STD, (Eshowe College), FDE,(Springfield College), B Ed (Hons), M Ed (UKZN)
	Mr B Tarr, SSTC (NOSA); NTTD (Dept. of Manpower); NTD (TN); FDE (NCE)
	Dr GK Zulu, SPTD (Umbumbulu College), FDE (UNP), B Ed (Hons) & M Ed (UKZN), D Ed [UniZulu]
Lab Technician	Vacant
Secretary	Ms U Rampersadh, BTech Degree (Commerical Administration) (MLST)
Administrative Assistant	Ms Sandra Khonyane, BA Library and Information Science (Fort Hare); BA (Hons) Library Information Science (UCT).

3. PROGRAMMES OFFERED BY THE SCHOOL

A programme is offered in this School which, upon successful completion, will lead to the award of the following qualification:

Qualification	SAQA NLRD Number
Bachelor of Education [BEd]	73076
Doctor of Education [DEd]	1533

4. PROGRAMME INFORMATION AND RULES

Bachelor of Education Degree in FET Teaching

The purpose of the B Ed FET Teaching Programme is:

To prepare and empower future teachers for a career in teaching at the FET band and to develop them for further studies.

All normal rules for undergraduate degrees apply. See the General Handbook for details.

In addition to the requirements of Rule G17, the following rules shall apply:

(a) To pass a year of study, all subjects as prescribed in the Instructional Programme must be passed with the exception of conditions (b) and [c] below

(b) (i) The pass mark for any level of each of the subjects General Subject Didactics, Skills and Life Orientation and Communication is a continuous assessment minimum average of 50 %.

(ii) However, a student who fails to comply with b(i) in any one or more of these subjects and has obtained a minimum average mark of 40 % in such subjects may be allowed to proceed with permission from the School Board to the next year of study but, the student will have to repeat and pass the subject/s before a degree will be confirmed.

(iii) If a student obtains less than an average mark of 40 % for the subjects in b (i), the student may not proceed with the next level of study in that subject.

(iv) A student who gets 45 % in continuous assessment subjects will be afforded an opportunity to improve the result through an additional supplementary assessment.

(c) The elective which does not continue beyond the first year:
If after a supplementary examination a student still fails, it is the responsibility of the student to re-register for the failed subject and pass. No special arrangement for this will be made on the time-table.

(d) To be promoted to the next level of study, a student **MUST** pass Education and the 2 majors at first year level. A pass in Education and 2 majors from second and third year level.

(e) A qualification must be completed within twice the minimum time and a student is only allowed two years to complete each level. Failure to comply with this rule precludes registration in the School of Education.

MINIMUM ADMISSION REQUIREMENTS

- A National Senior Certificate (NSC) with endorsement for entry into Bachelor studies with relevant subject combinations and levels of achievement for students who matriculated after 2008.
- A National Senior Certificate with Matriculation Exemption for students who matriculated before 2008
- A minimum of 30 points excluding Life Orientation
- 2x approved languages one of which must be English. Students who matriculated before 2008 must have either a "D" symbol on the Higher Grade or a "C" symbol on the Standard Grade for English. Students who matriculated after 2008 must have a" Level 4" pass in English
- Students in possession of a recognised certificate or diploma in EDUCATION may also present their qualifications for institutional consideration
- Students with N4, N5 or N6 qualifications from FET colleges with relevant subject combinations and levels of achievement as prescribed by the institution may present their qualifications for consideration. Entry into the B Ed programme is at the discretion of the institution.

CRITERIA FOR SELECTION OF STUDENTS INTO THE B ED PROGRAMME

- Students who matriculated before 2008 choosing the EMS area of specialisation must pass Accounting at NQF Level 4 (Matric) with either a "D" symbol on the Higher Grade or a "C" symbol on the Standard Grade. Students who matriculated after 2008 must have a "Level 4" pass in Accounting
- Students who matriculated before 2008 choosing the Natural Sciences area of specialisation must pass Mathematics at NQF Level 4 (Matric) with a "D" symbol on the Higher Grade or a "C" symbol on the Standard Grade. Students who matriculated after 2008 must have a "Level 4" pass in Mathematics.
- Students who matriculated before 2008 choosing the Technology area of specialisation must pass Mathematics **OR** Physical Science on NQF Level 4 with a "D" symbol on the Higher Grade or a "C" symbol on the Standard Grade. Students who matriculated after 2008 must pass Mathematics **OR** Physical Science **OR** Mathematical Literacy] with a "Level 4" pass
  - If Electrical Technology is selected, students who matriculated before 2008 must pass Mathematics with either a "D" symbol on the Higher Grade or a "C" symbol on the Standard Grade. Students who matriculated after 2008 must pass Mathematics with a Level 4 pass

Doctor of Education

- A Master's Degree in Education. The average mark obtained for the Degree is 60 %.
- SAQA approval letter for International students.
- A full Thesis
- Submission of a concept paper

All departmental requirements must be read in conjunction with Faculty and University requirements.

5. PROGRAMME STRUCTURE

B.Ed. FET: Technology Teaching: First Year							
Code	**Subjects:**	**Compulsory**		**Annual**	**Assessment Method**	**NQF Level**	**Pre-requisite**
CVTC101 ELTC101 MCTC101	Civil Technology Electrical Technology Mechanical Technology	*Mathematics Compulsory if Electrical Technology is chosen	Select 1 of 3	✓	Examinations Examinations Examinations	5 5 5	See Criteria for selection
EGDS101	Engineering Graphics and Design	Compulsory		✓	Examinations	5	
MTMC101	Mathematics Mathematical Literacy Physical Science		Select 1 of 3	✓	Examinations	5	

B. Ed. FET: Economics and Management Sciences Teaching: First Year							
Code	**Subjects:**	**Compulsory**		**Annual**	**Assessment Method**	**NQF Level**	**Pre-requisite**
ACCT101	Accounting	Compulsory		✓	Examinations	5 5	See Criteria for selection
ECON101 CAPT101 BSMN101 MTHL101 MTMC101	Economics Computer Application Technology Business Management Maths Literacy or Mathematics		Select 2 of 5	✓			

B.Ed. FET: Natural Sciences Teaching: First Year							
Code	**Subjects:**	**Compulsory**		**Annual**	**Assessment Method**	**NQF Level**	**Pre-requisite**
MTMC101	Mathematics	Compulsory		✓	Examinations	5	See Criteria for selection
PHSE101 CHED101 BIOE101	Physics Chemistry Biology		Choose 2 of 3	✓	Examinations	5	

B.Ed. Senior Phase and FET: Technology Teaching: Second Year							
Code	**Subjects:**	**Compulsory**		**Annual**	**Assessment Method**	**NQF Level**	**Pre-requisite**
CVTC201 ELTC201 MCTC201	Civil Technology Electrical Technology Mechanical Technology	*Mathematics Compulsory if Electrical Technology is chosen	Select 1 of 3	✓	Examinations	6	1st year level
EGDS201 MTMC201 MTHL201	Engineering Graphics and Design s Mathematics Mathematical Literacy		Select 1 of 3	✓	Examinations	6	1st year level

B.Ed. Senior Phase and FET: Economics and Management Sciences Teaching: SecondYear							
Code	**Subjects:**	**Compulsory**		**Annual**	**Assessment Method**	**NQF Level**	**Pre-requisite**
ACCT201 ECON201 CAPT201 BSMN201 MTMC201 MTHL201	Accounting Economics Computer Application Technology Business Management Mathematics Mathematical Literacy		Select 2 of 6	✓	Examinations		1st year level

B.Ed. FET: Natural Sciences Teaching: Second Year							
Code	**Subjects:**	**Compulsory**		**Annual**	**Assessment Method**	**NQF Level**	**Pre-requisite**
PHSE201 CHED201 BIOE201 MTMC201	Physics Chemistry Biology Mathematics		Select 2 of 4	✓	Examinations	6	1st year level

B.Ed. Senior Phase and FET: Technology Teaching: Third Year							
Code	**Subjects:**	**Compulsory**		**Annual**	**Assessment Method**	**NQF Level**	**Pre-requisite**
CVTC301 ELTC301 MCTC301	Civil Technology Electrical Technology Mechanical Technology	*Mathematics compulsory if Electrical Technology is chosen	Select 2 of 4	✓	Examinations	7	2nd year level
EGDS201 MTMC201 MTHL201	Engineering Graphics and Design Mathematics Mathematical Literacy		Selected electives from 2nd year	✓	Examinations	7	2nd year level

B.Ed. Senior Phase and FET: Economics and Management Sciences Teaching: Third Year							
Code	**Subjects:**	**Compulsory**		**Annual**	**Assessment Method**	**NQF Level**	**Pre-requisite**
ACCT301 ECON301 CAPT301 BSMN301 MTMC301 MTHL301	Accounting Economics Computer Application Technology Business Management Mathematics Mathematical Literacy		2 x selected electives from 2nd year	✓	Examinations	7	2nd year level

B.Ed. FET: Natural Sciences Teaching: Third Year							
Code	**Subjects:**	**Compulsory**		**Annual**	**Assessment Method**	**NQF Level**	**Pre-requisite**
PHSE301 CHED301 BIOE301 MTMC301	Physics Chemistry Biology Mathematics		2 x selected electives from 2nd year	✓	Examinations	7	2nd year level

6. ASSESSMENT RULES (If more stringent than General Rules)

Each student is expected to complete five [5] assessments per subject.

7. RE-REGISTRATION RULES (if more stringent than General Rules)

incl. Pre/Co requisite

Exclusion Rules (if more stringent than General Rules)

8. ACADEMIC MONITORING AND SUPPORT GUIDELINES FOR AT RISK STUDENTS

MISSION

The intent of Academic monitoring and support is to enhance student engagement in the learning process, encourage higher levels of academic performance, further critical thinking skills and to support and assist underperforming students. The School of Education acknowledges that academic monitoring and support is a pre-requisite for academic success.

AIM

These guidelines commit the School of Education to identify under-performing students timeously and to provide the necessary academic support to assist students to graduate in the minimum time possible. Appropriate interventions and systems of support are expected to reduce dropout rates and exclusions and to improve throughputs and completion rates.

SCOPE OF THESE GUIDELINES

These guidelines apply to all students registered in the School of Education. The students that are assessed as academically underperforming are classified by the School of Education as being "STUDENTS AT RISK" and will hereinafter be referred to as such.

STAFF RESPONSIBILITY

Staff have the responsibility of delivering quality teaching and assessment, ensuring that students have the opportunity and means to assess and monitor their performance on a regular basis, identifying underperforming students timeously and providing these students with appropriate academic support. Co-ordinators of focus areas need to take an active role in assuring that staff identify such students timeously.

STUDENT RESPONSIBILITY

Students are expected to assume responsibility for their own learning by committing themselves fully to their studies, monitor their academic performance on a regular basis, inform relevant academic staff of the difficulties they may be experiencing and to take advantage of all the resources and support made available to them in order to improve their academic performance in order to complete their studies successfully and preferably in the minimum time recommended for their qualification but not exceeding the maximum duration allowed.

THE GUIDELINES

Student's performance after each assessment will be assesses to identify students who are underperforming in a subject. Underperformance is identified as attaining a mark between 40%-50% in any assessment. According to Rule G14 in the General Handbook for Students, 50% is the final pass mark for all subjects in an examination hence this standard will be encouraged and maintained.

The School of Education has decided on a minimum of 5 assessments per subject per year however the lecturer can give as many assessments as they deem necessary but the **MINIMUM** of 5 assessments is enforced. The names of ""Students at Risk" will be submitted to the Academic Monitoring and Support Committee.

The Academic Monitoring and Support Committee will meet after every session of assessments are complete with a list of ""Students at Risk"from the various focus areas. The committee will then interview each student together with the subject lecturer and the focus area co-ordinator to determine the reason for the underperformance.

Depending on the reason for the underperformance, the committee together with the focus area co-ordinator and the subject lecturer will take a decision on what intervention strategy is required to support and assist the student. The Academic Monitoring and Support Committee will carefully monitor the performance of all "" "Students at Risk" by holding regular meetings with the subject lecturer and student to determine whether the intervention strategies have been effective.

However if underperformance persists after all attempts have been made to support and assist the student, then the Academic Monitoring and Support Committee will have to meet and make a decision. Students are referred to Rule G 17 in the Handbook.

"G 17 UNSATISFACTORY ACADEMIC PROGRESS

(1) A student will be refused re-registration at the Institution for any instructional programme if he/she is unable, due to unsatisfactory academic progress, to complete the instructional programme for which he/she is, or has most recently registered, within the maximum period of registered study stipulated in the relevant Rule (Rule G 19 to G25 refer)

(2) Notwithstanding Rule G17(1), the executive Committee of the relevant Faculty Board may, in circumstances which they deem exceptional, grant a student a further period/s of registration for completion of any instructional programme.

(3) A student may appeal against the application of Rule G17(1) in accordance with Rule G1 (8)"

ACADEMIC MONITORING COMMITTEE

The academic monitoring committee is headed by the School of Education who will be assisted by the programme co-ordinator and all focus area co-ordinators.

9. INDICATIVE CONTENT

NB: Students to read this section in conjunction with the relevant student guides.

Core Subjects are Compulsory for all B Ed Students

EDUCATION I (EDUC 101)

1. Education and Its Purpose
2. Basic Educational Concepts (Formal, Non-Formal and Informal Education)
3. Introduction to:
   - Philosophy of Education
   - Psychology of Education (theories of Human Development)
   - History and Comparative Education
   - Sociology of Education
4. Curriculum Design (OBE: NCS)

EDUCATION II (EDUC 201)

1. Issues in Education [Gender, Equity and Inclusive Education]

What is Inclusive Education?

An overview of the conceptual and operational framework that informs the strategy of inclusive education.

Discussions on inclusive education will include:

- The shift from categories of disability to levels of support
- The description and role of full-service schools
- The description and role of resource centres and their role in the implementation of inclusive education

Multicultural Education

Gender Issues in Education

Quality Education

2. Theories of Human Development II: Piaget —Cognitive Development

- Kohlberg's Theory —Moral Development
- Vygotsky —The Zone of proximal development
- Maslow —Hierarchy of needs

3. Information Processing Approach: Perkins (a self-study)

EDUCATION III (EDUC 301)

1. **Concept of Research**
2. **Research Processes**
   Defining a research problem
   Problem Identification
   Delimiting a research problem
3. **Approaches to research**
   Qualitative Research
   Quantitative Research
4. **Types of Research**
5. **Hypothesis/Research question**
6. **Literature Review**
7. **Research Designs**
8. **Sampling Techniques**
9. **Measuring Instruments**
10. **Data collection, organization and presentation**
11. **Measure of Central Tendency**
12. **Leadership and Management**
    What is classroom management
    Effective classroom management
    Planning a classroom management task
    Managing change in Education
    Parent involvement and classroom management
    Collegiality (teaching, mentoring and support)
13. **Education Policies**
    General Legislation
    Bill of Rights
    Labour Relations Act
    Employment Equity Act
14. **National Education Policy Act (84/1996)**
    National Policy on HIV/AIDs for learners and educator in public schools and students and educators in FET Institutions. Norms and standards for Educators
15. **South African Schools Act (84/1996)**
    Learners representative Councils
    The formation and the role of School Governing Bodies (SGBs).
    Guidelines for consideration of Governing Bodies
    In adopting a code of conduct for learners.
    National Norms and standards for School funding
    Exemption of parents from paying fees
    Employment of Educators Act
    South African Council of Educators Act (SACE)

EDUCATION IV (EDUC 401)

1. Partnerships in Education:
   - Role of Industry in Education
   - Role of Parents/Community in Education
   - Role of Government in Education
   - Role of SACE
2. Education and Law

3. Leadership and Management
4. Ethical issues in Education
   - Ethics of Justice
   - Ethics of Care
   - Ethics in the Workplace
   - Ethics and the South African Code of Conduct for Educators
5. Submission of research projects

GENERAL SUBJECT DIDACTICS I (GSDI 101)

1. Introduction to Didactics
2. What is teaching?
3. Teaching environment
4. Teaching approaches
   - Traditional approaches
   - OBE as an approach to teaching and learning
5. Introduction to Teaching and Learning Strategies
6. Teaching Methods
7. General Teaching Skills
8. Introduction to Media Applications

GENERAL SUBJECT DIDACTICS II (GSDI 201)

1. Micro-Teaching
   Introduction to Outcomes
   Designing Lesson Plans
   Teaching and Learning Media Applications
   Collaborative Teaching
2. Classroom Management
3. Outcomes Based Assessment (OBA)
4. Teaching Large Groups

GENERAL SUBJECT DIDACTICS III GSDI 301)

1. Micro-Teaching
   * Teaching and Learning Strategies
   * Questioning Techniques
   * Development of Media and production of teaching materials
2. Curriculum Development: Planning Work Programmes for different learning areas
3. Assessment Approaches and Principles
4. Balancing a Question Paper
5. Quality Assurance in Education

PLANNING A LEARNING PROGRAMME

New Curriculum Framework
Levels of Planning

GENERAL SUBJECT DIDATICS IV (GSDI 401)

1. Discipline in Education: Legislation around discipline in School
2. Decentralised School Governance: School Governing Bodies and their role
3. Portfolio Development Project

WORK INTEGRATED LEARNING (WIL) (EXBE 101)
1. 4 weeks: Academic Literacy and Micro-Teaching.
2. Portfolio and Logbook.

WORK INTEGRATED LEARNING (WIL) (EXBE 201)
1. 4 weeks: Guided Observation
2. Portfolio and Logbook.

WORK INTEGRATED LEARNING (WIL) (EXBE 301)
1. 4 weeks: Guided Observation and Collaborative Teaching
2. Portfolio and Logbook.

WORK INTEGRATED LEARNING (WIL) (EXBE 401)
1. 6 months, full time teaching
2. Portfolio and Logbook.
3. An experienced senior educator to be appointed as a mentor.
4. Students must comply with rules and regulations of the institution in which they are placed and are required to comply with DoE and the SACE: Code of Conduct for Educators.

Fundamental Subjects are Compulsory for all students

COMMUNICATION IN ENGLISH I (LANGUAGE X) (COEN 101)
1. The Communication types, processes and barriers
2. Academic and reflecting writing
3. Approaches to reading
4. Listening and feedback
5. Oral communication
6. Referencing methods

COMMUNICATION IN ENGLISH II (LANGUAGE X) (COEN 201)
1. Organisational Communication
2. Intercultural communication
3. Report writing
4. Non-verbal communication
5. Speaking in groups and meetings
5. How we read/improving your reading skills
6. Text analysis

COMMUNICATION IN ENGLISH III (LANGUAGE X) (COEN 301)
1. Organisational Correspondence: Application of writing skills
2. Linguistic issues and topics
3. Aspects Regarding Language Usage In The Context of The Teaching and Learning situation
4. Legislation and Professional issues pertaining to teaching and learning
5. Scientific investigations into linguistic issues

SKILLS AND LIFE ORIENTATION I (SKLO 101)
1 Religion
2 Basic Study Methods
3 Community Involvement
4. Role of the Individual in the Economy
5. Entrepreneurship

6. Computer Literacy I
    - Basic Concepts: Theory
    - The Operating System: Windows XP
    - Managing diskettes, drives and files
    - Impact of Computer Technology on socio-economic, environmental, political and ethical issues.
    - Word Processing: Microsoft Word 2003
    - Use of the Internet and Email

SKILLS AND LIFE ORIENTATION II (SKLO 201)

1. Comparative Religion Views
2. Self-Management Skills
3. Meeting Procedures
4. Computer Literacy
5. Loss Control
6. Computer Literacy
    - Word Processing: Microsoft Word 2003
    - Spreadsheet: Microsoft Excel 2003
    - Education Documents and lesson plans: Tables, Documents of meetings, Job
    - Application, Legal Documents
    - Guide to the Internet and Email

SKILLS AND LIFE ORIENTATION III (SKLO 301)

1. Personal Development and Well-Being
2. Citizenship Education
3. Career and Career Choices
4. Recreation and Physical Well-being
5. School Sports
    Athletics
    Soccer/Netball
    Volleyball
    Tennis (lawn/table)
    Basketball
    Indigenous Games
6. Outdoor Sport

<u>Additional optional language subjects</u>

COMMUNICATION IN ISIZULU I (LANGUAGEY1) (COZU 101)

1. IsiZulu njengolunye lwezilimi zabantu abamnyama eAfrika eseNingizimu
2. Ukubhala
3. Ukukhuluma
4. Ukulalela

COMMUNICATION IN ISIZULU II (LANGUAGE Y1) (COZU 201)

1. Ukubhala
    - Ukukhombisa inhlonipho lapho ubhala noma ukhuluma
    - Ulimi lwesimo
    - Amagama anembayo
2. Ukukhuluma
    - Inkulumo eyongayo neyonga amagama

- Imiyalezo ethunyelwa yisitho zomzimba lapho ukhuluma
- Ukuqikelela ukuthi kuzwakale kahle okushoyo
- Ulimi nozwelomagama
- IsiZulu soqobo

3. Ukufunda
   - Izinhlobo zezindlela zokufunda
   - Ukufunda okufanelene nohlobo lombhalo
   - Izinhlobo zemibhalo yesiZulu
   - Ukufingqa inkulumo
4. Ukwenza ucwaningo

COMMUNICATION IN AFRIKAANS I (LANGUAGE Y2) (CMAF 101)

1. Speaking
   - Using appropriate words
   - Using the everyday expressions correctly
   - Using good idiomatic expressions
   - Making a distinction between "borrowed' words and genuine [suiwer] Afrikaans words
   - Getting to the point
2. Reading
   - Reading and pronouncing words properly
   - Observing punctuation marks
   - Showing understanding of what is being read
3. Writing
   - Writing words and sentences properly
   - Letter —writing
   - Writing passages to observe punctuation marks
4. Research to discover new words and expressions and their meaning

COMMUNICATION IN AFRIKAANS II (LANGUAGE Y2) (CMAF 201)

1. Advanced Oral Skills
2. Advanced Reading Skills
3. Advanced Listening Skills
4. Advanced Writing Skills

B Ed (FET): Specialisation Economics and Management Sciences
ACCOUNTING (EDUCATION) I (ACCT 101)

1. Introduction to Accounting and Nature of Accounting
2. Accounting Concepts Procedures and Principles according to GAAP
3. Users of Financial Information to make informed decisions.
4. Basic business calculations eg. VAT, Cost Price , Discounts and Percentages.
5. Book-Keeping: CRJ, CPJ, DJ, DAJ, CJ, CAJ, PCT, GJ/posting to ledgers, preparing of trial balances, income statements and balance sheets.
6. Year adjustments of a sole trading.
7. Perpetual and periodic inventory systems.
8. Bank Reconcilation procedures.
9. Analyzing financial statements

ACCOUNTING (EDUCATION) II (ACCT 201)

1. Partnerships: Formation, financial statements, liquidation, conversion to a company.
2. Departmental Accounting: Cost allocation departmental journals, departmental financial Statements, inter-departmental transfers.
3. Cash Budgets: Preparing cash budgets from given information
4. Asset Disposal
5. Non Profit Organisations
6. Specific Subject Didactics

ACCOUNTING (EDUCATION) III (ACCT 301)

1. Companies: Financial statements, disclosure of information by way of notes.
2. Cash flow: Use given information from previous years and additional information.
3. Partnerships: Dissolution of a partnership, retirement and insolvency of partners, sales as a going concern, conversion to a company.
4. Non Profit Organisations
5. Branch Accounting
6. Specific Subject Didactics

BUSINESS MANAGEMENT (EDUCATION) I (BSMN 101)

Semester One

1. **Introduction to Business Management as a Science**
   The business world and business management
   Needs and needs satisfaction
   The main economic systems
   Needs satisfying institutions of the free market

2. **Entrepreneurship**
   What is entrepreneurship?
   What entrepreneurs do and why they do it?
   The role of entrepreneurs in society
   The small business
   The entrepreneurial process
   Skills required for entrepreneurship

3. **The establishment of a business**
   Legal forms of ownership and their formation in South Africa

4. **The business environment**
   The organization and environment change
   The three sub-environments [micro, market and macro environments]

5. **The general management principles**
   The role of management
   Different levels and types of management in businesses
   Skills at different managerial levels
   The role of managers

6. **The basic elements of planning**
7. **Organizing management**
8. **Leadership —leading people in the organization**
9. **Meeting human resource requirements and developing effectiveness in HR**
10. **The legal environment and human resources**

11. Controlling the management process-the importance of control
The control process
The focus of control
The characteristics of an effective control system

Second Semester

1. **The marketing process**
   Evolution of marketing thought
   Defining marketing
   The components of the marketing process
   Marketing research
2. **The marketing instruments**
   The key to the market; product decisions, brand decisions
   Price decisions, distribution decisions, marketing communication decisions
3. **The integrated marketing strategy**
   The marketing concept
   Marketing strategy during the product life cycle
   Marketing planning and control
4. **Public Relations**
   The nature of public relations
   Public relations management
   The communication programme
5. **The financial function and financial management**
   Concepts in financial management
   The objective and fundamental principles of financial management
6. **Asset management: the investment decision**
   The management of current assets
   Long-term investment decisions and capital budgeting
7. **The operations management function**
8. **The purchasing and supply function**
9. **Contemporary issues in business management**

BUSINESS MANAGEMENT (EDUCATION) II (BSMN 201)

1. **Managers and management, Managing in today's world**
   Functions of management
   Levels of managers and their essential roles
   Skills necessary for becoming successful managers
2. **Foundations of planning, foundations of decision making**
   Benefits and drawbacks of planning
   Types of plans and the steps of the strategic management process
   Steps in the decision making process
   Approaches to decision making
3. **Technology and operations, basic organizational design**
   Formula for calculating productivity
   Technology versus work obsolescence
   Elements of organizational structure
   Ways organizations may departmentalize
   Types of organizational structures

4. **Leadership and trust, Communication and interpersonal skills**
   Theories on leadership
   Communication process
   Communication barriers
   Delegation and conflict

Second Semester

1. **Competing with operations, Process Management**
   Operations as a function
   The role of operations strategy as a source of competitive strength in a global market place
   Main process decisions and how they must relate to volume
   Meaning of automation and economies of scope

2. **Managing processes and managing technology**
   Major activities associated with successful project processes
   Network of interrelated activities in a project
   The sequence of critical activities that determine the duration of a project
   Probability of completing a project on time
   Meaning of technology
   Fundamental role of the computer and information technology
   Factors that managers must consider when making technological choices

3. **Quality, capacity and location as well as layout**
   The principle of TQM
   Control charts
   Measuring capacity
   Capacity gaps
   Economies and diseconomies of scale
   Basic layout types
   Factors affecting choice of location

4. **Supply chain-management and forecasting**
   Nature of supply-chain management for both manufacturers and service providers
   Supply chain dynamics
   Demand patterns that combine to produce a demand line series
   Forecasting techniques

BUSINESS MANAGEMENT (EDUCATION) III (BSMN 301)

1. **The goal of financial management**
   Forms of business organizations,
   Functions of financial manager,
   Analysis of financial statements,
   Determining the influence of risk on the required rate of return,
   The role of time value for money and
   Capital budgeting techniques

2. **Understanding marketing management**
   Defining marketing in the 21st century,
   Developing marketing strategies and plans,
   Capturing marketing insights,
   Gathering information and scanning and environment

Conducting marketing research and
Forecasting demand

3. **Building strong brands:**
   Creating brand equity, [what is brand equity?, building brand equity, measuring brand equity, devising a branding strategy and customer equity].
   Crafting the brand positions
   Developing and communication a positioning strategy
   Product life-cycle marketing strategies, and
   Dealing with competition

4. **Shaping the market offering:**
   Setting product strategy
   Product characteristics and classifications, differentiation, product and brand relationships, packaging, labeling, warranties and guarantees,
   designing and managing services, the nature of services,
   marketing strategies for service firms,
   managing service quality,
   managing service brands,
   managing product-support services,
   developing pricing strategies and program,
   understanding pricing,
   setting the price,
   adapting the price,
   initiating and responding to price changes

5. **Delivering Value:**
   Designing and managing value networks and channels,
   Marketing channels and value networks,
   The role of marketing channels,
   Channel-design decisions,
   Channel-management decisions,
   Channel integration and systems,
   Conflict, co-operation and competition
   E Commerce marketing practices
   Managing retailing,
   Wholesaling and market logistics

6. **Creating successful long-term growth:**
   Introducing new market offerings,
   New product options,
   Challenges in new-product development,
   Organizational arrangements,
   Managing the development process and
   Tapping into global markets

COMPUTER APPLICATION TECHNOLOGY (EDUCATION) I (CAPT 101)

1. Open and close one or more documents

Create a new document with or without using a template
Save a document under a different name or in a different location or as a different type
Use the help function and on-line help
Change view types
Enter and edit data
Select data using a keyboard and/or a mouse
Copy, move and delete selected information using copy and paste tools and methods
Apply the basic font styles of bold, italics and underlining
Change the font type, colour, size and effects (including subscript and superscript)
Align to left, right and centre
Find and replace
Use a spell and grammar check
Copy information or objects between applications (including OLE techniques)
Input data from different formats
Use the undo and re-do functions
Change document orientation (portrait and landscape), margins and paper size
Add headers and footers including page numbers, date, path and file name
Proofread in terms of layout, presentation and accuracy
Preview a selection to print
Choose print output options such as range of pages, number of copies, odd or even pages, print quality and any other applicable printer options
Insert and manipulate objects in an application including clip art, charts and organisation charts
Use templates and wizards
Use the drawing tools
Import / Export data

2 Specific word processing skills

Use a word processing programme to an advanced level to manipulate text and graphics
Input data using various input devices, methods and procedures
Enter, edit and format text and graphics
Create visual and printed matter
Design and layout documents
Use and manipulate columns
Apply and copy styles and formats
Insert special characters or symbols
Use automatic hyphenation
Show non-printing characters
Insert, remove and manipulate line breaks, page breaks and section breaks
Indent paragraphs (left, right, first line, hanging)
Apply spacing within and between lines and paragraphs
Use tabs (left, centre, right, decimal, leader, bar)
Use bullets and styles of bullets in a multilevel list
Add borders and shading
Create, manipulate and format a table with cells, rows and columns
Use table properties
Convert text to table and vice versa
Perform a mail merge by creating a form letter and using an internal or external data

source such as a spreadsheet or table
Use track changes
Insert reference
Insert table of contents
Insert auto text, fields, and comments
Create, use and manipulate forms
Compare and merge documents

3 Specific spreadsheets skills:

Process basic numerical data using a spreadsheet programme
Insert, copy, delete and format rows and columns
Work with cells and ranges
Format cells and worksheets
Use basic formulas
Use basic functions
Mathematical functions such as sum, round, sqrt, power, sumif
Statistical functions such as average, min, max, count, large, small, mode, median, countif
Date and time functions such as date, day, now, today
Text functions such as left, right, mid, len, value, text
Logical functions such as If
Create and edit charts
Use relative and absolute cell reference
Insert, delete and change the format of rows, columns and cells
Select adjacent and non-adjacent ranges
Sort
Insert, copy, delete and rename worksheets
Work with and between worksheets
Use the auto fill tool
Use the basic mathematical operators (addition, subtraction, multiplication, division) in formulas
Interpret standard error values associated with using formulas
Format and round of numbers
Format date and text data
Split and merge cells
Manipulate text with wrapping and cell content orientation
Add borders, colours and other effects to a cell range
Create different types of charts and graphs (column chart, bar chart, line)
Change colours, labels, legends, titles and axes in a graph
Display gridlines, row and column headings and title rows for printing purposes

4 Specific database skills:

Create single table data sources to generate forms, queries and reports using a database programme
Create a single table data source
Understand database organisation including records, tables, fields, data types, indexes and primary keys
Manipulate tables, records and fields
Work with field properties including default values, validation rules, input mask
Construct databases and basic table relationships
Filter, group and sort records
Create and design forms, queries and reports
Specify criteria in a query using the relational operators
Add extra fields with calculations in forms, queries and reports

5 End-user computer application programme of own choice:
Presentations or web authoring tools or desktop publishing software or any other application software of own choice
Enter, edit and format text, numbers and graphics
Application of good design principles

6 Integration
Integration of end-user computer application programmes
Work between spreadsheet, database and word processor

7 Email
Create, open, delete, send, forward, reply, flag
Open attachments
Save attachments
Attach documents to mail
Send carbon copies
Sort
Set up and use an address book
Message rules

8 Internet:
Find a web site by using an URL
Follow hyperlinks
Use search engine to find information
Keywords
Evaluation of web sites
Download files
Save information to a disk

COMPUTER APPLICATION TECHNOLOGY (EDUCATION) II (CAPT 201)

1 Computers in all walks of life
General concepts of information technology including hardware, software and networked environments
Types of computer systems
Typical components and characteristics of a computer
Input and output devices
Types of system software and application software.
Computer ethics, security and viruses.
Impact of computers on the environment and society.
Safety and health issues.
File management and trouble-shooting simple end-user computer-related hardware and software problems.
Utilising the features of a typical operating system.

2 Graphics at an advanced level, using a word processing programme:
- proficiency in the input of data;
- entering, editing and formatting text, numbers and graphics;
- creation of visual and printed matter;
- design and layout of documents;
- use of templates.

3 Basic processing of numerical data, using a spreadsheet programme:

- working with cells and ranges;
- formatting cells and worksheets;
- basic functions and formulae, including SUM, AVERAGE, COUNT, IF, COUNTIF, MIN, MAX;
- creating and editing charts.

4 Creation of single-table data sources to generate forms, queries and reports, using a database programme:

- creation of a single-table data source;
- manipulation of records and fields;
- generation of forms, queries and reports.

5 Presentations or web authoring tools or desktop publishing software or any other application software of own choice:

- entering, editing and formatting text, numbers and graphics;
- application of good design principles.

6 Integration of end-user computer application programmes:

- working between applications;
- linking and exchanging (importing/exporting) data with other applications.

7 Effective communication of information:

- different types of communication tools;
- different modes of communication;
- use different modes and tools of communication;
- select appropriate communication modes and tools.

8 Task definition:

- recognising information needs;
- defining problems;
- identifying the type and amount of information needed to solve problems.

9 **Information-finding strategies:**

- considering possible information sources (e.g. various types of electronic resources for data gathering including databases, CD-ROM resources, commercial and Internet online resources, electronic reference works, community and government information electronic resources) as well as primary resources including interviews, surveys, experiments and documents that are accessible through electronic means;
- developing a plan/strategy for searching;
- identifying and applying specific criteria for evaluating resources;
- identifying and applying specific criteria for constructing meaningful data gathering tools;
- using a computer to generate modifiable flow charts, timelines, organisational charts and calendars which will help the student to plan and organise complex or
- group information problem-solving tasks;
- using a computer or other devices to manage the process (e.g. track contacts and create to-do lists and schedules).

10. Access information:

- locating information from a variety of resources using appropriate computer resources and available technologies;
- accessing specific information found within individual sources by using organisational systems and
- tools specific to electronic information sources that assist in finding specific and general information.

11 Use of information:

- engaging with information to determine its relevance;
- extracting relevant information through, for example, citations, note taking and summaries;
- processing and analysing statistical data;
- saving and backing up data gathered.

12 Synthesis:

- organising results of information gathering and processing;
- presenting results by selectively creating or generating printed reports, computer-generated graphics, charts, tables and graphs, original databases, electronic slide shows, overhead transparencies, Web pages, etc.

13 Evaluation of the effectiveness and efficiency of information management:

- content, format and design;
- spell and grammar checking capabilities;
- legal principles and ethical conduct related to information technology with special attention to copyright and plagiarism;
- netiquette when using Internet, e-mail, etc;
- information problem-solving process (efficiency)

COMPUTER APPLICATION TECHNOLOGY (EDUCATION) III (CAPT 301)

Advanced word processing and formatting skills.
Advanced desktop publishing skills
Multimedia presentations using text, sound, video, animation and graphics are designed and created.
Single table data source, simple forms, queries and reports are created and generated sing a database program.
Proof readers signs, i.e. manuscript signs are interpreted and applied.
Written and electronic layout and editing instructions are interpreted to produce accurate output in a competent fashion.
Advanced integration techniques are demonstrated using multi-and appropriate programs.
Various forms of data are located, collected, analysed and critically evaluated using technologies and relevant methods.
Information is organised, recorded and summarised in appropriate electronic formats.
Information is presented and communicated in a professional fashion.
Paragraphs —numbered main-, sub, sub-sub paragraphs and bullets.
Correspondence —Business letters, circulars and official letters
Job Application —Letters of application/Appointment/Rejection
Testimonial and Curriculum Vitae
Programs Portrait, A5 Landscape, A4 landscape divided into three columns
Tables —created in Microsoft Word

Documents for meetings —Notice of meeting with an agenda, Minutes
Templates and Wizards
Microsoft Excel —Formulas, Charts, integration
Microsoft Access —Create table and edit, queries, forms and reports
Microsoft Publisher —Create posters, invitation cards
Microsoft PowerPoint —slideshows application skills
Theory and Basic Concepts —Computer hardware, software, networks, computer ethics, viruses and Social issues.
Speed and accuracy — (40 wpm)
Research Project —integrating all software packages (Research process and Presentation)

ECONOMICS (EDUCATION) I (ECON 101)

1. Numeracy and Graphical Skills
2. Introductory Concepts
3. Circular Flow of Economic Activity in a Two - Sector Model
4. The Goods Market
5. Elasticity
6. The Labour Market
7. Production and Costs
8. Market Structures: Perfect Competition
9. Market Structures: Monopoly
10. Numeracy and Graphical Skills
11. Introductory Concepts
12. Circular Flow of Economic Activity in a Two - Sector Model
13. The Goods Market
14. Elasticity
15. The Labour Market
16. Production and Costs
17. Market Structures: Perfect Competition
18. Market Structures: Monopoly

ECONOMICS (EDUCATION) I (ECON 201)1. Consumer Behaviour

2. Production
3. Market structures and Economics Behaviour
4. Alternative theories of the firm

MACRO-ECONOMICS

1. The Keynesian model
2. The IS-LM Model
3. The Foreign Sector
4. The Aggregate Deman (AD) and Aggregate Supply (AS) approach: AD model
5. Different Schools of Thought on Microeconomic Theory and Polic

ECONOMICS (EDUCATION) III (ECON 301)

1. Economic Policy in South Africa
2. Labour Economics
3. Economic Development Subject Didactics

MATHEMATICS (EDUCATION) I (MTMC 101)

1. General Algebra —1st, 2nd and 3rd degree/inequalities equations, remainder/factor theorem
2. Function graphs and Transformation – Exploration
3. Algebraic and graphical solutions to equations and simultaneous intersections
4. Polynomial and rational functions/equations
5. Algebraic and Graphical representation of exponential and logarithmic functions
6. Trigonometric Functions, identities, equations, graphs and simple harmonics
7. Analytical Geometry Lines

MATHEMATICS (EDUCATION) II (MTMC 201)

1. Differential Calculus
2. Sequences, series and progressions
3. Analytical Trigonometry
4. Circle Geometry
5. Analytical Geometry Lines and Circles
6. Permutations, Combinations and Probability
7. Application of didactic principles to school grades 10 and 11 content

MATHEMATICS (EDUCATION) III (MTMC 301)

1. Further Differential Calculus
2. Linear Algebra
3. Vectors Algebra
4. Complex Numbers
5. Implicit differentiation and first order equations
6. Introduction to Integral Calculus
7. Further series —infinite, power, binomial expansion
8. Didactic principles applied to school grade 12 NCS content

B Ed (FET): Specialisation Natural Sciences

Electives

BIOLOGY (EDUCATION) I (BIOE 101)

2.. Introduction to Microscope and Laboratory equipment

a. Investigating phenomenon in Biological Sciences
   Identify parts of a microscope
   Prepare slides/wet mouths
   Use microscope
   Identify structures under microscope
   Identify various laboratory equipment
b. Constructing of knowledge in Biological Sciences
   Parts of microscope and their functions
   Use of various laboratory equipment
c. Application of Biological Sciences
   History of microscope development and applications
   The electron microscope and its value and applications

2. General Ecology

2.1 Investigating phenomenon in Biological Sciences

Use of field guides for identifying species
Investigate community structure within a habitat and changes that take place within the habitat
Use of sampling methods:

- quadrats
- transects
- traps
- direct observation

Importance of random sampling
Identification and investigation of primary and secondary succession
Investigate soil properties

2.2. Constructing of knowledge in Biological Sciences

Ecological terms
Biotic and abiotic factors
Interaction in ecosystem
Energy transfer
Special relationships
Succession
Soil Study

2.3. Application of Biological Sciences in Society

Human influence on community structure:

- Iron age settlement
- Industrialisation
- Urbanisation
- Farming practices
- Role of culling of animals

Parasitic infections; incidences in South Africa and relationship to sanitation, play habits.

3. Aquatic EcoSystems

3.1 Investigating phenomenon in Biological Sciences

Identify water plants and animals

Investigate water pollution and its effects on plant and animal life

3.2 Constructing of knowledge in Biological Sciences

Differences between terrestrial and aquatic systems

Abiotic factors that have an effect on aquatic systems and their effect;

Succession in aquatic systems;

Marine ecosystems, definition and types:

Dunes formation and salt spray effect on plants

3.3. Application of Biological Sciences

Management of water pollution;

Effect of uncontrolled sand mining;

Dune mining

Ecotourism

4. Population and Community Ecology

4.1. Investigating phenomenon in Biological Sciences

Experiments in investigating population size and movements;

Graphical representations

Investigate distribution patterns

4.2 Constructing of knowledge in Biological Sciences

Population dynamics and population parameters;

Population growth patterns and factors affecting population size;

Estimation of population size;

Survival strategies;

Competition

4.3 Application of Biological Sciences

Human population:

- Reasons for exponential growth in a natural system
- Interpret age and gender structure
- Human demands versus conversation needs [conservation of natural environment, hunting industry, sustainable harvesting of natural resources, creation and management of game reserves]
- Value systems with reference to biodiversity

Wild Life management

5. Pollution and Conservation

5.1 Investigating phenomenon in Biological Sciences

Conservation bodies and their roles;

Conservation need in the local area and on a national level.

Investigating pollution in local area and at national level.

5.2 **Constructing of knowledge in Biological Sciences**

Definition and causative factor of pollution;

Identification of pollution

Causes of water pollution:

- Household wastes and sewage
- Industrial pollution

- Oil pollution
- Chemical pollution
- Farming and soil erosion

Preventive measures
Conservation and preservation of soil, air, water and natural resources, wilderness, etc

5.3 Application of Biological Sciences
Preventing pollution
Joining of conversation body
Active lobbying against pollution

6. Plant Water Relationship
6.1. Investigating phenomenon in Biological Sciences
Experiments to demonstrate diffusion and osmosis
Demonstration:

- Water movement through xylem,
- Transpiration of water through leaves,
- Factors that bring about movement of water in plants
- Factors affecting transpiration in plant

6.2 Constructing of knowledge in Biological Sciences
Definition of diffusion and osmosis;
Uptake of water and mineral salts into a root and their transport to the leaves;
Transpiration
Definition and comparison with other types
Effect of variation in temperature, humidity and light intensity
Wilting

6.3 Application of Biological Sciences in Society
Applications in agriculture

BIOLOGY (EDUCATION) II (BIOE 201)
1. Bioversity and Classification
1.1 Investigating phenomenon in Biological Sciences
Demonstrate principles of classification;
Classify organisms into groups
Understanding distribution maps of species in South Africa

1.2 Constructing of knowledge in Biological Sciences
Extent of biodiversity and endemism in South Africa;
Classification schemes;
Introduction to the main groups of animals and plants;

1.3 Application in Society
History of classification;
Some examples of classification systems
Naming things in science
Linnaeus and his classification system
Threats to biodiversity in South Africa
Value of retaining biodiversity

2. Plant Diversity

2.1. Investigating phenomenon in Biological Sciences

Examine examples for the different groups of plants;
Compare morphology
Compare monocotyledon and dicotyledon plants and their flowers
Interpret phylogenetic tree representing evolutionary history

2.2. Constructing of knowledge in Biological Sciences

Structural plan and modifications
Habitat, external structure, nutrition and life cycle in examples of:

- Viruses
- Bacteria
- Mycophyta: Yeast cell and Bread mould
- Phycophyta: ***Chorella*** and ***Spirogyra***
- Bryophta: Moss —***Funaria sp***
- Pteridophyta: Ferns —***Dryopteris sp***
- Cycadophyta: Cycad
- Spermatophyta:
  Gymospermae —***Pinus sp***
  Angiospermae —a Monocot and a Dicot plant

2.3. Application in Society

Ancient and unique plant groups in Southern Africa, theft of plants and ecotourism;
Agricultural plants;
Medicinal plants;
Ecological importance;
Economic importance

3. Animal Diversity

3.1. Investigating phenomenon

Intrepret phylogenetic tree;
Identify South African examples of the different phyla;
Examine external features of examples
Illustrate biodiversity of the phyla and classes

3.2. Constructing of knowledge

Body plans and symmetry in different phyla; modifications.
Habitat of different examples;
External structure, nutrition;
Reproduction/Life Cycle

- Protozoa: ***Amoeba sp.,***
- ***Trypanosama sp., Paramecium sp***
- Coelenterata: ***Hydra*** *and* ***Aurelia***
- Platyhelminthes: ***Planaria*** and ***Taenia sp.***
- Nematoda: ***Ascaris sp.***
- Annelida: Earthworm and leeches
- Arthropoda: Characteristic features and examples of different classes; locust
- Molusca: Snail
- Echinodermata: Star fish
- Chordata: Cartilagenous fish, bony fish, frog, lizard, bird, rat/rabbit

3.3 Application in Society

Parasites: distribution, prevalence, effects on hosts, treatment, reducing spread
Arthropods as parasites and vectors of pathogens
Role of invertebrates in agriculture and the ecosystem
Animal farming and sustainable use, economic and employment opportunities
Poaching
Evolutionary implications

4. BioGeography

4.1. Investigating phenomenon in Biological Sciences

Worldwide distribution of animals [ostrich, emu, rhea, moa, kangaroo
Worldwide distribution of some plants

4.2 Constructing of knowledge

Diversity within continents
Specific animals and plants on land masses and islands

4.3 Application in Society

Nature of science
Charles Darwin's explanation
Speciation

BIOLOGY (EDUCATION) III (BIOE 301)

1. Organic and Inorganic Compounds

1.1 Investigating phenomenon in Biological Sciences

Construct simple and complex molecules;
Experiments on enzyme action;
Food tests

1.2 Constructing of knowledge in Biological Sciences

Inorganic compounds: Water, Macro and Micronutrients;
Carbohydrates
Proteins
Fats
Nucleic acids
Enzymes and Vitamins

1.3 Applying in Biological Sciences in Society

Diseases in respect of micronutrients
Fertilizers in agricultural farms and related problems
Difficiently diseases in respect of carbohydrates, proteins and fats;
Saturated and unsaturated fats- heart diseases and cholesterol

2. Genetics and Hereditary

2.1. Investigating phenomenon

Models of RNA and DNA;
Examine extractions of DNA using simple processes;
Cell division —practical investigation
Investigations of human genome, genetic disease and genetic engineering
Investigation of the causes, prevalence and treatment of cancer

2.2. Constructing of knowledge

Structure of DNA and RNA;
DNA replication;
Transcription;
Translation;
Mutations
Cell division
Hereditary and inheritance including sex chromosomes, sex-linked diseases and solving simple genetic problems

2.3. Application in Society

Historical developments: DNA structure and Mentel's experiments;
DNA fingerprinting;
Importance of DNA sequencing;
Abnormalities in meiosis and consequences and attitudes;
Polyploidy and its importance in agriculture;
Discovery of the principles of hereditary and genes;
Medicinal and agricultural applications of genetic engineering;
Genetics diseases, beliefs, attitudes and values;
Genetic counseling;
Ethics and legislation in genetic testing and engineering

3. Cytology

3.1 Investigating phenomenon in Biological Sciences

Investigations of plant and animal cells;
Microscopic/models/micrographs

3.2 Constructing of knowledge in Biological Sciences

Characteristics of cells and cell components;
Molecular make up of cells;
Cell structure, adaptations and functions

3.3 Application in Society

The cell theory
In-vitro experimentations
Cell tissue culture

4. Plant and Animal Tissue

4.1 Investigating phenomenon in Biological Sciences

Examine and identify plant and animal tissues
Draw observed cells to show specialized structure
Investigate fields in biotechnology related to plant and animal tissues [cloning, stem cell research]

4.2 Constructing of knowledge

Concept of tissues;
Location and relationship between structure and function of:

- Plant tissues: epidermis, parenchyma, chlorenchyma, collenchymas, Sclerenchyma, xylem and phloem
- Animal tissues: epithelial, connective, muscle and nerve

4.3 Application in Society

IKS and Technology
Traditional technology —traditional medicine and healers
Medical Technology —immunity, antibiotics and blood transfusion
Research in cloning, tissue and stem cell cultures
Current trends in tissue research

5. Plant and Animal Organs

1.1 Investigating phenomenon in Biological Sciences

Observation, interpretation and drawing of plant and animal organs

1.2 Constructing of knowledge in Biological Sciences

Concept of organs
External and internal structure in relation to function, of the following organs:
- Plant: Leaf, root or stem
- Animal: Lungs, Kidney or brain

5.3. Application in Society

Organ transplants
Plant grafting

6.1 Manmalian Body Systems

Skeletal (Supporting) system

6.1.1 Investigating phenomena

Study of skeletons of vertebrates
Analysis of X-rays of human bones
Study of long bone structure
Experiments —minerals and organic fibres in bones
Structure of skeletal muscles
Models; Antagonistic muscles

6.1.2 Constructing knowledge

Identify bones of axial and appendicular skeleton
Functions of different parts
Structure of a long bone
Joints
Antagonistic muscles and functioning

6.1.3 Application in Society

Diseases of the muscle-skeletal
Injuries
Importance of exercise

6.2 Human circulatory system

6.2.1 Investigating phenomena

Dissection of mammalian heart
Measuring pulse rate and the effects of exercise
Identifying different blood vessels

6.2.2 Constructing of knowledge in Biological Sciences

Closed and open blood systems
Different blood circuits
Structure and protection of the heart
Structure of blood vessels and differences
The cardiac cycle
Control of heart beat and rate

6.2.3 Application in Society

Cardiovascular diseases
Blood transfusions and blood types
Heart transplants

6.3 The Lymphatic System

6.3.1 Investigating phenomenon in Biological Sciences

Identifying lymph nodes in the human body

6.3.2 Constructing of knowledge in Biological Sciences

Blood and lymph as tissues
Relationship between lymphatic system and blood system
Structure of lymph glands and function of glands
General functions of the lymphatic system

6.4 Respiratory System in Man

6.4.1 Investigating phenomenon in Biological Sciences

Measurement and comparison of breathing depth and interpretation
Structure of lung —dissection
Experiments on:
- inspiration and expiration
- expired air contains carbon dioxide

Effect of altitude and air pollution health and activities

6.4.2 Constructing of knowledge in Biological Sciences

Distinction between cellular respiration, breathing
Requirements for efficient gaseous exchange
Parts of and structure of the respiratory system in mammals
Mechanism of breathing
Gaseous exchange and the transport of gases

6.4.3 Application in Society

Respiratory disorders and diseases
Effects of smoking
Artificial respiration

CHEMISTRY (EDUCATION) I (CHED 101)

1. Elementary statistics, precision and accuracy significant figures
2. Technical report writing
3. Laboratory practice and safety
4. Introduction to analytical chemistry
5. Sampling and sample handling
6. Introduction to volumetric and gravimetric analysis.
7. Matter and energy
8. Solutions
9. Acids and Bases
10. Redox, Electrochemistry
11. Chemical reaction reates and equilibrium
12. Introduction to inorganic chemistry
13. Introduction to organic chemistry

CHEMISTRY (EDUCATION) II (CHED 201)

1. Chemical Bonding
2. Properties of Gases
3. Physical Properties of Colloids and Solutions
4. Chemical Thermodynamics

5. Chemical Equilibra
6. Acids and Bases
7. Solubility
8. Nomeclature of Alkyl Substituents

CHEMISTRY (EDUCATION) III (CHED 301)

1. Electrochemistry
2. Chemical Kinetics
3. Solubility and Complexion Equilibria
4. The transition metals
5. Hydrogen, oxygen, nitrogen, phosphorous, sulphur and halogens
6. Organic Chemistry

PHYSICS (EDUCATION) I (PHSE 101)

1. Introduction and Mathematical Concepts
2. Kinematics in one dimension and two dimensions
3. Forces and Newton's Laws of motion
4. Impulse and momentum
5. Work Energy and Power

PHYSICS (EDUCATION) II (PHSE 201)

1. Magnetic forces
2. Electromagnetic induction
3. Simple Harmonics Motion and Elasticity
4. Fluids
5. Waves and Sound
6. Particles and Waves

PHYSICS (EDUCATION) III (PHSE 301)

1. Electric circuits
2. Alternating current circuits
3. Electronics
4. Electromagnetic Waves
5. Interference and Wave Nature of light
6. Nature of the Atoms
7. Nuclear Physics and Radioactivity

MATHEMATICS (EDUCATION) I (MTMC 101)

1. General Algebra —1st, 2nd and 3rd degree/inequalities equations, remainder/factor theorem
2. Function graphs and Transformation – Exploration
3. Algebraic and graphical solutions to equations and simultaneous intersections
4. Polynomial and rational functions/equations
5. Algebraic and Graphical representation of exponential and logarithmic functions
6. Trigonometric Functions, identities, equations, graphs and simple harmonics
7. Analytical Geometry Lines

MATHEMATICS (EDUCATION) II (MTMC 201)

1. Differential Calculus
2. Sequences, series and progressions
3. Analytical Trigonometry
4. Circle Geometry
5. Analytical Geometry Lines and Circles

6. Permutations, Combinations and Probability
7. Application of didactic principles to school grades 10 and 11 content

MATHEMATICS (EDUCATION) III (MTMC 301)

1. Further Differential Calculus
2. Linear Algebra
3. Vectors Algebra
4. Complex Numbers
5. Implicit differentiation and first order equations
6. Introduction to Integral Calculus
7. Further series —infinite, power, binomial expansion
8. Didactic principles applied to school grade 12 NCS content

B Ed (FET): Specialisation Technology

MATHEMATICS (EDUCATION) I (MTMC 101)

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MATHEMATICAL LITERACY (EDUCATION) I (MTHL101)

1. Numbers, Operations and Finance
2. Functional Relationships
3. Graphs
4. Shape, Space, and Measurement
5. Solids
6. Data Handling

MATHEMATICAL LITERACY (EDUCATION) II (MTHL 201)

1. Numerical solution of rate
2. Parameter and surface area of 2 D-shape
3. Functional relationships
4. Scale drawing
5. Interpretation of Data
6. Financial Mathematics

MATHEMATICAL LITERACY (EDUCATION) II (MTHL 301)

1. Working with formulae
2. Taxation and inflation
3. Parameter, surface area and volume of 3D-shape
4. Interpretation of table and graph
5. Data interpretation
6. Statistical Methods
7. Grids and Maps
8. Data Display
9. Budget and Banking

CIVIL TECHNOLOGY I (CVTC 101)

MECHANICAL TECHNOLOGY I (MCTC 101)

1. Technological processes
2. Structures
3. Electrical Systems and Control
4. Mechanical Systems and Control
5. Processing
6. Indigenous Technology
7. Impact of Technology

MECHANICAL TECHNOLOGY II (MCTC 201)

1. Safety
2. Tools
3. Materials
4. Terminology
5. Joining Methods
6. Mechanics
7. Maintenance
8. Systems
9. Heat Engines

MECHANICAL TECHNOLOGY III (MCTC 301)

1. Safety
2. Tools
3. Materials
4. Terminology
5. Joining Methods
6. Mechanics
7. Maintenance
8. Systems and Control
9. Turbines

ENGINEERING GRAPHICS AND DESIGN I (EGDS 101)

1. Introduction to Technological Design

Discuss the scope, educational and career opportunities related I to EGD. Include human rights, gender, inclusivity and HIV/AIDS issues.

2. Drawing principles as contained in the SANS code of practice as related to basic civil, electrical and mechanical drawing.

Practice line types according to the SANS Code of Practice (0111 & 0142 (elect) & 0143) and their application to: outline, construction, cutting plane line, line hatching, hidden detail and; centre line.

Practice the general lettering requirements according to the SANS code of practice.

3. Free-hand drawing

Practice the four basic hand movements need to reproduce proportional single, multi view and pictorial drawings using grid sheets and plain paper.

4. Setting up a Drawing Sheet

Paper sizes

Set up a drawing sheet showing all relevant information, eg. Name and. title blocks, appropriate symbols etc.

5. Instrument Drawing

Discuss, research and present in an appropriate form the dangers of the irresponsible use of sharp instruments that could cause bleeding and the transfer of HIV/AIDS Geometrical Constructions (need to know basis). Bisecting an angle, line, line division, circle through three points, perpendiculars, angles, line tangents, arc tangents, inscribed and circumscribed circle, polygons) 3.4.5.6.8 , circle and ellipse.

Scale drawings. (2:1, 1:1, 1:2, 1:5, 1:10, 1:20, 1:50, 1:100)

6. Orthographic

1st and 3rd angle orthographic projections as applied to simple castings from industry.

7. Projection (no sectional views)

Construction of polygons

8. Mechanical Drawings

Prisms, pyramid, cylinders and cones. The axis of the solids must include examples to be perpendicular, parallel and inclined to one principal plane.

9. Civil Drawings

Insert annotation, dimensioning and scale. Include floor plans and elevations that include: windows, doors and fixtures such as WC, bath, sink, shower, cupboard.

Apply colour coding according to building practice.

Show site plan and schedule of specifications. Include electrical, plumbing and drainage detail.

10 Descriptive geometry

Determine the orthographic views of points and line segments

Segments that are: perpendicular, inclined and oblique.

Determine the true length of a line segment and the true inclination of a line segment to the HP and VP using different methods, e.g. projection and construction methods.

11. Electrical Drawing

Use given electrical and electronic component symbols to draw simple circuit diagrams.

Draw parallel and series circuit diagrams that are relevant to; electrical appliances, house wiring etc. Include notes were appropriate and draw systems diagrams.

Draw wiring diagrams on floor plans of buildings.
Represent these as circuit diagrams and draw block diagrams.

12. Principles of Sectioning

Draw sectional views in 1st and 3rd angle of simple castings from Industry. Include the following:
SANS code of practice, dimensioning techniques, title, notes and symbol of projection.

13. Mechanical Drawing

Draw outside, sectional, half sectional and part sectional views of simple assemblies that include temporary fasteners. SANS code of practice, dimensioning techniques, title, notes and symbol of projection.
Draw outside, sectional, half sectional and part sectional multi-views of complex assemblies that include fasteners.
SANS code of practice, dimensioning techniques, title, notes and symbol of projection. Insert welding, machining and surface treatment symbols relevant to steel work.
Draw the sectional orthographic views of geometrical solids.

14. Solid Geometry

Prisms, pyramids, cylinders and cones. The axis of the solids must be perpendicular, parallel and inclined to one principal plane.
Combination of right regular geometrical solids.
True shapes

15. Civil Drawings

All applications only need to include single story dwellings
Draw elevations and sectional elevation showing foundation to slab.
Draw elevations and sectional elevation showing foundation to ceiling
Draw elevations and sectional elevation showing foundation to roof. includes roof trusses.

16. Principles of Pictorial Drawing

Draw simple oblique drawings. Include the circle in the front view only.
Draw simple to complex Isometric drawings including circles.(one point)
Produce 1 point perspective drawings of simple castings and single storey dwellings.
Produce 1 point perspective drawings of simple single story dwellings.
HL, PP and SP can be varied to provide among others a bird's eye and worms eye view.

17. Computer technology [CAD]

List the electronic and computer technologies that impact on graphical communication.
Evaluate the advantages and disadvantages of electronic and computer technologies that impact on graphical communication
Computer hardware, operating systems, software and file types and file management
CAD software
CAD drawing and printing templates (including layers) and modify functions
Computer peripherals

18. **The Design process:**

Apply the design process to the civil, electrical and mechanical
Problem identification and concept sketches
Analyze
Working drawings
Synthesizing
Model making where possible (optional)

Evaluation
Design a floor plan of a dwelling according to given specifications.
Design a simple mechanical product according to given specifications.

19. Visualisation cognitive and perceptual exercises

Analyze drawings and answer questions based on single multi-view and pictorial drawings within the context of civil, electrical and mechanical.
Visualization of cognitive and perception exercises

ENGINEERING GRAPHICS AND DESIGN II (EGDS 201)

1. Loci
- a. Helix
- b. Cams
- c. Cycloidal curves
- d. Link mechanisms

2. Solid Geometry
- a. Sectional views
- b. Auxiliary views
- c. True shapes
- d. Interpenetrations
- **e.** Developments

3. Pictorial Drawing
- a. Perspective

4. Engineering Graphics & Design Didactics
- a. Lesson planning
- b. Lesson presentation

ENGINEERING GRAPHICS AND DESIGN III (EGDS 301)

1. Mechanical drawing
- a. Development of transition pieces
- b. Dimensioning and annotation
- c. Auxiliary views
- d. Assembly drawings

2. Civil drawing
- a. Plan and elevations of dwellings
- b. Sectioned elevations
- c. Detailed drawings

3. **Pictorial drawing**
- a. Isometric drawings
- b. Sectioned isometric drawings

4. Computer aided drawing
- a. Mechanical drawing
- b. Civil drawing
- c. Isometric drawing
- d. Application in didactics

5. Engineering Graphics & Design Didactics
- a. Lesson plans preparation
- b. Lesson presentation

ELECTRICAL TECHNOLOGY 101

- **Occupational Health and Safety**
  - Personal protection equipment
  - Safety Practices in the work place
- **Basic Hand Tools**
  - Basic hand tools
  - Safety and tools
- **Electrical/Electronic Circuits**
  - Atomic theory of electricity
  - Ohm's law
  - Theory of current law
  - Series circuit as voltage divider
  - Parallel circuit as a current divider
  - Have electrical circuits with more than one output device in the circuit (series and parallel combinations)
  - That shows how simple electronic circuits and devices are used to make an output respond to an input signal (e.g. resistors, light-emitting diodes, transistors, push or magnetic switches, thermistors, light dependent resistors).
  - Temperature coefficient
  - Identify and describe the characteristics of electronic components such as:
    - Resistors
    - Light dependent resistors
    - Capacitors
    - Inductors
    - PN-diodes
    - Light emitting diodes
  - Transformers
  - Earth leakage devices
  - Distribution boards
  - Energy and Power
- **Digital Electronic systems**

Shows how electrical circuits with more than one input or control device which will work based on different logic conditions ('AND', 'NOT' and 'OR' logic) and represents them using circuit diagrams, systems diagrams and truth tables.
Convert binary numbers to decimals, hexadecimal, octal.
Demonstrates knowledge and understanding of digital electronic systems:
Identify and comprehend binary circuits and build binary circuits relating to electrical circuits

ELECTRICAL TECHNOLOGY 201

1. **Safety and instruments**
   - Identify unsafe conditions and acts and apply
   - Tools and instruments correctly.
   - Identify unsafe conditions and acts when doing
   - practical work and apply tools and instruments correctly to:

   Verify Kirchhoff's laws in AC-and DC circuits.
   Demonstrate the effect of single-phase AC on R, L and C components and investigate the effect of combinations of series circuits, including the effect of frequency changes
   Test insulation, continuity and earth continuity on equipment.

- Describe the Occupational Health and Safety (OHS) Act with reference to general unsafe actions, dangerous practices and unsafe conditions.
- Explain the Occupational Health and Safety (OHS) Act dealing with unsafe actions, dangerous practices and unsafe conditions.

2. Electrical applications

Construct and comprehend single-phase circuits
Construct and apply single-phase circuits.
Describe the use and care of different types of tools and measuring instruments, such as pliers, screwdrivers, multimeters and continuity or insulation testers.
Explain the use and care for instruments and their correct application and interpretation to ensure accurate measurements such as a multimeter, continuity or insulation tester, function generator and oscilloscope.

Describe the principles of electricity with reference to:

Atom theory
Ohm's law and calculations
Theory of current flow
Series circuit as voltage divider
Parallel circuit as a current divider
Combination circuits
Specific resistance

Temperature coefficient

- Describe the principles of electrostatics with reference to capacitance and electrostatic charge.
- Identify and describe the characteristics of electronic components such as:
  Resistors
  Light dependent resistors
  Capacitors
  Inductors
  PN-diodes
  Light emitting diodes and transformers
- Explain the principles and effect of AC on resistor, inductor and capacitor components with reference to:
  Series combination circuits containing one resistor, one capacitor and one inductor

Frequency changes

Phasor and wave representation
Resonance

Calculations

3. Electronics

- Construct and comprehend electronic circuits.
- Construct and apply electronic circuits.
- Describe the principles of electro-magnetism with reference to Faraday's law and Lenz's law and its application in a relay and DC motor.
- Describe the principles of operation and use of power sources like batteries and solar cells like internal resistance, capacity and VA rating.
- Describe the following logic concepts:
  Binary number systems
  Logic symbols
  Logic functions: AND, OR and NOT

- Describe and compare a variety of protective devices and applications such as fuses, miniature circuit breakers and earth leakage devices.
- Explain the principles of AC generation of a single-phase supply by a rotating conductor loop in a two-pole magnetic field.
- Explain the operating principles, characteristics curves and use of semi-conductor devices such as:
  PN diodes
  Bipolar transistors
  Thyristors

4. Digital electronics
Construct, comprehend and apply digital circuits.

ELECTRICAL TECHNOLOGY 301

- **Occupational Health and Safety**
  The consequences of the OHS act, risk assessment, human rights in the workplace, work ethics and emergencies

- **Three Phase Transformers**
  Principles of operation, calculations and application.

- **Three Phase Motors & Starters**
  Principle of operation, Testing and commissioning and starters

- **RLC**
  The effect of AC on Series and parallel RLC Circuits

- **Amplifiers**
  Principle of operation and application of operational amplifiers

- **Communications**
  Radio communications, antennas, modes of modulation, transmitters and receivers.