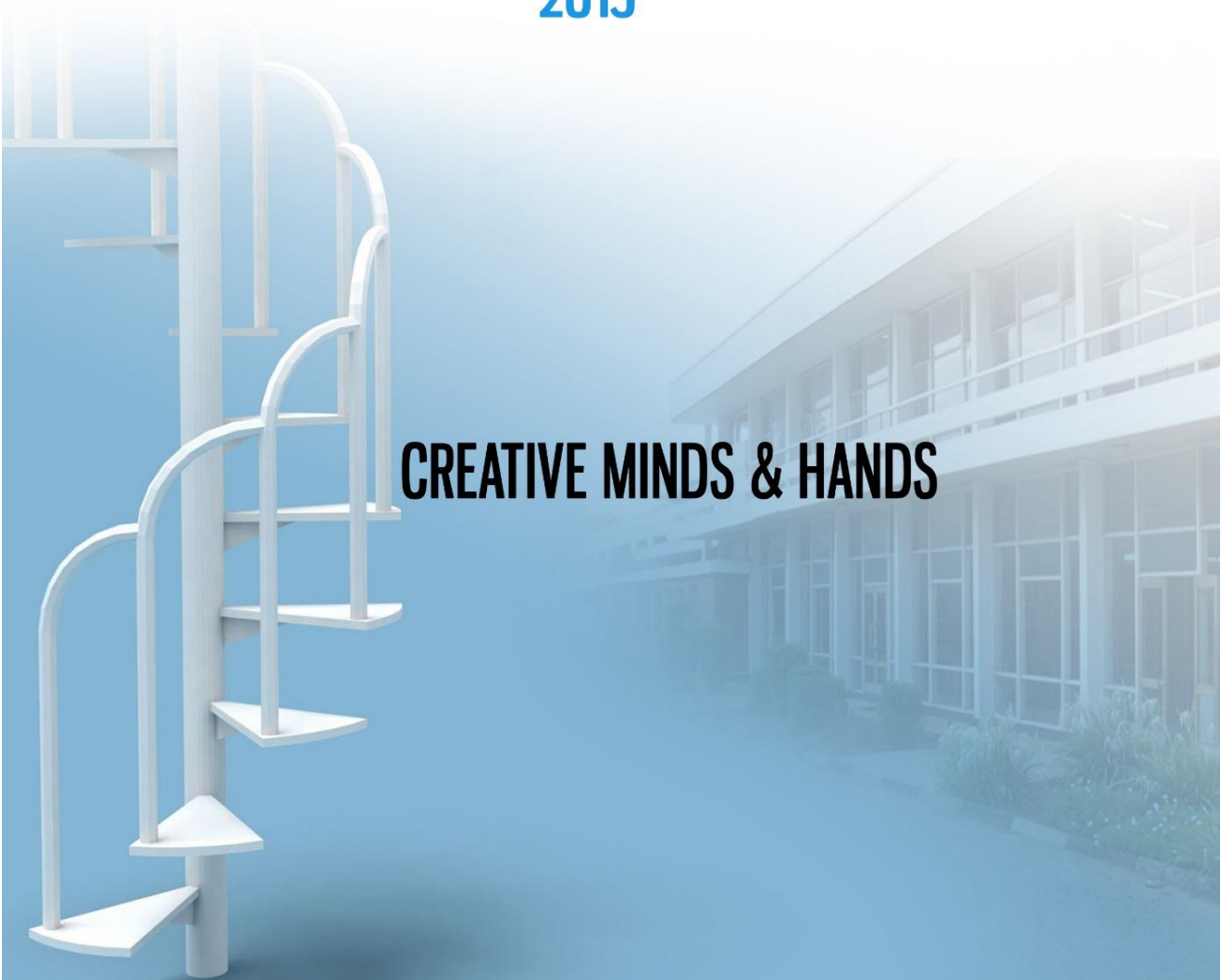




**OPEN DISTANCE AND FLEXIBLE LEARNING
[ODFL]**

**STUDENTS MANUAL
2015**

CREATIVE MINDS & HANDS



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1.0 INTRODUCTION

1.1 Northern Technical College

Northern Technical College, fondly known as NORTEC, was founded in 1964 as an Engineering skills training institute. It was established mainly to provide technical skilled man power to the country's flourishing copper mines. Throughout its half a century history of existence, NORTEC has consistently performed in accordance with its *raison d'être* by churning out highly competent Craftsmen, Technicians and Technologists who have positively contributed to the success of the mining industry. Over the years, the College has also been a major contributor of the requisite skills to Zambia's emerging sectors like construction, service, IT and entrepreneurship. Today NORTEC ranks among Zambia's leading technical training providers due its undiminishing contribution to both our nation and beyond.

The vision of the College is to be a leading training provider in the region while our commitment is to the noble values of *integrity, professionalism, team spirit, efficiency, excellence, innovativeness and pro-activeness in the delivery our services*. These values permeate our organizational system, form our character, guide our activities and reflect in both our character and the quality of our graduates. To achieve our vision, NORTEC has maintained its long held tradition of prioritizing quality and innovation in our training delivery efforts.

Northern Technical College is accredited with the Technical Educational Vocational and Entrepreneurship Training Authority (TEVETA). The College has also forged partnerships with leading local universities (Copperbelt University and the University of Zambia), corporations and international partners who include among others, the Kaizen Institute of Zambia, African Development Bank and, Volvo of Sweden.

NORTEC is a quasi – government institution administered by a Management Board. The institution has currently four academic departments namely, Mechanical, Electrical, Automotive /Heavy Equipment Repair and Applied Sciences and Business Studies. Our course portfolio includes: Mechanical Engineering, Electrical Engineering, Automotive Engineering, Heavy Equipment Repair, Biomedical Engineering, Laboratory Science, Computer Studies and Production Management. Additionally, the College offers various short intensive training courses.

Looking forward, NORTEC remains focused to maintain its role of being a reputable skills training provider in Zambia and the region, a TVET sector leader and an important solution to Zambia's technological, economic and social challenges. The institution will sustain the thrust to continue to design courses meant to tackle various prevailing national challenges like youth unemployment and industrial skills gaps.

1. VISION STATEMENT

The vision statement for NORTEC is to be recognized as **“A leading engineering institution in technical and vocational training in the region.”**

2. MISSION STATEMENT

NORTEC’s Mission Statement is **“To provide quality technical and vocational training in order to meet industry needs and contribute to socio-economic development.”**

3. VALUE STATEMENT

In an effort to become a leading engineering institution in technical and vocational training, NORTEC upholds the following values:

- **Integrity:** to be honest, sincere and ethical in our conduct by putting the obligations of the institution above personal interests
- **Professionalism:** to demonstrate the highest professional standards in the conduct of our work
- **Team spirit:** to achieve common objectives through mutual respect and collective effort
- **Pro-activeness:** to execute our duties with alertness and take initiative in resolving the anticipated challenges in a timely manner.
- **Efficiency:** to utilize our resources such as time, effort and money, for their intended purpose to produce specific outcomes with a minimum amount of waste, expense, or unnecessary effort.
- **Excellence:** to offer products and services with exceptionally good quality which surpasses ordinary standards
- **Innovativeness:** to promote better solutions that meet industry requirements by creating new and imaginative products and services.

1.2 Open Distance and Flexible Learning (ODFL)

Rapid changes witnessed in recent times have affected Zambia's education system in certain terms. Changes in social, economic and technological spheres have led to mounting pressure on Zambia's education system. The TVET sector, which is particularly seen as critical in providing solutions to such challenges through the impartation of industrial and life skills is, however, beset with numerous challenges too. A general problem encountered by both TVET and the education system in Zambia is limited access to training provision.

To tackle the problem of limited access to training, GRZ has taken cognizance of distance learning as a key alternative to the conventional training mode. And through collaboration with its education sector agencies the Zambian government has developed policy frameworks and key guidelines for the training stakeholders to follow in order operationalize distance learning. Consequently, many training institutions have seized the initiative and introduced distance learning as an alternative to conventional training delivery.

NORTEC has responded positively to government's call by adopting ODFL as an alternative learning pathway. Accordingly, NORTEC introduced Open Distance and Flexible Learning in 2012 in line with the TEVET Policy of 1996 which identifies the provision of access to training opportunities to all people in the community as a social objective.

Our ODFL strives to achieve the following objectives:

- 1) Increase access to training for the people closed out by the conventional mode of learning.
- 2) Provide opportunity for the working groups/individuals to enhance their qualification and skills
- 3) Increase training opportunities for women to learn skills in engineering
- 4) Expand the limited training places available at the college
- 5) Improve financial base for the college
- 6) Utilize college resources effectively

At NORTEC, we view distance learning as integral part of our training delivery system. This is because it enhances both the goals of the College and the nation. ODFL caters for the training needs of a variety of learners disadvantaged by the conventional school system. The mode of delivery for the course is also flexible. Thus, students who enroll in our engineering courses are able to access education in various engineering related skills and professional development because of the flexible study methods we offer.

1.3 Principal's Welcoming Message

On behalf of the Northern Technical College Management Board, the staff and indeed on my own behalf, I wish to welcome you to Open Distance and Flexible Learning (ODFL) at Northern Technical College.

In December 2012, Management of the College made a bold decision to start offering distance learning in Mechanical, Electrical and Automotive Engineering. The decision was significant for two key reasons:

1. NORTEC became the first training institution in Zambia to offer Engineering courses through distance learning
2. NORTEC provided opportunity for many willing but disadvantaged learners

Since our involvement in distance learning, we have continued to learn what the needs of our clients are and how to satisfy them. Experience has taught us that ODFL is a unique and interesting method of study delivery.

Firstly, we have learned that distance learning is dissimilar to full time learning in that the learner is separated from the facilitator by both place and time. The separation does present the learner with both opportunities and disadvantages. The advantage is that the learner can learn with the convenience of being away from the school set up. However, the separation of the learner from the trainer can as well create serious challenges especially where engineering subjects are to be delivered. To overcome the challenges, our College recognizes the need to employ IT based technologies and carefully designed instructional material that can lucidly communicate with the learner who is impersonally in contact with the facilitator. Thus at NORTEC, our ODFL team has given priority to the development of quality instructional material and the deployment of the Moodle E-learning platform.

The second important lesson we have learnt is that delivering this programme involves dealing with adult learners. Adult learners, who are already working, can sometimes easily link their theoretical training with the work situation. Many adults also tend to be highly motivated because they know what is at stake in case they failed an examination. However, our College is careful to avoid using such perception to disadvantage our learners. Our team is aware of the many difficulties under which many of our students have to study, and are therefore eager to provide assistance such as consultancy, face to face facilitation, revision classes, feedback, etc. to enable students to derive full benefit from their studies.

Despite the challenges we have overcome and those still to be faced, we are pleased with the results we have so far achieved. In fact, both the challenges and opportunities that we keep sighting each moment only strengthen our commitment to make this programme better.

In conclusion, we are pleased with the rapid growth of the ODFL programme at the College. Our recent analysis showed that between December 2012 and August 2016, the total of registered students on ODFL rose from 16 to about over 500. Our long term view of ODFL is to develop it into a directorate with satellite locations dotted throughout Zambia.

You are welcome to ODFL!

**V. MULENGA
PRINCIPAL,**

1.4 List of Abbreviations

ASBS	: Applied Sciences and Business Studies
CA	: Continuous Assessment
HOD	: Head of Department
NORTEC	: Northern Technical College
NSU	: NORTEC Student Union
ODFL	: Open Distance and Flexible Learning
QAA	: Quality Assurance and Assessment
RS	: Residential School
TEVETA	: Technical Education, Vocational and Entrepreneurship Training Authority
TM	: Training Manager
ZANACO	: Zambia National Commercial Bank

1.5 Contact Persons

Our learners and clients can contact the college the following College officials:

➤ Training Manager:	M. Kasonso	0977759675
➤ HOD Mechanical:	S. Mulapa	0967643977
➤ HOD Electrical:	E. Ng'andwe	0966940032
➤ HOD Auto/HER:	A. K Banda	0977536673
➤ HOD ASBS	W. Kangumu	0954174633
➤ HOD QAA:	J.B Mulenga	0964773211
➤ ODFL Coordinator:	M. Nkonde	0962820240
➤ Student Affairs Officer:	F. Muziya	0955696138
➤ IT Administrator:	J. Sakala	0977528864
➤ Registry Clerk:	D. Ponde	0977828379
➤ Librarian	C. M Banda	0977368572
➤ Finance Officer:	R. Mumba	0965766124
➤ Principal's secretary:	C. Kasapo	0977667674
➤ Examinations officer:	L. Chavula	0955919608

All Witten communication should be addressed to:

The principal
Northern Technical College
P.O Box 250095
NDOLA

Telephone: +260-212-680142/144
Fax: +260-212-680143
Email: principal@nortec.edu.zm

Visit our Website at: www.nortec.edu.zm

2.0 OPEN DISTANCE AND FLEXIBLE LEARNING

2.1 COURSES

2.1.1 Course Offered

There are currently five (5) courses we are offering under Open Distance and Flexible Learning (ODFL). All the courses are certified by the Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) and are as follows:

- Automotive Engineering Diploma (TEVETA)
- Electrical Engineering Diploma (TEVETA)
- Mechanical Engineering Diploma (TEVETA)

Newly introduced courses include:

- Diploma in Heavy Equipment Engineering (TEVETA)
- Diploma in Technical & Vocational Teaching (TEVETA)

2.1.2 Course Entry Requirements

Student enrolment in distance learning is restricted to mature. Students of any age and nationality who meet the following minimum qualifications:

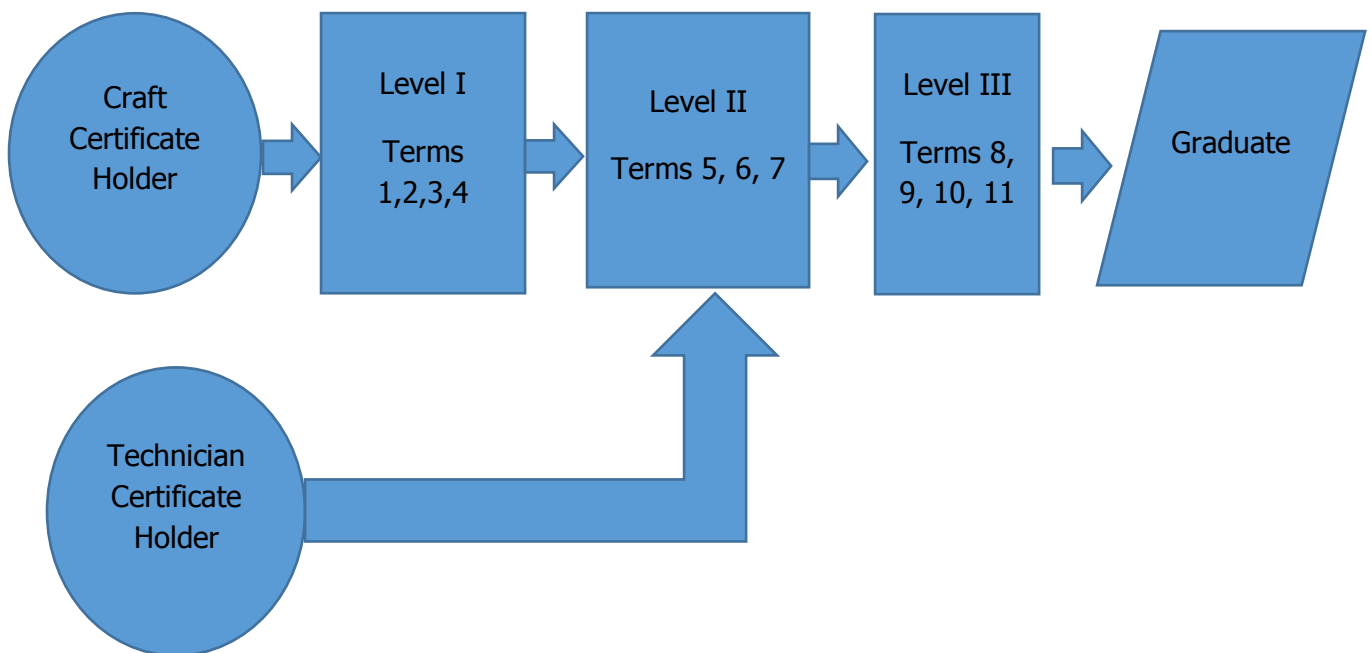
Course	Level	Entry requirements
MECHANICAL ENGINEERING	Diploma in Mechanical Engineering	Advanced Certificate in Mechanical Engineering or equivalent with two years minimum work experience Grade 12 School Certificate, or equivalent,
	Advanced Certificate in Mechanical Engineering	Craft Certificate with minimum of 2 years working experience.
AUTOMOTIVE ENGINEERING	Diploma in Automotive Engineering	Advanced Certificate in Automotive or Heavy Equipment Repair Engineering or equivalent with two years minimum work experience start at this level
	Advanced Certificate in Automotive Engineering (Technician)	Craft Certificate with minimum of 2 years working experience.
ELECTRICAL ENGINEERING	Diploma in Electrical Engineering (Technologist)	Advanced Certificate in Electrical Engineering or equivalent with two (2) years minimum work experience
	Advanced Certificate in Electrical Engineering	Craft Certificate with Grade 12 School Certificate, or equivalent, with five credits which must include English, Mathematics and Science and a minimum of 2 years working experience.

NB: Prospective learners with Foreign and other unspecified qualifications must have them evaluated against the TEVETA Qualification Framework to determine their equivalence before they are considered for enrolment.

2.1.3 Course Duration and learner progression

Experts and regulators recommend the allocation of a longer duration for distance learning courses than for full time learning. In this regard, NORTEC Management adds an extra term to each academic stage or level. By effecting this relaxation to the learning calendar, we have created more time for our learners' to study adequately, cover the syllabi and complete their assessments.

ODFL progression is according to the path charted below:

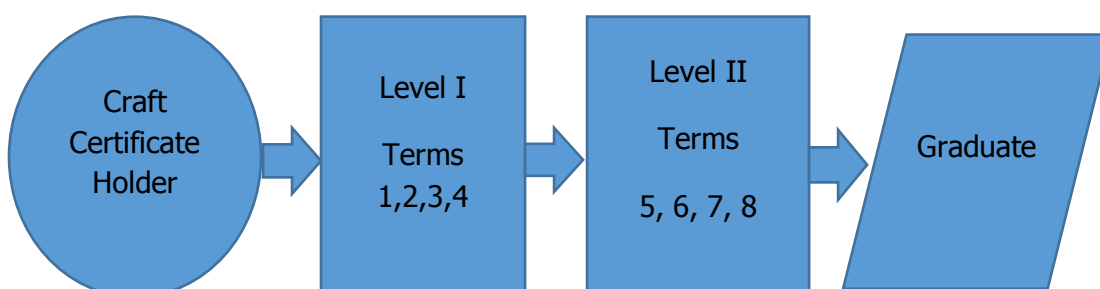


N.B: Craft Certificate holders start as Technician (Level I) students and only progress to the Diploma (Level II) upon scoring a set number of points in key subjects.

Duration of the Diploma course is as follows:

- Craft Certificate holders: 3 years and 2 terms (11 terms)
- Advanced Certificate holders: 2 years 1 term (7 terms)

ODFL progression **Electrical Technician** is according to the path charted below:



N.B: Craft Certificate holders start as Technician (Level I) students and only progress to the

2.2FEES

2.2.1 Tuition fees

Learners are required to pay their school fees termly in line with the College policy. Management of the College revises the fees through a consultative process with its stakeholders.

For current fees *see fees schedule in appendix*

The College demands that each learner pays his/her in full before being allowed to register for the term.

2.2.2 Method of payment

All fees are paid at the bank and students report to the College with deposit slips for receipting.

The fees must be deposited into the following College Bank Account:

ZANACO NORTEC BILLMUSTER
A/C Number 1560413300151

Learners and sponsors are advised to ensure that only correct amounts are deposited into the account. Any over payments will be credited to the student's account to offset future fees. Any refunds claimed will attract 15% administration charge.

2.3STUDENT APPLICATION AND ENROLMENT

2.3.1 When you can enroll

Our College enrolls distance students in August. Prospective learners can apply in reasonable time to avoid being left out

2.3.2 How you can access our application form

ODFL application forms can be accessed through the following ways:

- Downloading from the College website (*www.nortec.edu.zm*)
- Collecting from the College or

Whichever way the application form is accessed, the applicant must pay a **non-refundable application fee of K100.00**. The fee must be paid directly deposited into the College bank account given earlier.

N.B: The College does not receive cash payment.

2.3.3 How you can apply For Enrolment

Applying to be enrolled on distance learning is by way of the prospective student submitting a complete application form. The learner is required to accompany his/her application with at least, **a bank deposit slip, certified copies of their certificates and the National Registration Card.**

The completed application form can then be submitted to the Student Affairs Officer

If an application is sent through postage or email, it must have an accompanying proof of payment in form of the ***original bank deposit slip sent to the College.***

It is also important that application forms meant for ODFL are addressed as such to distinguish them from those meant for full time.

2.3.4 When and how you can get your response

ODFL has adopted blended communication approaches to ensure effective communication. Usually, we communicate through posted mails, emails, phone calls and SMSs.

We strive to respond promptly to our clients' issues. With regards to application for admission, the applicants can expect response within two weeks. Therefore applicants who fail to receive response the lapse of reasonable time should notify the ODFL Coordinator.

2.4 STUDENT REGISTRATION

2.4.1 Types of Registration

There are **three** important registrations that ODFL learners are required to fulfill when they join distance learning. These are:

- College Enrolment Registration
- TEVETA Enrolment Registration
- TEVETA Examination Registration

2.4.2 How you can register or confirm your Enrolment

When new students join ODFL they first undergo an enrolment process to be registered in the College. On the other hand, the returning students undertake a similar process to confirm their continuing. The processes are identical and done concurrently on the eve (**Sunday**) of the RS, between **08:00 and 17:00 hours**

To successfully complete the processes of registration candidates must take the following steps:

1. collect student enrolment forms (for new students) or confirmation slips for returning students from ODFL Coordinator /HOD
2. present completed forms and requirements to the Senior Lecturer of your department
3. register with matron/warden and SAO for room allocation and further registration
4. present deposit slip or make payment at the Accounts office for receipting
5. Submit documents at the registry for filing.

A learner who fails to register with the college during the registration period is in breach of the conditions of the offer and therefore liable to forfeit his or her place. To avoid having their offer revoked learners are required to communicate to the Principal of the College their situation. In extreme cases, learners may request to defer their enrolment.

2.4.3 How You Can Register With TEVETA For Enrolment

This registration is very important because TEVETA admits students in their courses based on this process. Students who fail to register with TEVETA can never be recognized as bonafide.

To successfully complete registration take the steps below:

1. collect the TEVETA enrolment forms ODFL office
2. complete the forms and attaches all requirements
3. present enrolment forms to the HOD for verification and approval
4. leave the form with the HOD once it is approved

Learners need to know that their registration is only completed if TEVETA approves the learners' enrolments and provides learners with student numbers. Feedback from TEVETA is usually communicated to our learners through QAA office.

When a learner fails to register with TEVETA, they are not recognized by the Authority and therefore cannot even register to sit for examinations.

2.4.4 How You Can Enroll For TEVETA Examinations

To be eligible to write any TEVETA examinations, the learner must have been duly registered by TEVETA and allocated a valid student number. This registration is usually conducted at our college with students performing the following:

1. Collect examination form from the examinations office at NORTEC, apply for examinations and pay examination fees not later than THREE (3) months from the examination due date and then ensure that you take your completed form to the head of your department.
2. Verify details when TEVETA examination registers are published a few weeks before examinations commence
3. Verify your Continuous Assessment performance through the department
4. Collect examination timetable a few days before examinations commence

Any student who fails to undertake examination registration is automatically disqualified from participating in examinations.

N.B: Students have to pay examination fees in full depending on the number of subjects they wish to sit.

The amount of examination fees is determined by TEVETA and may vary from time to time.

2.5 EXEMPTIONS

2.5.1 Can a student be awarded exemptions?

Yes, any student who meets the criteria set by TEVETA may be awarded exemptions. Thus our students who feel qualified for any exemption are normally encouraged to apply to TEVETA for such a consideration on their own.

Students can collect exemption forms from the Examination Officer at NORTEC and start the process.

When applying for exemptions, it is imperative that learners note the following:

- Exemptions are considered on request from the learner.
- Learners must provide proof of having adequately studied the subject (s)
- Exemptions are a prerogative of the examining board.
- There is a fee students are required pay to TEVETA for the subjects they seek to be exempted.

2.6 RESIDENTIAL SCHOOL

2.6.1 What happens during the Residential School?

Every term our College holds a TWO/THREE - week residential school to train and assess the learners. During each RS our ODFL team strives to maximally utilize the available time and resources to effectively attend to the needs of the learners.

The following are key activities conducted during the RS:

- Registration and confirmation of students
- Intensive face to face lectures
- Conducting of labs, workshops and practicals
- Continuous Assessments through assignments, tests, mock examinations, projects
- Distribution of modules
- Counselling and guidance

2.6.2 What can happen if you fail to attend the RS?

Attendance of the RS is **compulsory** to all students and those who miss the RS without permission can be withdrawn from the course by Management.

When a learner feels unable to attend the RS, they must write to the Principal of the College seeking permission to either withdraw from the course or proceed. Any learner who requests to continue and pays fees will be provided with modules, assessments etc. by the College while learners who withdraw from the course will have to resume their course next time there is an equivalent class.

2.7 LEARNER SUPPORT

Our learners are entitled to learner support on and off the campus. It is College policy to give academic, administrative and psychological support to learners.

We give learner support mainly through the following ways:

- Face-to-face tutorial support largely during the residential school
- Support personnel and part –time tutors to ensure adequate – learner tutor ratio for each programme
- Assessment and Clarification of tutorial comments made on assignments;
- Consultation
- Provision of study materials and supplementary readings
- Virtual classes on social media platforms
- Moodle platform, mobile phone, video
- Induction / orientation schedule
- Prospectus
- Counseling service

2.8 LEARNER STUDY MATERIAL

Every student who is fully registered for each term is entitled to receive our College – designed study materials or modules. The modules are expertly packaged to meet the training needs of industry and to address syllabi learning outcomes.

To enhance learner accessibility to College modules, instructional materials and other College resources, our IT section is in the process of uploading them to the Moodle platform- where our learners can access them online anywhere and anytime.

The cost of material is embedded in the fees paid by our learners.

2.9 STUDENT ASSESSMENT AND EXAMINATIONS

Our learners are subjected to two sets of examinations namely:

- Continuous Assessment (CA) and
- Final (TEVETA) Examinations

2.9.1 Continuous Assessments

Continuous assessment is a mandatory requirement for ODFL learners. It comprises assignments, tests, projects and mock examinations which account for **40%** marks of the overall subject marks.

Usually, our students are advised to handle their assignments outside the residential school period. However, lecturers can at times demand students complete their assignments during the RS period.

CA for theory papers is computed as follows:

Assessment Type	Mark %	Mark / 40
Assignments	10%	4
Mid Term Tests	30%	12
End Of Term Tests & Mock Exam	60%	24
Total	100%	40

Learners who fail to accumulate continuous assessment mark of 50% risk being excluded from the course

2.9.1.1 Guidelines for submitting Assignments

Submission of assignments must be done according to the following guidelines:

1. Submit assignments according to the dates given by the College. Any Assignment submitted after the due dates will NOT be marked. The College accepts late submission of assignments only on Medical and humanitarian reasons. Therefore you must attach valid documentary proof as part of the assignment before any late submission will be considered.
2. Ensure that the assignment conforms to the formal requirements set out by the College (see appendix V).
***N.B:** Learners, whose assignments fail to comply with these requirements, might lose marks.*
3. If you use express post for mailing the assignments, you must pay the costs attached to this service. The College will not pay penalties for assignments with insufficient postage.
4. Students living in the vicinity of NORTEC and those who prefer to submit their assignments personally must hand them in at the registry office.

5. Copying assignments constitutes a transgression of the Student Regulations of NORTEC and TEVETA. If found guilty of copying assignments, students will be awarded 0% for such an assignment.
6. You must acknowledge by means of complete referencing, all sources used and/or quoted in your assignments. Any students found guilty of plagiarism will be penalized and may be awarded 0%.
7. A learner, who has strong reasons to believe that an assignment mark may be incorrect, may apply that such mark be re-checked, regardless of the mark obtained. An application for a re-check must be directed to the Principal of the college. Applications must be accompanied by a full motivation explaining why a re-check is sought. Such a re-check shall not necessarily lead to a re-mark of the assignment, unless so determined by the college.

2.9.2 TEVETA Examinations

Our distance learners write the same examinations as students on conventional learning modes

The final TEVETA examination accounts for **60%** of the overall marks available in the examination.

To pass an examination subject, the student must **score at least 50%** (when marks for both continuous assessment and the final examination are aggregated). TEVETA grades learners' marks as follows:

MARKS %	GRADE	DESCRIPTION
80 – 100	D	DISTINCTION
70 – 79	M	MERIT
60 – 69	C	CREDIT
50 – 59	P	PASS
0 – 49	F	FAIL

Grading System

2.9.2. 1 Requirements To Sit The TEVETA Examinations

To successfully sit for any examinations each candidate is required fulfill the following minimum requirements:

1. Register fully with the College and TEVETA
2. Have a student examination number given by TEVETA
3. Fully pay TEVETA examination and College fees
4. Verify the enrolment approximately six (6) weeks before commencement of examinations
5. Amass a continuous assessment mark of at least 50%
6. Attend at least 80% of lectures

2.9.2.2 Examination timetable

Examination timetables are prepared by TEVETA but NORTEC through the ODFL Coordinator takes the responsibility of ensuring that all learners are availed the copy at the earliest possible time.

Thus ODFL learners who feel concerned about the examination timetable, especially in the period leading to the TEVETA examination should consult the Coordinator.

2.9.2.3 Conduct of examinations

Learners themselves are responsible for ensuring that they attend the correct examination session and receive the correct examination question paper.

Before permitting learners to enter the examination room, invigilators may demand learners comply with the following rules:

1. Prove their identity
2. Produce student card or proof of registration
3. Produce Examination slip / pass
4. Switch off Cellular phones, scientific calculators or any electronic devices

The duration of every examination paper will be indicated on the timetable.

2.9.2.4 Examination Results

1. The examination results are normally expected to be available within *two to three months* of writing the examinations. However, sometimes delays can occur
2. Examination results are usually in the custody of the Examination Office and students can collect them from there.
3. To collect their results students are required to produce statement of their accounts, NRC and clearance form
4. Students wishing to know their results may be furnished with such on their own request.
5. No results will be mailed or availed to a student before he or she has returned all books that he or she has borrowed from the library.
6. No results will be shown or sent to students who have not settled their accounts in full.

2.10 GRADUATION CEREMONY

Our learners consummate their study pursuit with a Graduation ceremony. The momentous occasion currently takes place every year at NORTEC. ODFL students graduate with their full time colleagues simultaneously.

2.11 COLLEGE ACADEMIC CALENDAR

Our ODFL academic calendar is published annually and distributed to learners as soon as it is available. Therefore every student must get a copy of this calendar to ensure they are familiar with the activities for each year *See appendix III*

2.12 ODFL FACILITIES

2.12.1 Hostels/ Accommodation

- NORTEC has a combined bed space capacity in excess of 550 at its Kwacha and Chela hostels.
- ODFL students wishing to be accommodated either during RS or examinations must pay **K150.00** per bed space for the period up to two weeks.
- Rooms are allocated on first pay first served basis. So learners must make reservations for the rooms early.

- Learners wishing to lodge outside our facilities must make their own arrangements

2.12.2 Catering

- NORTEC has a canteen within its premises which is independently administered. Learners wishing to feed from the canteen are supposed to make arrangements with its owners.
- Conversely, canteen payments must not be paid in the college account.
- Canteen schedules are dispatched to our learners together with the acceptance letter. *for catering services*

2.12.3 Workshops And Laboratories

Our unflinching commitment to promote effective hands-on approach to training in the fields of Mechanical, Automotive and Electrical Engineering has sustained our momentum to maintain our workshops and laboratories in a sound operational state. NORTEC currently boasts of a number of workshops, laboratories and equipment located in all the departments. The presence of these facilities makes the distance learners feel at home while on the course.

2.12.4 Library

Our learners have the chance of using our library facility which is also located within the premises of the main campus. The library is normally operational between 09:00 and 17:00 hours during week days. But during the residential school, the library operates up to 22:00 hours during work days and up to 14:00 hours over the weekends.

2.12.5 Internet

NORTEC also has both internet and wireless connections to enhance learner learning. Each department has its computer laboratories.

2.12.6 Sick Bay

We have within our campus a fully functional sick bay that provides medical services to our college community. The clinic is managed by two qualified medical staff.

3.0 FULL TIME LEARNING COURSES

NORTEC offers several programmes through its various Academic Departments. Simply, we are a multimodal training provider which seeks to cater for the training needs of various learner categories.

We offer our programmes through Distance Learning, Evening Classes, Full Time and Short Intensive Training.

This section gives you brief insights into the programmes offer by the Departments, their entry requirements as well as the progression.

3.1 MECHANICAL ENGINEERING DEPARTMENT

Our Mechanical Engineering Department offers exciting courses. The courses are highly practical; making our graduates ready to perform in industry on graduation.

The Mechanical department has three well-equipped Workshops and several Laboratories where practical training is conducted. Our Mechanical drafting lab has a mini- CNC Machine for demonstrations in Computer Aided Manufacturing stream (CAM) and solid works.

NORTEC has links with industry and other organizations, both local and international who help the department in areas such as acquisition of training equipment and materials, and curriculum development to meet modern trends.

We look forward to having you enroll with us in the following courses:

3.1.2 Courses offered

S/No.	Field	Diploma (Technologist/ TQF 6 Level)	Advanced Certificate (Technician/ TQF 5 Level)	Craft Certificate (TQF Level) ⁴	Trade Certificate (TQF 3 Level)
1	Mechanical Engineering	✓	✓	✓	✓
2	Mechanical Draughting		✓		
3	Metal Fabrication (Structural Engineering)		✓	✓	✓
4	Rigging			✓	✓

The courses are offered on the following learning modes:

S/No.	Programme	Full time	Evening	Distance
1	Diploma in Mechanical Engineering (Technologist)	✓	✓	✓
2	Advanced Certificate (Technician) in Mechanical	✓		
3	Advanced Certificate (Technician) in Mechanical Draughting	✓		
4	(Craft) Certificate in Mechanical	✓		
5	Advanced Certificate (Technician) in Metal Fabrication	✓		

3.1.3 Admission Requirements

Applicants to any course offered in our department must satisfy the minimum requirements listed below.

a. Advanced Certificate Courses

Direct Entry

- Grade 12 School Certificate, or equivalent, with five credits which must include English, Mathematics and Science

Mature Age Entry

- Craft Certificate with minimum of 2 years work experience

b. Diploma Courses

Direct Entry

- Grade 12 School Certificate, or equivalent, with five credits which must include English, Mathematics and Science

N.B: students are enrolled in the Advanced Certificate course and only progress to the Diploma Level upon them scoring a set number of points in key subjects.

Mature Age Entry

- Advanced Certificate in Mechanical Engineering or equivalent with a minimum of 2 years work experience.

3.1.4 Exemptions

Applicants with Advanced Certificate in Mechanical Engineering may be exempted from some practical and theory components. Exemptions are entirely the prerogative of the examinations body concerned.

3.2 ELECTRICAL ENGINEERING DEPARTMENT

At the Electrical Department, we are currently offering many interesting training programmes for both graduates and professionals. The main courses on offer include Electrical Engineering, Process Instrumentation, Biomedical Engineering as well as Refrigerant Management.

Our training programmes are highly saleable as they are tailored to meet customized needs and general varying needs of the industry and the economy.

Over time we have built a reputation synonymous with quality. Once our students graduate, they easily perform in industry due to practical training they are offered. Our learners are given exposure to experience real situations through the use of facilities such as Electronics Laboratory, Electrical and Refrigeration Workshops. Additionally, our students are trained in Programmable Logic Controllers (PLCs) and Control Systems. Our College also has the latest Siemens Logo Trainers, a versatile Logo Unit which can be programmed using a computer or on the Logo Module itself and it is installed with Simulation Software which allows trainees to test the functionality of their programmes before implementation.

3.2.1 Courses offered

The Electrical Department currently offers the following courses:

S/No.	Field	Diploma (Technologist/ TQF 6 Level)	Advanced Certificate (Technician/ TQF 5 Level)	Craft Certificate (TQF 4 Level)	Trade Certificate (TQF 3 Level)
1	Electrical Engineering	✓	✓		✓
2	Instrumentation	✓	✓		
3	Biomedical Engineering	✓			
4	Refrigeration & Air-conditioning		✓	✓	
5	Electronics			✓	✓

Our courses are available on the following modes of learning:

S/No.	Programme	Full time	Evening	Distance
1	Diploma in Electrical Engineering (Technologist)	✓	✓	✓
2	Diploma in Instrumentation Engineering (Technologist)	✓		✓
3	Diploma in Biomedical Engineering (Technologist)	✓		
4	Advanced Certificate (Technician) in Electrical	✓		
5	Advanced Certificate (Technician) in Instrumentation	✓		
6	Advanced Certificate (Technician) in Refrigeration & Air-conditioning	✓		
7	(Craft) Certificate in Refrigeration & Air-conditioning	✓		

3.2.2 Admission Requirements

Applicants to any course offered in our department must satisfy the minimum requirements listed below.

a. Advanced Certificate Courses

✚ Direct Entry

- Grade 12 School Certificate, or equivalent, with five credits which must include English, Mathematics and Science

✚ Mature Age Entry

- Craft Certificate with minimum of 2 years work experience.

b. Diploma Courses

✚ Direct Entry

- Grade 12 School Certificate, or equivalent, with five credits which must include English, Mathematics and Science

✚ Mature Age Entry

- Advanced Certificate in Electrical Engineering or equivalent with minimum of 2 years work experience

3.3 AUTOMOTIVE & HEAVY EQUIPMENT REPAIR DEPARTMENT

Recent developments in Motor Industry both light duty and heavy duty have posed a great challenge to motor vehicle engineers, technologists, technicians and artisans. However, our college has kept viewing these challenges as opportunities around which to build our training competency.

Our department of automotive and heavy equipment repair offers training programmes in automotive and heavy equipment repair up to diploma level. The automotive section of our department is specialized in small and light vehicles, whereas the heavy equipment section is specialized in earth moving machinery which is normally used in industries such as mines, agriculture, construction and transport.

The department has qualified lecturers and well equipped workshops and laboratories to ensure that our students are fully prepared to graduate into industry with the right skills and knowledge.

We also offer industry and company tailored training courses within our faculty

3.3.1 Courses Offered

Currently the department offers two programmes, which are:

S/No.	Field	Diploma (Technologist / TQF 6 Level)	Advanced Certificate (Technician / TQF 5 Level)	Craft Certificate (TQF 4 Level)	Craft Certificate (TQF 3 Level)
1	Heavy Equipment Repair		✓	✓	✓
2	Automotive Engineering	✓	✓	✓	✓

Modes offered are as follows:

S/No.	Programme	Full time	Evening	Distance
1	Diploma in Automotive Engineering (Technologist)	✓		✓
2	Advanced Certificate (Technician) in Heavy Equipment Repair	✓		
3	Craft Certificate in Automotive Engineering Craft Certificate in Heavy Equipment Repair	✓		
4	Trade Certificate in Automotive Engineering Trade Certificate in Heavy Equipment Repair	✓		

3.3 .2 Admission Requirements

Applicants to any course offered in our department must satisfy the minimum requirements listed below.

a. Advanced Certificate Courses

+ **Direct Entry**

- Grade 12 School Certificate, or equivalent, with five credits which must include English, Mathematics and Science

+ **Mature Age Entry**

- Craft Certificate with a minimum of 2 years work experience.

b. Diploma Courses

+ **Direct Entry**

- Grade 12 School Certificate, or equivalent, with five credits which must include English, Mathematics and Science

+ **Mature Age Entry**

- Advanced Certificate in Automotive or Heavy Equipment Repair with a minimum of 2 years work experience

3.3.3 Exemptions

Applicants with Advanced Certificate in Automotive or Heavy Equipment Repair Engineering may be exempted from some practical and theory subjects. However, exemptions shall be entirely the prerogative of the examinations body concerned.

3.4 APPLIED SCIENCES & BUSINESS DEPARTMENT

Welcome to the Department of Business Studies and Applied Sciences.

This department, fondly called ASBS, provides diverse and dynamic courses meant to provide skills necessary for today's industry and commerce.

Our department comprises two sections namely:

- Applied Sciences (AS)
- Business Studies (BS)

To best deliver our courses, the department blends classroom delivery with experiential learning through practical, modeling and industrial attachments. Our department has highly qualified personnel together with adequate teaching facilities like computer and science laboratories.

3.4.1 Courses Offered

We offer the following courses:

S/No.	Field	Diploma (Technologist/ TQF 6 Level)	Certificate (TQF Level) 4	Trade Certificate (TQF 4 Level)
1	Science Laboratory Technology	✓		
2	Production and Operations Management	✓		
3	Computer Systems Engineering	✓	✓	
4	Computer studies			✓

3.4.2 Admission Requirements

Applicants to any course offered in our department must satisfy the minimum requirements listed below.

1. Diploma In Science Laboratory Technology

- Five 'O' level credits including Mathematics, English, Biology and Science (or Physics and Chemistry)

2. Diploma In Production And Operations Management

- Five 'O' level credits including Mathematics and English,

3. Diploma In Computer Systems Engineering

Direct Entry (2 years)

- Five 'O' level credits including Mathematics, English, Science or Physics

Mature entry (1 year)

- Certificate in Computer Systems Engineering

4. Trade certificate in Computer studies:

- Five 'O' level passes including Mathematics and English

3.4.3 Progression Levels for students

For Science laboratory Technology and Production and Operations management, progression from one level to the next is facilitated for students who manage to pass all the subjects or only fail not more than two subjects.

For Computer Systems engineering, students are awarded a certificate upon passing all the subjects in first year and then proceed to second year after which they are awarded a Diploma.

APPENDICES

Appendix I: Course Codes

COURSE	LEVEL I	LEVEL II	LEVEL III
MECHANICAL ENGINEERING	D6/1-4 Technician Terms 1,2,3,4	D6/5-7 Diploma Terms 1,2,3	D6/8-11 Diploma Terms 1,2,3,4
AUTOMOTIVE ENGINEERING	D3/1-4 Diploma Terms 1,2,3,4	D3/5-7 Diploma Terms 1,2,3	D3/8-11 Diploma Terms 1,2,3,4
ELECTRICAL ENGINEERING	D8/1-4 Technician Terms 1,2,3,4	D8/5-7 Diploma Terms 1,2,3	D8/8-11 Diploma Terms 1,2,3,4
ADVANCED CERTIFICATE ELECTRICAL	C6/1-4 Technician Terms 1,2,3,4	C6/5-7 Technician Terms 1,2,3	

Appendix II: Distance Learning Subjects

Appendix II A: Automotive Engineering Diploma Subjects

	SUBJECTS
LEVEL I	<ul style="list-style-type: none"> ▪ WORKSHOP PROCESSES & PRACTICE ▪ ENGINEERING DRAWING ▪ ENGINEERING SCIENCE ▪ ENGINEERING MATHEMATICS ▪ WORKSHOP PRACTICE ▪ ESP – COMMUNICATION SKILLS ▪ INFORMATION TECHNOLOGY ▪ MOTOR VEHICLE TECHNOLOGY
LEVEL II	<ul style="list-style-type: none"> ▪ ENGINEERING MATHEMATICS II ▪ ENGINEERING SCIENCE II ▪ ENGINEERING DRAWING II ▪ MOTOR VEHICLE TECHNOLOGY II ▪ AUTOMOBILE ELECTRICAL & ELECTRONIC SYSTEMS ▪ ENGINEERING MATERIALS ▪ MOTOR INDUSTRY MANAGEMENT ▪ MECHANICS OF MACHINES ▪ WORKSHOP PRACTICE
LEVEL III	<ul style="list-style-type: none"> ▪ APPLIED THERMODYNAMICS ▪ MACHINE DESIGN ▪ FLUID MECHANICS ▪ MOTOR VEHICLE TECHNOLOGY III ▪ STRENGTH OF MATERIALS ▪ LEGAL ASPECT OF THE MOTOR INDUSTRY ▪ TRANSPORT OPERATION PRINCIPLES ▪ ENTREPRENEURSHIP

Appendix II B: Mechanical Engineering Diploma Subjects

	SUBJECTS
LEVEL I	<ul style="list-style-type: none"> ▪ ENGINEERING MATERIALS ▪ WORKSHOP PRACTICE AND PROCESSES ▪ ENGINEERING MATHEMATICS I ▪ ENGINEERING SCIENCE I ▪ ENGINEERING DRAWING I ▪ MOTOR VEHICLE TECHNOLOGY I ▪ COMPUTER APPLICATIONS ▪ COMMUNICATION SKILLS
LEVEL II	<ul style="list-style-type: none"> ▪ MECHANICS OF MACHINES ▪ INFORMATION TECHNOLOGY ▪ ENGINEERING MATHEMATICS ▪ MANUFACTURING PROCESSES ▪ MANUFACTURING PRACTICE ▪ MATERIALS AND METALLURGY ▪ MANAGEMENT AND ORGANISATION ▪ COMMUNICATION SKILLS ▪ ENGINEERING DRAWING
LEVEL III	<ul style="list-style-type: none"> ▪ MECHANICS OF MACHINES II ▪ APPLIED THERMODYNAMICS ▪ FLUID MECHANICS ▪ PROPERTIES AND MECHANICS OF MATERIALS ▪ MACHINE DESIGN ▪ INSTRUMENTATION AND CONTROL ▪ ELECTRICAL ENGINEERING

Appendix II C: Electrical Engineering Diploma Subjects

	SUBJECTS
LEVEL I	<ul style="list-style-type: none"> ▪ ELECTRICAL WORKSHOP ▪ ELECTRICAL FUNDAMENTALS ▪ ENGINEERING DRAWING ▪ ENGINEERING SCIENCE ▪ ENGINEERING MATHEMATICS ▪ ELECTRICAL INSTRUMENTATION I ▪ INTRODUCTION TO COMPUTERS ▪ ENGINEERING MATERIALS
LEVEL II	<ul style="list-style-type: none"> ▪ ▪ ELECTRICAL MACHINES I ▪ ELECTRONICS ▪ ELECTRICAL MOTOR CONTROL ▪ ENGINEERING MATHEMATICS II ▪ COMPUTER FUNDAMENTALS ▪ ELECTRICAL POWER SYSTEMS ▪ ENTREPRENEURSHIP ▪ ELECTRICAL INSTRUMENTATION II
LEVEL III	<ul style="list-style-type: none"> ▪ AUTOMATIC CONTROL SYSTEM ▪ POWER ELECTRONICS ▪ ELECTRICAL PROTECTION ▪ ELECTRICAL MACHINES II ▪ SUPERVISORY CONTROL & CARRIER SYSTEMS ▪ MANAGEMENT AND ORGANIZATION

Appendix III: Academic Calendar January – December 2015

Week (dates)	Activities
2 February – 6 February	<ul style="list-style-type: none"> • Deadline for April 2015 examination fees payments. is 6th February
9 February – 13 February	<ul style="list-style-type: none"> • <i>Submission of Assignment One</i>
16 February – 20 February	<ul style="list-style-type: none"> • Deferred Tests
23 February – 27 February	<ul style="list-style-type: none"> • Deferred Mock Examinations
16 March – 20 March	<ul style="list-style-type: none"> • <i>Submission of Assignment Two</i>
23 March – 27 March	<ul style="list-style-type: none"> • <i>Verification of details for candidates sitting for April 2015 Examinations</i>
30 March – 3 April	<ul style="list-style-type: none"> • TEVETA SUMMATIVE EXAMINATIONS
6 April – 10 April	<ul style="list-style-type: none"> • TEVETA SUMMATIVE EXAMINATIONS
13 April – 17 April	<ul style="list-style-type: none"> • RESIDENTIAL SCHOOL <ul style="list-style-type: none"> ➤ <i>Registration</i> ➤ <i>Confirmation</i> ➤ <i>Module collection</i> ➤ <i>Lectures</i> ➤ <i>Consultation</i>
20 April - 24 April	<ul style="list-style-type: none"> • RESIDENTIAL SCHOOL <ul style="list-style-type: none"> ➤ <i>Lectures</i> ➤ <i>Consultation</i> ➤ <i>Assessments</i>
25 May – 29 May	<ul style="list-style-type: none"> • Deadline for August 2015 examination fees payments is 29th May 2015
1 June – 5 June	<ul style="list-style-type: none"> • <i>Submission of Assignment One</i>
8 June – 12 June	<ul style="list-style-type: none"> • Deferred Tests
15 June – 19 June	<ul style="list-style-type: none"> • Deferred Mock Examinations • <i>Verification of details for candidates sitting for August 2015 Examinations.</i>
6 July – 10 July	<ul style="list-style-type: none"> • <i>Submission of Assignment Two</i>
27 July – 31 July	<ul style="list-style-type: none"> • TEVETA SUMMATIVE EXAMINATIONS
3 August – 7 August	<ul style="list-style-type: none"> • TEVETA SUMMATIVE EXAMINATIONS
10 August – 14 August	<ul style="list-style-type: none"> • RESIDENTIAL SCHOOL <ul style="list-style-type: none"> ➤ <i>Registration</i> ➤ <i>Confirmation</i> ➤ <i>Module collection</i> ➤ <i>Lectures</i> ➤ <i>Consultation</i>
17 August – 21 August	<ul style="list-style-type: none"> • RESIDENTIAL SCHOOL <ul style="list-style-type: none"> ➤ <i>Lectures</i> ➤ <i>Consultation</i> ➤ <i>Assessments</i>
28 September – 2 October	<ul style="list-style-type: none"> • <i>Submission of Assignment One</i> • Deadline for payment of TEVETA /December exam fees - 30th September 2015.

12 October – 16 October	<ul style="list-style-type: none"> • Deferred Tests
19 October – 23 October	<ul style="list-style-type: none"> • Deferred Mock Exams
26 October – 30 October	<ul style="list-style-type: none"> • Verification of details for candidates sitting for November/December 2015 examinations
2 November – 6 November	<ul style="list-style-type: none"> • Submission of Assignment Two
23 November – 27 November	<ul style="list-style-type: none"> • TEVETA SUMMATIVE EXAMINATIONS
30 November – 4 December	TEVETA SUMMATIVE EXAMINATIONS
7 December – 11 December	<ul style="list-style-type: none"> • RESIDENTIAL SCHOOL <ul style="list-style-type: none"> ➤ Registration ➤ Confirmation ➤ Module collection ➤ Lectures ➤ Consultation
14 December - 18 December	<ul style="list-style-type: none"> • RESIDENTIAL SCHOOL <ul style="list-style-type: none"> ➤ Lectures ➤ Consultation ➤ Assessments

Appendix IV A: Fees Per Level

CATEGORY					TOTAL COST/LEVEL
LEVEL I	Term 1	Term 2	Term 3	Term 4	K12,720.00
	K3,420.00	K3,100.00	K3,100.00	K3,100.00	
LEVEL II	Term 5	Term 6	Term 7	N/A	K9,520.00
	K3,320.00	K3,100.00	K3,100.00	N/A	
LEVEL III	Term 8	Term 9	Term 10	Term 11	K12,620.00
	K3,320.00	K3,100.00	K3,100.00	K3,100.00	

Appendix IV B: Fees Per Level for Advanced Certificate Electrical

CATEGORY					TOTAL COST PER LEVEL
Level I	Term 1	Term 2	Term 3	Term 4	K10,720.00
	K2,920.00	K2,600.00	K2,600.00	K2,600.00	
Level II	Term 5	Term 6	Term 7	Term 8	K10,620.00
	K2,820.00	K2,600.00	K2,600.00	K2,600.00	

Appendix V: Standard Assignment Cover Page



NORTHERN TECHNICAL COLLEGE

OPEN DISTANCE AND FLEXIBLE LEARNING

MECHANICAL ENGINEERING DEPARTMENT

Name: MUZUNGU TAWINA
Student Number: 13722
Class: D6/2
Task: ASSIGNMENT ONE
Due Date: 2 FEBRUARY 2018
Subject: ENGINEERING MATHEMATICS
Course: MECHANICAL ENGINEERING DIPLOMA
Lecturer: Mr. T. WACHIMVYA

Student cell number: 0977123456