THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY AND CHILDREN

PHARMACY COUNCIL

Pharmacy Council of Tanzania

CURRICULUM FOR

BASIC TECHNICIAN CERTIFICATE

(NTA LEVEL 4)

IN

PHARMACEUTICAL SCIENCES

Approved by the Council on	29th May, 2015
Valid for five (5) years until	28th May, 2020
Approval Reference	HASP 08.6/116

Pharmacy Council of Tanzania, P. O. Box 31818, **DAR ES SALAAM.**	National Council for Technical Education, P. O. Box 7109, **DAR-ES-SALAAM.**	

FOREWORD

One of the statutory functions of the Council as stipulated in Section 5 (10 (e) of the National Council for Technical Education (NACTE) Act (No. 9 of 1997) is to "establish and make awards in technical education and training which are consistent in standard and comparable to related awards in Tanzania and internationally".

The Council has defined and established a range of National Technical Awards (NTA) to be conferred on graduates of technical education and training institutions upon successful completion of their respective studies in various technical fields. The NTA are competence/outcomes based defined according to specific levels of achievement and designed to testify that the holder of the award possesses the requisite competences necessary to apply competently in the relevant occupational sector. Competence in this case refers to the ability to successfully carry out some occupational activity and it is described in terms of skills, knowledge and understanding.

The NTA framework is intended to provide clear and accurate information about the purposes and outcomes of technical education and training, in a form that will be useful to stakeholders. Each technical education and training qualification/award is pegged to a level in the qualifications framework and has a competence descriptor.

The Council has in place procedures which guide technical institutions, authorities or other interested parties to develop curricula. The procedures for curriculum development, review and validation requires an institution wishing to develop a curriculum to carry out Situational Analysis, set or adopt standards and use the same to structure the curriculum. After development of a curriculum, the institution is required to consult its stakeholders to ascertain both the information gathered through situational analysis and the curriculum. A complete submission for validation ought to include the Curriculum Information Report, Situational Analysis Report and Opinion of Stakeholders. This curriculum is validated by the Council because the institution fulfilled all the NACTE requirements for curriculum development, validation and approval.

After this approval, the institution is allowed to make small corrections, if any, during implementation. However, major changes ought to be made during review, which should take place within five years. The institution is also required, before implementing the curriculum, to facilitate the orientation of all teaching staff on CBET curriculum delivery to and ensure adherence to assessment guidelines throughout the training process.

As indicated on the cover page, this curriculum is valid for five years and it should not be used after the indicated validity date.

Dr. A.B. Rutayuga
Ag. EXECUTIVE SECRETARY

NATIONAL COUNCIL FOR TECHNICAL EDUCATION
P. O. BOX 7109
DAR ES SALAAM

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

SLF	=	Saint Luke Foundation
NTA	=	National Technical Award
NACTE	=	National Council for Technical Education
MUHAS	=	Muhimbili University of Health and Allied Science
RuCU	=	Ruaha Catholic University
CUHAS	=	Catholic University of Health and Allied Science
MoHCDGEC	=	Ministry of Health, Community Development, Gender, Elderly and Children
PHSDP	=	Primary Health Services Development Programme
PHC	=	Primary Health Care
MDGs	=	Millennium Development Goals
NSEGPE	=	National Strategy for Economic Growth and Poverty Elimination
GPA	=	Grade Point Average
TMTB	=	Tanganyika Medical Training Board
CA	=	Continuous Assessment
GMP	=	Good Manufacturing Practice
WHO	=	World Health Organization
CTC	=	Care and Testing Clinic
COSHH	=	Control of Substances Hazardous to Health
BRELA	=	Business Registration and Licencing Agency
SoP	=	Standard Operating Procedure
ADR	=	Adverse Drugs Reaction
MKUKUTA	=	Mpango wa Kukuza na Kuondoa Umasikini Tanzania
ADDO	=	Accredited Dispensing Drugs Outlets
HIV/AIDS	=	Human Immunovirus/Acquired Immunodeficiency Syndrome

ACKNOWLEDGEMENTS

The review and harmonization of a competence-based curriculum for pharmaceutical sciences has been accomplished through involvement of different stakeholders.

Special thanks go to the Pharmacy Council for spearheading the review and harmonization of the pharmacy training curricula after noticing that training institutions in Tanzania were using different curricula.

I would also like to extend my gratitude to St. Luke Foundation (SLF)/Kilimanjaro School of Pharmacy - Moshi for their tireless effort to mobilize funds from development partners.

Likewise, I am very grateful to Deutsche Gesellschaft Für Internationale Zusammenarbeit (Giz), Merck Kgaa, Boehringer Ingelheim Gmbh and Bayer Pharma Ag and action Medoer e.V for the financial and technical support.

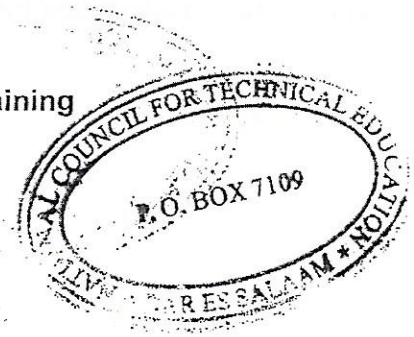
Special thanks to Institutions conducting pharmacy training for their willingness to harmonize their curricula into standard national curriculum for pharmacy NTA 4 to 6.

Likewise I do recognise great ideas and contributions by experts from Kilimanjaro School of Pharmacy, School of Pharmaceutical Sciences – MUHAS, School of Pharmaceutical Technicians – CUHAS, School of Pharmacy – RuCU, St. Peters College of Health Sciences.

I would like to acknowledge the facilitation and commitment by Members of Secretariat from the National Council for Technical Education (NACTE) for their determined support to guide us in the improvement of this curriculum.

The list of those who contributed to this great job is too long to be registered here. The Human Resources Development Directorate and the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) as a whole therefore wishes to take this opportunity to thank all those who actively took part in the curriculum development for the betterment of pharmaceutical training which will impact on health services provision in Tanzania.

Dr. Bumi L.A. Mwamasage
Assistant Director – Allied Health Training



FOREWORD

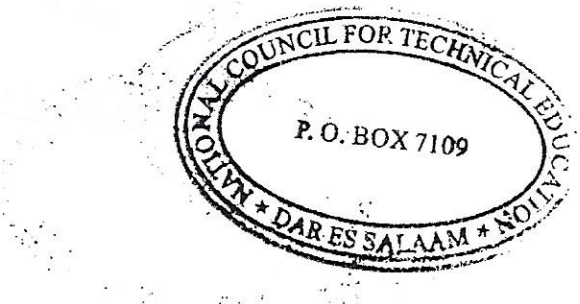
The MoHCDGEC has committed itself to provide comprehensive access to quality health services for all Tanzanians in line with the National Development Vision and National Health Policy goals.

In order to attain these goals, the MoHCDGEC has initiated Primary Health Services Development Programme (PHSDP). Among the strategies laid down in this programme is the human resource development to meet the human resource demand for health and a balanced skill mix.

This review and harmonization of the present pharmaceutical sciences curricula for certificate and diploma levels is in line with the policy measures currently being advocated by the MoHCDGEC. In addition, the review of the previous curricula was intended to meet NACTE requirements for National Technical Awards (NTA) implementation, which require a modular curriculum pegged to NTA Levels as well as to match with the changing nature of health services and introduction of exit at NTA Level 4 as a bridge to responsive health care delivery.

It is the MoHCDGEC's hope that this curriculum will enable pharmaceutical personnel to acquire necessary competencies in provision of quality pharmaceutical services to the community. It is also anticipated that institutions and stakeholders will find it useful in their academic undertakings.

Dr. Otilia T. Gowelle
Director, Human Resource and Development



EXECUTIVE SUMMARY

Adoption and implementation of the National Technical Awards (NTA) system is a mandatory requirement for technical training programmes to be accredited by the National Council for Technical Education (NACTE).

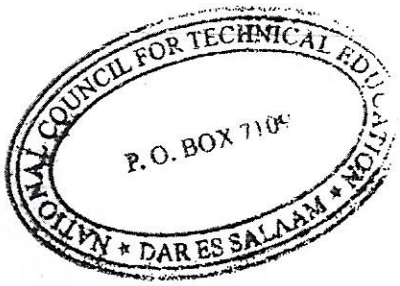
The Basic Technician Certificate course in Pharmaceutical Sciences is a two semester programme, which has been developed to suit the needs of the health sector, the labour market demands and professional needs that exist in our country. It is one of the initiatives by the Government to modernise qualifications within the health sector.

Development of this programme is aimed at rewarding individual achievement in learning and competence gained in a variety of different ways and contexts. The introduction of this programme is geared towards increasing productivity in Pharmaceutical training institutions, providing a climbing ladder for higher learning skills opportunities and competences, and achieving more responsive education and training system, aligned with health sector employment needs.

The philosophy of developing Pharmaceutical Sciences programme at NTA Level 4 is to provide for a fairly well developed career path in pharmaceutical sciences education and competence acquisition. It opens the possibility for moving around and within the NTA qualification framework as established by NACTE and allows graduates to receive appropriate recognition.

This level is comprised of 13 Modules spread over two semesters. Each semester has 20 weeks which include theory and practical training.

Students will be required to work in dispensing, store and compounding areas under supervision as an important learning method and gaining hands on experience in the provision of pharmaceutical services as well as patient/client management and care. They will prepare reports using practical/skill books noting clearly what they will have learnt in their practice.



PART I: INTRODUCTION

1.1 Background Information

The development of human resource required in various health disciplines is very important for sustainable health care services delivery and national development. Currently, with the ongoing globalisation and increased competitiveness, it is important for MoHCDGEC to use competent professionals to spearhead increased productivity in the health sector.

The National Bureau of Statistics estimated that there were 241 hospitals, 742 health centres and 5,680 dispensaries in the country (Tanzania in Figures 2012). Despite the existing network of primary health facilities, accessibility to health care services is still inadequate due to many reasons. In some areas the accessibility to health facilities is more than 10km whereas the Government intends to improve accessibility to be less than 5 kilometres to heath facilities. On the other hand, the availability of quality health care is inequitable, due to the fact that trained health personnel especially pharmaceutical personnel are inequitably deployed and it is estimated that only 35% of the existing primary health facilities are manned by skilled workforce of whom the majority are without appropriate pharmaceutical training.

As a result this contributes to high loss of medicines and excruciating mortalities to children and women in reproductive age groups who fail to access appropriate care at the time of need. The Maternal and Child Mortality rates are quite high standing at 578 per 100,000 live births and 68 per 1,000 live births respectively (DHS 2005).

On the other hand, the country is still grappling with a high burden of diseases from malaria, HIV/AIDS, TB and Leprosy, malnutrition and micronutrient deficiencies, child illnesses, accidents and non-communicable diseases are also on the increase.

It is within this context that MoHCDGEC is changing the current curricula from the conventional knowledge-based to outcomes / competence based curricula with a flexible mode of delivery and assessment. It is expected that with these curricula, the country can achieve the objective of having semi qualified pharmaceutical personnel, who could work effectively and assist to meet the demands of the health sector. It is also expected that training institutions will ensure that students are equipped with necessary competences, which will enable them play roles requiring basic skills, knowledge and understanding and in which they take responsibility for their professional role.

The aim of the training programme is to supply the country with adequately trained technicians in pharmacy who will work in various health facilities and participate in the provision of basic pharmaceutical services.

1.2 Objectives of Developing Competence Based Curriculum for Pharmaceutical Sciences Training

The main objective of developing competence-based curriculum for pharmaceutical training is to produce pharmaceutical personnel at technician level who are competent to enable them work flexibly in different work places. The specific objectives include among other things to:
Help trainees acquire the competences desired with the aim of enabling them to work effectively;

Facilitate training in consideration of individual learning differences by using alternatives paths and flexible scheduling of learning activities; and also help learners to be more responsible for their own learning;

Implement the training programme using a wide range provisions, which satisfy the educational criteria for competent professional training;
Make training needs clear and specific, resulting in more efficient utilisation of training resources; and

Facilitate more efficient educational exchange between trainers and trainees.

2.0 PROGRAMME RATIONALE AND PHILOSOPHY

2.1 Programme Rationale

The main objective of the National Health Policy (2003) is to improve the health and well-being of all Tanzanians, with a focus on those most at risk, and to encourage the health system to be more responsive to the needs of the people. This objective cannot be achieved without having appropriately and adequately trained pharmaceutical personnel and other health workers. According to WHO World Health Report 2006, health workers are crucially important for producing good health through the performance of health systems as they constitute a significant share of the labour force and perform key roles in all societies.

Tanzania Vision 2025, National Strategy for Economic Growth and Poverty Elimination (NSEGPE), Health for All, Primary Health Care (PHC) and Millennium Development Goals (MDGs) are not achievable without an appropriately prepared and deployed health workforce; and the training of health workers is crucial for achieving equity-oriented national health goals.

Pharmacy, like many other professions, is affected by the rapid changes currently taking place in the society, science and technology. It is also shaped by changing demography, epidemiology, health systems and consumer preference in the labour market. Therefore, strategic planning and actions should focus on investing in people, especially pre-service education to promote quality care and equity by correcting skill imbalances and in-service training to enhance the performance of the health system.

In this regard pharmaceutical sciences curricula must be responsive to changes in pharmacy practice, the society, the economy and changes in the nature of teaching and learning. It is important to provide an excellent education and training for all pharmaceutical sciences learners, to enable them and the health system to be responsive to the changing demands of life and work in the 21st century. It also been observed that pharmacy training has been taking long time unnecessarily due to duplication of contents in career path development.

This programme has been developed in line with the above considerations, which provides for a creation of a life-long learning culture, modularisation, credit accumulation, student choice and scalability, leading to acquisition of more knowledge, skills and wider understanding in pharmaceutical sciences and health care practice.

The rationale for this programme is therefore to achieve more responsive pharmacy education and training system, aligned with health sector employment needs.

2.2 Programme Philosophy

Philosophy describes set of values and beliefs that guide all learning experiences of the

implementation and evaluation of the curriculum. This programme is geared towards producing innovative, creative and flexible pharmaceutical personnel who will cope with the dynamic changes of the profession, technology and health needs.

Pharmacy is an art and science of drugs discovery, manufacturing, distribution and use, therefore:

2.2.1 The accessibility to the highest attainable standards of pharmaceutical services is a fundamental right of the human being irrespective of gender, age, race, religion, socio-cultural differences, political affiliation, economic or social background;

2.2.2 The practice of pharmacy is humanitarian in nature and requires knowledge, skills and attitudes in respect of compassion, respect and empathy, ethical and legal consideration in the provision of care;

2.2.3 Environment influences health of individuals, families and community at large. Therefore, a pharmaceutical personnel must acknowledge the different interaction patterns in the environment and the impact in interaction to health and illness;

2.2.4 Education is a continuous process that embraces new technology and community demands and therefore a pharmaceutical personnel shall keep abreast with current health development to render quality cost– effective services;

2.2.5 The learner is a unique individual with past experiences and needs, which should be respected. She/he has the responsibility for her/his own learning and self-development through active participation; and

2.2.6 Collaboration is necessary for effective actions to occur. Training institutions shall maintain teamwork spirit at all levels of training environment.

It is therefore expected that since the programme adopts a modular system and will operate under semester structure, the graduates from this level will have aspirations to pursue higher qualifications in pharmacy profession. This will facilitate a large degree of flexibility for recognition of learning experiences and professional practice for the graduates' future development.

3.0 VISION AND MISSION OF THE TRAINING PROGRAMME

3.1 Vision

To have competent pharmaceutical personnel who will provide pharmaceutical services effectively in different health care settings and cope with existing and emerging health issues.

3.2 Mission

To establish conducive and sustainable training environment that will allow students and graduates to perform competently at their relevant levels and aspire for attainment of higher knowledge, skills and attitudes in promoting health, preventing diseases and caring for clients in all settings

4.0 AIM AND OBJECTIVES OF THE PROGRAMME

4.1 Aim of the Programme

The programme aim to achieve the following goals:

(i) To form a flexible course that is responsive to dynamic and rapidly changing world of

(ii) To provide pharmaceutical knowledge, skills and behaviours vital to learners, employers and the community;
(iii) To entice self-realisation and team work skills that enable graduates to perform efficiently and aspire for higher level training;
(iv) To build capacity to participate in the implementation of National Health Policy and its accompanying operational guidelines; and
(v) To propagate and promote moral, legal and ethical conduct among pharmaceutical personnel and other health workers within the pharmacy profession and national legal framework.

4.2 Objectives

The objectives of this programme are to:

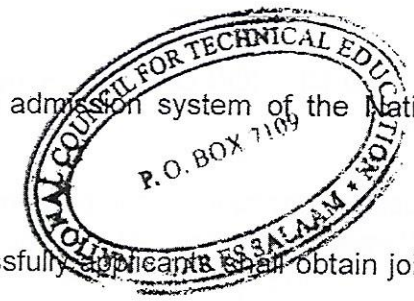
(i) Form a career advancement in pharmacy practice and an operational role for pharmaceutical management in health care service delivery;
(ii) Impart appropriate knowledge, skills and attitudes relevant to pharmacy practice in relation to preventive and curative health care services in the community;
(iii) Steer creativity and innovativeness in response to challenges inherent in pharmacy practice and health care delivery;
(iv) Inculcate a culture of team work, build critical thinking and problem solving skills in pharmacy and health care practice
(v) Inculcate sense of citizenship, professionalism, accountability and responsibility in provision of health care services;
(vi) Stimulate life-long learning behaviour for pharmaceutical personnel and advancement of pharmacy profession; and
(vii) Provide an international outlook of the learning content and context so as to widen learners' advantage into regional and international labour market.

5.0 ADMISSION REQUIREMENTS

The minimum entry qualification of the candidate shall be Certificate of Secondary Education Examination (CSEE) with minimum of D passes in four (4) subject including Chemistry and Biology. Mathematics and English will be an added advantage.

5.1 Mode of Application

Applicants should apply through the central admission system of the National Council for Technical Education at the www.nacte.go.tz.



5.2 Selection Procedure

Selection will be done by NACTE and successfully applicants shall obtain joining instructions from respective training institutions.

6.0 PROGRAMME DURATION

The NTA Level 4 programme has a total of 40 weeks of study divided in two semesters. Twenty three (23) weeks are set aside for theoretical training and seventeen (17) weeks are designated for pharmacy practice.

This level is meant to provide basic pharmaceutical sciences knowledge, skills and appropriate attitudes to students. All modules are fundamental and are intended to build students' knowledge and skills necessary for acquiring competences appropriate for modern

practice of pharmacy; instil motivation for life-long learning and good foundation for progress studies in pharmacy profession.

7.0 ASSESSMENT

Assessment is an integral part of the learning process and must support and complement the learning strategies in order to achieve the required outcomes. Assessment in particular, must reflect the required progression and be sensitive to the range of key skills developed.

7.1 Principles of Assessment

(i) Assessment will reflect aims and objectives of the overall scheme and learning outcomes of the module.

(ii) Assessment will be designed to assist students' learning, particularly, their development as self-directed learners and the acquisition of key skills.

(iii) Assessment will be varied to facilitate motivation and recognition of the need to adopt approaches which enable students to demonstrate and fulfil learning objectives.

(iv) Assessment will reflect progression through studying year, with increasingly more complex methods being associated with higher order skills.

7.2 Assessment Methods

The following assessment methods will be used:

7.2.1 Assignments

The object of assignments is to reinforce the learning process by involving the students in finding solution to a given question or problem which require decision-making. They include tasks given to students apart from written tests and examinations or projects, so as to enhance self- development.

Individual or group assignments will be in form of written work and/or practical exercises. For each module appropriate assessment methods and instruments will be indicated. Facilitators will administer not less than two assignments for a given module in a semester.

7.2.2 Competence Tests

The intention of competence tests is to measure the practical capability of learners through actual doing of a particular task or skill. This will be conducted in actual or simulated environment.

7.2.3 Class Room Knowledge Tests

The intention of classroom tests is to measure theoretical and practical performance of students through evaluation of written work and actual doing respectively.

There will be a minimum of two written classroom tests in each semester under supervision of qualified tutor (s). Duration of each test will be not less than two (2) hours.

7.2.4 End of Module Examination

This examination shall be conducted for duration of three (3) hours under supervision of qualified tutor (s).

7.3 Management of Assessment

The mode of conduct and administration of assessment shall be that approved by NACTE.

8.0 MINIMUM CREDIT REQUIREMENT

This Programme has 13 modules, which are assigned 120 credits.

9.0 MODULE CODING

The system of coding has adopted a combination of letters and numbers, which have a specific meaning. For example the following modules offered in the first semester by the department of Pharmaceutical Sciences may be coded respectively as PST 04101 where:

PST 04101 refers to Dispensing module.
PS Represents the first two letters of the department "Pharmaceutical Sciences".
T Represent the qualification at the respective level "Technician".
04 Represents the respective NTA Level.
1 Indicates the semester in which the module is conducted
01 Represents the serial number to which a particular module is assigned in the department (in this case 1st Module).

10.0 GRADING SYSTEM

Marks will be awarded out of 100 per cent. The marks so obtained from different assessment components will be graded as follows:

S/N	SCORE RANGE	GRADE	DEFINITION
1.	80 – 100	A	Excellent
2.	65 – 79	B	Good
3.	50 – 64	C	Average
4.	40 – 49	D	Poor
5.	0 – 39	F	Failure
6.	–	I	Incomplete
7.	0	Q	Disqualification

11.0 CLASSIFICATION OF AWARD

Grades for the different score ranges are assigned points as follows:

A – 4
B – 3
C – 2
D – 1
F – 0

The Grade Point Average (GPA) shall be computed from credits and grade weights and classified as shown below:

CLASS OF AWARD	CUMMULATIVE GPA
First class	3.5 – 4.0
Second class	3.0 – 3.4
Pass	2.0 – 2.9

An award shall be given to a student who satisfies the following conditions:

She/he has achieved the minimum cumulative Grade Point Average (GPA) equivalent to pass.

11.1 Computation of Cumulative GPA

(i) A cumulative grade point average (Cum GPA) for each candidate shall be computed by dividing the total number of grade points earned for all modules by the total number for the award examined.

$$i.e. cummulative\, GPA = \frac{SUM\ OF\ (PxN)}{SUMOF\ N}$$

Where P represents a grade point assigned to a letter grade scored by the students in a module and N represents the number of Credits associated with the module.

(ii) The Grade Point Average (GPA) shall be computed and truncated so that it won't provide a range of decimal point.

12.0 EXAMINATIONS REGULATIONS

The General Ministry of Health and Social Welfare (MoHCDGEC) Examination Regulations for Training Institutions on registration for examinations, board of examiners, preservation of scripts, procedures for appeals, examination offences and penalties, examination fees and certification and awards shall remain as stipulated in the MoHCDGEC Examination Regulations.

12.1 Eligibility for Examinations

(i) A student must have been present for at least 90% of the classes to be allowed to sit for end of semester examinations.

(ii) A student who fails to meet a minimum of 90% attendance in a particular semester with compelling reasons as determined by the participatory organs shall be allowed to repeat the semester otherwise he/she shall be discontinued from studies.

(iii) No student shall be allowed to sit for the end of semester examinations unless his/her average continuous assessment in each module is 50% or higher.

(iv) A student who fails to complete assignment(s) or research work in the scheduled time shall not be allowed to sit for the end of semester examinations.

(v) Where a student who fails to fulfil the eligibility requirements stipulated, sits for the end of semester examinations, his/her examination results shall be null and void.

12.2 Conduct of Examinations

End of semester examinations shall be conducted under the control and supervision of MoHCDGEC or any other body as the MoHCDGEC shall appoint.

12.3 Guidance for Invigilators

12.3.1 Before the examination:

(i) Invigilators shall personally collect from the head of the department sealed envelopes containing examination papers and any other materials prescribed in the rubrics at least thirty minutes before the examination

(ii) Invigilators shall be present in the examination room at least twenty minutes before commencement of the examination.

(iii) Invigilators shall admit candidates into the examination room at least twenty minutes before commencement of the examination and ensure that candidates are seated in their right places

12.3.2 During the examination:

(i) No candidate shall be allowed out of the examination room during the first thirty minutes of the examination
(ii) No candidate shall be allowed to leave the examination room during the last thirty minutes.
(iii) Invigilator shall allow five minutes for the candidates to read the examination paper and ensure they have the right paper with correct number of pages.

12.3.3 At the end of examination:

(i) Invigilator shall tell the candidates to stop attempting the examination and assemble their work/scripts
(ii) Candidates shall hand in their scripts to the invigilator and sign an examination attendance form
(iii) No candidate shall be allowed to leave the examination room before their scripts are collected
(iv) No candidate shall be allowed to leave with any examination materials found in the examination room.
(v) Invigilators shall enter the total of scripts collected and sign in the examination attendance form (Appendix 1) and submit the scripts and the examination attendance form to the head of the department.

12.4 Absence from Examinations

(i) A student who fails to appear for a scheduled examination with valid reason (s) shall be allowed to sit for that particular examination when next scheduled. The student shall not be allowed to proceed to the next semester if the missed examination(s) is for a pre-requisite module.
(ii) When a candidate misses an examination without valid reason(s), as determined by participatory organs (i.e. academic committees/boards), the candidate shall be discontinued from the studies

12.5 Falling Sick Immediately Before or During Examination

A candidate who falls sick immediately before or during the time of a scheduled examination and is medically unable to proceed (fit as certified by a medical officer) shall be allowed to postpone the examination until next scheduled. Any student who is sick and nevertheless decides to take or proceed with an examination does so at his/her own risk and must abide by the results of the examination.

12.6 Reporting Late for Examinations

(i) A candidate, who without valid reason(s), reports late for an examination (more than thirty minutes after commencement of examination) shall not be allowed into the examination room but will be allowed to sit for that particular examination when next scheduled. The candidate shall not be allowed to proceed to the next semester if the missed examination(s) is/are for pre-requisite module(s).

(ii) A candidate, who for valid reason, reports late for an examination (more than thirty minutes after commencement of examination) and pleads in writing to take the

examination within the remaining time at his/her own risk. All cases of late arrivals for examinations shall be reported in writing by the invigilator to head of department.

12.7 Students Progression and Disposal

(i) The semester shall be the basic academic audit unit. All modules offered during the semester shall be assessed within that semester; at the end of each module external examiners or moderators shall be invited at the end of the semester. A student shall be allowed to proceed to the next semester if he/she passes end of module examinations in all modules prescribed in a semester.

(ii) For every module there shall be at least two continuous assessment (CA) tests and regular assessment of competencies which shall constitute 60% of summative assessment. The end of module examination shall constitute another 40% of the summative assessment.

12.8 Supplementary Examination

(i) A candidate who fails one or more modules shall be allowed to sit for supplementary examination if his/her GPA in that semester is not less than 1.8.

(ii) A candidate who fails one or more modules must sit for supplementary examinations when scheduled before proceeding to the next semester. The student who passes a supplementary examination will be awarded a maximum of "C" grade regardless of his/her score (equivalent to 50% score). The passing of supplementary examination shall take into account the continuous assessment scores.

12.9 Repeating the Semester

(i) A candidate who fails to obtain an average of 50% in his/her continuous assessment shall repeat the semester.

(ii) A candidate who fails supplementary examination(s) shall repeat the semester. A candidate who fails a repeated semester shall be discontinued from studies.

(iii) A candidate who fails to meet a minimum of 90% attendance in a particular semester with acceptable grounds as determined by the participatory organs shall repeat the semester.

12.10 Discontinuation

(i) A candidate who fails to meet a minimum of 90% attendance in a particular semester without acceptable grounds shall be discontinued from studies.

(ii) When a candidate misses examination(s) without valid reason(s) shall be discontinued from the studies.

(iii) A candidate who obtains a semester GPA of less than 1.8 shall be discontinued from studies.

(iv) A candidate who does not appear for supplementary examination(s) without compelling reason(s) approved by participatory organs shall be discontinued from studies.

(v) A candidate found guilty of an examination irregularity shall be discontinued from

(vi) A candidate who has been disqualified from an examination following his/her walking out of the examination room in protest shall be discontinued from studies.

12.11 Examination Irregularities or Academic Dishonesty

Examination irregularities shall include but not limited to:

(i) A candidate found with unauthorized materials/information at any time during the examination process. Such unauthorized materials will include written pieces of papers, mobile/cellular phones or any other unauthorized materials.

(ii) A candidate attempting to copy from another candidate's work or permitting another candidate to do so.

(iii) A candidate communicating with another candidate by giving or obtaining unauthorized assistance or attempting to do so.

(iv) A candidate removing question papers, scripts or any other examination materials found in the examination room.

(v) A candidate starting to attempt examination before being authorized to do so.

(vi) A candidate continuing to attempt the examination after being ordered to stop.

(vii) A candidate refusing to obey a lawful order given by an invigilator.

(viii) A candidate destroying or attempting to destroy evidence of suspected irregularities.

(ix) A candidate found to have committed plagiarism.

(x) A candidate behaving in such a manner as to disrupt the examination process

(xi) An invigilator violating examinations regulations.

12.12 Procedure for Dealing with Examination Irregularities

In case of alleged examinations irregularity:

(i) The candidate shall be stopped by the invigilator from continuing with the examination and be required to sign an examination irregularity report (**Appendix 2**) and the materials pertinent to the incidence to confirm that they are his/hers. However, the candidate shall be allowed to sit for the remaining examinations.

(ii) The invigilator shall counter sign and submit to the head of department the examination irregularity report together with the candidate's examination script and all pertinent materials immediately after the end of examination for further transmission through appropriate participatory organs for action as stipulated in the examination offences and penalties of the MoHCDGEC Examination Regulations.

12.13 Instruction to Students

(i) Candidates shall be admitted into examination room twenty minutes before the examination starts.

(ii) No candidate shall be permitted to enter the examination room 30 minutes after commencement of the examination.

(iii) Candidates without examination numbers and identity cards shall not be allowed into the examination room.

(iv) Candidates are responsible for consulting examinations time table for any changes.

(v) Candidates are not allowed to enter examination room with books, bags, purses, notes, rough papers, mobile phones, or other such items.

(vi) When candidates are allowed to bring specified items in the examination room, no borrowing from one another will be allowed during examination time, and the items allowed will be liable to inspection by the invigilator.

(viii) Candidates shall write only their examination numbers on every page used. Candidates shall not write their names anywhere in the script.

(ix) No candidate shall be allowed to leave the examination room during the last thirty minutes.

(x) At all times during the examination the candidate's examination number/identity card shall be conspicuously placed on the desk in front of the student by the student.

(xi) Smoking, beverages and food shall not be allowed into the examination room. Any special needs for eating, drinking or medication shall be reported to the invigilator before start of the examination.

(xii) At the end of examination, and on the instruction of the invigilator, candidates shall be required to stop writing, and organize their work. The candidate shall personally hand in his/her scripts to the invigilator and sign to that effect.

(xiii) Candidates are allowed to bring pens, pencils and other materials explicitly prescribed by the department into the examination room.

(xiv) For a candidate wishing to answer a call of nature may, with permission of invigilator and under escort, leave the examination room for a period of time not exceeding five (5) minutes. Only one candidate at a time will be allowed to leave the examination room and will be monitored at all times.

(xv) A candidate who walks out of the examination in protest shall be disqualified from that particular examination.

(xvi) Candidates must understand that the ultimate responsibility for taking supplementary examination(s) at the correct time rests on him/her.

(xvii) Invigilator(s) shall have the power to:

- Specify and change the sitting arrangement in the examination room
- Inspect candidates to make sure they are not in possession of unauthorized materials. Inspection of candidates shall observe gender issues.
- Confiscate any unauthorized material and to remove from the examination room any candidate found with such material.
- Remove from the examination room any candidate who disrupts the examination process

12.14 Release and publication of Examination Results

The head of department may publish the examinations results provisionally subject to approval by the Tanganyika Medical and Training Board (TMTB) as recommended by the participatory organs.

12.15 Examination Components Contribution

Due to the nature of pharmacy training, this programme is constituted by theory modules and practical modules. For each module there shall be at least two continuous assessment (CA) tests and regular assessment of competencies which shall constitute 60% of summative assessment. The end of module examination shall constitute another 40% of the summative assessment.

Summary of contribution of components of assessment to final mark

Module	Continuous Assessment Tests (%)	End of Semester Examination (%)	Grand Total (%)
Theory Modules	60	40	100
Practical Modules	60	40	100

12.16 Examination Appeals

The appeals of candidates, who have not satisfied the examiners, should follow the process described in the training regulation of the Ministry of Health and Social Welfare.

13.0 TEACHING PERSONNEL

Tutors for modules in this programme should have at least an Ordinary Diploma in relevant field and/or evidence of competency in respective module.

14.0 TRAINING REGULATIONS

14.1 Reporting to the Training Institution

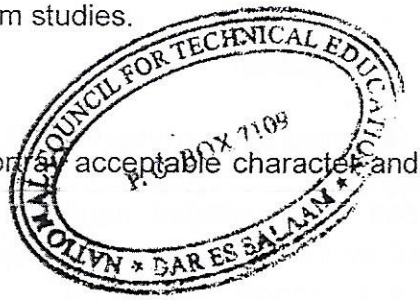
Students selected for admission should report to the training institution not more than 15 days after commencement of the academic year.

14.2 Programme Completion Requirements

For a candidate to qualify for award of the qualification of this NTA Level must have attended classes by not less than 90% of the total programme sessions, submitted required assignments and reports and passed all modules and acquired a cumulative GPA of not less than 2.0 (i.e. equivalent to a "C" grade).

14.3 Period of Absence

A student who fails to meet a minimum of 90% attendance in a particular semester with compelling reasons as determined by the participatory organs shall be allowed to repeat the semester otherwise he/she shall be discontinued from studies.



14.4 Conduct and Behaviour

Students admitted into pharmacy training should portray acceptable character and behaviour at all times.

15.0 PROGRAMME MODULES

15.1 Semester I Modules

Code	Module Title	Scheme of Study (Hours per week)				Credits / Semester
		Theory	Tutorials	Practical	Assignment	
PST 04101	Dispensing	2	-	1	1	8
PST 04102	Disease Control and Prevention	4	-	-	1	10
P ST04103	Human Anatomy and Physiology	4	1	-	1	12
PST 04104	Pharmaceutical Dosage Forms	2	-	-	1	4
PST 04105	Pharmaceutical Calculations	4	1	-	1	11
PST 04106	Communication Skills	1	-	-	1	4
PST 04107	Basic Computer Applications	1	-	2	1	6

15.2 Semester II Modules

Code	Module Title	Scheme of Study (Hours per week)				Credits / Semester
		Theory	Tutorials	Practical	Assignment	
PST 04208	Law and Ethics in Pharmacy Practice	2	-	-	1	4
PST 04209	Compounding of Pharmaceutical Liquid Preparations	2	-	6	1	20
PST 04210	Pharmaceutical Inorganic Chemistry	2	1	-	1	12
PST 04211	Basic Pharmacology	4	1	-	1	12
PST 04212	Medical Stores Management	4	1	2	1	12
	TOTAL	**14**	**3**	**8**	**5**	**60**

Code	Module Title	Scheme of Practice (Hrs per week over six weeks)				Credits
		Dispensing	Drugs Store	Industrial	Sterile Preparations	
PST 04213	Pharmacy Practice	120	120	0	0	5

15.3 Summary of Modules

CODE	MODULE TITLES	TOTAL CREDITS	SEMESTER I	SEMESTER II
PST04101	Dispensing	8	√	
PST04102	Disease Control and Prevention	10	√	
PST04103	Human Anatomy and Physiology	12	√	
PST04104	Pharmaceutical Dosage Forms	4	√	
PST04105	Pharmaceutical Calculations	11	√	
PST04106	Communication Skills	4	√	
PST04107	Basic Computer Applications	6	√	
PST04208	Law and Ethics in Pharmacy Practice	4		√
PST04209	Compounding of Pharmaceutical Liquid	20		√

PST04210	Pharmaceutical Inorganic Chemistry	12		√
PST04211	Basic Pharmacology	12		√
PST04212	Medical Stores Management	12		√
PST04213	Pharmacy Practice	5		√
	TOTAL CREDITS	**120**		

PART II – CURRICULUM DETAILS

1.0	**Qualification:**	Basic Technician Certificate in Pharmaceutical Sciences
2.0	**Purpose(s) of Qualification:**	This qualification is meant for a person who will perform routine pharmaceutical duties including dispensing of medicines and medical supplies, reconstitutions of oral preparations, dilution of concentrated liquid preparations, maintaining hygienic working environment, storage of medicines and medical supplies, promoting rational use of medicines, providing healthcare education, keeping records and documents adhering to professional ethics and code of conduct in health care settings.
3.0	**NTA Level:**	4
4.0	**Competence Descriptors:**	Competence involving application of skills and knowledge at routine level
5.0	**Credits at this Level:**	120
6.0	**Cumulative Credits from Lowest Level:**	0
7.0	**Date the Qualification Standard Last Developed**	February 2016

8.0 Principal Learning Outcomes

S/No	PRINCIPLE OUTCOME	CREDITS	ASSESSMENT CRITERIA
1	Apply principles of good dispensing practices in promoting safe and effective use of medicines, medical supplies and other pharmaceutical products.	20	(i) Clarity of prescription, completeness, authenticity and legality established.
			(ii) Medicines and medical supplies are correctly identified, properly packed and clearly/appropriately labelled.
			(iii) Medicines and patient's records are correctly documented and archived.
			(iv) Appropriate information on proper usage, side and adverse effects, interaction,

			medical supplies explained.
			(v) Amounts of medicine required for dispensing are correctly calculated
			(vi) Good professional conduct is demonstrated
			(vii) Roles of pharmaceutical dispensers are well spelt out
2	Utilise basic principles applicable to pharmacy practice in compounding of oral and external liquid preparations, dilution of concentrated liquid preparations and reconstitution of oral preparations.	20	(i) Suitable conditions, equipment and compounding procedures and techniques for simple extemporaneous oral and external liquid preparations are correctly described.
			(ii) Amounts of ingredients required for compounding are correctly calculated
			(iii) Appropriate weighing/measuring equipment/apparatus are selected and used.
			(iv) Ingredients are mixed, reconstituted, diluted or compounded according to formula and procedures
			(v) Preparations are packed in appropriate containers and correctly labelled.
3	Apply basic principles of hygiene and disease prevention for controlling contaminants in health care settings and community	15	(i) Types of disease causative agents are described.
			(ii) Common communicable and non-communicable diseases in the community are described
			(iii) Environmental health and hygienic approaches in disease prevention and control explained
			(iv) Different methods of waste disposal are well described
			(v) Sources of contamination in health care settings are explained.
4	Utilise principles of basic health sciences and nutrition in the delivery of pharmaceutical care and services.	40	(i) Structure and function of human body systems are well described
			(ii) Tissue/body reactions to diseases and injuries correctly explained
			(iii) Different administration routes and dosage forms of medicines are correctly described
			(iv) Dressing materials classification, selection and use are described
			(v) Essential medicines according to pharmacological activities are classified.
			(vi) Doses, indications and contraindications, interactions and side effects of essential medicines are correctly explained
			(vii) Basic Inorganic chemistry applied in

			pharmacy practise correctly described
			(viii) Groups of food substances differentiated
			(ix) Sources of nutrients are correctly described
			(x) Disease associated with nutritional deficiencies correctly described.
5	Apply basic principles of storage, facility-based distribution, use and record keeping in supporting delivery of pharmaceutical services in health care settings.	15	(i) Procedures for receiving medicines and medical supplies into the store are correctly described
			(ii) Arrangement methods in storage of medicines and medical supplies are correctly described
			(iii) Special storage conditions and stock rotation methods are correctly described
			(iv) Conditions influencing quality of stored medicines and medical supplies are explained
			(v) Factors contributing to rational and irrational use of medicines described
			(vi) Inventory records of medicines and medical supplies described
6	Apply basic computer skills and effective communication techniques in effective provision of pharmaceutical care and services.	10	(i) Computer hardware components correctly described
			(ii) Basic operating system and software packages (word processor, spreadsheet, database, internet) are correctly described and applied
			(iii) Procedures for computer basic troubleshooting correctly demonstrated
			(iv) Effective communication in pharmaceutical care provision well described and applied

9.0 Principal and Enabling Outcomes

S/No	PRINCIPLE OUTCOME	Enabling Outcomes
1	Apply principles of good dispensing practice in promoting safe and effective use of medicines and medical supplies.	1.1 Demonstrate procedures for good dispensing practice in provision of pharmaceutical services.
		1.2 Apply safe and effective use of dispensed medicines and medical supplies
		1.3 Explain concepts and principles of good dispensing practice in provision of pharmaceutical services.
2	Utilise basic principles of pharmacy practice in compounding oral and external liquid preparations, diluting concentrated liquid preparations and reconstitution	2.1 Differentiate equipment, instrument and apparatus for use in compounding
		2.2 Apply procedures for compounding oral and external liquid preparations, dilution of concentrated liquid preparations and reconstitution of oral preparations.
		2.3 Apply appropriate materials and references in

3	Apply basic principles of hygiene and disease prevention for controlling contaminants in health care settings and community.	3.1 Describe strategies for diseases prevention and control.
		3.2 Differentiate common communicable and non-communicable diseases.
		3.3 Employ measures for preventing and controlling contaminants in the provision of pharmaceutical services.
4	Utilise principles of basic health sciences and nutrition in the delivery of pharmaceutical care and services.	4.1 Describe human anatomy and physiology in health and disease condition
		4.2 Differentiate pharmaceutical dosage forms in provision of health care services.
		4.3 Perform pharmaceutical calculations in various aspects of pharmaceutical services.
		4.4 Describe basic principles and concepts of inorganic chemistry, nutrition and medicines interactions in the human body in provision of pharmaceutical care and services.
5	Apply basic principles of pharmaceutical storage, facility-based distribution, use and record keeping in supporting delivery of pharmaceutical services.	5.1 Apply proper procedures for distribution of medicines and medical supplies in a facility. 5.2 Apply appropriate methods and techniques in storage of medicines and medical supplies
		5.3 Maintain proper records of medicines and medical supplies.
6	Apply basic computer and communication skills for effective provision of pharmaceutical care and services.	6.1 Apply basic computer knowledge and skills in capturing data, generating documents and presenting information
		6.2 Utilize computer to organise and keep records in provision of pharmaceutical services
		6.3 Demonstrate effective communication skills in health care settings.

10.0. Enabling and Sub-enabling Outcomes

S/No	Enabling Outcomes	Subenabling Outcomes
1.1	Demonstrate procedures for good dispensing practice in provision of pharmaceutical services.	1.1.1 Establish clarity, completeness, authenticity and legality of a prescription.
		1.1.2 Identify, pack and label medicines and medical supplies for dispensing.
		1.1.3 Issue medicines and medical supplies to patients/clients with clear instructions and advice
		1.1.4 Keep records of dispensed medicines and other pharmaceutical products.
1.2	Apply safe and effective use of dispensed medicines and medical supplies	1.2.1 Describe rational use of medicines
		1.2.2 Describe irrational prescribing
		1.2.3 Describe irrational dispensing
1.3	Explain concepts and principles of good dispensing practice in provision of pharmaceutical services.	1.3.1 Maintain a functional and organized dispensing unit
		1.3.2 Demonstrate understanding of law of pharmacy practice

			institutional guidelines on dispensing and the pharmacy professional code of conduct
		1.3.4	Describe national health care delivery system
		1.3.5	Differentiate roles of pharmaceutical personnel in different levels of national health care delivery system
2.1	Differentiate equipment, instrument and apparatus for use in compounding	2.1.1	Identify and list equipment used for compounding
		2.1.2	Identify and list instruments used for compounding
		2.1.3	Identify and list apparatus used for compounding
2.2.	Apply procedures for compounding oral and external liquid preparations, dilution of concentrated liquid preparations and reconstitution of oral preparations.	2.2.1	Explain the importance of compounding in pharmacy practice
		2.2.2	Calculate and measure/weigh amounts of ingredients
		2.2.3	Describe facility requirements for compounding area of oral and external liquid preparations
		2.2.4	Mix, reconstitute and/or dilute ingredients for preparation of oral and external liquid preparations
2.3	Apply appropriate materials and references in compounding	2.3.1	Identify references of pharmaceutical formulations
		2.3.2	Identify appropriate materials for use in compounding of oral and external liquid preparations according to formula
		2.3.3	Use formula and procedures to compound oral and external liquid preparations
3.1	Describe strategies for diseases prevention and control.	3.1.1	Describe common methods of disease control
		3.1.2	Describe measures of improving sanitation, safe water supply, housing and general hygiene.
		3.1.3	Describe antisepsis and disinfection as means for disease prevention and control
3.2	Differentiate common communicable and non-communicable diseases.	3.2.1	Describe common communicable diseases
		3.2.2	Describe common non-communicable diseases
		3.2.3	Describe management of common communicable and non-communicable diseases
3.3	Employ measures for preventing and controlling contaminants in the provision of pharmaceutical services.	3.3.1	Describe sources of contamination in provision of pharmaceutical services
		3.3.2	Describe measures for preventing and controlling contaminants in provision of pharmaceutical services
		3.3.3	

		3.3.4	Describe safe disposal of pharmaceutical wastes
4.1	Describe human anatomy and physiology in health and disease condition	4.1.1	Describe the relationship between cells and tissues
		4.1.2	Describe the structure, location and functions of body organs
		4.1.3	Describe components and functions of body systems
		4.1.4	Describe composition and functions of blood and other body fluids
		4.1.5	Describe common disorders of body organs and systems
4.2	Differentiate pharmaceutical dosage forms in provision of health care services.	4.2.1	Describe pharmaceutical dosages forms
		4.2.2	Differentiate routes of drugs administration
		4.2.3	Describe the composition of pharmaceutical dosage forms
		4.2.4	Describe packaging materials for pharmaceutical dosage forms
4.3	Perform pharmaceutical calculations in various aspects of pharmaceutical services.	4.3.1	Perform calculations involving enlarging and reducing formula for compounding
		4.3.2	Perform calculations involving density, specific gravity, dosage, dilutions, concentrations and reconstitutions
		4.3.3	Demonstrate understanding of the standard international units, empirical and metric systems of units
		4.3.4	Determine percent strength, ratio, proportion, conversion, dimensional analysis and variation
4.4	Describe basic principles and concepts of inorganic chemistry, nutrition and medicines interactions in the human body in provision of pharmaceutical care and services.	4.4.1	Demonstrate an understanding of the range and chemistry of elements in the periodic table and their compounds
		4.4.2	Outline chemical and physical nature of drugs
		4.4.3	Describe the role of inorganic chemistry in pharmaceutical sciences
		4.4.4	Describe sources and uses of nutrients according to their nutritional classes
		4.4.5	Describe common nutritional diseases and their management
		4.4.6	Classify essential medicines according to pharmacological activities
		4.4.7	Describe indications and contraindications of essential medicines as per national standard treatment guideline
		4.4.8	Describe side effects, adverse effects, interactions and precautions of essential medicines
5.1	Apply proper procedures for distribution of medicines and	5.1.1	Describe procedures for storage of medicines and medical supplies

			medicines and medical supplies
		5.1.3	Describe pharmacy legislation related to storage and distribution of medicines and medical supplies
5.2	Apply appropriate methods and techniques in storage of medicines and medical supplies	5.2.1	Describe premise suitable for storage of medicines and medical supplies
		5.2.2	Describe factors affecting the quality of stored medicines and medical supplies
		5.2.3	Describe procedures for receiving, zoning, locating and coding medicines and medical supplies in the storage facility
5.3	Maintain proper records of medicines and medical supplies.	5.3.1	Describe principles of inventory management.
		5.3.2	Differentiate stock records for storage of medicines and medical supplies
		5.3.3	Carry out physical inventory and reconciliation of medicines and medical supplies
6.1	Apply basic computer knowledge and skills in capturing data, generating documents and presenting information	6.1.1	Carry out basic computer operations and troubleshooting
		6.1.2	Describe basic structure and functions of computers and peripherals
		6.1.3	Use information technology in inventory management
6.2	Utilize computer to organise and keep records in provision of pharmaceutical services	6.2.1	Describe the importance of computers in pharmacy practice
		6.2.2	Use office software (word processing, spreadsheet, access) in pharmaceutical operations
		6.2.3	Use computers for data maintenance and information sharing.
6.3	Demonstrate effective communication skills in health care settings.	6.3.1	Describe forms and process of communication
		6.3.2	Use different communication techniques with clients and other health care professionals
		6.3.3	Prepare formal letters and reports in health care settings.
		6.3.4	Explain the importance of customer service in provision of pharmaceutical services and care

11.0 ASSESSMENT CRITERIA AND THEIR BENCHMARKING

11.1 Related Tasks, Assessment Criteria and Assessment Instruments

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
1.1.1. Establish clarity, completeness, authenticity and legality of a prescription.	a) Define a medical prescription	Clarity, completeness, authenticity and legality of a prescription established.	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Distinguish parts of a prescription (Name of patient, sex and age, institution, prescriber's name and signature, date, name(s) of medicine(s) and dosage, signature of dispenser)			
	c) Identify features of different parts of a prescription			
	d) Describe various medical symbols and abbreviations			
	e) Explain guidelines on prescribing medicines			
	f) Explain categories of authorised prescribers			
	g) Explain national and different institutional policies and guidelines on prescribing medicines			
	h) Identify prescription errors			
	i) Relate diagnosis and prescribed medicines			
1.1.2. Identify, pack and label medicines and medical supplies for dispensing.	a) Describe good dispensing procedure	Medicines and medical supplies correctly identified, packed and labelled	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Determine quantities of medicines to dispense			
	c) List types of suitable containers/packaging materials for medicines to be dispensed			
	d) List essential features of a label			
	e) Design and prepare			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	f) Differentiate between generic (non-proprietary) and brand (proprietary) medicines			
	g) List advantages and disadvantages of generic and brand medicines			
	h) Explain global and national initiatives on generic and brand medicines			
1.1.3. Issue medicines and medical supplies to patients/clients with clear instructions and advice	a) Give appropriate instructions on the use of dispensed medicine(s)/medical supplies	Medicines and medical supplies correctly issued to patients/clients with clear instructions and advice	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Explain precautions, interactions, side effects and storage of dispensed medicines			
	c) Check patient/client understanding on use/precautions of dispensed medicine(s) /medical supplies			
	d) Identify suspected adverse drug reactions (ADRs) e) Report suspected adverse drug reactions (ADRs)			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
1.1.4. Keep records of dispensed medicines and other pharmaceutical products.	a) Mention components of dispensing register/ prescription record book/sales book	Records of dispensed medicines and other pharmaceutical products correctly kept	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Enter information of dispensed medicines/ medical supplies in dispensing register/ prescription record book/sales book			
	c) Retain and file prescriptions of dispensed medicines and medical supplies			
1.2.1.Describe rational use of medicines	a) Define rational use of medicines	Rational use of medicines correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Explain the importance of rational use of medicines			
	c) List the consequences of irrational use of medicines			
1.2.2. Describe irrational prescribing	a) Define irrational prescribing	Irrational prescribing correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Distinguish types of irrational prescribing practices			
	c) List factors influencing irrational			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	d) Identify irrational prescriptions e) List measures to alleviate irrational prescribing			
1.2.3. Describe irrational dispensing	a) Define irrational dispensing b) Identify irrational dispensing practices c) Mention measures to alleviate irrational dispensing	Irrational dispensing correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
1.3.1. Maintain a functional and organized dispensing unit	a) List different sections of the pharmacy department. b) Explain activities carried out and services offered in pharmacy department c) Explain the requirements for a functional dispensing unit (premise, supply of medicines and medical supplies, dispensing equipment, quality assurance procedures, accessible sources of drug information, trained personnel	Maintenance of a functional and organized dispensing unit correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
1.3.2. Demonstrate understanding of law of pharmacy practice	a) Explain establishment, functions, organization/structure and powers of the Pharmacy Council of Tanzania	Understanding of law of pharmacy practice demonstrated	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) List requirements for enlistment, enrolment and registration of pharmaceutical personnel			
	c) Mention requirements for registration and licensing of premises for pharmacy business			
1.3.3. Demonstrate understanding of institutional guidelines on dispensing and the pharmacy professional code of conduct	a) Describe historical background of pharmacy practice	Understanding of institutional dispensing code and the pharmacy professional code of conduct demonstrated	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe standards and values in pharmacy profession			
	c) Describe the code of ethics and professional conduct for pharmaceutical practitioners			
1.3.4. Describe national health care delivery system	a) Mention levels of health care delivery system in Tanzania	National health care delivery system correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Identify medicines and medical supplies			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	different levels of health care delivery system			
	c) Describe the referral system in the health care delivery			
1.3.5. Differentiate roles of pharmaceutical personnel in different levels of national health care delivery system	a) Mention roles of pharmaceutical dispensers	Roles of pharmaceutical personnel in different levels of national health care delivery system correctly differentiated	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) List and describe roles of pharmaceutical assistants			
	c) Mention roles of pharmaceutical technicians			
	d) Mention roles of pharmacists			
2.1.1. Identify and list equipment used for compounding	a) Mention equipment used in compounding	Equipment used for compounding correctly identified and listed	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Demonstrate correct use of equipment			
	c) Describe and practice proper cleaning, preventive maintenance and storage of equipment used in compounding			
2.1.2. Identify and list instruments used for compounding	a) Mention instruments used in compounding	Instruments used for compounding correctly identified and listed	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Demonstrate correct use of instruments.			
	c) Describe and practice proper cleaning, preventive maintenance and storage of			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	used in compounding			
2.1.3. Identify and list apparatus used for compounding	a) Mention apparatus used in compounding b) Demonstrate correct use of apparatus c) Describe and practice proper cleaning, preventive maintenance and storage of apparatus used in compounding	Apparatus used for compounding correctly identified and listed	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
2.2.1. Explain the importance of compounding in pharmacy practice	a) Describe historical background of compounding b) Define pharmaceutical compounding c) Explain reasons for compounding in pharmacy practice	Importance of compounding in pharmacy practice correctly explained	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
2.2.2. Calculate and measure/weigh amounts of ingredients	a) Use appropriate formula for compounding b) Determine amounts of each ingredient needed for compounding c) Weigh amounts of ingredients required for compounding d) Measure volumes of ingredients required for compounding	Correct amounts of ingredients are calculated and weighed/measured	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
2.2.3. Describe facility requirements for compounding area of oral and external liquid preparations	a) Outline personnel requirements b) Outline premise requirements c) Explain procedures for cleaning, drying and storage of containers and closures suitable for packaging of prepared preparations	Suitable conditions for compounding of oral and external liquid preparations are described and prepared	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
2.2.4.Mix, reconstitute and/or dilute ingredients for preparation of oral and external liquid preparations	a) Describe stock solutions b) Perform triturations, alligation medial and alligation alternate for dilution of pharmaceutical preparations c) Dilute concentrated solutions for external use d) Prepare antiseptics and disinfectants e) Describe reconstitution of powders/granules for oral preparations (e.g. suspensions, syrups etc.) f) Perform reconstitution of powders/granules for oral preparations (e.g. suspensions, syrups etc.) g) Describe procedures for preparing solutions of solid in liquid h) Prepare solution of solids in liquid (e.g. simple syrup etc.)	Appropriate techniques and procedures are used to mix, reconstitute or compound oral and external liquid preparations	Written tests Oral questioning Practical assignment	Question papers Model answer Answer scripts Practical report Checklist

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	i) Describe procedures for preparing solution of liquid in liquid			
	j) Prepare pharmaceutical solutions of liquid in liquid for oral and external use (e.g. emulsions)			
	k) Describe procedure of preparing mixtures of solids in solids (e.g. divided powders, bulky powders)			
	l) Prepare mixtures of solids in solids (e.g. divided powders, bulky powders)			
	m) Prepare mixtures of solids in liquid (e.g. pharmaceutical mixtures, suspensions etc.)			
2.3.1. Identify references of pharmaceutical formulations	a) List references /compendia used in compounding of pharmaceutical preparations	References of pharmaceutical formulations correctly identified	Written tests Oral questioning Practical assignment	Question papers Model answer Answer scripts Practical report Checklist
	b) Identify formula for pharmaceutical preparation			
	c) Reduce or enlarge official formula to obtain required formula for compounding			
2.3.2. Identify appropriate materials for use in	a) List ingredients for compounding according to official formula	Materials for use in compounding of oral and external liquid	Written tests Oral questioning Practical	Question papers Model answer Answer

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
compounding of oral and external liquid preparations according to formula	b) List equipment/instrument/apparatus for compounding as per official formula	preparations are appropriately identified	assignment	scripts Practical report Checklist
	c) Identify container and closure for packaging oral and external liquid preparations			
2.3.3. Use formula and procedures to compound oral and external liquid preparations	a) Use formula to determine quantities of ingredient for compounding oral and external liquid preparations	Formula and procedures for compounding oral and external liquid preparations correctly used	Written tests Oral questioning Practical assignment	Question papers Model answer Answer scripts Practical report Checklist
	b) Use appropriate procedure/methods to prepare oral and liquid preparations			
	c) Make final volume of prepared oral and external liquid preparations			
	d) Dispense prepared oral and external liquid preparations into suitable containers			
	e) Label prepared oral and external liquid preparations			
3.1.1. Describe common methods of disease control	a) Define disease and disease control	Common methods of diseases correctly described	Written tests Oral questioning Practical assignment	Question papers Model answer Answer scripts Practical report Checklist
	b) List and describe common airborne diseases			
	c) Describe methods for controlling airborne diseases			
	d) List and describe diseases transmitted by faecal contamination			
	e) Describe methods			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	diseases transmitted by faecal contamination f) List common vector borne diseases g) Describe vectors of medical importance h) Describe methods of vector control i) List and describe diseases transmitted by animal bites j) Describe methods for controlling diseases transmitted by animal bites			
3.1.2. Describe measures of improving sanitation, safe water supply, housing and general hygiene	a) Differentiate between hygiene and sanitation b) Describe the importance of sanitation and hygiene c) Describe sources of water supply d) Identify sources of water contamination e) Describe measures for preventing water contamination f) Explain water treatment methods g) Describe types of water for pharmaceutical use h) Describe the importance of safe sewage disposal i) Describe methods for safe sewage disposal	Measures of improving sanitation, safe water supply, housing and general hygiene correctly described	Written tests Oral questioning Practical assignment	Question papers Model answer Answer scripts Practical report Checklist

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	j) Describe health hazards of poor housing			
	k) Explain types and importance of proper ventilation in various settings			
	l) Explain process and application of air purification in pharmaceutical settings			
3.1.3. Describe antisepsis and disinfection as means for disease prevention and control	a) Differentiate between antisepsis and disinfection	Antisepsis and disinfection as means for disease prevention and control correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Classify agents used for antisepsis and disinfection			
	c) List characteristics of an ideal disinfectant and antiseptic			
	d) Describe uses of various antiseptics and disinfectants			
3.2.1. Describe common communicable diseases	a) Define common terms in communicable diseases	Common communicable diseases correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe cause(s), mode of transmission, major signs and symptoms, prevention, control and treatment of malaria			
	c) Describe cause(s), mode of transmission, major signs and symptoms, prevention, control and treatment of common lower respiratory tract infection (URTIs) – e.g. common cold			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	cough, bronchitis etc.			
	d) Describe cause(s), mode of transmission, major signs and symptoms, prevention, control and treatment for common lower respiratory tract infections (LRTIs) – TB, Pneumonia etc.			
	e) Describe cause(s), mode of transmission, major signs and symptoms, prevention, control and treatment common gastrointestinal tract diseases e.g. diarrhoeal diseases etc.			
	f) Describe cause(s), mode of transmission, major signs and symptoms, prevention, control and treatment of communicable dermatological diseases			
	g) Describe cause(s), mode of transmission, major signs and symptoms, prevention, control and treatment of HIV/AIDS, STI and Leprosy etc.			
3.2.2. Describe common non-communicable diseases	a) Define common terms in non-communicable diseases	Common non-communicable diseases correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	b) Describe causes, major clinical signs and symptoms of common non-communicable diseases (e.g. Hypertension, diabetes, Peptic/gastric ulcerations, asthma, allergic reactions etc.)			Assignment report Checklist
	c) Describe preventive and control measures for non-communicable diseases			
3.2.3. Describe management of common communicable and non-communicable diseases	a) List medicine of choice for treatment of common communicable diseases	Management of common communicable and non-communicable diseases correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) List medicine of choice for treatment of common non-communicable diseases			
	c) Explain non pharmacological approaches used for management of non-communicable diseases			
3.3.1. Describe sources of contamination in provision of pharmaceutical services	a) Define contamination	Sources of contamination in provision of pharmaceutical services correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) List and explain sources of contamination in pharmaceutical settings			
	c) Explain the consequences of contamination on			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
3.3.2. Describe measures for preventing and controlling contaminants in provision of pharmaceutical services	a) List measures for preventing and controlling contamination in pharmaceutical settings	Measures for preventing and controlling contaminants in provision of pharmaceutical services correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Explain the importance of appropriate dressing and protective gears in preventing and controlling contamination			
	c) Explain the importance of scrupulous cleanliness in preventing and controlling contamination in pharmaceutical setting			
3.3.3. Describe safe disposal of pharmaceutical wastes	a) Define terminologies applied in disposal of pharmaceutical wastes	Safe disposal of pharmaceutical wastes correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe categories of healthcare wastes			
	c) Describe principles of waste management			
	d) Describe methods for disposal of pharmaceutical wastes			
	e) Explain the consequences of improper disposal of pharmaceutical wastes			
	f) Describe procedure for safe disposal of unfit			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	Tanzania Foods, Drugs and Cosmetics Act, 2003			
4.1.1 Describe the relationship between cells and tissues	a) Describe cell structure under light microscope b) List different types of cells c) Describe characteristics of cells d) Explain functions of cell e) Describe epithelial tissues f) Describe connective tissues g) Describe muscle tissue h) Describe neural tissue	Relationship between cells, tissues, organs and systems correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
4.1.2. Describe the structure, location and functions of body organs	a) Describe division of human body b) List organs of the human body c) Describe location of different organs of the human body d) Describe structure of different organs of the human body (kidneys, heart, liver, lungs, reproductive organs, sense organs etc.) e) Describe functions of different organs of the human body	Structure, location and functions of body organs correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
4.1.3. Describe components and functions of body systems	a) List systems of the human body b) Describe structure and functions of the gastrointestinal system c) Describe structure and functions of the cardiovascular system d) Describe structure and functions of the respiratory system e) Describe structure and functions of the male and female reproductive system f) Describe structure and functions of the urinary system g) Describe structure and functions of the endocrine system h) Describe structure and functions of the nervous system	Components and functions of body systems correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
4.1.4. Describe composition and functions of blood and other body fluids	a) List the components of blood b) Describe functions of blood c) Describe erythrocytes, leucocytes and platelets d) Describe the ABO system of blood grouping e) Describe Rhesus factors in relation to blood grouping f) Describe blood clotting mechanism g) Describe the importance of vitamin K and its	Composition and functions of blood and other body fluids correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	h) Describe haemophilia			
	i) Differentiate between intracellular and extracellular fluids			
	j) Describe electrolytes in body fluids and their functions			
	k) Describe thrombosis			
4.1.5. Describe common disorders of body organs and systems	a) Describe common disorders of the cell (cancer, tumours and neoplasms)	Common disorders of body organs and systems correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe common disorders of the digestive system and accessory organs (ulcerations, hernia, pancreatitis, jaundice and haemorrhoids, constipation etc.)			
	c) Describe common disorders of cardiovascular system (hypertension, hypotension, cardiac failure, ischaemic heart diseases, angina pectoris, myocardial infarction, arrhythmias, shock, varicose veins, aneurisms, arteriosclerosis, atherosclerosis etc.)			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	d) Describe common disorders of the respiratory system (asthma, nasal polyps etc.)			
	e) Describe common disorders of the male reproductive system (prostate cancer, impotence, infertility, gynaecomastia, inflammation of prostate gland)			
	f) Describe common disorders of the female reproductive system (cervical cancer, endometriosis, fibroids, ectopic pregnancy, infertility etc.)			
	g) Describe common disorders of the urinary system (renal failure, glomerulonephritis, polynephritis, abnormal constituents of urine-uric acid, kidney stones, etc)			
	h) Describe common disorders of the endocrine system (Giantism, dwarfism, Cushing's syndrome, Addison's syndrome, adrenal insufficiency, hypothyroidism, hyperthyroidism, diabetes mellitus, etc.)			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	i) Describe common disorders of the nervous system (Parkinson's disease, hydrocephalus, neurotic disorders, schizophrenia and epilepsy)			
	j) Describe disorders of special senses organs (skin, ear, eye, tongue and nose)			
	k) Describe common disorders of connective tissue (gout, rheumatism, etc)			
	l) Describe cardinal signs of inflammation			
	m) Describe oedema and ascites			
	n) Explain electrolytes imbalance			
	o) Describe acidosis and alkalosis			
	p) Describe anaemia and its types			
4.2.1. Describe pharmaceutical dosages forms	a) Define dosage form	Pharmaceutical dosages forms correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Classify pharmaceutical dosage forms according to their physical forms and routes of administration			
	c) Explain the importance of dosage forms			
	d) Describe solid dosage forms (tablets, capsules, powders, pills, lozenges etc.)			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	e) Describe semisolid dosage forms (creams, ointments, pastes, gels etc.)			
	f) Describe liquid dosage forms for internal use (e.g. syrups, elixirs, linctuses, suspensions, mixtures, emulsions, solutions etc.)			
	g) Describe liquid dosage forms for external use (lotions, liniments, solutions, applications, enemas, etc.)			
	h) Describe gaseous dosage forms (aerosols, inhalers etc.)			
	i) Describe parenteral dosage forms (IV/IM, s/c, etc.)			
4.2.2. Differentiate routes of drugs administration	a) Mention routes of drug administration	Routes of drugs administration correctly differentiated	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Explain advantages of each route of drug administration			
	c) Explain disadvantages of each route of drug administration			
4.2.3. Describe the composition of pharmaceutical dosage forms	a) Mention major components of pharmaceutical dosage form	Composition of pharmaceutical dosage forms correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Define pharmaceutical excipient			
	c) List and describe pharmaceutical			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	d) Describe chemical, physical and microbiological stabilities of dosage forms			
	e) Classify factors affecting stability of pharmaceutical dosage forms			
4.2.4. Describe packaging materials for pharmaceutical dosage forms	a) List characteristics of pharmaceutical packaging materials	Packaging materials for pharmaceutical dosage forms correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Explain the role of packaging			
	c) Mention criteria for selection of pharmaceutical packaging materials			
	d) List ideal requirements of a pharmaceutical container			
	e) List types of pharmaceutical containers			
	f) Describe materials for making pharmaceutical containers			
	g) Describe closures for pharmaceutical containers			
	h) Explain types of closures for pharmaceutical containers			
	i) List materials used for making closures for pharmaceutical containers			
4.3.1. Perform calculations involving enlarging and	a) Compare total quantity needed for compounding with total quantity of	Calculations involving enlarging and reducing formula	Written tests Oral questioning Assignment	Question papers Model answer Answer

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	d) Describe chemical, physical and microbiological stabilities of dosage forms			
	e) Classify factors affecting stability of pharmaceutical dosage forms			
4.2.4. Describe packaging materials for pharmaceutical dosage forms	a) List characteristics of pharmaceutical packaging materials	Packaging materials for pharmaceutical dosage forms correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Explain the role of packaging			
	c) Mention criteria for selection of pharmaceutical packaging materials			
	d) List ideal requirements of a pharmaceutical container			
	e) List types of pharmaceutical containers			
	f) Describe materials for making pharmaceutical containers			
	g) Describe closures for pharmaceutical containers			
	h) Explain types of closures for pharmaceutical containers			
	i) List materials used for making closures for pharmaceutical containers			
4.3.1. Perform calculations involving enlarging and	a) Compare total quantity needed for compounding with total quantity of	Calculations involving enlarging and reducing formula	Written tests Oral questioning Assignment	Question papers Model answer Answer

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
formula for compounding	b) Calculate ratio (factor) of quantity needed for compounding to quantity of official formula	correctly performed		Assignment report Checklist
	c) Calculate the quantities of each ingredient required for compounding required quantity			
	d) Calculate final quantity of preparation			
4.3.2. Perform calculations involving density, specific gravity, dosage, dilutions, concentrations and reconstitutions	a) Define density and specific gravity	Calculations involving density, specific gravity, dosage, dilutions, concentrations and reconstitutions correctly performed	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Calculate specific gravity of liquids and solids			
	c) Convert specific gravity to specific volume and vice versa			
	d) Calculate weights and volumes using specific gravity			
	e) Calculate dilutions using alligations (medial and alternate)			
	f) Calculate dilutions of acids and alcohols			
	g) Calculate dilutions and concentrations of liquids (strength and total quantity, formulas)			
	h) Calculate dilutions and concentrations of solids and semisolids			
	i) Calculate quantities of water to use in			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	powders/granules for oral preparations			
	j) Calculate quantities of water to use in reconstituting powders for parenterals			
	k) Perform calculations of doses for paediatric and elderly patients			
	l) Perform calculations of doses based on age			
	m) Perform calculations of doses based on body weight			
	n) Calculate aliquot weights and measures			
	o) Perform calculations of doses based on body surface area			
	p) Perform calculations of miscellaneous dosage problems (heparin, insulin etc.)			
4.3.3. Demonstrate understanding of the standard international units, empirical and metric systems of	a) Describe Arabic and Roman numerals	Understanding of the standard international units, empirical and metric systems of units demonstrated	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Covert Arabic to Roman numerals and vice versa			
	c) Describe Metric system: definitions, prefixes,			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	length, volume and weight			
	d) Describe international units, imperial units and household equivalents			
	e) Convert metric measurements to IU, imperial and house hold units and vice versa			
4.3.4. Determine per cent strength, ratio, proportion, conversion, dimensional analysis and variation	a) Calculate percentage strength (%w/v, %v/v, %w/w, mg%)	Per cent strength, ratio, proportion, conversion, dimensional analysis and variation correctly determined	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Calculate ratio strength (w/v, v/v, w/w, ppm)			
	c) Convert percentage strength to ratio strength and vice versa			
4.4.1. Demonstrate an understanding of the range and chemistry of elements in the periodic table and their compounds	a) Define key terminologies used in inorganic chemistry	Understanding of the range and chemistry of elements in the periodic table and their compounds demonstrated	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe the importance of chemistry in pharmacy			
	c) Describe the structure of an atom			
	d) Describe arrangement of elements in the periodic table of elements			
	e) Describe characteristics of elements in the periodic table (in their groups)			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	f) Define mixtures and compounds g) Describe characteristics of mixtures and compounds			
4.4.2. Outline chemical and physical nature of drugs	a) List the physical and chemical characteristics of drugs b) Differentiate between acids, bases and salts of pharmaceutical importance c) Describe properties of acids, bases and salts of pharmaceutical importance d) Define the term pH e) Explain the importance of degree of dissociation f) Determine pH of different acids g) Describe the use of the pH scale h) Describe buffer solutions and their uses in pharmacy	Chemical and physical nature of drugs correctly outlined	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
4.4.3. Describe role of inorganic chemistry in pharmaceutical sciences	a) Describe the importance of acids, bases and salts in pharmacy b) Describe medicinal uses of various inorganic elements in pharmacy (Iodine, sodium, magnesium, calcium, aluminium etc.)	Role of inorganic chemistry in pharmaceutical sciences described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	c) Describe pharmaceutical uses (excipients) of different inorganic elements (Magnesium etc.)			
4.4.4. Describe sources and uses of nutrients according to their nutritional classes	a) Describe sources and classes of different food substances	Sources and uses of nutrients according to their nutritional classes correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe the composition of each class of food (carbohydrates, proteins, fats and oils, vitamins and minerals, etc.)			
	c) Define balanced diet and explain its importance to human health			
	d) Differentiate between fat soluble and water soluble vitamins			
4.4.5. Describe common nutritional diseases and their management	a) List common nutritional deficiency diseases and their causes	Common nutritional deficiency diseases and their management correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe signs and symptoms of common nutritional deficiency diseases			
	c) Describe management of nutritional deficiency diseases			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
4.4.6. Classify essential medicines according to pharmacological activities	a) Define terminologies used in pharmacology (pharmacology, drug, pharmacokinetics, pharmacodynamics, agonist, antagonist, synergy, receptor, pro-drug, therapeutic index, half- life, bioavailability, biotransformation, first pass elimination etc.)	Essential medicines correctly classified according to pharmacological activities	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) List sources of medicines			
	c) Describe toxic and therapeutic doses			
	d) Describe tolerance, habituation, dependence and addiction			
	e) Describe the pharmacological/therapeutic classes of essential medicines			
4.4.7. Describe indications and contraindications of essential medicines as per national standard treatment guideline	a) Describe the rationale of using medicines in health	Indications and contraindications of essential medicines as per national standard treatment guideline correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe clinical use of essential medicines in treatment of common diseases according to the standard treatment guideline			
	c) Describe dose, dosage and course of essential medicines used for common diseases according to the Tanzania standard treatment			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	d) List contraindications of essential medicines			
4.4.8. Describe side effects, adverse effects, interactions and precautions of essential medicines	a) List important side effects of essential medicines	Side effects, adverse effects, interactions and precautions of essential medicines correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) List adverse effects of essential medicines			
	c) Describe important interactions of essential medicines according to Tanzania standard treatment guidelines			
	d) Describe precautions for the use of essential medicines			
5.1.1. Describe procedures for storage of medicines and medical supplies	a) Describe arrangement of medicines and medical supplies in the store (on shelves, pallets etc.)	Procedures for storage of medicines and medical supplies correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe common systems for arranging medicines and medical supplies in the store (alphabetical by generic name, pharmacological/therapeutic, dosage form, frequency of use, random bin, commodity coding)			
	c) Describe rotation of stock in the medicines and medical supplies (FEFO/FIFO)			
	d) List medicines/medical supplies requiring			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	special storage conditions			
	e) Describe documentation in storage of medicines and medical supplies (Goods receiving/delivery note, bin cards, ledger, etc.)			
5.1.2. Describe procedures for distribution of medicines and medical supplies	a) Explain the goals of distribution	Procedures for distribution of medicines and medical supplies correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe features of a good distribution system			
	c) List and describe steps in distribution cycle for medicines and medical supplies			
	d) Describe documentation in distribution of medicines and medical supplies (Requisition/issue voucher, etc.)			
5.1.3. Describe pharmacy legislation related to storage and distribution of medicines and medical supplies	a) Identify sections in the Pharmacy Act, 2011 related to storage and distribution of medicines and medical supplies	Pharmacy legislation related to storage and distribution of medicines and medical supplies correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe sections in the Pharmacy Act, 2011 related to storage and distribution of medicines and medical supplies			
	c) Describe the guidelines for handling of unfit medicines and			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	as per Tanzania Foods , Drugs and Cosmetic Act, 2003			
5.2.1 Describe premise suitable for storage of medicines and medical supplies	a) Describe importance of proper storage of medicines and medical supplies b) Describe requirements of premises for storage of medicines and medical supplies c) Describe the environment suitable for storage of medicines and medical supplies	Premise suitable for storage of medicines and medical supplies correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
5.2.2 Describe factors affecting the quality of stored medicines and medical supplies	a) List and describe factors that affect the quality of medicines and medical supplies in storage b) List signs of deteriorated medicines c) Explain the consequences of poor storage on the quality of medicines and medical supplies	Factors affecting the quality of stored medicines and medical supplies correctly described.	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
5.2.3 Describe procedures for receiving, zoning, locating, and coding medicines and medical supplies in the storage facility	a) Describe the process of receiving medicines and medical supplies into the store (inspect, count, document) b) Describe the criteria for establishing different storage zones for	Procedures for receiving, zoning, locating, and coding medicines and medical supplies in the storage facility correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	medical supplies in the storage facility			
	c) Describe locations of medicines and medical supplies in the storage facility (fluid, semi-fluid and fixed)			
	d) Explain coding and its importance in storage of medicines and medical supplies			
5.3.1 Describe principles of managing medicines and medical supplies	a) Define common terms used in supplies management in pharmaceutical services	Principles of inventory management correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Describe relevancy of supplies management in pharmaceutical services			
	c) Explain the concept and principles of managing medicines and medical supplies			
	d) Describe common dynamics in medicines and medical supplies management			
	e) List indicators of poor management in medicines and medical supplies			
5.3.2 Differentiate stock records for storage of medicines and medical	a) Describe different inventory control records and documents	Stock records for storage of medicines and medical supplies correctly differentiated	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment
	b) Describe steps for recording			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	inventory records			Checklist
	c) Recognise importance and benefits of inventory control records			
	d) Describe legal requirements and implications in inventory records			
5.3.3 Carry out physical inventory and reconciliation of medicines and medical supplies	a) Explain the importance of physical inventory and reconciliation	Physical inventory and reconciliation of medicines and medical supplies carried out	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) List methods for carrying out physical inventory of medicines and medical supplies			
	c) List criteria for selecting a method for physical inventory			
	d) Explain procedures in reconciliation of medicines and medical supplies			
	e) Explain the procedures for assessing stock status of medicines and medical supplies			
6.1.1 Carry out basic computer operations and troubleshooting	a) Connect major parts of a computer (to power supply and each other)	Basic computer operations and troubleshooting carried out	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment report Checklist
	b) Turn on and shut down computer			
	c) Carry out computer basic operating system tasks			
	d) Operate mouse and keyboard			
	e) Carry out basic			

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	operations (restart, refresh, etc.)			
6.1.2. Describe basic structure and functions of computers and peripherals	a) Describe different types of computers and their generations b) Differentiate major parts of a computer c) Explain functions of major parts of a computer d) Identify different devices and peripherals of a computer e) Explain back-up systems and their importance	Basic structure and functions of computers and peripherals correctly described	Written tests Oral questioning Assignment	Question papers Model answer Answer scripts Assignment report Checklist
6.1.3. Use information technology in inventory management	a) List benefits of information technology in inventory management b) Mention commonly used computerized inventory systems c) Practice tally based system in inventory management	Information technology in inventory management correctly used	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment report Checklist
6.2.1. Describe the importance of computers in pharmacy practice	a) List advantage and disadvantage of using computers in pharmacy b) List areas where computer can be used in pharmacy c) Explain the use of computer in dispensing	Importance of computers in pharmacy practice described	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment report Checklist
6.2.2. Use office software (word processing, spread sheet, access) in	a) List different standard application packages b) Comprehend and practice the use standard	Office software (word processing, spread sheet, access) in pharmaceutical operations	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment report

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
al operations	packages c) Select appropriate application for use			
6.2.3 Use computers for data maintenance and information sharing	a) Create folders and files for data storage b) Create backup data c) Use different computer applications to share information d) Protect and encrypt files	Computers for data maintenance and information sharing correctly used	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment report Checklist
6.3.1. Describe forms and process of communicatio n	a) Explain the importance of communication b) Describe different forms of communication c) Describe different methods of communication d) Describe factors influencing choice of communication media e) Explain elements and the process of communication	Forms and process of communication described	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment report Checklist
6.3.2. Use different communicatio n techniques with clients and other health care professionals	a) Describe different communication skills b) Describe principles of effective communication c) List and explain barriers to effective communication	Different communication techniques with clients and other health care professionals correctly used	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment report Checklist
6.3.3. Prepare formal letters and reports in health care settings	a) Write official and referral letters b) Fill health related forms and documents c) Write technical	Formal letters and reports in health care settings prepared	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment

Sub-Enabling Outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	d) Prepare financial claims, drug budgets and MTUHA/NHIF reports			Checklist
6.3.4. Explain the importance of customer service in provision of pharmaceutical services	a) Define customer care b) Describe the importance of customer care in pharmacy c) Describe factors influencing customer care d) Use different communication techniques in patients with special needs	Importance of customer service in provision of pharmaceutical services explained	Written tests Oral questioning Practical Assignment	Question papers Model answer Answer scripts Assignment report Checklist

11.2 Benchmarking of Assessment Criteria

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
1.1.1 Clarity, completeness, authenticity and legality of a prescription correctly established	Distinguish parts of a prescription (Name of patient, sex and age, institution, prescriber's name and signature, date, name(s) of medicine(s) and dosage, signature of dispenser)	Distinguish parts of a prescription (Name of patient, sex and age, institution, prescriber's name and signature, date, name(s) of medicine(s) and dosage, signature of dispenser) and Identify features of different parts of a prescription	Distinguish parts of a prescription (Name of patient, sex and age, institution, prescriber's name and signature, date, name(s) of medicine(s) and dosage, signature of dispenser), Identify features of different parts of a prescription and relate diagnosis and prescribed medicines
1.1.2. Medicines and medical supplies correctly identified, packed and labelled	Describe good dispensing procedure; determine quantities of medicines to dispense and list types of suitable containers/packaging materials for medicines	Describe good dispensing procedure; determine quantities of medicines to dispense; list types of suitable	Describe good dispensing procedure; determine quantities of medicines to dispense; list types of suitable containers/packaging

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
		medicines to be dispensed; list essential features of a label and design and prepare appropriate label	dispensed; list essential features of a label and design; prepare appropriate label; differentiate between generic (non-proprietary) and brand (proprietary) medicines and list advantages and disadvantages of generic and brand medicines prescribing
1.1.3. Medicines and medical supplies correctly issued to patients/clients with clear instructions and advice	Give appropriate instructions on the use of dispensed medicine(s)/medical supplies	Give appropriate instructions on the use of dispensed medicine(s)/medical supplies; and explain precautions, interactions, side effects and storage of dispensed medicines.	Give appropriate instructions on the use of dispensed medicine(s)/medical supplies; explain precautions, interactions, side effects and storage of dispensed medicines and check patient/client understanding on use/precautions of dispensed medicine(s) /medical supplies and explain procedures for detecting, analysing and reporting adverse drug reactions (ADRs).
1.1.4. Records of dispensed medicines and other pharmaceutical products correctly kept	Mention components of dispensing register/ prescription record book/sales book	Mention components of dispensing register/ prescription record book/sales book and enter information of dispensed medicines/ medical supplies in dispensing register/ prescription record book/sales book	Mention components of dispensing register/ prescription record book/sales book; enter information of dispensed medicines/ medical supplies in dispensing register/ prescription record book/sales book and retain and file prescriptions of

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
			and medical supplies
1.2.1. Rational use of medicines correctly described	Define rational use of medicines	Define rational use of medicines and explain the importance of rational use of medicines	Define rational use of medicines; explain the importance of rational use of medicines and list the consequences of irrational use of medicines.
1.2.2. Irrational prescribing correctly described	Define irrational prescribing and distinguish types of irrational prescribing practices	Define irrational prescribing ; distinguish types of irrational prescribing practices and list factors influencing irrational prescribing	Define irrational prescribing; distinguish types of irrational prescribing practices; list factors influencing irrational prescribing; identify irrational prescriptions and list measures to alleviate irrational prescribing.
1.2.3. Irrational dispensing correctly described	Define irrational dispensing	Define irrational dispensing and identify irrational dispensing practices	Define irrational dispensing; identify irrational dispensing practices and mention measures to alleviate irrational dispensing.
1.3.1. Maintenance of a functional and organized dispensing unit correctly described	List different sections of the pharmacy department.	List different sections of the pharmacy department and explain activities carried out and services offered in pharmacy department	List different sections of the pharmacy department; explain activities carried out and services offered in pharmacy department and explain the requirements for a functional dispensing unit (premise, supply of medicines and medical supplies, dispensing equipment, quality assurance procedures, accessible sources of drug information, trained personnel
1.3.2.	Explain establishment,	Explain establishment	Explain establishment

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
practice demonstrated	and powers of the Pharmacy Council of Tanzania	organization/structure and powers of the Pharmacy Council of Tanzania and list requirements for enlistment, enrolment and registration of pharmaceutical personnel	organization/structure and powers of the Pharmacy Council of Tanzania; list requirements for enlistment, enrolment and registration of pharmaceutical personnel and mention requirements for registration and licensing of premises for pharmacy business
1.3.3. Understanding of institutional guidelines on dispensing and the pharmacy professional code of conduct demonstrated	Describe historical background of pharmacy practice	Describe historical background of pharmacy practice and standards and values in pharmacy profession	Describe historical background of pharmacy practice; standards and values in pharmacy profession and the code of ethics and professional conduct for pharmaceutical practitioners.
1.3.4. National health care delivery system correctly described	Mention levels of health care delivery system in Tanzania	Mention levels of health care delivery system in Tanzania and identify medicines and medical supplies provided at different levels of health care delivery system.	Mention levels of health care delivery system in Tanzania; identify medicines and medical supplies provided at different levels of health care delivery system and describe the referral system in the health care delivery.
1.3.5. Roles of pharmaceutical personnel in different levels of national health care delivery system correctly differentiated	Mention roles of pharmaceutical dispenser and describe roles of pharmaceutical assistants	Mention roles of pharmaceutical dispensers; list and describe roles of pharmaceutical assistants and that of pharmaceutical technicians	Mention roles of pharmaceutical dispensers; list and describe roles of pharmaceutical assistants; pharmaceutical technicians and that of pharmacists
2.1.1. Equipment used for compounding	Mention equipment used in compounding	Mention equipment used in compounding and demonstrate	Mention equipment used in compounding; demonstrate correct

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
			proper cleaning, preventive maintenance and storage of equipment used in compounding
2.1.2. Instruments used for compounding correctly identified and listed	Mention instruments used in compounding	Mention instruments used in compounding and demonstrate correct use of each instruments	Mention instruments used in compounding; demonstrate correct use of each instruments and describe and practice proper cleaning, preventive maintenance and storage of instruments used in compounding
2.1.3. Apparatus used for compounding correctly identified and listed	Mention apparatus used in compounding	Mention apparatus used in compounding and demonstrate correct use of each apparatus	Mention apparatus used in compounding; demonstrate correct use of apparatus and describe and practice proper cleaning, preventive maintenance and storage of apparatus used in compounding
2.2.1. Importance of compounding in pharmacy practice correctly explained	Define pharmaceutical compounding	Define pharmaceutical compounding and describe historical background of compounding	Define pharmaceutical compounding; describe historical background of compounding and explain reasons for compounding in pharmacy practice
2.2.2. Correct amounts of ingredients are calculated and weighed/measured accurately	Use appropriate formula for compounding and determine amounts of each ingredient needed for compounding	Use appropriate formula for compounding; determine amounts of each ingredient needed for compounding and accurately weigh amounts of ingredients required for compounding or measure volumes of ingredients required	Use appropriate formula for compounding; determine amounts of each ingredient needed for compounding and accurately weigh amounts of ingredients required for compounding and measure volumes of ingredients required

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
2.2.3. Suitable conditions for compounding of oral and external liquid preparations are described and prepared	Outline personnel requirements for compounding	Outline personnel and premise requirements for compounding.	Outline personnel, premise requirements for compounding and explain procedures for cleaning, drying and storage of containers and closures suitable for packaging of prepared preparations.
2.2.4. Appropriate techniques and procedures are used to mix, reconstitute or compound oral and external liquid preparations	Perform triturations, alligation medial and alligation alternate for dilution of pharmaceutical preparations and describe procedures for the preparations of solutions of solid in liquid and liquid in liquid for oral and external use.	Perform triturations, alligation medial and alligation alternate for dilution of pharmaceutical preparations; describe procedures for the preparations of solutions of solid in liquid; liquid in liquid; and mixtures of solids in solids for oral and external use.	Perform triturations, alligation medial and alligation alternate for dilution of pharmaceutical preparations; describe procedures for the preparations of solutions of solid in liquid; liquid in liquid; and mixtures of solids in solids and perform reconstitution of powders/granule for oral and external use.
2.3.1. References of pharmaceutical formulations correctly identified	List references /compendia used in compounding of pharmaceutical preparations	List references /compendia used in compounding of pharmaceutical preparations and identify formula for pharmaceutical preparation	List references /compendia used in compounding of pharmaceutical preparations; identify formula for pharmaceutical preparation and reduce or enlarge official formula to obtain required formula for compounding
2.3.2. Materials for use in compounding of oral and external liquid preparations are appropriately identified	List ingredients for compounding according to official formula	List ingredients and equipment/instrument /apparatus for compounding as per official formula for compounding	List ingredients and equipment/instrument/ apparatus for compounding as per official formula for compounding and identify container and closure for packaging oral and external liquid preparations

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	**Good**	**Excellent**
2.3.3. Formula and procedures for compounding oral and external liquid preparations correctly used	Use formula to determine quantities of ingredient and appropriate method for compounding oral and external liquid preparations	Use formula to determine quantities of ingredient; appropriate method for compounding and make final volume of prepared oral and external liquid preparations	Use formula to determine quantities of ingredient; appropriate method for compounding; make final volume and label and dispense prepared oral and external liquid preparations
3.1.1. Common methods of disease control correctly described	List and describe common methods for controlling airborne diseases	List and describe common methods for controlling airborne; faecal and vector transmitted diseases	List and describe common methods for controlling airborne; faecal; vector and animal bites transmitted diseases.
3.1.2. Measures of improving sanitation, safe water supply, housing and general hygiene correctly described	Describe sources of water supply; contamination; measures for preventing its contamination and explain types and importance of proper ventilation in various settings	Describe sources of water supply; its contamination; measures for preventing water contamination; types and importance of proper ventilation in various settings and methods for water treatment and types of water for pharmaceutical use	Describe sources of water supply; its contamination; measures for preventing contamination; methods for water treatment; types of water for pharmaceutical use; types and importance of proper ventilation in various settings and the importance of sanitation and hygiene
3.1.3. Antisepsis and disinfection as means for disease prevention and control correctly described	Differentiate and classify agents used for antisepsis and disinfection	Differentiate between antisepsis and disinfection; classify agents for antisepsis and disinfection and list ideal characteristics for antiseptics and disinfectants	Differentiate between antisepsis and disinfection; classify agents for antisepsis and disinfection; list ideal characteristics for antiseptics and disinfectants and describe uses of various antiseptics and disinfectants
3.2.1. Common communicable diseases correctly described	Describe cause(s), mode of transmission, major signs and symptoms, prevention, control and	Describe cause(s), mode of transmission, major signs and symptoms,	Describe cause(s), mode of transmission, major signs and symptoms,

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	**Good**	**Excellent**
	infection (URTIs) –e.g. common cold, cough, bronchitis and lower respiratory tract infections (LRTIs) –TB, Pneumonia	malaria upper respiratory tract infection (URTIs) –e.g. common cold, cough, bronchitis; lower respiratory tract infections (LRTIs) – TB, Pneumonia and common gastrointestinal tract diseases e.g. diarrhoeal diseases etc.	malaria; upper respiratory tract infection (URTIs) – e.g. common cold, cough, bronchitis; lower respiratory tract infections (LRTIs) – TB, Pneumonia; common gastrointestinal tract diseases e.g. diarrhoeal diseases and HIV/AIDS, STI and Leprosy.
3.2.2. Common non-communicable diseases correctly described	Define common terms in non-communicable diseases	Define common terms in non-communicable diseases and describe causes, major clinical signs and symptoms of common non communicable diseases (e.g. Hypertension, diabetes, Peptic/gastric ulcerations, asthma, allergic reactions etc.)	Define common terms in non-communicable diseases; describe causes, major clinical signs, symptoms, preventive and control measures for non-communicable diseases (e.g. Hypertension, diabetes, Peptic/gastric ulcerations, asthma, allergic reactions etc.),
3.2.3. Management of common communicable and non-communicable diseases correctly described	List medicine of choice for treatment of common communicable diseases	List medicine of choice for treatment of common communicable and non-communicable diseases	List medicine of choice for treatment of common communicable and non-communicable diseases and explain non pharmacological approaches used for management of non-communicable diseases
3.3.1. Sources of contamination in provision of pharmaceutical services correctly described	Define contamination	Define contamination and list and explain sources of contamination in pharmaceutical settings	Define contamination; list and explain sources of contamination in pharmaceutical settings and explain

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
			pharmaceutical products
3.3.2. Measures for preventing and controlling contaminants in provision of pharmaceutical services correctly described	List measures for preventing and controlling contamination in pharmaceutical settings	List measures for preventing and controlling contamination in pharmaceutical settings and explain the importance of appropriate dressing and protective gears in preventing and controlling contamination	List measures for preventing and controlling contamination in pharmaceutical settings and explain the importance of appropriate dressing, protective gears and scrupulous cleanliness in preventing and controlling contamination
3.3.3. Safe disposal of pharmaceutical wastes correctly described	Describe principles of waste management and methods for disposal of pharmaceutical wastes.	Describe principles of waste management; methods for disposal of pharmaceutical wastes and the consequences of improper disposal of pharmaceutical wastes	Describe principles of waste management; methods for disposal of pharmaceutical wastes; consequences of improper disposal of pharmaceutical wastes and procedure for safe disposal of unfit medicines as per Tanzania Foods, Drugs and Cosmetics Act, 2003
4.1.1. Relationship between cells, tissues, organs and systems correctly described	Describe cell structure, list different types of cells and explain their characteristics	Describe cell structure, list different types of cells and explain their characteristics and functions.	Describe cell structure, list different types of cells; their characteristics; functions and explain epithelial tissues; connective tissues; muscle tissue and neural tissue
4.1.2.Structure, location and functions of body organs correctly described	List organs of the human body and describe their location.	List organs of the human body (i.e. kidneys, heart, liver, lungs, reproductive organs, sense organs etc.) and describe their location and structure	List organs of the human body (i.e. kidneys, heart, liver, lungs, reproductive organs, sense organs etc.) and describe their location; structure and

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
			pharmaceutical products
3.3.2. Measures for preventing and controlling contaminants in provision of pharmaceutical services correctly described	List measures for preventing and controlling contamination in pharmaceutical settings	List measures for preventing and controlling contamination in pharmaceutical settings and explain the importance of appropriate dressing and protective gears in preventing and controlling contamination	List measures for preventing and controlling contamination in pharmaceutical settings and explain the importance of appropriate dressing, protective gears and scrupulous cleanliness in preventing and controlling contamination
3.3.3. Safe disposal of pharmaceutical wastes correctly described	Describe principles of waste management and methods for disposal of pharmaceutical wastes.	Describe principles of waste management; methods for disposal of pharmaceutical wastes and the consequences of improper disposal of pharmaceutical wastes	Describe principles of waste management; methods for disposal of pharmaceutical wastes; consequences of improper disposal of pharmaceutical wastes and procedure for safe disposal of unfit medicines as per Tanzania Foods, Drugs and Cosmetics Act, 2003
4.1.1. Relationship between cells, tissues, organs and systems correctly described	Describe cell structure, list different types of cells and explain their characteristics	Describe cell structure, list different types of cells and explain their characteristics and functions.	Describe cell structure, list different types of cells; their characteristics; functions and explain epithelial tissues; connective tissues; muscle tissue and neural tissue
4.1.2.Structure, location and functions of body organs correctly described	List organs of the human body and describe their location.	List organs of the human body (i.e. kidneys, heart, liver, lungs, reproductive organs, sense organs etc.) and describe their location and structure	List organs of the human body (i.e. kidneys, heart, liver, lungs, reproductive organs, sense organs etc.) and describe their location; structure and

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	**Good**	**Excellent**
4.1.3. Components and functions of body systems correctly described	List systems of the human body and describe structure and functions of the gastrointestinal; cardiovascular and respiratory system	List systems of the human body and describe structure and functions of the gastrointestinal; cardiovascular; respiratory, endocrine and male and female reproductive system	List systems of the human body and describe structure and functions of the gastrointestinal; cardiovascular; respiratory, nervous; endocrine and male and female reproductive system
4.1.4. Composition and functions of blood and other body fluids correctly described	List the components of blood; its functions and describe erythrocytes, leucocytes; platelets; ABO system of blood grouping Rhesus factors in relation to blood grouping and blood clotting mechanism.	List the components of blood; its functions and describe erythrocytes, leucocytes; platelets; ABO system of blood grouping Rhesus factors in relation to blood grouping; blood clotting mechanism; haemophilia; thrombosis; electrolytes in body fluids and their functions and the importance of vitamin K and its deficiency	List the components of blood; its functions and describe erythrocytes, leucocytes; platelets; ABO system of blood grouping Rhesus factors in relation to blood grouping; blood clotting mechanism; haemophilia; thrombosis; electrolytes in body fluids and their functions; the importance of vitamin K and its deficiency and differentiate between intracellular and extracellular fluids.
4.1.5.Common disorders of body organs and systems correctly described	Describe common disorders of the cell (cancer, tumours and neoplasms) and digestive system and accessory organs (ulcerations, hernia, pancreatitis, jaundice and haemorrhoids, constipation etc.)	Describe common disorders of the cell (cancer, tumours and neoplasms); digestive system and accessory organs (ulcerations, hernia, pancreatitis, jaundice and haemorrhoids, constipation); cardiovascular system (hypertension, hypotension, cardiac failure, ischaemic heart diseases	Describe common disorders of the cell (cancer, tumours and neoplasms); digestive system and accessory organs (ulcerations, hernia, pancreatitis, jaundice and haemorrhoids, constipation); cardiovascular system (hypertension, hypotension, cardiac failure, ischaemic heart diseases, angina pectoris

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
		myocardial infarction, arrhythmias, shock, varicose veins, aneurisms, arteriosclerosis,) and respiratory system (asthma, nasal polyps etc.)	arrhythmias, shock, varicose veins, aneurisms, arteriosclerosis,) respiratory system (asthma, nasal polyps etc.) and special senses organs (skin, ear, eye, tongue and nose)
4.2.1. Pharmaceutical dosages forms correctly described	Define and classify pharmaceutical dosage forms according to their physical forms and routes of administration; their importance and describe liquid dosage forms for internal use (e.g. syrups, elixirs, linctuses, suspensions, mixtures, emulsions, solutions etc.) and external use (lotions, liniments, solutions, applications, enemas, etc.)	Define and classify pharmaceutical dosage forms according to their physical forms and routes of administration; their importance and describe liquid dosage forms for internal use (e.g. syrups, elixirs, linctuses, suspensions, mixtures, emulsions, solutions etc,); external use (lotions, liniments, solutions, applications, enemas, etc.) and semi-solid dosage forms (creams, ointments, pastes, gels etc.)	Define and classify pharmaceutical dosage forms according to their physical forms and routes of administration; their importance and describe liquid dosage forms for internal use (e.g. syrups, elixirs, linctuses, suspensions, mixtures, emulsions, solutions etc.); external use (lotions, liniments, solutions, applications, enemas, etc.); semi-solid dosage forms (creams, ointments, pastes, gels etc.); solid dosage forms (tablets, capsules, powders, pills, lozenges etc.); gaseous dosage forms (aerosols, inhalers etc.) and parenteral dosage forms (IV/IM, s/c, etc.)
4.2.2. Routes of drugs administration correctly differentiated	Mention routes of drug administration	Mention routes of drug administration and explain advantages of each route of drug	Mention routes of drug administration and explain advantages and disadvantages of

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	**Good**	**Excellent**
4.2.3. Composition of pharmaceutical dosage forms correctly described	Mention major components of pharmaceutical dosage form and list and describe pharmaceutical excipients	Mention major components of pharmaceutical dosage form; list and describe; chemical, physical and microbiological stabilities of dosage forms and pharmaceutical excipients	Mention major components of pharmaceutical dosage form; classify factors affecting stability of pharmaceutical dosage forms list and describe; chemical, physical and microbiological stabilities of dosage forms and pharmaceutical excipients.
4.2.4. Packaging materials for pharmaceutical dosage forms correctly described	List characteristics; types and the roles of pharmaceutical packaging materials	List characteristics; types and the roles of pharmaceutical packaging materials and explain ideal requirements of a pharmaceutical container and criteria for selection	List characteristics; types and the roles of pharmaceutical packaging materials; ideal requirements of a pharmaceutical container/closures; criteria for selection and describe materials for making containers and closures for pharmaceutical dosage forms
4.3.1. Calculations involving enlarging and reducing formula for compounding correctly performed	Compare total quantity needed and total quantity of official formula and calculate ratio (factor) of quantity needed for compounding to quantity of official formula	Compare total quantity needed and total quantity of official formula and calculate ratio (factor) of quantity needed to quantity of official formula and quantities of each ingredient required for compounding.	Compare total quantity needed and total quantity of official formula and calculate ratio (factor) of quantity needed to quantity of official formula; quantities of each ingredient required and final quantity of preparation
4.3.2.Calculations involving density, specific gravity, dosage, dilutions, concentrations and reconstitutions	Perform calculations of doses based on age, body weight and body surface area	Perform calculations of doses based on age, body weight and body surface area and dilutions and concentrations of liquids (strength and	Perform calculations of doses based on age, body weight and body surface area; dilutions and concentrations of liquids (strength and

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
performed		formulas)	formulas) and quantities of water to use in reconstitutions of powders/granules for oral and parenteral preparations.
4.3.3.Understanding of the standard international units, empirical and metric systems of units demonstrated	Describe Metric system: definitions, prefixes, measures of length, volume and weight	Describe Metric system: definitions, prefixes, measures of length, volume, weight, international units, imperial units and household equivalents	Describe Metric system: definitions, prefixes, measures of length, volume, weight, international units, imperial units and household equivalents
4.3.4. Per cent strength, ratio, proportion, conversion, dimensional analysis and variation correctly determined	Calculate percentage strength (%w/v, %v/v, %w/w, mg%)	Calculate percentage strength (%w/v, %v/v, %w/w, mg%) and ratio strength (w/v, v/v, w/w, ppm)	Calculate percentage strength (%w/v, %v/v, %w/w, mg%); ratio strength (w/v, v/v, w/w, ppm) and convert percentage strength to ratio strength and vice versa.
4.4.1.Understanding of the range and chemistry of elements in the periodic table and their compounds demonstrated	Describe arrangement and characteristics of elements in the periodic table of elements	Describe arrangement and characteristics of elements in the periodic table of elements mixtures and compounds	Describe arrangement and characteristics of elements in the periodic table of elements mixtures and compounds and the importance of chemistry in pharmacy
4.4.2. Chemical and physical nature of drugs correctly outlined	List the physical and chemical characteristics of drugs	List the physical and chemical characteristics of drugs and differentiate between acids, bases and salts of pharmaceutical importance	List the physical and chemical characteristics of drugs; differentiate between acids, bases and describe their properties of pharmaceutical importance
4.4.3. Role of inorganic chemistry in pharmaceutical	Describe the importance of acids, bases and salts in pharmacy	Describe the importance of acids, bases, salts and medicinal uses of	Describe the importance of acids, bases, salts, medicinal uses of

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
		pharmacy (Iodine, sodium, magnesium, calcium, aluminium etc.)	(Iodine, sodium, magnesium, calcium, aluminium etc.) their pharmaceutical uses as excipients.
4.4.4. Sources and uses of nutrients according to their nutritional classes correctly described	Describe sources and classes of different food substances	Describe sources, classes of food substances, their composition (carbohydrates, proteins, fats, oils, vitamins and minerals, etc.) and explain the importance of balanced diet to human health	Describe sources, classes of food substances, their composition (carbohydrates, proteins, fats, oils, vitamins and minerals, etc.), differentiate between fat soluble and water soluble vitamins and explain the importance of balanced diet to human health
4.4.5. Common nutritional diseases and their management correctly described	List common nutritional deficiency diseases and their causes	List common nutritional deficiency diseases, their causes and describe their signs and symptoms	List common nutritional deficiency diseases, their causes and describe their signs, symptoms and management
4.4.6.Essential medicines correctly classified according to pharmacological activities	Define terminologies used in pharmacology (pharmacology, drug, pharmacokinetics, pharmacodynamics, agonist, antagonist, synergy, receptor, pro-drug, therapeutic index, half- life, bioavailability, biotransformation, first pass elimination etc.)	Define terminologies used in pharmacology (pharmacology, drug, pharmacokinetics, pharmacodynamics, agonist, antagonist, synergy, receptor, pro-drug, therapeutic index, half- life, bioavailability, biotransformation, first pass elimination etc.) an list sources of medicines	Define terminologies used in pharmacology (pharmacology, drug, pharmacokinetics, pharmacodynamics, agonist, antagonist, synergy, receptor, pro-drug, therapeutic index, half- life, bioavailability, biotransformation, first pass elimination etc.), list sources of medicines and describe the pharmacological/therapeutic classes of essential medicines
4.4.7. Indications and contraindications of essential medicines as per	Describe dose, dosage and course of essential medicines used for common diseases according to the	Describe dose, dosage, course and clinical use of essential medicines for common diseases	Describe dose, dosage, course, clinical use and contraindications of

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	**Good**	**Excellent**
treatment guideline correctly described	treatment guidelines	Tanzania standard treatment guidelines	according to the Tanzania standard treatment guidelines
4.4.8. Side effects, adverse effects, interactions and precautions of essential medicines correctly described	List important side and adverse effects of essential medicines used for common diseases according to the Tanzania standard treatment guidelines	List important side effects, adverse effects and interactions of essential medicines used for common diseases according to the Tanzania standard treatment guidelines	List important side effects, adverse effects, interactions and precautions of essential medicines used for common diseases according to the Tanzania standard treatment guidelines
5.1.1.Procedures for storage of medicines and medical supplies correctly described	Describe common systems for arranging medicines and medical supplies in the store (alphabetical by generic name, pharmacological/therapeutic, dosage form, frequency of use, random bin, commodity coding)	Describe common systems for arranging medicines and medical supplies in the store (alphabetical by generic name, pharmacological/therapeutic, dosage form, frequency of use, random bin, commodity coding) and list medicines/medical supplies requiring special storage conditions	Describe common systems for arranging medicines and medical supplies in the store (alphabetical by generic name, pharmacological/therapeutic, dosage form, frequency of use, random bin, commodity coding); list medicines/medical supplies requiring special storage conditions and describe documentation in storage of medicines and medical supplies (Goods receiving/delivery note, bin cards, ledger, etc.
5.1.2.Procedures for distribution of medicines and medical supplies correctly described	Explain the goals and features of a good distribution system of medicines and medical supplies	Explain the goals, features of a good distribution system and list and describe steps in distribution cycle for medicines and medical supplies	Explain the goals, features of a good distribution system, list steps in distribution cycle for and describe documentation in

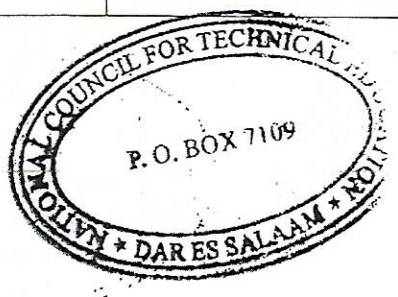
Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
			medical supplies (Requisition/issue voucher, etc.)
5.1.3. Pharmacy legislation related to storage and distribution of medicines and medical supplies correctly described	Identify sections in the Pharmacy Act, 2011 related to storage and distribution of medicines and medical supplies	Identify and explain sections in the Pharmacy Act, 2011 related to storage and distribution of medicines and medical supplies	Identify and explain sections in the Pharmacy Act, 2011 related to storage and distribution of medicines and medical supplies and describe the guidelines for handling of unfit medicines and medical supplies as per Tanzania Foods , Drugs and Cosmetic Act, 2003
5.2.1.Premise suitable for storage of medicines and medical supplies correctly described	Describe the environment suitable for storage of medicines and medical supplies	Describe the environment and requirements for premises suitable for storage of medicines and medical supplies	Describe the environment, requirements for premises and importance of proper storage of medicines and medical supplies
5.2.2. Factors affecting the quality of stored medicines and medical supplies correctly described.	List signs of deteriorated medicines	List signs of deteriorated medicines and describe factors that affect the quality of medicines and medical supplies in storage	List signs of deteriorated medicines, factors that affect the quality of medicines and medical supplies in storage and explain the consequences of poor storage on the quality of medicines and medical supplies
5.2.3. Procedures for receiving, zoning, locating, and coding medicines and medical supplies in the storage facility correctly described	Describe the process of receiving medicines and medical supplies into the store (inspect, count, document)	Describe the process of receiving medicines and medical supplies into the store (inspect, count, document) and the criteria for establishing different storage zones for medicines and medical supplies in the storage facility	Describe the process of receiving medicines and medical supplies into the store (inspect, count, document), criteria for establishing different storage zones for medicines and medical supplies in the storage facility Locations and coding

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	**Good**	**Excellent**
			medical supplies in the storage facility
5.3.1.Principles of inventory management correctly described	Explain the purpose, concept and principles of inventory management	Explain the purpose, concept, principles of inventory management and the ideal inventory model and its application	Explain the purpose, concept, principles of inventory management, ideal inventory model and its application, indicators of poor performing inventory control system and relevancy of inventory control in pharmaceutical services
5.3.2.Stock records for storage of medicines and medical supplies correctly differentiated	Describe different inventory control records, documents and steps for recording information in inventory records	Describe different inventory control records, documents, steps for recording information in inventory records and recognise importance and benefits of inventory control records	Describe different inventory control records, documents, steps for recording information in inventory records, importance and benefits of inventory control records and legal requirements and implications in inventory records
5.3.3.Physical inventory and reconciliation of medicines and medical supplies carried out	List methods for carrying out physical inventory of medicines and medical supplies and criteria for selecting a method for physical inventory	List methods for carrying out physical inventory of medicines and medical supplies, criteria for selecting a method for physical inventory and explain the importance of physical inventory and reconciliation	List methods for carrying out physical inventory of medicines and medical supplies, criteria for selecting a method for physical inventory, explain the importance of physical inventory and procedures in reconciliation of medicines and medical supplies and explain the procedures for assessing stock status of medicines and medical supplies
6.1.1.Basic	Connect major parts of a	Connect major parts	Connect major parts

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
troubleshooting carried out	and turn on and shut down computer	each other), turn on and shut down computer and operate mouse and keyboard	each other), turn on and shut down computer operate mouse and keyboard, carry out computer basic operating system tasks and basic troubleshooting operations (restart, refresh, etc.)
6.1.2.Basic structure and functions of computers and peripherals correctly described	Describe different types of computers, their generations and functions of major parts of a computer	Describe different types of computers, their generations and functions of major parts and different devices and peripherals of a computer	Describe different types of computers, their generations and functions of major parts, different devices and peripherals, back-up systems and their importance
6.1.3.Information technology in inventory management correctly used	List benefits of information technology in inventory management	List benefits of information technology in inventory management and mention commonly used computerized inventory systems	List benefits of information technology in inventory; mention commonly used computerized inventory systems and practice tally based system in inventory management
6.2.1.Importance of computers in pharmacy practice described.	List areas where computer can be used in pharmacy	List areas where computer can be used in pharmacy and explain its use in dispensing	List areas where computer can be used in pharmacy and explain its advantage and disadvantage
6.2.2.Office software (word processing, spread sheet, access) in pharmaceutical operations correctly used	List different standard application packages	List different standard application packages and select appropriate application for use	List different standard application packages, select appropriate application for use and comprehend and practice the use of standard application packages
6.2.3.Computers for data maintenance and information	Create backup data, folders and files for data storage	Create backup data, folders, files for data storage and use different computer	Create backup data, folders, files for data storage, use different computer applications

Assessment Criteria	BENCHMARKING A LEARNER HAS THE ABILITY TO/KNOWLEDGE OF/CAN		
	Satisfactory	Good	Excellent
			encrypt files
6.3.1.Forms and process of communication described	Describe different forms and methods of communication	Describe different forms, methods, element and the process of communication	Describe different forms, methods, element, process and factors influencing the choice of communication media
6.3.2.Different communication techniques with clients and other health care professionals correctly used	Describe different communication skills	Describe different communication skills and principles of effective communication	Describe different communication skills and principles of effective communication and list its barriers.
6.3.3.Formal letters and reports in health care settings prepared	Write official, referral letters and fill health related forms and documents	Write official, referral letters, fill health related forms and documents and write technical reports	Write official, referral letters, fill health related forms and documents, technical reports and prepare financial claims, drug budgets and MTUHA/NHIF reports
6.3.4.Importance of customer service in provision of pharmaceutical services explained	Describe customer care and its importance in pharmacy	Describe customer care, its importance and factors influencing customer care in pharmacy	Describe customer care, importance and factors influencing customer care in pharmacy and use different communication techniques in patients with special needs

12.0 DESCRIPTION OF MODULES



12.1 Module Title: DISPENSING

Module Code: PST 04101

Number of Credits: 8

Sub-Enabling Outcomes

1.1.1 Establish clarity, completeness, authenticity and legality of a prescription.
1.1.2 Identify, pack and label medicines and medical supplies for dispensing.
1.1.3 Issue medicines and medical supplies to patients/clients with clear instructions and advice
1.1.4 Keep records of dispensed medicines and other pharmaceutical products.

1.2.3 Describe irrational prescribing
1.3.1 Maintain a functional and organized dispensing unit

Pre-requisite Module: None

Learning Context:
This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:
Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) Cooper and Gunn's (1987) Dispensing for Pharmaceutical Students, 12th Ed. CBS Publishers and Distributors; Delhi
a) Aulton M.E (ed) 1988 Pharmaceutics: The science of dosage form design. Churchill Livingstone, Edinburgh
b) Aulton M.E (2013), Aulton's Pharmaceutics: The design and manufacture of medicines, 4th Edition, Churchill Livingstone, Edinburgh
c) Rawlins E.A, (ed) 1977 Bentley's Textbook of Pharmaceutics, 8th Ed. Baillie're Tindall. London
d) World Health Organization (WHO), Regional Office for Africa Brazzaville 2004, Management of Drugs at Health Centre Level Training Manual.
e) International Pharmaceutical Federation (FIP) 1998, Good Pharmacy Practice (GPP) in Developing Countries, Recommendations for step-wise implementation.
f) Ansel, H.C and Stoklosa, M. J (2001) Pharmaceutical Calculations, Lippincott Williams and Wilkins, Baltimore USA
g) Senya, S, et al (2011): Tanzania Pharmaceutical Handbook, School of Pharmaceutical Sciences- MUHAS.
h) Lund, W. Editor (1994): The Pharmaceutical Codex, 12th Edition. Pharmaceutical Press, London.
i) Gennaro, A.R (1995), Remington: The science and practice of Pharmacy, 19th edition. Mack Publishing Co, Pennsylvania
j) Aulton M.E and Kevin M.G, Eds: (2013) Pharmaceutics the design and manufacture of medicines,4th Churchill edition Livingstone

12.2 Module Title: DISEASE CONTROL AND PREVENTION

Module Code: PST 04102

Number of Credits: 10

Sub-Enabling Outcomes
3.1.1 Describe common methods of disease control
3.1.2 Describe measures of improving sanitation, safe water supply, housing and general hygiene
3.1.3 Describe antisepsis and disinfection as means for disease prevention and control
3.2.1 Describe common communicable diseases
3.2.2 Describe common non-communicable diseases
3.2.3 Describe management of common communicable and non-communicable diseases
3.3.1 Describe sources of contamination in provision of pharmaceutical services

3.3.2 Describe measures for preventing and controlling contaminants in provision of pharmaceutical services
3.3.3 Describe safe disposal of pharmaceutical wastes
4.4.4 Describe sources and uses of nutrients according to their nutritional classes
4.4.5 Describe common nutritional diseases and their management

Pre-requisite Module: None

Learning Context:
This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:
Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) Erik Nordberg (1999): Communicable Diseases, a Manual for Health Workers in Sub-Saharan Africa, AMREF, Nairobi
b) MoHCDGEC (2004): National Infection Prevention and Control (IPC) Guidelines for Healthcare Workers, Dar es Salaam
c) Nyamwaya D, et al (1994): A Guide to Health Promotion through Water and Sanitation, AMREF; Nairobi
d) Hugo and Russell (2011), Pharmaceutical Microbiology 8th Edition, willey-Blackwel publications
e) Jan Ehuis and Peter Manschot, Communicable diseases, AMREF, Nairobi
f) Thimothy Horne, Medical Microbiology, Churchill, Livingstone, London
g) MacDonald, J.J (1992): Primary Health Care, Earthcan.
h) Hubley, J. (1993). Communicating Health. An action and guide to health and health promotion. 1st Edition.
i) World Health Organization (1999), Guidelines for safe disposal of unwanted pharmaceuticals in and after emergencies
j) Tanzania Food and Drugs Authority (2009), Guidelines for safe disposal of unfit medicines and cosmetic products

12.3 Module Title: HUMAN ANATOMY AND PHYSIOLOGY

Module Code: PST 04103

Number of Credits: 12

Sub-Enabling Outcomes
4.1.1 Describe the relationship between cells and tissues
4.1.2 Describe the structure, location and functions of body organs
4.1.3 Describe components and functions of body systems
4.1.4 Describe composition and functions of blood and other body fluids
4.1.5 Describe common disorders of body organs and systems

Pre-requisite Module: None

Learning Context:
This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) Ross and Wilson (2001): Anatomy and Physiology in Health and Illness, 9th Edition; Churchill Livingstone
b) Rogde W, Anatomy and Physiology for nurses, Elsevier, New Delhi India
c) Ganong W, Review of medical physiology, Lange medical publication, New Delhi India
d) Laurie Kelly, McCorry (2008), Essentials of human physiology for pharmacy, 2nd edition, CRC press.

12.4 Module Title: PHARMACEUTICAL DOSAGE FORMS

Module Code: PST 04104

Number of Credits: 4

Sub-Enabling Outcomes

4.2.1 Describe pharmaceutical dosages forms
4.2.2 Differentiate routes of drugs administration
4.2.3 Describe the composition of pharmaceutical dosage forms
4.2.4 Describe packaging materials for pharmaceutical dosage forms

Pre-requisite Module: None

Learning Context:

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) B. Peter, et al (2012), Dermatological Preparations for the Tropics, 2nd edition, Beta Science Shop, University of Groningen, The Netherlands
b) Editted by Allen Loyd, (2012), Remington the Science and practice of pharmacy, 22nd Edition, Pharmaceutical Press, UK
c) Aulton M.E and Kevin M.G, (2013) Pharmaceutics the design and manufacture of medicines; 4th Churchill edition Livingstone
d) Cooper and Gunns (1987) Dispensing for Pharmaceutical Students, 12th Ed. CBS Publishers and Distributors; Delhi
e) Aulton M.E (1988) Pharmaceutics: The science of dosage form design. Churchill Livingstone, Edinburgh
f) Rawlins E.A, (1977) Bentley's Textbook of Pharmaceutics, 8th Ed. Baillie're Tindall. London

12.5 Module Title: PHARMACEUTICAL CALCULATIONS

Module Code: PST 04105

Number of Credits: 11

Sub-Enabling Outcomes

4.3.1 Perform calculations involving enlarging and reducing formula for compounding

4.3.2 Perform calculations involving density, specific gravity, dosage, dilutions, concentrations and reconstitutions
4.3.3 Demonstrate understanding of the standard international units, empirical and metric systems of units
4.3.4 Determine percent strength, ratio, proportion, conversion, dimensional analysis and variation

Pre-requisite Module: None

Learning Context:
This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:
Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) Ansel, H.C and Stoklosa, M. J (2001) Pharmaceutical Calculations, Lippincott Williams and Wilkins, Baltimore USA
b) Joel L. Zatz, Maria Glaucia Teixera (2013), Pharmaceutical Calculations, 4th Edition, John Wiley & sons Inc. Canada.
c) Liebsch, B et al (1988): Tanzania Pharmaceutical Handbook, Dar es Salaam University Press.
d) Ansel H C. (2010) Pharmaceutical Calculations 13th Edition, Wolters Kluwer Health Lippincott Williams & Wilkins
e) Senya, S, et al (2011): Tanzania Pharmaceutical Handbook, School of Pharmaceutical Sciences- MUHAS.

12.6 Module Title: COMMUNICATION SKILLS

Module Code: PST 04106

Number of Credits: 4

Sub-Enabling Outcomes
6.3.1 Describe forms and process of communication
6.3.2 Use different communication techniques with clients and other health care professionals
6.3.3 Prepare formal letters and reports in health care settings
6.3.4 Explain the importance of customer service in provision of pharmaceutical services and care

Pre-requisite Module: None

Learning Context:
This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:
Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

a) Bruce A., Berger (2009)Communication skills for pharmacist; building relationships, improving patient care, 4th edition, American pharmacist association
b) Kurtz, S. Silnerman.J. and Draper, J; Teaching and learning communication skills in medicine
c) Runga Paidiachy, D.M (1999) Interpersonal communication and Psychology 1st Edition.
d) Mahundu, C.M. (1999). A manual on communication skills. 1st Edition.
e) Hubley, J. (1993). Communicating Health. An action and guide to health and health promotion. 1st Edition.
f) Burnard, P. (1992). A communication skills Guide for Health Care Workers 1st Edition.
g) Pitt, B. (1991). Health, teachers Diploma Communication MOH Zimbabwe.

12.7 Module Title: BASIC COMPUTER APPLICATIONS

Module Code: PST 04207

Number of Credits: 6

Sub-Enabling Outcomes

6.1.1 Carry out basic computer operations and troubleshooting
6.1.2 Describe basic structure and functions of computers and peripherals
6.1.3 Use information technology in inventory management
6.2.1 Describe the importance of computers in pharmacy practice
6.2.2Use office software (word processing, spreadsheet, access) in pharmaceutical operations
6.2.3 Use computers for data maintenance and information sharing.

Pre-requisite Module: None

Learning Context:
This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:
Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) Morris, M & Charles, M (2003): Logic and Computer Design Fundamentals, 17th Edition; Prentice Hall.
b) International Council on Archives (1999), Managing Public sector records, Understanding computers an overview for records and archives, International Records Management Trust London
c) Microsoft office (2010); Introduction to computers,

12.8 Module Title: LAW AND ETHICS IN PHARMACY PRACTICE

Module Code: PST 04208

Number of Credits: 4

Sub-Enabling Outcomes

1.3.2 Demonstrate understanding of law of pharmacy practice

1.3.3 Demonstrate understanding of institutional guidelines on dispensing and the pharmacy professional code of conduct
1.3.4 Describe national health care delivery system
1.3.5 Differentiate roles of pharmaceutical personnel in different levels of national health care delivery system
5.1.3 Describe pharmacy legislation related to storage and distribution of medicines and medical supplies

Pre-requisite Module: None

Learning Context:
This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:
Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) MoHCDGEC (2011), The Pharmacy Act, 2011; Government Printer, Dar es salaam Tanzania
b) MoHCDGEC (2005), The Pharmacy (Education and Training) Regulations; Government Printer, Dar es salaam Tanzania
c) MoHCDGEC (2003), Tanzania, Food, Drugs and Cosmetics Act, Government Printer, Dar es salaam Tanzania
d) Appelbe and Wingfield (2001): Pharmacy Law and Ethics, 7th Edition. Pharmaceutical Press, London

12.9 Module Title: COMPOUNDING OF PHARMACEUTICAL LIQUID PREPARATIONS

Module Code: PST 04209

Number of Credits: 20

Sub-Enabling Outcomes
2.1.1 Identify and list equipment used for compounding
2.1.2 Identify and list instruments used for compounding
2.1.3 Identify and list apparatus used for compounding
2.2.1 Explain the importance of compounding in pharmacy practice
2.2.2 Calculate and measure/weigh amounts of ingredients
2.2.3 Describe facility requirements for compounding area of oral and external liquid preparations
2.2.4 Mix, reconstitute and/or dilute ingredients for preparation of oral and external liquid preparations
2.3.1 Identify references of pharmaceutical formulations
2.3.2 Identify appropriate materials for use in compounding of oral and external liquid preparations according to formula
2.3.3 Use formula and procedures to compound oral and external liquid preparations

Pre-requisite Module: PST 04104: PHARMACEUTICAL DOSAGE FORMS and PST 0105: PHARMACEUTICAL CALCULATIONS

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:
Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) Senya, S, et al (2011): Tanzania Pharmaceutical Handbook, School of Pharmaceutical Sciences- MUHAS.
b) Liebsch, B et al (1988): Tanzania Pharmaceutical Handbook, Dar es Salaam University Press.
c) Marriot et al (2010), Pharmaceutical Compounding and Dispensing, 2nd edition, Pharmaceutical Press
d) Loyd V. Allen (2005); The art and science of pharmaceutical compounding, 2nd edition, APhA Publications.
e) B. Peter, et al (2012), Dermatological Preparations for the Tropics, 2nd edition, Beta Science Shop, University of Groningen, The Netherlands\
f) Lund, W. Editor (1994): The Pharmaceutical Codex, 12th Edition. Pharmaceutical Press, London.
g) Martindale the complete drug reference (2014), Pharmaceutical Press
h) British Pharmaceutical Handbook (2015), Pharmaceutical Press
i) United State Pharmacopoeia NF (2014), United States Pharmacopeial Convention
j) International Pharmacopoeia
k) European Pharmacopoeia

12.10 Module Title: PHARMACEUTICAL INORGANIC CHEMISTRY

Module Code: PST 04210

Number of Credits: 12

Sub-Enabling Outcomes
4.4.1. Demonstrate an understanding of the range and chemistry of elements in the periodic table and their compounds
4.4.2. Outline chemical and physical nature of drugs
4.4.3. Describe the role of inorganic chemistry in pharmaceutical sciences

Pre-requisite Module: None

Learning Context:
This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:
Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) Holderness and Lambert (1987), New Certificate Chemistry, 6th Edition,
b) Ramsden E.N (2000), A-Level Chemistry, 4th Edition
c) Botharah K.G (2007), Handbook of inorganic pharmaceutical chemistry, 9th edition, Niral Pragashan

e) Remington J.R, Remington Pharamaceutical Sciences, Kessinger publishers, USA
f) Moore F; Fundamentals of chemistry, Geofrey Willkson, New York

12.11 Module Title: BASIC PHARMACOLOGY

Module Code: PST 04211

Number of Credits: 12

Sub-Enabling Outcomes

4.4.6. Classify essential medicines according to pharmacological activities
4.4.7. Describe indications and contraindications of essential medicines as per national standard treatment guideline
4.4.8. Describe side effects, adverse effects, interactions and precautions of essential medicines

Pre-requisite Module: PST 04103: HUMAN ANATOMY AND PHYSIOLOGY

Learning Context:

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) Foster R.W (1996); Basic Pharmacology, 11th edition, CRC publishers
b) Tricia M. Berry et al (2009); Clinical Pharmacology made incredibly ease, 3rd edition, Lippincort Williams and Wilkins
c) Goodman and Gilman's (2011) The Pharmacological Basis of therapeutics, 11th Ed.McGraw Hill
d) Richard A and Pamela C (2009) Lippincott's Illustrated Reviews: Pharmacology, 4th Edition, Lippincott Williams & Wilkins
e) Jaypee KD Trpathy, (2008), Essentials of Medical Pharmacology, 6th edition, Jaypee brothers medical Publishers delhi
f) Heinza et al (2000), Color atlas of Pharmacology, 2nd edition, Thieme Stuttgart
g) James M.R et al (2008), Textbook of Clinical Pharmacology and Therapeutics, 8th Edition, Hodder Arnold London
h) Rang, H. P et al (1995), Pharmacology, 3rd Edition, Churchill Livingstone

12.12 Module Title: MEDICAL STORES MANAGEMENT

Module Code: PST 04212

Number of Credits: 12

Sub-Enabling Outcomes

5.1.1. Describe procedures for storage of medicines and medical supplies
5.1.2. Describe procedures for distribution of medicines and medical supplies
5.2.1. Describe premise suitable for storage of medicines and medical supplies
5.2.2. Describe factors affecting the quality of stored medicines and medical supplies
5.2.3. Describe procedures for receiving, zoning, locating and coding medicines and medical supplies in the storage facility
5.3.1. Describe principles of inventory management.
5.3.2. Differentiate stock records for storage of medicines and medical supplies
5.3.3.Carry out physical inventory and reconciliation of medicines and medical supplies

Pre-requisite Module: None

Learning Context:

This module will be conducted through lectures, lecture discussion, group discussion, role plays, simulation, assignments and practical assignments

Learning Materials:

Books, Journals, Writing Board, Flip Charts, OHP, Multimedia Projector, Audio visual

Key References:

a) MSH and WHO (2012) Managing Access to Medicines and Health Technology, 3rd Edition. Kumarian Press
b) World Health Organization (WHO), Regional Office for Africa Brazzaville 2004, Management of Drugs at Health Centre Level Training Manual.
c) Shirima, L. L (1988) Basic Store-keeping and Warehouse Management. General Publication
d) United Republic of Tanzania, Public Procurement Act, 2004, Dar es Salaam
e) Jessop, D and Morrison (1994) Storage and Supply of Materials, 6th Edition, Prentice Hall
f) Laurie Lyons, Editor, (2003) Guidelines for the Storage of Essential Medicines and Other Health Commodities. John Snow, Inc./DELIVER in collaboration with the World Health Organization