THE UNITED REPUBLIC OF TANZANIA

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

PHARMACY COUNCIL

Pharmacy Council of Tanzania

CURRICULUM FOR

ORDINARY DIPLOMA

(NTA LEVEL 6)

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.**	THE NATIONAL COUNCIL FOR TECHNICAL EDUCATION

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 7104

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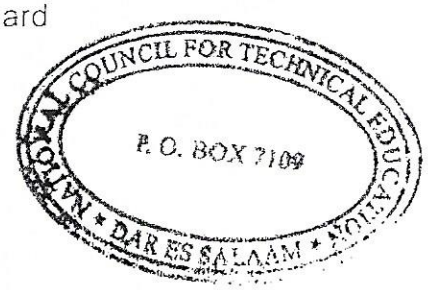
LIST OF ABBREVIATIONS

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
MoHSW	=	Ministry of Health and Social Welfare
GIZ	=	Deutsche Gesellschaft Für Internationale Zusammenarbeit
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.

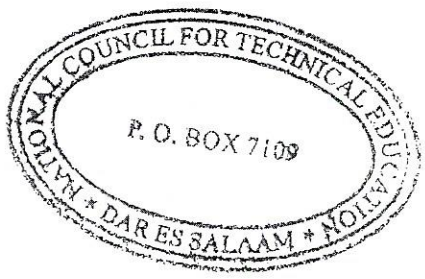
Special thanks to Institutions conducting pharmacy training for their willingness to harmonize their curricula into standard national curriculum for pharmacy NTA 4 to 6.

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 MoHSW 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 Ministry of Health and Social Welfare (MoHSW) 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 MoHSW 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 MoHSW. 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 as a bridge to responsive health care delivery.

It is the MoHSW'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).

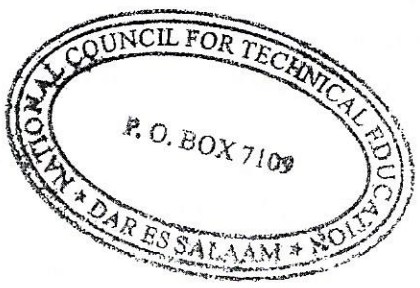
The Technician Certificate course in Pharmaceutical Sciences is a two semester programme, which has been developed to suit the needs of the health sector, the labour market demands and professional needs that exist in our country. It is one of the initiatives by the Government to modernise qualifications 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 6 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 12 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

1.0 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 MoHSW 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 MoHSW 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.

1.1 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:

(i) Help trainees acquire the competences desired with the aim of enabling them to work effectively;

(ii) 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;

(iii) Implement the training programme using a wide range provisions, which satisfy the educational criteria for competent professional training;

(iv) Make training needs clear and specific, resulting in more efficient utilisation of training resources; and

(v) 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

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 curriculum. It is the basic foundation that directs all further planning, organisation, 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:

(i) 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;
(ii) 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;
(iii) 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;
(iv) 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;
(v) 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
(vi) 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

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 work and the society

(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

(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

5.1 Direct Entry

The entry qualification for this programme shall be holders of Certificate of Secondary Education (CSEE) with four passes including "C" pass in Chemistry and Biology; and "D" pass in Physics/Engineering Sciences and any other subject.

5.2 Equivalent qualifications

Pharmaceutical assistant (holder of NTA L5 certificate) with at least two years of working experience who has passed selection examination recognized by NACTE

5.3 Mode of Application

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

5.4 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 6 programme has a total of 40 weeks of study divided in two semesters. Twenty four (24) weeks are set aside for theoretical training and sixteen (16) 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.

(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.

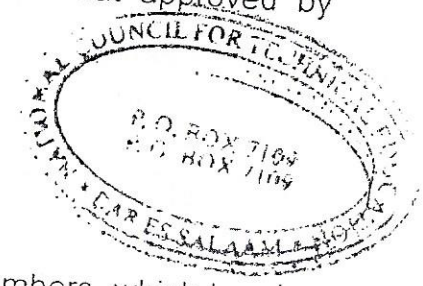
There will be a minimum of two written classroom tests in each semester under supervision of qualified tutor(s). Duration of each test will be not less than two (2) hours.

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 12 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 06103 where:

PST 06103 refers to Pharmaceutical Production module.

PS Represents the first two letters of the department "Pharmaceutical Sciences".

T Represent the qualification at the respective level "Technician".

06 Represents the respective NTA Level.

1 Indicates the semester in which the module is conducted

03 Represents the serial number to which a particular module is assigned in the department (in this case 3rd Module).

10.0 GRADING SYSTEM

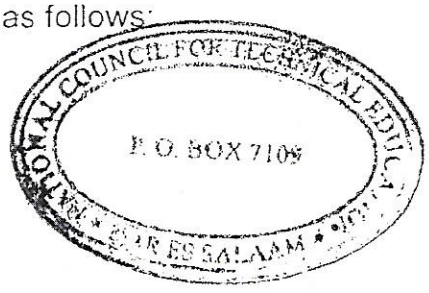
Marks will be awarded out of 100 per cent. The marks so obtained from different assessment components will be graded as follows:

S/N	SCORE RANGE	GRADE	DEFINITION
1.	75 – 100	A	Excellent
2.	70 - 74	B+	Very Good
3.	65 – 69	B	Good
4.	50 – 64	C	Average
5.	40 – 49	D	Poor
6.	0 – 39	F	Failure
7.	–	I	Incomplete
7.	0	Q	Disqualification

11.0 CLASSIFICATION OF AWARD

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

A – 5
B+ – 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	4.4 – 5.0
Upper second class	3.5 – 4.3
Lower second class	2.7 – 3.4
Pass	2.0 – 2.6

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

a) She/he must have successfully completed all modules for which the award is to be made; and

b) 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.

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

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 (MoHSW) 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 MoHSW 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 MoHSW or any other body as the MoHSW 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.

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 (i.e. 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 may, subject to the discretion of the invigilator, be allowed to do 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 studies.

(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

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 MoHSW 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.

(vii) Candidates shall follow the examination instructions.

(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.

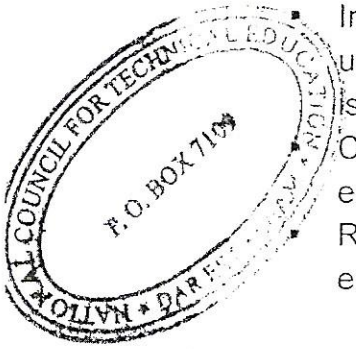
(xiv) For a candidate wishing to answer a call of nature may, with permission of invigilator and under escort, leave the examination room for a period of time not exceeding five (5) minutes. Only one candidate at a time will be allowed to leave the examination room and will be monitored at all times.

(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	
PST06101	Leadership and Management	4	1	-	1	12
PST06102	Counselling and Guidance Skills	2	1	-	1	8
PST06103	Pharmaceutical Production	5	1	4	1	20
PST06104	Health and Medicines Policy	2	-	-	1	7
PST06105	Health Financing	4	1	-	1	12
PST06106	Basic Pharmacotherapy					6
PST06107	Basic Veterinary Pharmacology					6
	SUB-TOTAL	17	4	4	5	59

15.2 Semester II Modules

Code	Module Title	Scheme of Study (Hours per week)				Credits / Semester
		Theory	Tutorials	Practical	Assignment	
PST06208	Pharmaceutical Public Health	2	1	-	1	8
PST06209	Entrepreneurship	4	1	-	1	12
PST06210	Operational Research	8	1	-	5	24
PST06211	Monitoring and Evaluation of Medicines Use	4	1	-	1	12
	TOTAL	18	4	-	8	56

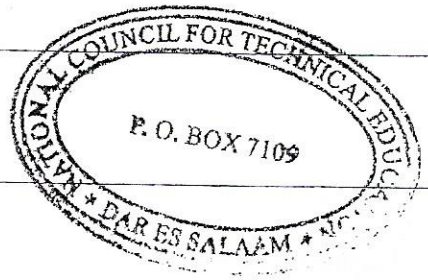
Code	Module Title	Scheme of Practice (Hrs per week over six weeks)				Credits
		Dispensing	Drugs Store	Industrial	Non Sterile Preparations	
PST06212	Pharmacy Practice	120	120	0	0	5

15.3 Summary of Modules

CODE	MODULE TITLES	TOTAL CREDITS	SEMESTER I	SEMESTER II
PST06101	Leadership and Management	12	√	
PST06102	Counselling and Guidance Skills	8	√	
PST06103	Pharmaceutical Production	20	√	
PST06104	Health and Medicines Policy	7	√	
PST06105	Health Financing	12	√	
PST06106	Basic Pharmacotherapy	6	√	
PST06107	Basic Veterinary Pharmacology	6	√	
PST06208	Pharmaceutical Public Health	8		√
PST06209	Entrepreneurship	12		√
PST06210	Operational Research	24		√
PST06211	Monitoring and Evaluation of Medicines Use	12		√
PST06212	Pharmacy Practice	5		√
	TOTAL CREDITS	120		

PART II – CURRICULUM DETAILS

Qualification:	Ordinary Diploma in Pharmaceutical Sciences
Purpose(s) of Qualification:	This qualification is intended for a person who will apply pharmaceutical sciences, ethics, principles and evidences in health promotion through dispensing, compounding, manufacturing and managing medicines supply chain in the healthcare delivery system. May also be engaged in relevant pharmaceutical activities such as research, academic, quality control and profession regulatory issues.
NTA Level:	6
Competence Descriptors:	Apply skills and knowledge in a broad range of work activities most of which are non-routine (supervisory)
Credits at this Level:	120
Cumulative Credits from Lowest Level:	0
Date the Qualification Standard Last Developed:	February, 2015



8.0 Principal Learning Outcomes

S/N	PRINCIPAL OUTCOME	CREDITS	ASSESSMENT CRITERIA
1	Establish good work-relationship with colleagues, other healthcare providers and clients in the provision of pharmaceutical services.	15	(i) Channels of communication well described (ii) Information sharing capacity demonstrated (iii) Methods of pharmacy related health education and promotion are described (iv) Techniques for establishing good working relationship is described (v) Counselling and guidance approaches explained
2	Apply Good Manufacturing	30	(i) Principles of

	Practice (GMP) and techniques in a large scale manufacturing of pharmaceutical products.		compounding/manufacturing of solid dosage forms are described. (ii) Functionality and integrity of GMP and techniques in large scale manufacturing and storage of pharmaceutical products are clearly described (iii) Measures for creation and maintenance of safe working environment and conditions correctly described (iv) Components of Quality improvement reports correctly described (v) Routine/preventive equipment maintenance schedules correctly developed.
3	Apply principles of management, leadership, entrepreneurship and health financing systems in the provision of pharmaceutical services in line with public policies, ethical and legal framework	30	(i) Principles and importance of entrepreneurship in pharmaceutical services well described. (ii) Procedures for establishing pharmaceutical business venture clearly described (iii) Steps of developing simple business plan explained. (iv) Professional ethics and conducts in relation to pharmaceutical business are appropriately explained. (v) Principles of marketing and sales are described (vi) Management functions correctly described (vii) Leadership skills correctly demonstrated (viii) Health financing

			are differentiated and described
4	Apply principles of operational research in improving provision of pharmaceutical services.	25	(i) Fundamentals of biostatistics described (ii) Steps of conducting operational research described (iii) Research methods and tools correctly described
5	Apply basic principles of pharmacotherapy and pharmacovigillance in provision of medical and veterinary pharmaceutical services	20	(i) Principles and concept of pharmacotherapy correctly explained (ii) Pharmacotherapeutic management of common diseases applied (iii) Principles and concept of veterinary medicine described (iv) Pharmacological management of common veterinary diseases correctly described (v) Concept and principles of monitoring and evaluation described (vi) Components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations described

9.0 Principal and Enabling Outcomes

S/No.	Principal Outcome	Enabling Outcome
1	Establish good work-relationship with colleagues, other healthcare providers and clients in the provision of pharmaceutical services.	1.1 Build coalitions and networks for promoting rational use of medicines
		1.2 Develop health promotion programmes related to provision of pharmaceutical services
		1.3 Utilize counselling and guidance techniques in promoting rational use of medicines.

2	Apply Good Manufacturing Practice (GMP) and techniques in manufacturing of pharmaceutical products.	2.1 Describe procedures and processes in pharmaceutical production
		2.2 Describe requirements for establishing manufacturing of pharmaceutical products
		2.3 Employ quality assurance and control techniques in production of pharmaceutical products.
3	Apply principles of management, leadership, entrepreneurship and health financing systems in the provision of pharmaceutical services.	3.1 Apply managerial and leadership skills in delivery of pharmaceutical services.
		3.2 Describe global initiatives and national policies related to the provision of pharmaceutical services
		3.3 Apply entrepreneurial skills in provision of pharmaceutical services
		3.4 Describe mechanisms of health financing applicable to provision of health services
		3.5 Apply basic principles of financial management in provision of pharmaceutical services
4	Apply principles of operational research in improving provision of pharmaceutical services.	4.1 Use basic statistical concepts and principles in processing and interpreting pharmaceutical services data
		4.2 Conduct facility based research to support improvement of pharmacy practice
		4.3 Analyse public health problems related to quality, safety and efficacy of medicines
5	Apply basic principles of pharmacotherapy and pharmacovigillance in provision of medical and veterinary pharmaceutical services	5.1 Apply principles of pharmacotherapy in the management of common human diseases
		5.2 Apply principles of veterinary pharmacology in pharmaceutical services
		5.3 Monitor utilization of medicines in health care delivery system

10.0. Enabling and Sub-Enabling Outcomes

	Enabling Outcome	Sub-Enabling Outcomes
1.1	Build coalitions and networks for promoting rational use of medicines	1.1.1 Describe the concept of participatory planning in provision of health care services.
		1.1.2 Describe the role of pharmaceutical personnel in health care teams.
		1.1.3 Describe networking and negotiations techniques in delivery of health care services.
1.2	Develop health promotion programmes related to provision of pharmaceutical services	1.2.1 Describe health promotion programmes related to pharmaceutical care and services.
		1.2.2 Explain concepts and principles of pharmaceutical public health
		1.2.3 Describe the concept of advocacy in relation to provision of pharmaceutical services.
1.3	Utilize counselling and guidance techniques in promoting rational use of medicines.	1.3.1 Describe counselling and guidance techniques in promoting rational use of medicines.
		1.3.2 Describe operating mechanisms of Care and Treatment Clinics (CTC)
		1.3.3 Describe various methods to encourage adherence, compliance and concordance to treatment
2.1	Describe procedures and processes in pharmaceutical production	2.1.1 Describe procedures and processes of producing solid dosage forms
		2.1.2 Describe quality control and assurance procedures in pharmaceutical production
		2.1.3 Describe waste management and disposal in pharmaceutical production
		2.1.4 Describe premise and equipment maintenance

			procedures in pharmaceutical manufacturing facilities
2.2	Describe requirements for establishing manufacturing of pharmaceutical products	2.2.1	Describe policies and legislations governing manufacturing of pharmaceuticals
		2.2.2	Describe the importance of environmental impact assessment in establishing manufacturing of pharmaceuticals
		2.2.3	Explain statutory taxes and licencing procedures in establishing manufacturing of pharmaceuticals
2.3	Employ quality assurance and control techniques in production of pharmaceutical products.	2.3.1	Describe the importance of Standard Operating Procedures (SoPs) in the production of pharmaceuticals
		2.3.2	Describe the components of SoP
		2.3.3	Carry out quality tests for raw materials and finished pharmaceutical products
3.1	Apply managerial and leadership skills in delivery of pharmaceutical services.	3.1.1	Describe management concept and functions
		3.1.2	Describe organization behaviour in relation to workplace productivity
		3.1.3	Differentiate forms of leadership and management styles
		3.1.4	Distinguish various structures of organisations
		3.1.5	Describe leadership attributes in provision of pharmaceutical services
3.2	Describe global initiatives and national policies related to the provision of pharmaceutical services	3.2.1	Describe national policies related to provision of health care services.
		3.2.2	Describe the primary health care concept and principles
		3.2.3	Describe components of the National Health Policy

		3.3.2 Distinguish between types of entrepreneurs and their key competencies
		3.3.3 Explain challenges encountered by entrepreneurs in provision of pharmaceutical services
		3.3.4 Describe concept and principles of marketing and sales of pharmaceuticals
		3.3.5 Describe procedures and requirements for establishing marketing outlets for medicines and medical supplies
3.4	Describe mechanisms of health financing applicable to provision of health services	3.4.1 Describe basic concept and principles of economics
		3.4.2Describe the concept and principles of health economics in delivery of pharmaceutical services.
		3.4.3Identify practices in health care delivery affecting the adoption of health economics principles
3.5	Apply basic principles of financial management in provision of pharmaceutical services	3.5.1 Describe health financing mechanisms
		3.5.2 Describe public financing through Government subvention
		3.5.3 Describe health insurance mechanisms
4.1	Use basic statistical concepts and principles in processing and interpreting pharmaceutical services data	4.1.1Describe basic statistical concepts and principles
		4.1.2Summarize data using basic statistical principles to support decision making in provision of pharmaceutical services.
		4.1.3Establish trends in health care services
4.2	Conduct facility based research to support improvement of pharmacy practice	4.2.1Describe basic concept and principles of research
		4.2.2Differentiate between various types of research
		4.2.3Describe procedures for conducting operational research
4.3	Analyse public health problems related to quality, safety and efficacy	4.3.1 Explain the concept of pharmacovigillance

	of medicines	4.3.2 Describe the procedures for monitoring and detection of adverse drug reactions (ADRs)
		4.3.3 Describe methods of controlling substandard and counterfeit medicines
		4.3.4 Explain factors contributing to distribution of substandard and counterfeit medicines
5.1	Apply principles of pharmacotherapy in the management of common human diseases	5.1.1Explain the principles and concept of pharmacotherapy
		5.1.2Apply knowledge of pharmacotherapy in management of common communicable diseases
		5.1.3 Apply knowledge of pharmacotherapy in management of common non communicable diseases
5.2	Apply principles of veterinary pharmacology in pharmaceutical services	5.2.1Describe principles and concept of veterinary medicine
		5.2.2Classify veterinary medicines according to pharmacological activities
		5.2.3Apply knowledge of pharmacology in treatment of common veterinary diseases
5.3	Monitor utilization of medicines in health care delivery system	5.3.1 Describe the concept and principles of monitoring and evaluation
		5.3.2 Describe components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations
		5.3.3 Identify common drawbacks in monitoring and evaluation of medicines use
		5.3.4 Describe common indicators in medicines use

11.0 ASSESSMENT CRITERIA AND THEIR BENCHMARKING

11.1 Sub-enabling Outcomes, Related Tasks, Assessment Criteria, Methods and Instruments

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
1.1.1 Describe the concept of participatory planning in provision of health care services	a) Define participatory planning b) List steps in participatory planning c) Explain the importance of participatory planning in pharmaceutical services	Concept of participatory planning in provision of health care services described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
1.1.2 Describe the role of pharmaceutical personnel in health care teams	a) Explain stages of team development b) Explain the role of pharmaceutical personnel in health care team c) Explain the importance of team work in delivery of health care services	Role of pharmaceutical personnel in health care teams described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
1.1.3 Describe networking and negotiation techniques in delivery of health care services	a) Define networking and negotiation b) List networking skills in delivery of health care services. c) List negotiation skills in delivery of health care services. d) Explain the importance of networking and negotiation in delivery of health care services	Networking and negotiation techniques in delivery of health care services described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
1.2.1 Describe health promotion programmes related to pharmaceutical care and services.	a) Define health care promotion b) Identify health promotion programmes related to pharmaceutical care and services c) Explain steps in conducting health promotion related to pharmaceutical health care and services	Health promotion programmes related to pharmaceutical care and services described.	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	d) Explain importance of health care promotion programmes.			
1.2.2 Explain concepts and principles of pharmaceutical public health	a) Define public health b) Explain principles of public health c) Explain principles of pharmaceutical public health d) Explain importance of pharmaceutical public health in provision of health care services.	Concepts and principles of pharmaceutical public health explained	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
1.2.3 Describe the concept of advocacy in relation to provision of pharmaceutical services.	a) Explain concepts of advocacy b) Differentiate between advocacy, sensitisation and mobilisation c) Explain approaches of conducting advocacy d) List components of advocacy plan e) Carry out needs assessment for advocacy f) Explain steps in conducting advocacy g) Explain the importance of advocacy in promoting rational use of medicines.	Concept of advocacy in relation to provision of pharmaceutical services described.	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
1.3.1 Describe counselling and guidance techniques in promoting rational use of medicines	a) Define counselling and guidance b) Differentiate between counselling and guidance c) Explain counselling and guidance techniques. d) Identify situations requiring counselling. e) Identify situations requiring guidance. f) Explain the role of counselling and guidance in promoting	Counselling and guidance techniques in promoting rational use of medicines described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
1.3.2 Describe operating mechanisms of Care and Treatment Clinics (CTC)	a) Explain operating procedures of CTC. b) Describe the role of pharmaceutical personnel in CTC c) Explain interrelationship between health workers in CTC	Operating mechanisms of Care and Treatment Clinics (CTC) described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
1.3.3 Describe various methods to encourage adherence, compliance and concordance to treatment	a) Define adherence, compliance and concordance b) Differentiate between adherence, compliance and concordance c) Explain the importance of adherence, compliance and concordance in treatment d) List reasons for non-adherence e) List methods of improving adherence and compliance	Various methods to encourage adherence, compliance and concordance to treatment described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
2.1.1Describe procedures and processes of producing solid dosage forms	a) Define terminologies used in tablets and capsule production b) Explain concept and principles of powder technology in relation to solid dosage forms c) Classify and explain solid dosage forms d) Explain formulation and production of tablets and capsules e) List common problems and remedies in tableting and encapsulation processes	Procedures and processes of producing different dosage forms described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
2.1.2 Describe quality control and assurance procedures in pharmaceutical production	a) Explain the concept of in-process quality control b) List tests and equipment/tools/apparatus used for in-process quality control of tablets and capsules	Quality control and assurance procedures in pharmaceutical production described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	c) Explain the consequences of in-process quality control of tablets and capsules.			
	d) Explain the role of qualification equipment and validation of processes in assuring the quality of the tablets and capsules			
	e) List documents used in production of tablets and capsules			
	f) Explain importance of documentation in pharmaceutical production			
2.1.3 Describe waste management and disposal in pharmaceutical production	a) Explain the importance of waste management in pharmaceutical production	Waste management and disposal in pharmaceutical production described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) List types of wastes in pharmaceutical production			
	c) Explain methods of waste management in pharmaceutical production			
	d) Describe control of substances hazardous to health (COSHH) in pharmaceutical production.			
2.1.4 Describe premise and equipment maintenance procedures in pharmaceutical manufacturing facilities	a) Explain maintenance procedures of premise and equipment in pharmaceutical manufacturing.	Premise and equipment maintenance procedures in pharmaceutical manufacturing facilities described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Differentiate documents relevant to premise and equipment maintenance in GMP complaint facility			

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	c) Explain GMP principles in relation to premise and equipment maintenance.			
2.2.1 Describe policies and legislations governing manufacturing of pharmaceuticals	a) Explain sections of Tanzania Food, Drugs and Cosmetics Act, 2003 regulating manufacturing of pharmaceuticals	Policies and legislations governing manufacturing of pharmaceuticals described.	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Explain sections of the Environmental Management Act, 2004 regulating manufacturing			
	c) Describe registration procedures for pharmaceutical manufacturing facilities.			
	d) Explain the role of Tanzania Investment Centre in supporting establishment of pharmaceutical industries			
2.2.2 Describe the importance of environmental impact assessment in establishing manufacturing of pharmaceuticals	a) Define environmental impact assessment	Importance of environmental impact assessment in establishing large scale manufacturing of pharmaceuticals described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Explain steps in conducting environmental impact assessment			
	c) List components of environmental impact assessment			
	d) List benefits of environmental impact assessment			
2.2.3 Explain statutory taxes and licencing procedures in establishing manufacturing of pharmaceuticals	a) Explain the role of Tanzania revenue authority in establishment of pharmaceutical industries	Statutory taxes and licencing procedures in establishing large scale manufacturing of pharmaceuticals explained	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Explain the role of Tanzania Food and Drugs Authority in establishment of pharmaceutical industries			

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	c) Explain the role of Business Registrations and Licencing Agency (BRELA) in establishment of pharmaceutical industries			
	d) List taxes, levy and tariffs applicable to pharmaceutical industries			
2.3.1 Describe the importance of Standard Operating Procedures (SoPs) in the production of pharmaceuticals	a) Define SoP	Importance of Standard Operating Procedures (SoPs) in the production of pharmaceuticals described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) List types of SoP in the production of pharmaceutical			
	c) Explain the need of SoP in production			
	d) Explain the development and approval process of SOPs			
2.3.2 Describe the components of SoP	a) Define the SoP of SoPs	Components of SoP described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) List components of SoP of SoPs			
	c) Explain the importance of SoP of SoPs in production			
2.3.3 Carry out quality tests for raw materials and finished pharmaceutical products	a) Explain the importance of quality testing of raw materials and finished pharmaceutical products	Quality tests for raw materials and finished pharmaceutical products carried out	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) List quality tests for raw materials and finished pharmaceutical products			
	c) Explain methods for testing raw materials and finished pharmaceutical products			
3.1.1 Describe management concept and functions	a) Define different terms used in management	Management concept and functions described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Explain the historical development of management theory.			
	c) Distinguishing between various			

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	d) Enumerate various management functions e) Describe the relationship between management functions f) Explain different management schools of thoughts			
3.1.2 Describe organization behaviour in relation to workplace productivity	a) Define organization culture b) Explain cultural diversity in relation to workplace and productivity c) Relate productivity in workplace with management.	Organization behaviour in relation to workplace productivity described.	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
3.1.3 Differentiate forms of leadership and management styles	a) Describe forms of leadership b) Describe management style c) Relate forms of leadership with management style.	Forms of leadership and management styles differentiated	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
3.1.4 Distinguish various structures of organisations	a) Describe types of organizations b) Describe organization structures. c) Draw organizational charts or diagrams d) Explain principles of organizations (Scalar chain of command, specialization, unit of command and span of control) e) Describe relationships within organization structures (vertical, horizontal, functional, formal and informal) f) Describe relationship with external organizations g) Explain delegation and its principles h) Explain advantages and disadvantages of delegations i) Describe organization context (Political, economic and social	Various structures of organisations distinguished	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	atmosphere)			
3.1.5 Describe leadership attributes in provision of pharmaceutical services	a) Differentiate between a leader and a manager b) List leadership attributes c) List leadership skills	Leadership attributes in provision of pharmaceutical services described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
3.2.1 Describe national policies related to provision of health care services.	a) List objectives and components of Tanzania Vision 2025 b) List objectives and components of Alma-Ata Declaration c) List objectives and components of agenda 21 of Rio de Janeiro d) List objectives and components of Millenium Development Goals	National policies related to provision of health care services described.	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
3.2.2 Describe the primary health care concept and principles	a) State vision and mission of the MoHSW b) List levels of health care in Tanzania c) Define primary health care d) List principles of primary health care e) List objectives and components of Primary Health Services Development Programme (PHSDP	Primary health care concept and principles described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
3.2.3 Describe components of the National Health Policy	a) State vision and mission of the National Health Policy, 2003 b) List objectives of the National Health Policy c) Explain the link between National Health Policy to the National Medicine Policy	Components of the National Health Policy described.	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
3.3.1 Describe the concept and principles of entrepreneurship	a) Define terms used in entrepreneurship b) Explain historical development and	Concept and principles of entrepreneurship described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	c) Explain concept and principles of entrepreneurship			
	d) Differentiate between intrapreneurship and entrepreneurship.			
	e) Explain the importance of entrepreneurship in the economy and pharmacy profession			
	f) Explain national strategy for economic empowerment and poverty reduction (NSEGPR) MKUKUTA objectives and National Development Vision 2025.			
3.3.2. Distinguish between types of entrepreneurs and their key competencies	a) Describe types of entrepreneurs	Types of entrepreneurs and their key competencies distinguished	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Describe characteristics of entrepreneurs			
	c) Enumerate inherent competencies of entrepreneurs			
	d) Explain factors influencing tendency to engage in entrepreneurship			
3.3.3 Explain challenges encountered by entrepreneurs in provision of pharmaceutical services	a) List challenges faced by entrepreneurs	Challenges encountered by entrepreneurs in provision of pharmaceutical services explained	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Explain ways to address challenges faced by entrepreneurs			
	c) List misconceptions/myths about entrepreneurs			
	d) Explain the role of innovation and creativity in entrepreneurship			
3.3.4 Describe concept and principles of marketing and sales of pharmaceuticals	a) Explain concept and principles of marketing	Concept and principles of marketing and sales of pharmaceuticals described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) List marketing skills needed in sales of pharmaceuticals			
	c) Explain ethical issues in marketing and sales of pharmaceuticals			

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
3.3.5 Describe procedures and requirements for establishing marketing outlets for medicines and medical supplies	a) List types of medicines and medical supplies outlets in Tanzania b) List requirements for establishing medicines and medical supplies outlets (ADDO, pharmacies and warehouses etc) c) Explain the procedures for establishing medicines and medical supplies outlets	Procedures and requirements for establishing marketing outlets for medicines and medical supplies described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
3.4.1 Describe health financing mechanisms	a) Explain the concept of health financing b) List health financing mechanisms (Insurance, direct purchase, user fee, Government subsidy etc) c) Explain how each health financing mechanism operates d) Enumerate advantages and disadvantages of each health financing mechanism	Health financing mechanisms described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
3.4.2 Describe public financing through Government subvention	a) Explain the role of government in medicines and medical supplies financing b) Distinguish various public financing strategies c) Explain control of expenditures for medicines and medical supplies d) List challenges in public financing of medicines and medical supplies	Public financing through Government subvention described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
3.4.3 Describe health insurance mechanisms	a) Explain the concept of health insurance b) List health insurance agencies in Tanzania c) List benefits and challenges associated with health insurance	Health insurance mechanisms described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
4.1.1 Describe basic statistical concepts and principles	a) Define common terms in biostatistics b) Explain the importance of different measures in statistics (central tendency, quartile and variations) c) Explain the application of statistics in data analysis	Basic statistical concepts and principles described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
4.1.2 Summarize data using basic statistical principles to support decision making in provision of pharmaceutical services.	a) Define data b) List types of data c) List and explain methods of summarizing data (charts, tables, graphs etc.) d) Explain conditions in which each method is used	Data using basic statistical principles to support decision making in provision of pharmaceutical services summarised.	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
4.1.3 Establish trends in health care services	a) Generate tables, charts and graphs b) Interpret tables, charts and graphs c) Relate information from interpretation to project future results	Establish trends in health care services	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
4.2.1 Describe basic concept and principles of research	a) Explain the concept and principles of research b) Explain the importance of research in pharmaceutical services c) Explain ethical clearance in research d) Identify areas of research requiring ethical clearance	Basic concept and principles of research described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
4.2.2 Differentiate between various types of research	a) Classify research b) Explain classes of research c) Explain approaches and strategies used in research	Various types of research differentiated	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
4.2.3 Describe procedures for conducting operational research	a) Identify research problem b) Explain the role of literature review in research c) Explain development of a research proposal d) Explain methods and	Procedures for conducting operational research described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	process for data collection			
	e) Explain methods and process for data analysis			
	f) Explain the procedure for writing research report			
	g) Explain methods for dissemination of research findings			
4.3.1 Explain the concept of pharmacovigillance	a) Define terminologies in pharmacovigillance	Concept of pharmacovigillance explained	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) List aims of pharmacovigillance			
	c) Identify and explain pharmacovigillance methods			
	d) Explain different ways of documenting and reporting pharmacovigillance data			
	e) Explain the importance of pharmacovigillance information			
4.3.2 Describe the procedures for monitoring and detection of adverse drug reactions (ADRs)	a) Classify ADRs	Procedures for monitoring and detection of adverse drug reactions (ADRs) described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Explain the importance of monitoring ADRs in pharmacy practice			
	c) Explain documentation and reporting of ADRs			
	d) List centres for monitoring ADRs			
4.3.3 Describe methods of controlling substandard and counterfeit medicines	a) Define substandard and counterfeit medicines	Methods of controlling substandard and counterfeit medicines described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Distinguish between counterfeit and substandard medicines			
	c) Explain the effect of substandard and counterfeit medicines in the public health			
	d) List and explain methods for detecting substandard and counterfeit medicines			

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	e) List and explain methods for controlling substandard and counterfeit medicines			
4.3.4 Explain factors contributing to distribution of substandard and counterfeit medicines	a) List factors contributing to existence of substandard and counterfeit medicines	Factors contributing to distribution of substandard and counterfeit medicines explained	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Identify possible points of entry for substandard and counterfeit medicines into Tanzania			
	c) Identify loopholes contributing to spreading of substandard and counterfeit medicines in health systems			
	d) Explain mechanisms for curbing spread of substandard and counterfeit medicines in Tanzania			
5.1.1 Explain the principles and concept of pharmacotherapy	a) Define terms used in pharmacotherapy	Principles and concept of pharmacotherapy explained	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) List principles and concepts applied in pharmacotherapy			
	c) Explain the importance of pharmacotherapy in management of common human diseases			
5.1.2 Apply knowledge of pharmacotherapy in management of common communicable diseases	a) Define the disease status of a patient	Knowledge of pharmacotherapy in management of common communicable diseases applied	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Explain pathophysiology of common communicable disease			
	c) Relate diagnosis and therapy of common communicable disease			

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	d) Monitor therapy of common communicable disease			
5.1.3 Apply knowledge of pharmacotherapy in management of common non communicable diseases	a) Define the disease status of a patient	Knowledge of pharmacotherapy in management of common non communicable diseases applied	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Explain pathophysiology of common non communicable disease			
	c) Relate diagnosis and therapy of common non communicable disease			
	d) Monitor therapy of common non communicable disease			
5.2.1 Describe principles and concept of veterinary medicine	a) Define terminologies used in veterinary pharmacology	Principles and concept of veterinary medicine described	Oral questioning Written tests and assignment	Question papers Marking schemes Assignment reports
	b) Describe principles and concepts applied in veterinary medicine			
	c) Explain the importance of veterinary medicines in the management of common animal diseases			
5.2.2 Classify veterinary medicines according to pharmacological activities	a) List sources of veterinary medicines	Veterinary medicines are classified according to pharmacological activities	Oral questioning Written tests and assignment	Question papers Marking schemes Assignment reports
	b) Describe toxic and therapeutic doses of common veterinary medicines			
	c) Describe the pharmacological/therapeutic classes of essential veterinary medicines			

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
5.2.3 Apply knowledge of pharmacology in treatment of common veterinary diseases	a) Describe the rationale of using veterinary medicines	Knowledge of pharmacology in treatment of common veterinary diseases applied	Oral questioning Written tests and assignment	Question papers Marking schemes Assignment reports
	b) Describe clinical use of veterinary medicines in treatment of common animal diseases			
	c) Describe dose, dosage and course of veterinary medicines used for common animal diseases			
	d) List contraindications of common veterinary medicines			
	e) List important side effects and adverse effects of common veterinary medicines			
5.3.1 Describe the concept and principles of monitoring and evaluation	a) Define terms used in monitoring and evaluation	Concept and principles of monitoring and evaluation described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Differentiate between monitoring and evaluation			
	c) Explain the importance of monitoring and evaluation in pharmacy practice			
5.3.2 Describe components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations	a) List components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations	Components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
	b) Explain each component of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations			

Sub-enabling outcomes	Related Tasks	Assessment Criteria	Assessment Methods	Assessment Instruments
	c) List performance indicators in monitoring and evaluation of different pharmaceutical situations			
5.3.3 Identify common drawbacks in monitoring and evaluation of medicines use	a) List factors hindering monitoring and evaluation of medicines use b) Explain factors hindering monitoring and evaluation of medicines use c) Identify measures to improve monitoring and evaluation of medicines uses	Common drawbacks in monitoring and evaluation of medicines use correctly identifies	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report
5.3.4 Describe common indicators in medicines use	a) List indicators used in monitoring and evaluation of medicines use b) Explain application of each indicator in monitoring and evaluation of medicines use c) Describe tools used in monitoring and evaluation of medicines use	Common indicators in medicines use described	Oral questioning Written tests Assignments	Checklist Question papers and marking scheme Assignment report

11.2 Benchmarking of Assessment Criteria

BENCHMARK
A LEARNER HAS ABILITY TO/ KNOWLEDGE/ CAN.....

Assessment Criteria	SATISFACTORY	GOOD	EXCELLENT
1.1.1 Concept of participatory planning in provision of health care services described	Define participatory planning	Define and list steps in participatory planning.	Define list steps and explain the importance of participatory planning in pharmaceutical services.
1.1.2 Role of pharmaceutical personnel in health care teams described	Explain stages of team development	Explain stages of team development and the role of pharmaceutical personnel in health care team	Explain stages of team development, the role of pharmaceutical personnel in health care team and importance of team work in delivery of health care services

1.1.3 Networking and negotiation techniques in delivery of health care services described	Define networking and negotiation	Define networking and negotiation, list networking and negotiation skills in in delivery of health care services.	Define networking and negotiation, list networking, negotiation skills and explain the importance of networking and negotiation in delivery of health care services.
1.2.1 Health promotion programmes related to pharmaceutical care and services described.	Define health promotion	Define health promotion, Identify health promotion programmes and explain steps in conducting health promotion related to pharmaceutical health care and services	Define health promotion, Identify health promotion programmes, explain steps in conducting health promotion and importance of health care promotion programmes related to pharmaceutical health care and services
1.2.2 Concepts and principles of pharmaceutical public health explained	Define public health and explain principles of public health,	Define public health, explain principles of public health, and explain principles of pharmaceutical public health	Define public health, explain principles of public health, Explain principles of pharmaceutical public health and importance of pharmaceutical public health in provision of health care services
1.2.3 Concept of advocacy in relation to provision of pharmaceutical services described.	Explain concepts of advocacy	Explain concepts of advocacy, differentiate between advocacy, sensitisation and mobilisation and explain approaches of conducting advocacy	Explain concepts of advocacy, explain approaches of conducting advocacy, list components of advocacy plan and importance of advocacy in promotional of rational use medicines.
1.3.1 Counselling and guidance techniques in promoting rational use of medicines described	Define and differentiate between counselling and guidance.	Define, differentiate between counselling and guidance, identify situations requiring guidance and counselling and explain counselling and guidance techniques	Define, differentiate between counselling and guidance, identify situations requiring guidance and counselling, and explain the role of counselling and guidance in promoting rational use of medicines.
1.3.2 Operating mechanisms of Care and Treatment Clinics (CTC) described	Explain operating procedures of CTC.	Explain operating procedures of CTC and describe the role of pharmaceutical personnel in CTC	Explain operating procedures of CTC, describe the role of pharmaceutical

			interrelationship between health workers in CTC
1.3.3 Various methods to encourage adherence, compliance and concordance to treatment described	Define adherence, compliance and concordance and differentiate between adherence, compliance and concordance	Define, adherence, compliance and concordance , differentiate between adherence, compliance and concordance and explain the importance of adherence, compliance and concordance in treatment	Define adherence, compliance and concordance ,differentiate between adherence, compliance and concordance, explain the importance of adherence, compliance and concordance in treatment, list reasons for non-adherence and methods of improving adherence and compliance
2.1.1 Procedures and processes of producing different dosage forms described	Define terminologies used in tablets and capsule production, list tests and equipment/tools/apparatus used for in-process quality control of tablets and capsules and documents used in production of tablets and capsules.	Define terminologies used in tablets and capsule production, list tests and equipment/tools/apparatus used for in-process quality control of tablets and capsules and list documents used in production of tablets and capsules explain concept and principles of powder technology in relation to solid dosage forms.	Define terminologies used in tablets and capsule production, explain concept and principles of powder technology in relation to solid dosage forms, explain formulation and production of tablets, capsules, concept of in-process quality control and explain the role of qualification equipment and validation of processes in assuring the quality of the tablets and capsules.
2.1.2 Quality control and assurance procedures in pharmaceutical production described	List tests and equipment/tools/apparatus used for in-process quality control of tablets and capsules; List documents used in production of tablets and capsules; Explain importance of documentation in pharmaceutical production	Explain the concept of in-process quality control; List tests and equipment/tools/apparatus used for in-process quality control of tablets and capsules; List documents used in production of tablets and capsules; Explain importance of documentation in pharmaceutical production	Explain the concept of in-process quality control; List tests and equipment/tools/apparatus used for in-process quality control of tablets and capsules; Explain the consequences of in-process quality control of tablets and capsules; Explain the role of qualification equipment and validation of processes in assuring the quality of the tablets and capsules; List

			and capsules; Explain importance of documentation in pharmaceutical production
2.1.3 Waste management and disposal in pharmaceutical production described	List types of wastes in pharmaceutical productions	List types of wastes, explain importance and methods of waste management in pharmaceutical production	List types of wastes, explain importance and methods of waste management also describe control of substances hazardous to health (COSHH) in pharmaceuticals production.
2.1.4 Premise and equipment maintenance procedures in pharmaceutical manufacturing facilities described	Explain maintenance procedures of premise and equipment in pharmaceutical manufacturing.	Explain maintenance procedures of premise and equipment in pharmaceutical manufacturing and differentiate documents relevant to premise and equipment maintenance in GMP complaint facility	Explain maintenance procedures of premise and equipment in pharmaceutical manufacturing, differentiate documents relevant to premise and equipment maintenance in GMP complaint facility and explain GMP principles in relation to premise and equipment maintenance
2.2.1 Policies and legislations governing manufacturing of pharmaceuticals described.	Explain sections of Tanzania Food, Drugs and Cosmetics Act, 2003 regulating manufacturing of pharmaceuticals	Explain sections of Tanzania Food, Drugs and Cosmetics Act, 2003 regulating manufacturing of pharmaceuticals and sections of the Environmental Management Act, 2004 regulating manufacturing	Explain sections of Tanzania Food, Drugs and Cosmetics Act, 2003 regulating manufacturing of pharmaceuticals, sections of the Environmental Management Act, 2004 regulating manufacturing and describe registration procedures for pharmaceutical manufacturing facilities also explain the role of Tanzania Investment Centre in supporting establishment of pharmaceutical industries
2.2.2 Importance of environmental impact assessment in establishing manufacturing of pharmaceuticals described	Define environmental impact assessment and explain steps in conducting environmental impact assessment	Define environmental impact assessment, explain steps in conducting environmental impact assessment and list components of environmental impact assessment	Define environmental impact assessment, explain steps in conducting environmental impact assessment, list

			benefits of environmental impact assessment.
2.2.3 Statutory taxes and licencing procedures in establishing large scale manufacturing of pharmaceuticals explained	List taxes, levy and tariffs applicable to pharmaceutical industries	List taxes, levy and tariffs applicable to pharmaceutical industries, explain the role of Tanzania revenue authority, Tanzania Food and Drugs Authority in establishment of pharmaceutical industries	Explain the role of Tanzania revenue authority, Tanzania Food and Drugs Authority and Business Registrations and Licencing Agency (BRELA) in establishment of pharmaceutical industries.
2.3.1 Importance of Standard Operating Procedures (SoPs) in the production of pharmaceuticals described	Define SoP, List types of SoP in the production of pharmaceuticals	Define SoP, List types of SoP in the production of pharmaceuticals and explain the need of SoP in production	Define SoP, List types of SoP in the production of pharmaceuticals, explain the development and approval process of SOPs and the need of SoP in production.
2.3.2 Components of SoP described	Define the SoP of SoPs	Define the SoP of SoPs and list components of SoP of SoPs	Define the SoP of SoPs, list components of SoP of SoP and explain the importance of SoP of SoPs in production
2.3.3 Quality tests for raw materials and finished pharmaceutical products carried out	List quality tests for raw materials and finished pharmaceutical products	List quality tests for raw materials and finished pharmaceutical products and explain the importance of quality testing of raw materials and finished pharmaceutical products	List quality tests for raw materials and finished pharmaceutical products, Explain the importance of quality testing and methods for testing raw materials and finished pharmaceutical products
3.1.1 Management concept and functions described	Define different terms used in management and enumerate various management functions	Distinguish between various management theories and their pioneers and explain different management schools of thoughts	Distinguish between various management theories and their pioneers, explain different management schools of thoughts and describe the relationship between management functions
3.1.2 Organization behaviour in relation to workplace productivity described.	Define organization culture	Define organization culture and explain cultural diversity in relation to workplace and productivity.	Define organization culture, explain cultural diversity in relation to workplace and productivity and relate productivity in

3.1.3 Forms of leadership and management styles differentiated	Describe forms of leadership	Describe forms of leadership and describe management styles	Describe forms of leadership, describe management style and relate forms of leadership with management styles
3.1.4 Various structures of organisations distinguished	Explain advantages, disadvantages of delegation and its principles.	Describe types of organizations, draw organizational charts or diagrams and describe relationships within organization structures	Describe types and principles of organizations, draw organizational charts or diagrams, describe relationships within organization structures, and relationship with external organizations and context (Political, economic and social atmosphere)
3.1.5 Leadership attributes in provision of pharmaceutical services described	List leadership attributes	List leadership attributes and skills	List leadership attributes and skills and differentiate between a leader and a manager
3.2.1 National policies related to provision of health care services described.	List objectives and components of Tanzania Vision 2025 and Alma-Ata Declaration	List objectives and components of Tanzania Vision 2025, Alma-Ata Declaration and agenda 21 of Rio de Janeiro	List objectives and components of Tanzania Vision 2025,Alma-Ata Declaration, agenda 21 of Rio de Janeiro and Millenium Development Goals
3.2.2 Primary health care concept and principles described	Define primary health care and list levels of health care in Tanzania	Define primary health care, List levels of health care in Tanzania and principles of primary health care.	Define primary health care, List levels of health care in Tanzania and principles of primary health care, levels of health care in Tanzania State vision and mission of the MoHSW, objectives and components of Primary Health Services Development Programme (PHSDP
3.2.3 Components of the National Health Policy described.	List objectives of the National Health Policy	List objectives of the National Health Policy and state vision and mission of the National Health Policy, 2003.	List objectives of the National Health Policy, state vision and mission of the National Health Policy, 2003 and explain the link between National Health Policy to the National Medicine Policy

principles of entrepreneurship described	entrepreneurship and differentiate between entrepreneurship and entrapreneurship.	development, theories and importance of entrepreneurship in the economy and pharmacy profession.	historical development, theories importance and principles of entrepreneurship and national strategy for economic empowerment and poverty reduction (NSEGPR) MKUKUTA objectives and National Development Vision 2025.
3.3.2 Types of entrepreneurs and their key competencies distinguished	Enumerate inherent competencies of entrepreneurs	Enumerate inherent competencies of entrepreneurs and explain factors influencing tendency to engage in entrepreneurship	Enumerate inherent competencies of entrepreneurs, describe types and characteristics of entrepreneurs and explain factors influencing tendency to engage in entrepreneurship
3.3.3 Challenges encountered by entrepreneurs in provision of pharmaceutical services explained	List challenges faced by entrepreneurs	List challenges faced by entrepreneurs and misconceptions/myths about entrepreneurs	List challenges faced by entrepreneurs, misconceptions/myths about entrepreneurs and explain the role of innovation and creativity in entrepreneurship
3.3.4 Concept and principles of marketing and sales of pharmaceuticals described	List marketing skills needed in sales of pharmaceuticals	List marketing skills needed in sales of pharmaceuticals and explain concept and principles of marketing	List marketing skills needed in sales of pharmaceuticals, explain concept, principles of marketing, ethical issues in marketing and sales of pharmaceuticals
3.3.5 Procedures and requirements for establishing marketing outlets for medicines and medical supplies described	List types of medicines and medical supplies outlets in Tanzania	List types of medicines and medical supplies outlets in Tanzania and requirements for establishing medicines and medical supplies outlets (ADDO, pharmacies and warehouses etc.)	List types of medicines and medical supplies outlets in Tanzania, requirements for establishing medicines and medical supplies outlets and explain the procedures for establishing medicines and medical supplies outlets
3.4.1 Health financing mechanisms described	Explain concept of health financing, list health financing mechanisms	Explain concept of health financing, list health financing mechanisms, Explain how each health financing mechanism operates	Explain concept of health financing, list health financing mechanisms, Explain how each health financing mechanism

			role of innovation and creativity in entrepreneurship
3.4.2. Public financing through government subversion described	Explain the role of government in medicines and medical supplies financing and distinguish various public financing strategies	Explain the role of government in medicines and medical supplies financing, distinguish various public financing strategies and explain control of expenditures for medicines and medical supplies	Explain the role of government in medicines and medical supplies financing, distinguish various public financing strategies, explain control of expenditures for medicines and medical supplies and list challenges in public financing of medicines and medical supplies
3.4.3. Health insurance mechanisms described	Explain the concept of health insurance	Explain the concept of health insurance and list health insurance agencies in Tanzania	Explain the concept of health insurance, list health insurance agencies in Tanzania and list benefits and challenges associated with health insurance
4.1.1 Basic statistical concepts and principles described	Define common terms in biostatistics	Define common terms in biostatistics and explain the importance of different measures in statistics (central tendency, quartile and variations)	Define common terms in biostatistics, explain the importance of different measures in statistics (central tendency, quartile and variations and explain the application of statistics in data analysis
4.1.2 Data using basic statistical principles to support decision making in provision of pharmaceutical services summarised	Define data and List types of data	Define data and List types of data and explain methods of summarizing data (charts, tables, graphs etc.)	Define data and list types of data, explain methods of summarizing data (charts, tables, graphs etc.) and conditions in which each method is used
4.1.3 Establish trends in health care services	Generate tables, charts and graphs	Generate tables, charts and graphs and Interpret tables, charts and graphs	Generate tables, charts and graphs Interpret tables, charts and graphs and relate information from interpretation to project future results
4.2.1 Basic concept and principles of research described	Identify areas of research requiring ethical clearance	Identify areas of research requiring ethical clearance and explain the concept and principles of research	Identify areas of research requiring ethical clearance, explain the concept and principles of research, the importance of research

			clearance in research
4.2.2 Various types of research differentiated	Classify research	Classify research and explain classes of research	Classify research, explain classes of research, approaches and strategies used in research
4.2.3 Procedures for conducting operational research described	Identify research problem and explain the role of literature review in research	Identify research problem, explain the role of literature review in research, development of a research proposal and methods and process for data collection	Identify research problem, explain the role of literature review in research, development of a research proposal, methods and process for data collection, procedure for writing research report and methods for dissemination of research findings
4.3.1 Concept of pharmacovigillance explained	Define terminologies in pharmacovigillance and list aims of pharmacovigillance	Define terminologies in pharmacovigillance, list aims of pharmacovigillance and explain pharmacovigillance methods	Define terminologies in pharmacovigillance, list aims of pharmacovigillance, explain pharmacovigillance methods, different ways of documenting and reporting pharmacovigillance data and the importance of pharmacovigillance information
4.3.2 Procedures for monitoring and detection of adverse drug reactions (ADRs) described	Classify ADRs and list centres for monitoring ADRs	Classify ADRs, list centres for monitoring ADRs and explain the importance of monitoring ADRs in pharmacy practice.	Classify ADRs, list centres for monitoring ADRs and explain the importance of monitoring ADRs in pharmacy practice, documentation and reporting of ADRs
4.3.3 Methods of controlling substandard and counterfeit medicines described	Define substandard and counterfeit medicines, list and explain methods for detecting substandard and counterfeit medicines	Define substandard and counterfeit medicines, distinguish between counterfeit and substandard medicines, list and explain methods for detecting and controlling substandard and counterfeit medicines	Define substandard and counterfeit medicines, distinguish between counterfeit and substandard medicines, list and explain methods for detecting and controlling substandard and counterfeit medicines and the effect of substandard and counterfeit medicines in the public health

4.3.4 Factors contributing to distribution of substandard and counterfeit medicines explained	List factors contributing to existence of substandard and counterfeit medicines and identify possible points of entry for substandard and counterfeit medicines into Tanzania	List factors contributing to existence of substandard and counterfeit medicines, identify possible points of entry for substandard and counterfeit medicines into Tanzania and identify loopholes contributing to spreading of substandard and counterfeit medicines in health systems	List factors contributing to existence of substandard and counterfeit medicines, identify possible points of entry for substandard and counterfeit medicines into Tanzania, identify loopholes contributing to spreading of substandard and counterfeit medicines in health systems and explain mechanisms for curbing spread of substandard and counterfeit medicines in Tanzania
5.1.1. Principles and concept of pharmacotherapy explained	Define terms used in pharmacotherapy	Define terms used in pharmacotherapy and List principles and concepts applied in pharmacotherapy	Define terms used in pharmacotherapy, List principles and concepts applied in pharmacotherapy and Explain the importance of pharmacotherapy in management of common human diseases
5.2.2. Knowledge of pharmacotherapy in management of common communicable diseases applied	Define the disease status of a patient and explain pathophysiology of common communicable disease	Define the disease status of a patient, explain pathophysiology of common communicable disease and relate diagnosis and therapy of common communicable disease	Define the disease status of a patient , explain pathophysiology of common communicable disease, relate diagnosis and therapy of common communicable disease and monitor therapy of common communicable disease
5.1.3. Knowledge of pharmacotherapy in management of common non communicable diseases applied	Define the disease status of a patient and explain pathophysiology of common non communicable diseases	Define the disease status of a patient, explain pathophysiology of common non communicable diseases and relate diagnosis and therapy of common non communicable disease	Define the disease status of a patient, explain pathophysiology of common non communicable diseases, relate diagnosis and therapy of common non communicable disease and monitor therapy of common non communicable diseases

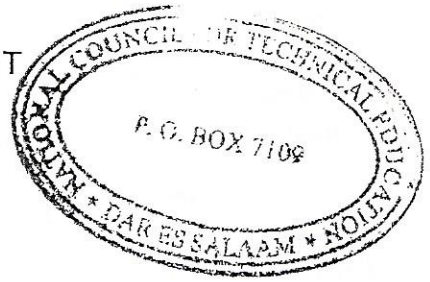
5.2.1. Principles and concept of veterinary medicine described	Define terminologies used in veterinary pharmacology	Define terminologies used in veterinary pharmacology, and describe principles and concepts applied in veterinary medicine	Define terminologies used in veterinary pharmacology, describe principles and concepts applied in veterinary medicine and explain the importance of veterinary medicines in the management of common animal diseases
5.2.2. Veterinary medicines are classified according to pharmacological activities	List sources of veterinary medicines	List sources of veterinary medicines and describe toxic and therapeutic doses of common veterinary medicines	List sources of veterinary medicines, describe toxic and therapeutic doses of common veterinary medicines and describe the pharmacological/therapeutic classes of essential veterinary medicines
5.2.3. Knowledge of pharmacology in treatment of common veterinary diseases applied	Describe the rationale of using veterinary medicines, describe clinical use of veterinary medicines in treatment of common animal diseases and describe dose, dosage and course of veterinary medicines used for common animal diseases	Describe the rationale of using veterinary medicines, describe clinical use of veterinary medicines in treatment of common animal diseases, describe dose, dosage and course of veterinary medicines used for common animal diseases and list contraindications of common veterinary medicines	Describe the rationale of using veterinary medicines, describe clinical use of veterinary medicines in treatment of common animal diseases, describe dose, dosage and course of veterinary medicines used for common animal diseases, list contraindications of common veterinary medicines and list important side effects and adverse effects of common veterinary medicines
5.3.1. Concept and principles of monitoring and evaluation described	Define terms used in monitoring and evaluation	Define terms used in monitoring and evaluation and differentiate between monitoring and evaluation	Define terms used in monitoring and evaluation, differentiate between monitoring and evaluation and explain the importance of monitoring and evaluation in pharmacy practice

5.3.2. Components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations described	List components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations	List components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations and explain each component of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations	List components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations, explain each component of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations and list performance indicators in monitoring and evaluation of different pharmaceutical situations
5.3.3. Common drawbacks in monitoring and evaluation of medicines use correctly identifies	List factors hindering monitoring and evaluation of medicines use	List factors hindering monitoring and evaluation of medicines use and explain factors hindering monitoring and evaluation of medicines use	List factors hindering monitoring and evaluation of medicines use, explain factors hindering monitoring and evaluation of medicines use and identify measures to improve monitoring and evaluation of medicines uses
5.3.4. Common indicators in medicines use described	List indicators used in monitoring and evaluation of medicines use	List indicators used in monitoring and evaluation of medicines use and explain application of each indicator in monitoring and evaluation of medicines use	List indicators used in monitoring and evaluation of medicines use, explain application of each indicator in monitoring and evaluation of medicines use and describe tools used in monitoring and evaluation of medicines use

BLUE PHARMA COLLEGE OF HEALTH.
(BPHACOH)
P. O. Box 1570, SINGIDA
Sign:.....
HEAD OF DEPARTMENT

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

12.0 DESCRIPTION OF MODULES



12.1 Module Title: LEADERSHIP AND MANAGEMENT

Module Code: PST 06101

Number of Credits: 12

Sub-Enabling Outcomes

1.1.1 Describe the concept of participatory planning in provision of health care services.

1.1.2 Describe the role of pharmaceutical personnel in health care teams

1.1.3 Describe networking and negotiations techniques in delivery of health care services

3.1.1 Describe management concept and functions

3.1.2 Describe organization behaviour in relation to workplace productivity

3.1.3 Differentiate forms of leadership and management styles

3.1.4 Distinguish various structures of organisations

3.1.5 Describe leadership attributes in provision of pharmaceutical services

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:

Cole, G. A (2000) Management Theory and Practice, 6th Edition: Continuum

Marquis, B. L and Huston, C. J (1996) Leadership Roles and Management Functions in Nursing – Theory and Application, 2nd Edition: Lippincott, Philadelphia.

Ndeki S.; Management of health services, CEDHA

Peterson A.M, Kelly N.W (2014); Leadership and management in pharmacy practice, 2nd edition, CRC press

MSH and WHO (1997) Managing Drug Supply, 2nd Edition. Kumarian Press

Module Code: PST 06102

Number of Credits: 8

Sub-Enabling Outcomes

1.3.1 Describe counselling and guidance techniques in promoting rational use of medicines.

1.3.2 Describe operating mechanisms of Care and Treatment Clinics (CTC)

1.3.3 Describe various methods to encourage adherence, compliance and concordance to treatment

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:

Agrawal, R (2006) Educational, Vocational Guidance and Counselling, New Delhi, Sipra Publication.

Bhatnagar A, and Gupta N, (1999) Guidance and Counselling, A theoretical approach (Ed) New Delhi, Vikash Publishing house.

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Hubley, J. (1993). Communicating Health. An action and guide to health and health promotion. 1st Edition.

12.3 Module Title: PHARMACEUTICAL PRODUCTION

Module Code: PST 06103

Number of Credits: 20

Sub-Enabling Outcomes

2.1.1 Describe procedures and processes of producing different dosage forms

2.1.2 Describe quality control and assurance procedures in pharmaceutical production

2.1.3 Describe waste management and disposal in pharmaceutical production

2.1.4 Describe premise and equipment maintenance procedures in pharmaceutical manufacturing facilities

2.2.1 Describe policies and legislations governing manufacturing of pharmaceuticals

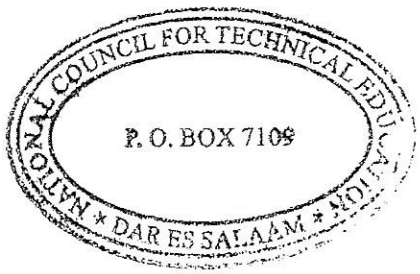
2.2.2 Describe the importance of environmental impact assessment in establishing large scale manufacturing of pharmaceuticals

2.2.3 Explain statutory taxes and licencing procedures in establishing large scale manufacturing of pharmaceuticals

2.3.1 Describe the importance of Standard Operating Procedures (SoPs) in the production of pharmaceuticals

2.3.2 Describe the components of SoP

2.3.3 Carry out quality tests for raw materials and finished pharmaceutical products



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:

Polderman, J (1990) Introduction to Pharmaceutical Production: Novib, The Hague

Lund, W. Editor (1994). The Pharmaceutical Codex, Principles and Practice of Pharmaceutics 12th Edition: The Pharmaceutical Press, London

Watson, D. G (1999) Pharmaceutical Analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists: Churchill Livingstone, Edinburgh.

Aulton M.E (ed) 1988 Pharmaceutics: The science of dosage form design. Churchill Livingstone, Edinburgh

Aulton M.E and Kevin M.G, Eds: (2013) Pharmaceutics the design and manufacture of medicines,4th Churchill edition Livingstone

Hugo and Russell (2011), Pharmaceutical Microbiology 8th Edition, willey-Blackwel publications

Liebsch, B et al (1988): Tanzania Pharmaceutical Handbook, Dar es Salaam University Press.

Gennaro, R. A. (ed) 1990 Remington's Pharmaceutical Sciences 18th edition: Mack Publishing Company, Easton, Pennsylvania 18042

Gennaro, R. A, et.al (eds) 1995 Remington: The Science and Practice of Pharmacy, Volume I & II, 19th edn: Mack Publishing Company, Easton, Pennsylvania 18042

Schmidt, O. (ed) 2000 Pharmaceutical Quality systems, Interpharm Press, Colorado.

Rawlins E.A, Editor: 1977 Bentley's Textbook of Pharmaceutics, 8th Ed. Baillie're Tindall. London Kamm, G. and Kohler, B. Editors: 1995 Manual for Decentralized Infusion Production, Infusion Unit Project Tanzania

Shayne C et al (2008), Pharmaceutical Manufacturing Handbook: Production and processes, John Wiley & Sons

Aulton M.E (ed) 2013 Pharmaceutics: The design and manufacture of Medicines, 4th Churchill Livingstone, Edinburgh

Gennaro, R. A, et.al (eds) 1990 Remington's Pharmaceutical Sciences 18th edn: Mack Publishing Company, Easton, Pennsylvania 18042

12.4 Module Title: HEALTH AND MEDICINES POLICY

Module Code: PST 06104

Number of Credits: 7

Sub-Enabling Outcomes

3.2.1 Describe national policies related to provision of health care services
3.2.2 Describe the primary health care concept and principles
3.2.3 Describe components of the National Health Policy

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:

MoHSW (2003), The National Health Policy, Dar es salaam
MoHSW (1991), The National Drugs Policy, Dar es salaam
Alma-Ata Declaration. http://www.who.int/publications/en/
Tanzania vision 2025. www.mof.go.tz/mofdocs/overarch/Vision2025
WHO, Geneva, Report of the International conference on Primary Health Care Alma- Ata, USSR, 6-8 September1978

12.5 Module Title: HEALTH FINANCING

Module Code: PST 06105

Number of Credits: 12

Sub-Enabling Outcomes

3.4.1 Describe basic concept and principles of economics
3.4.2 Describe the concept and principles of health economics in delivery of pharmaceutical services.
3.4.3 Identify practices in health care delivery affecting the adoption of health economics principles
3.5.1 Describe health financing mechanisms
3.5.2 Describe public financing through Government subvention
3.5.3 Describe health insurance mechanisms

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:
William, J (1999) Principles of Health Economics for Developing Countries, 1st Edition: WBI of Development Studies, Washington.
Diane M. Dewar (2010) Essential of health economics
Gashaw Andargie (2008) Introduction to health Economics; Ethiopia Public Health Training Initiative

12.6 Module Title: PHARMACEUTICAL PUBLIC HEALTH

Module Code: PST 06206

Number of Credits: 8

Sub-Enabling Outcomes
1.2.1 Describe health promotion programmes related to pharmaceutical care and services.
1.2.2 Explain concepts and principles of pharmaceutical public health
1.2.3 Describe the concept of advocacy in relation to provision of pharmaceutical services.

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:
Alma Ata, USSR. WHO, Geneva, 1978, Report of the international conference on primary health care.
Health promotion journal 1.1 113-127, 1986
Promoting health in developing countries: A call for Action/WHO/HEP/90.1,WHO, Geneva 1990.
Health Service Executive (2011) Health promotion framework

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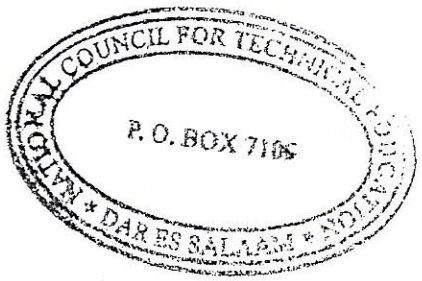

12.7 Module Title: ENTREPRENEURSHIP

Module Code: PST 06207

Number of Credits: 12

Sub-Enabling Outcomes

3.3.1 Describe the concept and principles of entrepreneurship

3.3.2 Distinguish between types of entrepreneurs and their key competencies

3.3.3 Explain challenges encountered by entrepreneurs in provision of pharmaceutical services

3.3.4 Describe concept and principles of marketing and sales of pharmaceuticals

3.3.5 Describe procedures and requirements for establishing marketing outlets for 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:

Zimmerer, T. W. and N. M. Scarborough. Essentials of Entrepreneurship and Small Business Management; 5th Edition. Pearson Education International, New Jersey, 2008.

Charantimath, P. M (2006) Entrepreneurship Development Small Business Enterprises: Pearson Education, Delhi.

Buskirk, R. H (1994). The Entrepreneurs Handbook: Premier Entrepreneur Programs, Inc. Denver, Co.

Module Code: PST 06208

Number of Credits: 24

Sub-Enabling Outcomes

4.1.1 Describe basic statistical concepts and principles

4.1.2 Summarize data using basic statistical principles to support decision making in provision of pharmaceutical services.

4.1.3 Establish trends in health care services

4.2.1 Describe basic concept and principles of research

4.2.2 Differentiate between various types of research

4.2.3 Describe procedures for conducting operational research

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:
Kothari C.R (1985); Research Methodology – Methods and techniques, 2nd edition, Wiley Eastern Limited New Delhi

Ranjit K (205); Research methodology – step by step guide for begginers, 2nd edition, Singapore, pearson education

Smith F.J (2010); Conducting your pharmacy research project, 2nd edition, Pharmaceutical Press, UK

Varkevisser, C. M, Pathmanathan, I and Brownlee, A (1991) Designing and Conducting Health Systems Research Projects, Vol. 2 Part I. IDRC, Ottawa

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Saunders, M., Lewis, P. and Thornhill, A. (2007) Research Methods for Business Students, Harlow, Prentice Hall.

Anderson, D.R., Sweeney, D.J., Williams, T.A., Freeman, J. & Shoesmith, E. (2007) Statistics for Business and Economics, Thomson Learning, London.

12.9 Module Title: MONITORING AND EVALUATION OF MEDICINES USE

Module Code: PST 06209

Number of Credits: 12

Sub-Enabling Outcomes

5.3.1 Describe the concept and principles of monitoring and evaluation

5.3.2 Describe components of WHO operational package for assessing monitoring and evaluation of country pharmaceutical situations

5.3.3 Identify common drawbacks in monitoring and evaluation of medicines use

5.3.4 Describe common indicators in medicines use

4.3.1 Explain the concept of pharmacovigillance

4.3.2 Describe the procedures for monitoring and detection of adverse drug reactions (ADRs)

4.3.3 Describe methods of controlling substandard and counterfeit medicines

4.3.4 Explain factors contributing to distribution of substandard and counterfeit medicines

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:
2011 The Global Fund to fight Against AIDS, Tuberculosis and Malaria, Monitoring and Evaluation Toolkit Fourth Edition.
WHO, Operational package for assessing monitoring and evaluating country pharmaceutical situations. Guide for coordinators and data collectors. (December 2007)
MSH and WHO, (1997) Managing Drug Supply, 2nd Edition. Kumarian Press

Module Title: BASIC PHARMACOTHERAPY

Module Code: PST 06106

Number of Credits: 6

Sub-Enabling Outcomes

5.1.1 Explain the principles and concept of pharmacotherapy
5.1.2 Apply knowledge of pharmacotherapy in management of common communicable diseases
5.1.3 Apply knowledge of pharmacotherapy in management of common non communicable diseases

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:
Pharmacotherapy: A Pathophysiologic Approach, 8th Edition, Joseph T. DiPiro, Robert L. Talbert, Gary C. Yee, Gary R. Matzke, Barbara G. Wells, L. Michael Posey

Pharmacotherapy Casebook: A Patient-Focused Apprcach by Terry L. Schwinghammer, Julia M. Koehler

MSH and WHO, (1997) Managing Drug Supply, 2nd Edition. Kumarian Press

Basic Principles of Pharmacotherapy by Mohammad H. Farjoo.

Module Title: BASIC VETERINARY PHARMACOLOGY

Module Code: PST 06107

Number of Credits: 6

Sub-Enabling Outcomes

5.2.1 Describe principles and concept of veterinary medicine
5.2.2 Classify veterinary medicines according to pharmacological activities
5.2.3 Apply knowledge of pharmacology in treatment of common veterinary diseases

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:

Veterinary Pharmacology and Therapeutics (2009); 9th Edition by Jim E. Riviere , Mark G. Papich

Handbook of Veterinary Pharmacology (2008); Walter H. Hsu