ASIIN Seal

Accreditation Report

Master's Degree Programmes
Pharmacology
Clinical Pharmacy
Pharmacognosy and Natural Medicine Science

Provided by
Mbarara University of Science and Technology, Uganda

Version: 24 March 2023

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	**(Official) English translation of the name**	**Labels applied for [1]**	**Previous accreditation (issuing agency, validity)**	**Involved Technical Committees (TC)[2]**
Master of Science in Pharmacology		ASIIN	NCHE[3]	09, 14
Master of Pharmacy in Clinical Pharmacy		ASIIN	NCHE	09, 14
Master of Science in Pharmacognosy and Natural Medicine Science		ASIIN	NCHE	09, 14
Date of the contract: 13.04.2021 **Submission of the final version of the self-assessment report:** 05.09.2022 **Date of the audit:** 26.10. – 27.10.2022 **at:** Mbarara University of Science and Technology, Uganda				
Peer panel: Prof. Dr. Moritz Bünemann, Philipps-University Marburg MPharm. Oksana Pyzik, University College London, School of Pharmacy Prof. Dr. Gert Fricker, Ruprecht-Karls-University Heidelberg Dr. Michael Mungoma, Mount Kenya University Henry Kyeyune, Makerere University Kampala student				
Representative of the ASIIN headquarter: Rainer Arnold				

[1] ASIIN Seal for degree programmes;
[2] TC: Technical Committee for the following subject areas: TC 09 – Chemistry, Pharmacy, TC 14 – Medicine
[3] National Council for Higher Education (Uganda)

Responsible decision-making committee: Accreditation Commission for Degree Programmes	
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 28.03.2014	

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[4]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Master of Science in Pharmacology	Master of Science	-	7	full time	no	4 Semester	75 credits	Annually 2006
Master of Pharmacy in Clinical Pharmacy	Master of Pharmacy	• Oncology • Internal Medicine • Paediatrics • Emergency and Critical Care • Psychiatry	7	full time	no	4 Semester	79 credits	Annually 2018
Master of Science in Pharmacognosy and Natural Medicine Science	Master of Science	-	7	full time	no	4 Semester	74 credits	Annually 2018

[4] EQF = The European Qualifications Framework for lifelong learning

For the Master of Science in Pharmacology (MPP), Mbarara University of Science and Technology (MUST) has presented the following profile on its webpage:

"It is envisaged that this program will fill the need for pharmacologists and toxicologists, professionals who can contribute towards improving health care by way of evidence-based therapy, especially through drug-related and toxin-related research, in and outside Uganda. These professionals are also predicted to contribute towards the workforce in the growing pharmaceutical industry sector in the East African region and beyond, as well as contribute personnel to academia, both in the biomedical and clinical fields.

The development of this curriculum is one contribution to the increase of a body of teachers in pharmacology in particular, besides training of professionals needed to continue research with an overall goal of advancements in health care practice and development of therapeutic agents in Uganda and beyond."

For the Master of Pharmacy in Clinical Pharmacy (MPCP), Mbarara University of Science and Technology (MUST) has presented the following profile on its webpage:

"Over the past four decades, there has been a global trend for pharmacy practice to move away from product focus to a patient-centred care model ensuring the safe and effective use of medications in all practice settings. Thus, the role of the pharmacist has evolved from that of a compounder and supplier of pharmaceutical products to that of a provider of services and information, and ultimately, that of a provider of patient care.

The mission of the Mbarara University of Science and Technology (MUST) Master of Pharmacy in Clinical Pharmacy degree program is to provide the graduate with the relevant knowledge base, skills, attitudes, ethics and values to engage in clinical practice as a member of a multidisciplinary healthcare team, and expand career opportunities in the field of clinical pharmacy."

For the Master of Science in Pharmacognosy and Natural Medicine Science (MPNMS), Mbarara University of Science and Technology (MUST) has presented the following profile on its webpage:

"The mission of this programme is to provide the graduate with the relevant and practical knowledge base, skills, attitudes, ethics and values to engage in advanced level of natural medicines research, product development, production and business practice.

The curriculum is unique in that it combines traditional Pharmacognosy, natural medicine knowledge and pharmaceutical biotechnology, which enables graduates to be experts that can translate natural drugs or preparations thereof from field to shelves. Thus the philosophy behind this programme - 'natural drugs from field to shelves'.

At the end of the 2-year programme, graduates should have acquired specialized knowledge, skills and competencies in the areas of Pharmacognosy and Natural Medicine Science."

C Peer Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Study plans
- Module descriptions
- Webpage MUST: https://med.must.ac.ug/
- Webpage Ma Pharmacology: https://www.must.ac.ug/postgraduate-programs/master-of-science-in-pharmacology/
- Webpage Ma Clinical Pharmacy: https://www.must.ac.ug/postgraduate-programs/master-of-pharmacy-clinical-pharmacy/
- Webpage Ma Pharmacognosy and Natural Medicine Science: https://www.must.ac.ug/postgraduate-programs/master-of-science-in-pharmacognosy-and-natural-medicine-sciences/

Preliminary assessment and analysis of the peers:

The curriculum of the Master of Science in Pharmacology is designed to help interested qualified candidates from Uganda and other international students to acquire comprehensive and advanced knowledge of Pharmacology. The teaching methods are mostly student-centred and try to integrate both theoretical and practical training. Laboratory training is aimed at reinforcing the theoretical knowledge gained. Through a blend of instructions, practical work, self-studies, and supervision, the student is expected to gradually develop problem-solving skills as well as acquire professional competences necessary for a career in teaching, industry, research, and clinical settings.

The Master of Science in Pharmacology deals with the research, characterization, and application of chemicals which show biological effects and the elucidation of cellular and organismal functions in relation to these chemicals. To this end, students learn about the

design, the medical properties, and application of drugs, where a drug may be defined as any artificial, natural, or endogenous (from within the body) molecule which exerts a biochemical or physiological effect on the cell, tissue, organ, or organism. Moreover, graduates should be familiar with the interactions that occur between a living organism and chemicals that affect normal or abnormal biochemical function.

With the increasing need for professionals capable of developing therapeutic agents and advancing research on conventional drugs and local herbal products, there is need to train more pharmacologists in Uganda. Currently, the number of pharmacologists in Uganda is quite low and many universities lack lecturers in Pharmacology. There is yet need to train more pharmacologists with skills relevant to the needs of Uganda and Africa in general.

Graduates of the Master of Science in Pharmacology can work in a scientific environment such as in pre-clinical studies, clinical trials, and academia, which involves training future health care workers such as medical doctors, pharmacists, pharmaceutical scientists, nurses, medical laboratory scientists, and other members of the healthcare team. Graduates can also be employed to carry out pharmaceutical research to solve problems in society, industries, manufacturing, and drug discovery from natural sources.

The Master of Pharmacy in Clinical Pharmacy focuses on the provision of patient care with the use of medications to optimise the health outcomes of patients. This includes promoting wellness and preventing disease. Specifically, it combines patient care with specialized therapeutic knowledge about the use of medications. To this end, students should learn about patient care that optimises medication therapy and promotes health, and disease prevention. In addition, graduates should be able to use their clinical knowledge and skills to manage patients with chronic illnesses, collaborate with other health care providers to provide cost-effective care, provide consultations on drug-related issues, educate patients, other healthcare professionals, and family members or caregivers on the correct way to use medications, and actively participate in a healthcare team.

Furthermore, graduates should be able to deliver pharmaceutical care (monitor, evaluate, design, recommend, and implement patient specific pharmaceutical care plans), be familiar with therapeutics, and be able to conduct research activities. The Master of Pharmacy in Clinical Pharmacy takes the health priorities of the World Health Organization (WHO) into account, and includes taught courses within the university (e.g. clinical therapeutics, research methods, management, communication skills), and clinical/research experiences at the Mbarara Regional Referral Hospital in the various wards (paediatrics, oncology, surgery, obstetrics & gynaecology, Internal medicine, psychiatry, TB/HIV, and emergency department), and other hospitals in and outside Mbarara City.

Clinical pharmacists are mostly employed in medical clinics and hospitals, but often work as part of a multidisciplinary team with physicians, nurses and other healthcare professionals to optimise the use of medications for the best patient outcomes. Clinical pharmacists can work in all areas of pharmacy, which are concerned with the science and practice of rational medication use. The career and employment opportunities for clinical pharmacists are manifold and include the following areas: Clinical Administration, Clinical Informatics, Emergency Medicine, Geriatrics, Haematology/Oncology, Infectious Diseases, Nutrition, Pain and Palliative Care, Paediatrics, Toxicology and in pharmaceutical companies as well as in medical and research institutions.

The Master of Science in Pharmacognosy and Natural Medicine Science has the goal of educating specialists in pharmacognosy and natural medicine. These specialists should be able to apply scientific methods in discovering and applying traditional medicines. In addition, they should have acquired an indigenous knowledge on the production and provision of high quality, safe and efficacious natural drugs and medicines in order to reduce the disease burden in Uganda and other ~~African~~ countries.

The Master of Science in Pharmacognosy and Natural Medicine Science is designed to provide the graduates with the relevant and practical skills, attitudes, ethics, and values to engage in science driven development of traditional medicines and natural drugs through research, development, production, quality control, and entrepreneurship. The programme has the goal to bridge academics with industrial practice by enabling industry experts including traditional medicine practitioners teach and mentor students alongside the university academicians.

Graduates should be able to follow careers in both the public and private sector, including but not limited to the following areas: research and medical institutions, pharmaceutical companies, herbal medicine industries, cosmetic industries, health ministries, drug regulatory agencies, herbal and food supplement stores, pharmacies, and teaching institutions.

Finally, the graduates of all three Master's programmes should have adequate competencies in oral and written communication skills, be adaptive to the development of pharmaceutical and medical sciences, and have adequate English proficiency as well as a social and academic attitude.

The intended educational objectives and learning outcomes of all three degree programmes under review are expected to equip the graduates with life skills required to develop and adapt to the broad spectrum of possible occupations. In addition, they should be able to join PhD programmes in their respective areas of expertise.

In summary, the peers are convinced that the intended qualification profiles of all three programmes under review allow graduates to take up an occupation, which corresponds with their qualification. Furthermore, the programmes address a need in the job market that would enhance health care provision. The degree programmes are designed in such a way that they meet the goals set for them. The peers conclude that the objectives and intended learning outcomes of the degree programmes adequately reflect the intended level of academic qualification (EQF 7).

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Reports

Preliminary assessment and analysis of the peers:
The auditors believe that the English names of all three Master's programmes correspond with the intended aims and learning outcomes and the course language (English).

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Study plans
- Module descriptions
- Webpage Ma Pharmacology: https://www.must.ac.ug/postgraduate-programs/master-of-science-in-pharmacology/
- Webpage Ma Clinical Pharmacy: https://www.must.ac.ug/postgraduate-programs/master-of-pharmacy-clinical-pharmacy/
- Webpage Ma Pharmacognosy and Natural Medicine Science: https://www.must.ac.ug/postgraduate-programs/master-of-science-in-pharmacognosy-and-natural-medicine-sciences/

Preliminary assessment and analysis of the peers:
All three Master's programmes under review are offered by the Faculty of Medicine of MUST. More specifically, the Departments of Pharmacy, Pharmacology, and Pharmaceutical Sciences are involved in offering the three Master's programmes. The curricula/study

plans of each degree programme are published on the university's website, with detailed courses as hard copy available and can be accessed through the Academic Registrar's office and the Dean of the Faculty of Medicine. All three degree programmes are taught in English and are designed for two years (four semester) and 79 credits are awarded for the Master of Pharmacy in Clinical Pharmacy, 74 credits for the Master of Science in Pharmacognosy and Natural Medicine Science and 79 credits for the Master of Science in Pharmacology. The maximum period a student can spend on a two-year programme is six semesters.

As defined in the Examination Regulations, the academic year at MUST consists of two semesters and one recess semester. The length of each semester includes seventeen weeks, in which fifteen weeks shall be used for teaching. The last two weeks of each semester are for examinations. The recess semester encompasses ten weeks and takes place at the end of the second semester before the start of the next academic year.

The curriculum of Master of Science in Pharmacology is designed to provide students with the necessary theoretical knowledge and practical training that will enable them to work as experts in the area of drug research and discovery. The first two semesters cover core materials using lectures, tutorials and practical work, and aim to ensure that all students achieve the core knowledge of the principles and practice of pharmacology. More specialised courses are offered in the second year of studies.

The Master of Pharmacy in Clinical Pharmacy has the aim of preparing students to be general clinical pharmacists that can work in interdisciplinary healthcare team in order to ensure and deliver optimal patients' pharmaceutical care. The curriculum is designed to produce clinical pharmacists, who can research, generate, disseminate, and apply new knowledge that contributes to improved health and quality of life. In addition, they should be capable of providing medication therapy evaluations and recommendations to patients and health care professionals, and serve as a primary source of scientifically valid information and advice regarding the safe, appropriate, and cost-effective use of medications.

To achieve desired therapeutic goals, the clinical pharmacist applies evidence-based therapeutic guidelines, evolving sciences, emerging technologies, and relevant legal, ethical, social, cultural, economic, and professional principles. In addition, clinical pharmacists assume responsibility and accountability for managing medication therapy in direct patient care settings, whether practicing independently or in consultation or collaboration with other health care professionals.

The curriculum of the Master of Science in Pharmacognosy and Natural Medicine Science builds on undergraduate pharmacognosy, pharmacology, and chemistry courses. It incorporates natural medicine science (ethnomedicine, ethnopharmacology, and ethnophar-

macy) to produce scientists that can discover, identify, analyse, develop, formulate, standardise, and produce natural drug products and traditional/herbal medicines. It also draws into pharmacobiotechnology; an area that encompasses the intricate production of natural-product-drug substances using modified organisms.

Natural drugs including biopharmaceutical products development entails harnessing of natural flora and fauna as well as traditional healthcare knowledge. It involves applying principles and methods of modern science and technology such as pharmacognosy, biotechnology, microbiology, chemistry, pharmaceutics, and experimental pharmacology. To this end, the curriculum is designed to combine the traditional Pharmacognosy and medicine with pharmaceutical biotechnology at Master's level to produce experts who can "translate natural drugs from field to shelve".

In general, the peers confirm that the study plans of all three Master's programmes are suitable to achieve the respective intended learning outcomes.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Webpage MUST: https://med.must.ac.ug/

Preliminary assessment and analysis of the peers:

The Directorate of Research and Graduate Training (DRGT) receives the applications within the given time period as stated in the call for applications and short lists the candidates using the following selection criteria: the intake capacity of the programme, the academic qualifications of the applicant, the academic institution where the qualifications have been achieved, and the applicant's stated interest, commitment, and motivation for studying at MUST. Based on the shortlists received from the DRGT, the respective department selects the best candidates and recommends them to the Faculty of Medicine and the University Admissions Committee.

The entry requirements for all three Master's programmes are similar. They include the Uganda Certificate of Education (UCE) or its equivalent, the Uganda Advanced Certificate of Education (UACE) or its equivalent, and a Bachelor's degree (GPA above 2.80) in Health

Sciences (i.e. Human Medicine, Veterinary Medicine, Pharmacology, Pharmacy, Nursing, Biochemistry, Physiology or relevant field such as Botany and Zoology).
Applicants whose first language or medium of instruction is not English, must provide evidence from a recognized English language training institution that they have sufficient command of English language. In addition, applicants whose degree is not from Uganda should have them verified by National Council for Higher Education which is the regulatory body in Uganda.

The Faculty of Medicine defines the number of new students every year, taking into account the available facilities and resources as well as the needs of the community and society. The two Master's programmes (Master of Pharmacy in Clinical Pharmacy and Master of Science in Pharmacognosy and Natural Medicine Science) have a maximum yearly intake of 15 students and the Master of Science in Pharmacology of five students. These numbers are determined by National Council for Higher Education (NCHE) based on the available resources (teachers, facilities) and the demand of the labour market. However, this limit is usually not reached, and this has been exacerbated especially during the COVID-19 pandemic. The applicants come from various academic and professional backgrounds which include health sciences, biomedical sciences, biological and chemical sciences discipline backgrounds and applicants come from all over Africa. Since MUST did not provide the current number of applications and registered students, the peers ask to provide this information for the intake years 2021/22 and 2022/23 for all three Master's programmes.

The number of applications and registered new students from 2018/19 to 2020/21 is depicted in the following table:

Programme Name	2018/2019		2019/2020		2020/2021	
	Admitted	Registered	Admitted	Registered	Admitted	Registered
Msc in Pharmacognosy and Natural Medicine Science	17	12	10	6	4	4
Master of Pharmacy in Clinical Pharmacy	27	23	16	11	5	3
Msc in Pharmacology	6	4	4	1	5	4

Table 1: Applications and Registered Students, Source: MUST Self-Assessment Report

As described in the Self-Assessment Report, all students at MUST have to pay tuition fees. The fees are the same for each of the three Master's programmes. Students from Uganda have to pay a tuition fee of 1,400,000 SHS (EUR 375) per semester and an additional functional fee of 1,270,000 SHS (EUR 340) per year. The costs for international students are exactly twice as high as for students from Uganda.

All three Master's programmes face the challenge of a low and declining number of applications and registered students. When the Clinical Pharmacy and Pharmacognosy programmes were first introduced, the Ugandan Government (especially the Uganda Ministry of Health) and PHARMBIOTRAC provided several scholarships for the programmes, which resulted in a sufficient number of applications, not only from Uganda but also from other African countries. In order to attract new students, MUST is running advertisements and announcements via their homepage and also the contacts of the staff members and alumni are used for attracting new international students.

Due to the COVID pandemic and the resulting economic problems in Uganda, the government did not provide any scholarships for the programmes within the last two years. As a consequence, there are hardly enough registered students to sustain the programmes and all students are self-sponsored. The peers see the danger that the programmes could not be sustained if the number of registered students further declines. For this reason, they emphasise that it is essential for the Faculty of Medicine and the concerned departments to raise independent scholarships, which are based on academic merit and financial need. Since the Faculty of Medicine has good contacts to companies from the area (e.g. through the work placement programme), it should be possible to convince them to sponsor a few scholarships. At the same time, it would be useful to also contact the World Bank and to ask them to provide scholarships directly to some students. As a result, the Government of Uganda, through the Ministry of Education and Sports, has already developed a concept for phase two funding of the project called ACE II Impact, which is expected to be funded by the World Bank. As the programme coordinators explain during the audit, the first steps to becoming financially more independent from the Ugandan government have already been done. A foundation has been established (Friends of PHARMBIOTRAC Foundation) with the goal of acquiring additional funds from different international organisations and philanthropists, especially from the USA, and national institutions. This is foreseen to be more beneficial and attractive to potential funders if the programmes receive international accreditation. The peers encourage the programme coordinators to further pursue this path and hope that it will be possible to get more funding and scholarships for the three Master's programmes.

The admission regulations are defined and published in the Mbarara University of Science and Technology Admissions Policy, which is available via the university's website.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

The peers thank MUST for providing the current number of applications and registered students for the intake years 2021/22 and 2022/23 for all three Master's programmes. As can

been seen from the respective table, the numbers of applications and registered students remain on a low level, especially in the Master of Science in Pharmacognosy and Natural Medicine Science. In this Master's programme, no new student have registered during the last two years! The peers emphasise that it essential to raise the number of registered students to the expected level, otherwise, the future of the Master's programmes is in question.

The peers consider criterion 1 to be fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Study plans
- Postgraduate Academic Handbook
- Examination Regulations
- Module descriptions

Preliminary assessment and analysis of the peers:

The Master of Science in Pharmacology comprises 23 courses, including two electives, an internship (work placement), and the Master's thesis. The courses start with fundamental principles and move forward to more advanced topics. The first year is dedicated mainly to course work and the second year to research and dissertation writing. In the first semester, biomedical sciences are covered by courses such as General Principles of Pharmacology, General Principles of Physiology and Biochemistry, General Microbiology/Bacteriology. Clinical aspects are treated by courses such as Neuropharmacology, Chemical, Endocrine and Autacoid Pharmacology, Pharmacology of Visceral Organs, Dermatological and Ocular Pharmacology, Clinical Chemotherapy and Immunomodulation, Toxicology as well as Therapeutics and Rational Drug Use. Each of these modules involves clinical case scenarios. The work placement is conducted between the second and the third semester in different com-

panies/industries and lasts for eight weeks. Students have to write a report on the internship, which is assessed by the local supervisor and the supervisor from MUST. The supervisor from MUST also visits the students during the internship to make sure that the projects proceed as planned.

The Master of Pharmacy in Clinical Pharmacy consists of 20 courses, including a clinical placement at various healthcare facilities and community pharmacies and the Master's thesis. Out of the two years' duration of the programme, students spend about 75 % of their time at the Mbarara Regional Teaching Hospital doing their Advanced Pharmacy Practice Experience (clerkship), where they not only take care of patients, but also practice as members of an interdisciplinary healthcare team.

The courses offered in the first semester mostly refer to clinical skills and knowledge acquisition in order to build a solid foundation with respect to concepts and methods of the clinical sciences. There is a focus on biomedical research, because it is the first step towards the creation of new medications and treatments that help to manage all different types of health conditions and diseases. Without this research, the prevention and cure of diseases would be practically impossible. The students, therefore, engage in evidence-based research and implementation both in the laboratories and at the clinical settings throughout their training.

In the second year of their studies, students are given the liberty to choose an area of specialization during their clerkships in the practical medical specialties. These include emergency and critical care, surgery, internal medicine, obstetrics and gynaecology, paediatrics, psychiatry, oncology, and outpatient/ambulatory practice. Thus, the programme allows students to focus on their aspirations by giving them the flexibility to pick specialisations of their choice.

However, during the discussions, the peers learn that students' direct contact with patients is sometimes limited and that there are not always enough patients with the full variety of diseases available in the Mbarara Regional Referral Hospital, which has only 600 beds. Therefore, the Faculty of Medicine is currently trying to establish more co-operations with hospitals and other healthcare facilities so that students of the Clinical Pharmacy programme have the opportunity to see more patients with different kinds of diseases and to give the students more exposure to patients.

The Master of Science in Pharmacognosy and Natural Medicine Science encompasses 17 courses, including a work placement, and the Master's thesis. The courses are mostly laboratory and industry based training with only minimal patients' contact. To this end, students spend over half of their time in various laboratories. Nevertheless, students acquire knowledge and professional skills to provide a safe and effective application of natural

products. Students have the flexibility of choosing industrial placement sites where they would usually spend their time familiarizing themselves with various production processes, including workflow and business dynamics, as well as quality assurance operations. In the Pharmacognosy programme, there is also an industrial placement with a length of four weeks. It usually takes place between the first and second year of studies. However, the same number of credits (5) are awarded, even if the internship covers only half of the time as in the Pharmacology programme.

Students of all three Master's programmes learn about research methods, scientific writing, research communication, biostatistics, health policies, planning and management of health systems, epidemiology, learning, assessment and evaluation relevant for health care professionals (pedagogy), and analytical methods in research. In addition, they receive hands-on experimental training in Pharmacology and Toxicology. Students also attend seminars, so that they can develop their analytical and critical thinking skills together with independent experimental designs, which they conduct as part of the coursework training before starting on their independent research projects. A Master's thesis is a compulsory part of the curriculum. Students write research proposals, which need to be approved respectively by the Faculty Research Committee (FRC), the Mbarara University Research Ethics Committee (MUST-REC), and the Uganda National Council for Science and Technology (UNCST) before the project starts. The final results are presented in form of a thesis and defended in an oral colloquium or a viva voce.

After analysing the module descriptions and the study plans, the peers agree that in all three Master's programmes the individual courses correspond with the definition of „module" in the sense that each course is a sum of coherent learning and teaching units.

The arrangement of the courses is presented in the study plans, and each course's intended learning outcomes are specified in the respective module description. The module descriptions also describe the content and training activities as well as the educational and assessment methods of each course.

In summary, the peers gain the impression that the choice of modules and the curriculum's structure ensures that the intended learning outcomes of the respective degree programmes can be achieved.

International Mobility

International exchange programmes and windows of mobility exist through memoranda of understanding between MUST and collaborating partner institutions abroad. The university also participates in mobility programmes for teaching staff in the East African Community through the Interuniversity Council for East Africa (IUCEA).

For the three Master's programmes under review, MUST has over the years received faculty from several countries such as Kenya, Sudan, India, USA, Ethiopia, and Cameroon. Students from the three programmes have conducted stays abroad at international institutions in countries such as Kenya, Nigeria, USA, India, Pakistan, Mexico, South Africa, and UK.

As described in the handbook, a student who wishes to transfer credits from another Institution of Higher Learning to MUST need to make a formal application to the Directorate of Research and Graduate Training (DRGT). The application will be reviewed by the Faculty of Medicine to establish the adequacy of the achieved credits. However, the peers observe that there is no official regulation on how credits acquired abroad are recognised at MUST and the Faculty of Medicine. The recognition of credits acquired outside MUST should be granted unless MUST proves substantial differences in the achieved competences. Especially, if MUST wants to further internationalise its programmes and if plans exist to establish similar curricula in several East African countries so that students can easily attend courses at other universities, such a regulation is essential. For this reason, MUST needs to establish a regulation that defines an adequate set of conditions for recognising credits acquired outside MUST, which should be aligned with the Lisbon Convention.

Staff members can spend time abroad by attending workshops, conferences, and participating in research activities through financial resources provided through memoranda of understanding between MUST and collaborating partner institutions. Additional funding for certain activities is provided by small grants given by MUST, and some scholarships/grants are provided by organisations which sponsor these activities.

MUST's International Relations Office manages the international mobility of students, administrative staff, and teachers to increase MUST's international visibility and attract qualified international students and staff members. The following list shows in detail, what cooperation exist at the Faculty of Medicine:

S/N	Stakeholder	Contribution
	Name of institution or Organization	
	LOCAL (UGANDA)	
1.	Mbarara Regional Referral Hospital	Teaching Hospital
2.	Ministry of Health (MoH)	- Support supervision to Mbarara Regional Referral Hospital - Government funding of the Hospital - MoH scholarships for postgraduates (MMED, MMLS, Certificate in Critical Care Nursing) - Financial support of Senior House Officers (MMED students)
3.	District Local Governments (especially districts in southwestern and western namely; Mbarara, Bushenyi, Lyantonde, Mitoma, Sheema, Rubirizi, Kasese, Kiruhura, Isingiro, Ibanda, Rubaya)	Health facilities especially Health Centers for inter-professional community placement of undergraduate students and training of postgraduates.
4.	Jinja School of Nursing and Midwifery	Training Site for Bachelor of Nursing Completion.
5.	Uganda Institute of Allied Health & Management Sciences (Mulago Paramedical Schools)	Training Site
6.	Ankole Diocese: Ruharo Eye Centre and MUST Ophthalmology	Training Site – Year 4 medical students & Ophthalmology Residents
7.	JCRC	Research facilities
8.	National Drug Authority	Research; MUST Department of Pharmacy to conduct quality control analyses for herbal products
9.	Uganda National Bureau of Standards (UNBS)	For analysis of food products.

10.	Uganda Cancer Institute	Specialized training of faculty-Dr. Barnabas Atwiine (Pediatric Oncologist); Supporting the operations of the Cancer Registry in the Faculty; Research
11.	Uganda Heart Institute	Specialized training of postgraduate students and faculty – Dr. Dora Nampijja (Pediatric cardiologist)
12.	Uganda Blood Transfusion Service	Training of Medical Laboratory Science Students
13.	Kasese District local government	Research; Community Engagement; human resource support of Bugoye Health Centre III for COBERS
14.	Rubirizi District Local Government (Rugazi Health Centre)	Research; Community Engagement
15.	Kigezi Health Care Foundation (KIFEHO)	Community Engagement
16.	Sisters of St Joseph`s Hospital	Support Department of Internal Medicine
17.	School of Psychiatric Clinical Officers in Butabika	Together (MUST and PCO School), we offer the Advanced Diploma in Child and Adolescent Mental Health
18.	INTERNATIONAL The Cuban Cooperation-CUBA	Staff support
19.	Massachusetts General Hospital & Harvard University (MGH GHC)	Staff and postgraduate exchange; research; support to Departments of pathology & Nursing
20.	University of Virginia	Staff and postgraduate exchange
21.	University of Calgary	Facilitation of short course – pedagogy; facilitate training of community medical education
22.	Butabika East London link child and adolescent mental health project- UK	Staff-Staff exchange, Department of Psychiatry
23.	Seed Global Health	Support to Department of Emergency Medicine, support salaries of occasional visiting lecturers; Donated PPE and 300 face masks
24.	University of British Columbia	Staff-staff exchange program
25.	University of California Sans Francisco	Research
26.	Bethany Kids in Kenya	Support of Pediatric Surgery
27.	Case Western Reserve University	Co-leadership and faculty support of Mbarara University of Science Research Ethics Education Program
28.	University of Oxford	Staff exchange
29.	University of Gent	Staff exchange
30.	University of Kwazulu Natal	Research; training facilities for postgraduates
31.	Cukurova University	Support of Forensic Medicine
32.	Uganda Police	Support of forensic medicine
33.	The Medical College of Wisconsin USA	Research, exchange of academic staff and researchers
34.	McMaster University	Longstanding collaboration. In the past seven years, they have supported our MMed Psychiatry programme

Table 2: International Cooperations, Source: MUST Self-Assessment Report

The Faculty of Medicine encourages its students and teachers to participate in international programmes and to spend some time abroad. The peers see that some opportunities for international educational exchange exist. Nevertheless, the academic mobility of the students is very low. On the one hand, students in the three Master's programme come from 11 different countries (e.g. Tanzania, Burundi, Kenya, Gambia), on the other hand, only few students spend some time abroad during their studies. The academic mobility is mostly limited due to financial restrictions and the lack of funding.

Since MUST has the strategic goal of further internationalising its degree programmes and to foster students' and teachers' academic mobility, the efforts to raise the academic mobility should be increased. For this reason, the peers recommend encouraging and supporting students to spend some part of their studies abroad, for example by participating in international summer schools. In addition, it would also be useful if MUST and the Faculty of Medicine would organise own international summer schools. The students confirm during the discussions with the peers, that currently only few opportunities for academic mobility exist and that they wish for more mobility programmes. The peers strongly support this point of view.

Criterion 2.2 Work load and credits

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Study plans
- Examination Regulations
- Module descriptions

Preliminary assessment and analysis of the peers:

At MUST, all courses are awarded credits. As described in the Examination Regulations, the largest course will have five credit units. A five-credit course is a course that is taught for five contact hours per week or a course that takes seventy five contact hours per semester. A contact hour is equivalent to one hour of lecture or two hours of practical sessions, tutorials, junior, senior clerkship and fieldwork.

The peers point out that it will be necessary to introduce (in addition to the described Ugandan system) a credit point system that is based on the students' total workload. It would be most useful to adopt the European Credit Transfer System (ECTS). In the ECTS, 25 - 30 hours of students' workload (including lecture hours and self-study hours) are equivalent

to one ECTS credit. The peers stress that the students' total workload in hours also needs to be indicated in the module descriptions and the distinction between classroom work and self-study should be made transparent.

During the discussions with the programme coordinators and the students, the peers learn that so far there has been no survey asking the students to evaluate the amount of time they spend outside the classroom for preparing the classes and studying for the exams. Since this is necessary in the ECTS framework, the peers suggest asking the students directly about their experiences. This could be done by including a respective question in the course evaluations. The peers point out that the Faculty of Medicine should follow the ECTS users' guide, while determining the students' total workload. This is the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study, and examinations).

In other words, a seminar and a lecture may require the same number of contact hours, but one may require significantly greater workload than the other because of differing amounts of independent preparation by students. Typically, the estimated workload will result from the sum of:

- the contact hours for the educational component (number of contact hours per week x number of weeks)
- the time spent in individual or group work required to complete the educational component successfully (i.e. preparation beforehand and finalising of notes after attendance at a lecture, seminar or laboratory work; collection and selection of relevant material; required revision, study of that material; writing of papers/projects/dissertation; practical work, e.g. in a laboratory)
- the time required to prepare for and undergo the assessment procedure (e.g. exams)

Since workload is an estimation of the average time spent by students to achieve the expected learning outcomes, the actual time spent by an individual student may differ from this estimate. Individual students differ because some progress more quickly, while others progress more slowly. Therefore, the workload estimation should be based on the time an "average student" spends on self-study and preparation for classes and exams. The initial estimation of workload should be regularly refined through monitoring and student feedback.

The peers point out that MUST also needs to define how many hours of students' total workload is require for one ECTS point. This information should be anchored in an official regulation and made transparent.

In summary, the peers expect the Faculty of Medicine to verify the students' total workload and to adjust the awarded ECTS credits accordingly.

The students confirm in discussion with the peers that the workload is high but manageable and that it is possible to finish the programmes within two years.

Based on the study plans, the statistical data, and the students' comments, the peers conclude that there are no obstacles to the quality of teaching and the level of education due to the workload. However, MUST and the Faculty of Medicine did not provide any information on the average length of studies and the number of students that drop-out of the programmes. Since this data is important for verifying the success of the programmes, the peers ask MUST to provide statistical information on the average length of studies and the number of drop-outs for each of the three programmes.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Study plans
- Module descriptions

Preliminary assessment and analysis of the peers:
All three Master's programmes under review are face-to-face degrees, which make use of different educational methods for each course such as laboratory work, presentations, assignments, seminars, lectures, clerkships, and research project.

The teaching staff uses formal teaching methods that involve audio-visual presentations by using PowerPoint and other video formats. Tutorials are also used for preparing the presentations.

Predesigned laboratory experiments are compulsory for students to gain hands-on experience. Written assignments such as term papers are frequently used as tools to promote critical thinking and scientific writing skills and literature search abilities. In-class exercises are often included. Most classes also promote class participation and discussion. In several courses, students are given presentation assignments to promote their scientific presentation skills.

In the clinical courses (especially in MPCP), there is a focus on patient-centred care and clinical monitoring including different types of physical assessments, e.g. for drug-related

problems are conducted as well as medication administered. In addition, students receive experiential education and develop clinical skills such as taking classic vital signs from patients to monitor their therapy. This is done both at the Mbarara Regional Referral Hospital and in surrounding communities. Students take various course modules both in the classroom and at the hospital where they interface with patients, caregivers, and other healthcare providers in an interdisciplinary manner to foster inter-professional communication skills and team-based learning.

MUST's educational model is intended to actively involve students in the learning processes, and focuses on continuous assessment. Therefore, training activities and assessment forms applied in the courses should facilitate the acquisition of the intended learning outcomes.

There is an electronic learning platform at MUST, which is called the Learning Management System (LMS). It is a customization of an Open-Source platform called "Claroline". It is hosted under the university's official domain. LMS is a web-based system which was chosen on the basis of its ease of use while ensuring online interaction between academic staff and students. Teachers and students use LMS to present documents and interact with each other. Via the platform, students can access electronic mails and academic information and register for courses online. There are also discussion forums on the e-platform where students can interact with each other as well as with the academic staff members.

In summary, the auditors consider the applied teaching methods and the underlying didactic concept as appropriate and helpful in supporting the students in achieving the intended learning outcomes.

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Reports
- Discussions during the audit

Preliminary assessment and analysis of the peers:

Social counselling at MUST is provided by the Dean of Student's Office at the Faculty of Medicine, while the responsibility for academic counselling lies with the staff members of the Faculty of Medicine.

MUST also employs professional counsellors, who offer psychosocial support to both students and staff. The counsellors use face-to-face discussions and online digital platforms for their support.

In addition, MUST and the Faculty of Medicine support students' extracurricular interests through different activities like the Inter-Faculty Sports Competitions, the Cultural Gala, the International Students Gala, and several student associations. In addition, free medical services for standard procedures are provided at the University Clinic.

The programme coordinators meet with their students at least once a semester, but in addition, it would be useful to assign a teacher as an advisor/mentor, who is different from the programme coordinator, to each Master's student at the beginning of the programme. The task of the advisor would be to give academic and personal advice, to discuss suitable topics for the Master's thesis, and to help with career planning. However, the students confirm during the discussion with the peers that all teachers are approachable and offer help and guidance if needed. This is facilitated by the small number of students in each programme, so that there is enough room for personal contact between teachers and students. The identification of students, teachers, and stakeholder with MUST is one of the strong points of the programme.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

The peers are pleased to learn that MUST acknowledges the challenge to define an adequate set of conditions for recognising credits acquired outside MUST, which should be aligned with the Lisbon Convention.

The peers thank MUST for providing information on the number of drop-outs in the three Master's programmes for the academic years 2021/2022 and 2022/2023. As the peers derive from the submitted table, there are almost no drop-outs in the programme, which is important because the number of registered students is already quite low. The only two drop-outs occurred in the Master of Science in Pharmacology in the academic year 2021/22. This is a low number but since only three students have registered in this programme in that semester, only one student in that batch remains. MUST should find out for what reason the students left the programmes in order to establish suitable measures for preventing more drop-outs in the future.

The peers consider criterion 2 to be mostly fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Module descriptions
- Study plans
- Examination Regulations

Preliminary assessment and analysis of the peers:
According to the Self-Assessment Report, the following forms of assessment are applied: written tests, practical tests, fieldwork, logbook, mid-semester assessment, and final exam. In clinical disciplines, the final exam will include both written and clinical examinations. Coursework (tests, fieldwork, logbook, mid-semester exams) accounts for 40%, while the final exams account for 60% of the final mark.

The most common evaluation types used are written examinations; however, quizzes, laboratory work, assignments (small projects, reports, etc.), presentations, seminars, and discussions may contribute to the final grade. Written examinations, either closed-book or open-book, typically include short answers, essays, problem-solving or case-based questions, and calculation problems. The grade from laboratory work usually consists of laboratory skills, discussions, reports, and oral exams.

The minimum class attendance in each course is 80 % of lectures, tutorials, and practical sessions. If minimum attendance is not achieved, the student may not take part at the final exam. If a student fails an examination (score a mark below 60%, corresponding to a grade point less than 3.0 or grade letter F) she or he can retake the course when it is next offered. The student is required to follow the course when it is next offered by taking classes, course works, and examinations. Student who provides a credible reason (e.g. illness) for failure to complete coursework assessment or to attend an examination may be permitted to re-sit the deferred examination or other coursework assignments.

Students who have failed more than 15 % of the courses offered in an academic year, are not allowed to proceed to the next academic year. They are required to retake the failed courses, that is take the classes, re-do course work, and examinations. Students need to pay a specified unit cost for the retake. A failed course can be repeated two times, students who fail the course on the third attempt will be exempted.

The grading scheme at MUST is depicted in the following table:

Grade	Range of Marks (%)	Grade Point
A	80 – 100	5
B+	75 – 79.9	4.5
B	70 – 74.9	4
C+	65 – 69.9	3.5
C	60 – 64.9	3
F	0 – 59.9	F

Table 3: Grading Scheme, Source: MUST Self-Assessment Report

Students can appeal their grades; they need to report the complaint first to the Head of Department, who will request the concerned teacher to resolve the matter. In case the examiner fails to resolve the matter, the Head of Department will forward the case to the Faculty's Examinations Board. An appeal to the University Senate is possible if the faculty fails to resolve the matter.

The Master's thesis is prepared by writing a research proposal based on a problem identified by the student. It includes conducting the research activities, writing the dissertation, and making an oral defence before a panel of examiners and the university community. This is a requirement for all postgraduate students in the Faculty of Medicine. Students who conduct their thesis outside MUST are expected to have onsite supervisors to ensure the quality of work. The supervisors are normally given an appointment letter by MUST.

The students confirm that they are well informed about the examination schedule, the examination form, and the grading rules.

The peers conclude that the criteria regarding the examinations system, concept, and organization of exams are fulfilled and that the examinations are suitable to verify whether the intended learning outcomes are achieved or not.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

MUST does not comment on this criterion in its statement.

The peers consider criterion 3 to be fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Staff Handbook
- Human Resource Manual
- MUST Annual Report 2020

Preliminary assessment and analysis of the peers:

At MUST, the full-time staff members hold various academic positions. There are full professors, associate professors, lecturers, teaching assistants and non-teaching staff members. Specifically, at the Faculty of Medicine, there are 4 professors, 14 associate professors, 26 senior lecturers, 53 lecturers, 32 assistant lecturers, and 11 teaching assistants. In addition, the Faculty of Medicine has 51 non-teaching staff members. The majority are laboratory technicians (34), but there are also administrators (2), secretaries (4), office attendants (6), skills lab coordinator (1), community-based health facilitators (2), a theatre assistant, and a guest house attendant. The details are shown in the following table:

Designation	Male	Female	Comments
Professor	4	0	2 are Cubans; 1 is the Director of MNCHI
Assoc. Professor	12	2	Of the 2 female, 1 is a Cuban, the other is the Dean. Male: 1 the Director of DRGT.
Senior Lecturer	18	8	2 of the females benefited from the October, 2020 internal recruitment.
Lecturer	40	13	2 of the 11 females are visiting lecturers from the UK.
Assistant Lecturer	24	8	
Teaching Assistant	10	1	3 completed Master's degrees.
Total	107	30	

Table 4: Staff Members, Source: MUST Annual Report 2020

The academic position of each teacher is mainly based on academic qualification as well as research and teaching activities. For example, assistant lecturers need a Master's degree, while senior lecturers, associate, and full professors need a PhD degree. However, during the discussion with the teachers, the peers learn that even if a teacher fulfils all requirements for a promotion, achieving this new position depends on the availability of funds.

The Faculty of Medicine even loose qualified teachers to other institutions due to delayed appointments (for the case of teaching assistants) and promotions due to limitations in funding. This is an unfortunate situation, but the available financial resources, as provided by the Ugandan government, are limited.

Guest lecturers come from different universities in Uganda and from other countries (e.g., India, Sudan, Cameroon, and Kenya) to teach at the Faculty of Medicine. Some guest lectures are industry experts, who are not necessarily involved in academia fulltime. The share of teaching covered by guest lecturers is around 30 % in MPCP and 60 % in MPNMS. On the other hand, there were no guest lecturers in MSP Pharmacology with the last few years. The share of teaching load covered by guest lecturers is quite high, which is due to the difficulties with respect to hiring qualified staff members. It is easier for the Faculty of Medicine to invite guest lecturers who then fill in for missing permanent teachers. The peers appreciate the good contact with companies and the involvement of international guest lecturers in the programmes.

The peers discuss with MUST's management how new staff members are hired. Vacancies are publicly announced via the official webpage of the University. MUST hires new staff members according to the needs and requests of the departments. Qualified applicants are assessed by the departments and then their applications are considered by the University Appointments and Recruitments Board. New academic staff members are usually employed as assistant lecturers or teaching assistants. The MUST Human Resource Manual describes further details about the application and decision-making process.

Master's students are also involved in teaching undergraduate students, which helps to overcome some of the restrictions due to the lack of full-time teachers. There is also a cooperation between MUST and Makerere University (the most prominent university in Uganda) with respect to staff support and providing research opportunities for students. So, some teachers from Makerere University teach for a limited time at MUST and students from MUST can use the facilities and laboratories at Makerere University.

The peers see that the teachers at the Faculty of Medicine are professionally qualified and several obtained their PhD degrees from abroad. Their research and teaching qualification profiles fit well with the scientific focus of the degree programmes. In addition, the peers appreciate that a high number of teachers have a PhD degree.

Nevertheless, recruitment of more qualified teachers who have the necessary scientific expertise in the required areas is difficult and one of the biggest challenges for MUST and the Faculty of Medicine. This is due to the limited financial resources, which MUST receives from the Ugandan government. MUST not only tries to recruit new teachers from Uganda but also from other African countries and from oversees. To this end, the available financial

resources are prioritised with the goal of providing sufficient financial resources for key programmes such as the three Master's programmes under review. Since funding from the Ugandan government is limited, MUST needs to decide how to best spend the available resources in order to achieve its strategic goals. However, the goal must be to hire more permanent staff members and not to rely on guest lecturers from other countries to such a large extent.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Human Resource Manual
- Staff Handbook

Preliminary assessment and analysis of the peers:

As stated in the Human Resource Manual, staff members have the opportunity to improve their professional skills as well as advancing their academic career by pursuing further studies. To this end, interested staff members usually search for relevant courses and apply to pursue them. A number of staff are currently pursuing their PhD, others are on fellowships, and many have undertaken short term courses to develop/upgrade their expertise.

A university committee called "Staff Development Committee" is responsible for organising staff development. It supports staff members applying to further their academic and professional development and recommends them to organisations, which provide scholarships.

Since the funds from MUST are limited, financial support for stays abroad are mostly provided by international organisations. Staff are also usually given academic leave by the university when they attend universities abroad for higher qualifications. Moreover, teachers can apply for research funds either on university or on national level. But the competition is high and only few projects receive additional funds. For this reason, several teachers receive financial support from international organisations such as the DAAD, WHO etc.

In addition, there is the Pharm-Biotechnology and Traditional Medicine Center (PHARMBIOTRAC) located at MUST. It is one the 24 African of Centers of Excellence for Higher Education in Eastern and Southern Africa set up and financed by the World Bank and regional governments. PHARMBIOTRAC has the task to build capacity in the region to train and raise

a critical mass of specialized and skilled human capital (specialists) that can use multidisciplinary and transdisciplinary approach to advance drug discovery, biotechnology applications, bio manufacturing, and traditional medicine.

Moreover, short course on specialised fields like project management, institutional leadership, financial management, good clinical practice, health research ethics, laboratory animal training, post graduate teaching and supervision, intellectual property as well as key technological training on specialised laboratory equipment use are offered by PHARMBIOTRAC.

During the discussion with the peers, the staff members point out that the opportunities for improving their teaching and didactic skills are rather limited. For this reason, the peers consider it important that MUST and the Faculty of Medicine provide more opportunities for teachers to further develop their pedagogical skills.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Reports
- Discussions during the audit
- Visitation of the facilities

Preliminary assessment and analysis of the peers:

MUST provides funding for all three Master's programmes. The primary source of income are the funds provided by the Ugandan government. The university's budget is assigned by the Ugandan government, also tuition and functional fees are first paid to the government before the funds are transferred to MUST. The same procedure is applied for financial resources provided by the World Bank. However, funds from the World Bank are mainly used for improving the infrastructure and facilities, whereas the funds from the government cover the salaries of all the employees.

As the peers observe during the audit, facilities at the "old" town campus are limited, but a new campus in Kihumuro, just outside Mbarara, is already under construction and eventually almost all faculties will move there, which will result in improved facilities in general and more laboratory space in particular. During the audit, the peers visit the old as well as the new campus and observe that the new laboratories are well equipped and have sufficient space for teaching students as well as for conducting research activities. The old laboratories are also sufficiently equipped for teaching students, but are limited with respect to working places.

For conducting research activities, the Faculty of Medicine has established several laboratories and is cooperating with some private laboratories on campus such as the "Epicentre", which is operated by the "Medecins Sans Frontieres". The Epicentre focuses on epidemiology and collaborates closely with MUST, the Mbarara Regional Referral Hospital in order to conduct health related research, which is relevant to Africa and Uganda in particular.

A small animal lab for animal research, primarily to test the effects of herbal ingredients on rats/mice, is also available for lecturer and students. In these facilities, teachers and students can conduct their research activities.

In addition, there is a simulation lab, which is equipped with mannequins (Sim Man) of different complexity, where Clinical Pharmacy students can get first-hand practical experience on how to diagnose problems, therapeutic drug monitoring and how to apply the correct treatment and drugs.

During the discussion with the peers, the students express their satisfaction with the library and the available books and access to electronic literature and scientific databases.

In general, there are sufficient training resources available for adequately teaching the students and for conducting research activities. In addition, the peers consider the available technical equipment, and the infrastructure (laboratories, library) to comply – besides the mentioned restrictions- with the requirements for adequately sustaining the degree programmes.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

MUST does not comment on this criterion in its statement.

The peers consider criterion 4 to be fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Self-Assessment Reports
- Module descriptions

Preliminary assessment and analysis of the peers:
MUST provides module descriptions that include all necessary information about teaching methods, awarded credits, intended learning outcomes, content, admission and examination requirements, forms of assessment, details explaining how the final mark is calculated, and biographical references. However, while analysing the module handbooks, the peers see that the module descriptions (course outlines) do not include the necessary information about the awarded ECTS points and the students' total workload (contact hours, time for self-studies). For this reason, the peers expect MUST to update the module descriptions and include all required information.

In addition, the peers point out that the module descriptions should be accessible to all stakeholders. This could, for example, be done by publishing them on the respective programme's webpage.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Sample Transcript of Records
- Sample Diploma Certificate
- Sample Diploma Supplement

Preliminary assessment and analysis of the peers:
The peer group observes that so far MUST does not issue a Diploma Supplement to its graduates. For this reason, the peers expect MUST to draft a Diploma Supplement and to hand it out to every student upon graduation. The Diploma Supplement should be aligned with the template as provided by the European Union.

The Diploma Supplement is a document which provides information that makes it easier for employers and education institutions to understand the acquired qualifications. Especially if graduates apply abroad for a job or courses, it can be challenging to explain what the study programme has covered. The Diploma Supplement provides information on the type and level of qualification awarded, the institution that issued the qualification, the content of the programme and results gained, and details of the national education system.

The submitted sample Transcripts of Records lists all attended courses, the achieved credits, grades, and cumulative GPA. However, the Transcript of Records should also mention the awarded ECTS points for each course.

Criterion 5.3 Relevant rules

Evidence:

- Self-Assessment Reports
- Webpage MUST: https://med.must.ac.ug/
- Webpage Ma Pharmacology: https://www.must.ac.ug/postgraduate-programs/master-of-science-in-pharmacology/
- Webpage Ma Clinical Pharmacy: https://www.must.ac.ug/postgraduate-programs/master-of-pharmacy-clinical-pharmacy/
- Webpage Ma Pharmacognosy and Natural Medicine Science: https://www.must.ac.ug/postgraduate-programs/master-of-science-in-pharmacognosy-and-natural-medicine-sciences/

Preliminary assessment and analysis of the peers:

The peers confirm that the rights and duties of both MUST and the students are clearly defined and binding. Most regulations are published in English on the university's webpage.

However, it is necessary to make all relevant information about the degree programme (complete module handbook, academic guidelines) available to all stakeholders, e.g. by publishing them on the homepage of the respective programme.

In addition, MUST needs to draft a guideline for recognising credits achieved outside the university, which should be aligned with the Lisbon Convention (see criterion 2.1).

Finally, the peers point out that the information on the number of awarded credits for each degree programme needs to be consistent in all documents. This has been corrected in the respective documents (Master of Science in Pharmacology Curriculum and Master of Science in Pharmacognosy and Natural Medicine Science)

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

The peers appreciate that MUST will make the module descriptions available to stakeholders by publishing them on the respective programme's website. In addition, the Transcript of Records will be updated to include the awarded ECTS points for each course. Finally, MUST has corrected the information on the number of awarded credits for each degree programme in all relevant documents. The peers expect MUST to submit the updated and corrected documents in the further course of the procedure.

The peers consider criterion 5 to be mostly fulfilled.

6. Quality management: quality assessment and development

Evidence:

- Self-Assessment Reports
- Discussions during the audit

Preliminary assessment and analysis of the peers:

All degree programmes at MUST are subject to external evaluation by the National Council for Higher Education. This evaluation is conducted every five years. During this period, minor changes are possible, which allows the programme coordinators to continuously improve the modules and the programme as a whole.

Students at MUST have a leadership structure called "Student's Guild"; its members are elected by their fellow students. The Student's Guild is represented on the academic and governing boards of MUST. For example, there are five students' representatives in the Faculty Board, two students' representatives in the Faculty Quality Assurance Committee, three students' representatives in the Postgraduate Committee, two student representatives in the University Quality Assurance Committee, two students' representatives in the University Senate, and two students' representatives in the University Council. In addition, each batch of Master's students has a Class Representative who gives feedback to the respective programme coordinator if there are some issues to solve. There is also a representative of postgraduate students on the Student's Guild.

The University Senate is responsible for the organization, control and direction of the academic matters of the university and shall be in charge of the teaching, research and general standards of education and their assessment. The University Council is the supreme organ of a public University in Uganda and as such responsible for the overall administration of the University.

While the Faculty of Medicine has a Quality Assurance Committee, it also has five working committees of the Faculty Board, which handle different aspects that assure quality education. These include the Faculty Research Committee, Postgraduate Committee, Mature Age Entry and Exemption Committee, Clinical Service Committee, Appointments and Promotions Committee.

The Quality Assurance Committee coordinates and manages the procedures which assures the quality and standards of both undergraduate and postgraduate courses within the Faculty of Medicine. Together with the departments, it ensures that the curricula adhere to the minimum requirements of the National Council for Higher Education (NCHE); considers

proposed amendments to programmes and curricula before they are submitted to the Office of the Academic Registrar. The committee receives and considers students' examination appeals; receives and considers students' evaluation of lecturers' performance. The Quality Assurance Committee, which takes into consideration the suggestions from the different departments also has students' representatives as members. However, there is no similar committee at department level. The peers think that it would be useful of setting up a similar committee at department level and make not only teachers but also students members of this committee. The Faculty of Medicine with 24 departments is very large, so it is not feasible for them to discuss about all the offered programmes in detail and participating students maybe from totally different study programmes. For this reason, it would be useful to institutionalise the involvement of the departments and the students by establishing an official curriculum committee on department or programme level.

Relevant stakeholders are periodically involved in surveys that ask for their feedback and also submit their concerns and suggestions through their faculty representatives who sit on the University Senate and other committees.

According to the Quality Assurance Framework for Universities in Uganda, every higher education institution must have appropriate and effective internal structures and mechanisms for monitoring its institution quality control procedures to ensure quality. This includes that all teachers at university level are assessed by the students in a standardized format at the end of each course. Students need to have the opportunity to assess academic staff performance. For this reason, there are mandatory course evaluations every semester at MUST, where students give their feedback on the courses through anonymous online questionnaires. They assess various aspects such as students' understanding, lecturer's preparation, course delivery, lecturer's proficiency, explanation of course objectives, and references in each enrolled course.

The questionnaires are used to monitor and evaluate the learning processes and the Heads of Department collect, analyse, and evaluate students' feedback and send the results to the respective teacher. If there is critique, the Department Head invites the concerned teacher to discuss about his or her teaching methods and thus, they are expected to improve their performance in the future.

During the audit, the students confirm that the satisfaction questionnaires are conducted regularly but point out that they are not directly informed about the results. The peers emphasise that it is important to close the feedback cycles. For this reason, there should be an institutionalised procedure, which makes sure that all teachers are required to discuss directly with the students about the results of the satisfaction questionnaires and possible improvements.

The employers express their satisfaction with the qualification profile of the graduates and stress that they benefit from the cooperation with the Faculty of Medicine. The peers appreciate the close contacts between the employers and the university and confirm that the graduates of all three Master's programmes have good job perspectives.

The peers discuss during the audit, whether there are regular meetings with employers from private companies or governmental institutions where they discuss the needs and requirements of the job market and possible improvement to the programmes. They learn that some employers and alumni are invited to give their feedback on the content of the degree programmes and participate in tracer studies. The peers appreciate that MUST stays in contact with its alumni and has a close relation with its partners. However, an advisory board with external stakeholders does not exist. As the peers consider the input of the employers to be very important for the further improvement of the degree programme, they appreciate the existing culture of quality assurance with the involvement of employers in the quality assurance process. Nevertheless, they recommend establishing an academic advisory board at the Faculty of Medicine and to invite them regularly to discuss the needs of the job market and how to further develop the programmes. The advisory board should consist of a group of professionals, employers, and experts of the relevant fields from outside the university.

External quality assessment of the degree programmes is provided by the National Council for Higher Education (NCHE) every five years. This national standard of higher education was designed to encourage educational institutions to improve their performance in providing quality education services. Moreover, the objective of this standard is to support transparency and accountability in the implementation of the national education system.

In summary, the peer group confirms that the quality management system is suitable for identifying weaknesses and improving the degree programmes. The students are involved in the process, but the feedback loops need to be closed and the students' involvement in the curriculum committee could be improved.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

MUST does not comment on this criterion in its statement.

The peers consider criterion 6 to be mostly fulfilled.

D Additional Documents

Before preparing their final assessment, the panel asks that the following missing or unclear information should be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

- Current numbers (2021/22, 2022/23) on applications and registered students for all three programmes.
- Statistical information on the average length of studies and the number of drop-outs for each of the three programmes.

E Comment of the Higher Education Institution (06.01.2023)

MUST provides a short comment on the report and submits the following additional information:

Tables showing current numbers (2021/2022, 2022/2023) on applications and registered students for all three programmes, and statistical information on the average length of studies and the number of drop-outs for each of the three programmes.

Table A: Academic Year 2021/2022

Item	**Master of Pharmacy in Clinical Pharmacy**	**Master of Science in Pharmacognosy and Natural Medicine Science**	**Master of Science in Pharmacology**
Number of Applicants	13	7	20
Number Admitted	10	5	13
Number of Registered Students	6	0	3
Number of Dropouts	0	0	2
Average length of Study	2 years	2 years	2 years

Table B: Academic Year 2022/2023

Item	**Master of Pharmacy in Clinical Pharmacy**	**Master of Science in Pharmacognosy and Natural Medicine Science**	**Master of Science in Pharmacology**
Number of Applicants	12	3	10
Number Admitted	9	1	5
Number of Registered Students	6	0	3
Number of Dropouts	0	0	0
Average length of Study	2 years	2 years	2 years

F Summary: Peer recommendations (25.01.2023)

Taking into account the additional information and the comments given by MUST, the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Master of Science in Pharmacology	With requirements for one year	-	30.09.2028
Master of Pharmacy in Clinical Pharmacy	With requirements for one year	-	30.09.2028
Master of Science in Pharmacognosy and Natural Medicine Science	With requirements for one year	-	30.09.2028

Requirements

For all degree programmes

A 1. (ASIIN 2.1) Draft a guideline on the recognition of credits achieved at universities outside MUST.

A 2. (ASIIN 2.2) Verify the students' total workload and award ECTS points for each course.

A 3. (ASIIN 2.2) Make transparent how many hours of students' total workload are required for one ECTS point. This should be anchored in an official regulation.

A 4. (ASIIN 5.1) The module descriptions need to include information about the students' total workload and the awarded ECTS points.

A 5. (ASIIN 5.2) Award a Diploma Supplement to all graduates.

A 6. (ASIIN 5.3) The information on the awarded credits for each degree programme needs to be consistent in all relevant documents.

A 7. (ASIIN 5.3) Make all relevant information about the degree programme (complete module handbook, academic guidelines) available to all stakeholders, e.g. by publishing them on the English homepage of the respective programme.

A 8. (ASIIN 6) Close the feedback cycles and make sure that all teachers discuss with their students about the results of the satisfaction questionnaires and what changes might be possible.

Recommendations

For all degree programmes

E 1. (ASIIN 2.1) It is recommended to further promote the academic mobility of the students.

E 2. (ASIIN 2.4) It is recommended to provide all Master's students with an academic advisor.

E 3. (ASIIN 4.3) It is recommended to provide scholarships based on academic merits and financial needs.

E 4. (ASIIN 5.3) It is recommended to include the number of awarded ECTS points for each course in the study plans.

E 5. (ASIIN 6) It is recommended to establish an advisory board with external stakeholders at the Faculty of Medicine.

E 6. (ASIIN 6) It is recommended to establish a curriculum committee on department level with students' representatives as members.

G Comment of the Technical Committees (15.03.2023)

Technical Committee 09- Chemistry, Pharmacy (15.03.2023)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and agrees with the peers' assessment. The proposed requirements and recommendations are supported without any changes.

The Technical Committee 09 – Chemistry, Pharmacy recommends the award of the seals as follows:

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Master of Science in Pharmacology	With requirements for one year	-	30.09.2028
Master of Pharmacy in Clinical Pharmacy	With requirements for one year	-	30.09.2028
Master of Science in Pharmacognosy and Natural Medicine Science	With requirements for one year	-	30.09.2028

Technical Committee 14- Medicine (06.03.2023)

Assessment and analysis for the award of the ASIIN seal:

Overall, the Technical Committee is satisfied with the programmes under review; the four proposed requirements primarily concern formal aspects such as the module descriptions, the Diploma Supplement, the recognition of credits achieved outside MUST, the awarding

of ECTS credits and the information on the homepage. These are all typical points of criticism in procedures with universities which are new to international accreditation procedures. In addition, six recommendations are proposed.

The Technical Committee discusses the procedure and shares the positive assessment of the expert group. It also sees that MUST is suffering from financial bottlenecks because the government does not pass on all the funds from the World Bank. This has the consequence that at the moment no scholarships can be given to students and therefore the number of new students is very low. To counter this problem, the university plans to raise independent funds through a newly established foundation, which can then directly support the degree programmes. The proposed requirements and recommendations are supported.

The Technical Committee 14 – Medicine recommends the award of the seals as follows:

Degree Programme	**ASIIN seal**	**Subject-specific labels**	**Maximum duration of accreditation**
Master of Science in Pharmacology	With requirements for one year	-	30.09.2028
Master of Pharmacy in Clinical Pharmacy	With requirements for one year	-	30.09.2028
Master of Science in Pharmacognosy and Natural Medicine Science	With requirements for one year	-	30.09.2028

H Decision of the Accreditation Commission (24.03.2023)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission sees that the main problem of the degree programmes is the very low number of students, which is caused by the lack of scholarships. They expect that the new funding scheme will help to acquire additional funds that can be used for offering scholarships. The proposed requirements and recommendations are supported without any changes.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Master of Science in Pharmacology	With requirements for one year	-	30.09.2028
Master of Pharmacy in Clinical Pharmacy	With requirements for one year	-	30.09.2028
Master of Science in Pharmacognosy and Natural Medicine Science	With requirements for one year	-	30.09.2028

Requirements

For all degree programmes

A 1. (ASIIN 2.1) Draft a guideline on the recognition of credits achieved at universities outside MUST.

A 2. (ASIIN 2.2) Verify the students' total workload and award ECTS points for each course.

A 3. (ASIIN 2.2) Make transparent how many hours of students' total workload are required for one ECTS point. This should be anchored in an official regulation.

A 4. (ASIIN 5.1) The module descriptions need to include information about the students' total workload and the awarded ECTS points.

A 5. (ASIIN 5.2) Award a Diploma Supplement to all graduates.

A 6. (ASIIN 5.3) The information on the awarded credits for each degree programme needs to be consistent in all relevant documents.

A 7. (ASIIN 5.3) Make all relevant information about the degree programme (complete module handbook, academic guidelines) available to all stakeholders, e.g. by publishing them on the English homepage of the respective programme.

A 8. (ASIIN 6) Close the feedback cycles and make sure that all teachers discuss with their students about the results of the satisfaction questionnaires and what changes might be possible.

Recommendations

For all degree programmes

E 1. (ASIIN 2.1) It is recommended to further promote the academic mobility of the students.

E 2. (ASIIN 2.4) It is recommended to provide all Master's students with an academic advisor.

E 3. (ASIIN 4.3) It is recommended to provide scholarships based on academic merits and financial needs.

E 4. (ASIIN 5.3) It is recommended to include the number of awarded ECTS points for each course in the study plans.

E 5. (ASIIN 6) It is recommended to establish an advisory board with external stakeholders at the Faculty of Medicine.

E 6. (ASIIN 6) It is recommended to establish a curriculum committee on department level with students' representatives as members.

Appendix: Programme Learning Outcomes and Curricula

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Pharmacology:

"The aims of the MSc in Pharmacology program are to train graduate students in pharmacology who are knowledgeable, skilled and with the right attitude to advance the practice of pharmacology wherever they will be.

Specific objectives

1. Produce graduates with knowledge and skills necessary to function as teachers in a medical college or as consultants in hospitals or pharmaceutical establishments.
2. Develop the abilities for initiative, creativity and leadership.
3. Be able to utilize the qualities of sound judgment and logic in the critical analysis of scientific data.
4. Develop interest and skills in research, advance research into local medicinal products to produce locally effective drugs

Programme Learning Outcomes

1. Produce Competent pharmacologist and Toxicologist
2. Advance drug research in the country
3. Produce Teachers of Pharmacology for the country
4. Contribute to community development through advanced therapeutic research."

The following **curriculum** is presented:

Year 1, SEMESTER 1

Course Code	Course Name	Review status	Status (Core/Elective)	LH	PH	TH	CH	CU
PHA 7101	General Principles of Pharmacology	Modified	Core	45	-	0	45	3
PHA 7102	Neuropharmacology	Modified	Core	45	-	0	45	3
PHA 7103	Chemical, Endocrine and Autacoid Pharmacology	Modified	Core	45	-	0	45	3
PHA 7104	General Principles of Physiology and Biochemistry	Modified	Core	45	-	0	45	3
PHA 7105	Seminars in Pharmacology I	Modified	Core	-	90	0	45	3
PHA 7106	Drug Regulation, Development & Clinical Trials	Modified	Core	45	-	0	45	3
	TOTAL			**225**	**90**	**00**	**270**	**18**

Year 1, SEMESTER 2

Course Code	Course Name	Review status	Status (Core/Elective)	LH	PH	TH	CH	CU
PHA 7201	Pharmacology of Visceral Organs	Modified	Core	45	-	0	45	3
PHA 7202	Dermatological and Ocular Pharmacology	Modified	Core	45	-	0	45	3
PHA 7203	Clinical Chemotherapy and Immunomodulation	Modified	Core	45	-	0	45	3
PHA 7204	Toxicology	Modified	Core	26	38	0	45	3
EDU 7201	Introduction to teaching, Learning, assessment and evaluation relevant for health care professionals	New	Core	43	64	0	75	5
PHA 7206	Experimental Techniques and Instrumentation in Pharmacology	New	Core	30	30	0	45	3
	TOTAL			**234**	**132**	**0**	**300**	**20**

Year 1, SEMESTER 3 (RECESS)

Course Code	Course Title	Review status	Status (Core/Elective)	LH	PH	TH	CH	CU
PHA 7301	Research Placement Training	New	Core	-	90	0	45	5
	TOTAL			**-**	**90**	**00**	**45**	**5**

Year 2, SEMESTER 1

Course Code	Course Title	Review status	Status (Core/Elective)	LH	PH	TH	CH	CU
MPH 7102	Biostatistics	Modified	Core	45	0	0	45	3
MPH 7104	Research Methods and Survey Design	Modified	Core	45	0	0	45	3
MPH 7103	Epidemiology	Modified	Elective	45	0	0	45	3
PHA 8101	Pharmacology of Natural Products	Modified	Core	45	0	0	45	3
MSM 7101	General Microbiology/bacteriology	Modified	Core	15	60	30	60	4
PHA 8102	Therapeutics and Rational Drug Use	Modified	Core	45	0	0	45	3
MLM7101	Biorisk and Laboratory Quality Management.	New	Elective	30	30	60	75	5
PHA 8103	Dissertation Proposal Development	Modified	Core	0	90	0	45	3
	TOTAL			**270**	**180**	**90**	**405**	**27**

Year 2, SEMESTER 2

Course Code	Course Title	Review status	Status (Core/Elective)	LH	PH	TH	CH	CU
PHA 8201	Seminars in Pharmacology II	New	Core	0	90	0	45	3
PHA 8202	Dissertation	Modified	Core	0	150	0	75	5

	TOTAL			**0**	**240**	**0**	**120**	**8**

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Clinical Pharmacy:

"The overall aim of the Mbarara University of Science and Technology (MUST) Master of Pharmacy in Clinical Pharmacy degree program is to train clinical pharmacists who would be able to provide patient-centred care in a multidisciplinary approach by applying medical and therapeutic knowledge to clinical pharmacy practice in identifying, resolving and preventing medication related problem.

Core competencies/learning outcomes:

The Master of Pharmacy in Clinical Pharmacy curriculum at MUST is designed to prepare students to be entry level generalist Clinical pharmacists that can proactively integrate into the interdisciplinary healthcare team in order to collaboratively advance and deliver optimal patient care.

The curriculum is designed to produce pharmacists who have the abilities, skills and competence in the following areas:

- Provide patient care
- Apply medical and therapeutic knowledge to pharmacy practice
- Demonstrate a comprehensive approach to practice and care
- Demonstrate professional behavior
- Manage and Use the Resources of the Health-Care System
- Engage in Personal and Professional Development

A set of overall competencies have therefore been developed to represent what graduates are expected to be able to do as entry-level Clinical Pharmacists as a result of their education in the Master of Pharmacy in Clinical Pharmacy degree program. They are acquired across the length and breadth of the curriculum, and reflect the integration of knowledge, skills and attitudes learned in the curriculum.

By the end of the training program, the students should be able to:

- Apply evidence based practice in the daily clinical practice on identifying, resolving, and preventing medication related problems.
- Tailor medication therapy to patients needs and monitor medicines use to ensure optimal treatment
- Contribute to medication clinical knowledge & skills to the healthcare team
- Identify and reduce risks associated with medication use

- Health educate patients, caretakers and other health care professionals on medication therapy
- Identify sources, retrieve, evaluate, organize, assess and disseminate drug resources to the collaborating health team
- Identify opportunities through critical thinking and innovate clinical pharmacy services
- Review medication therapy (even the unknown) and provide appropriate advice
- Manage the pharmaceutical resources in a hospital/healthcare setting
- Work effectively in a multidisciplinary team
- Detect dangers/complications/adverse pharmaceutical events and refer patients appropriately
- Understand the role of complementary medicine in relation to conventional medicine in practice
- Create rapport effectively and counsel patients on the use of complimentary medicines
- Apply business and entrepreneurship skills
- Long life learning
- Conduct research, influence policy and health system management

Specific objectives

- To prepare graduates for a successful career in Pharmacy Profession with effective planning skills, problem analysing skills, leadership skills, communication skills, and professional ethics
- To create dynamic and proficient Pharmacists for their successful careers in Pharmaceutical industry, academia, government organization, hospitals, and other organizations and as an entrepreneur
- To inculcate in the graduates, the spirit of professionalism that will form the basis for integrated and multi-disciplinary approach to patient care in their practice of pharmacy
- To ensure that the students, upon graduation, will appreciate and demonstrate the importance and significance of research in advancing pharmaceutical care and developing sustainable life-long learning skills.
- To establish collaborative links with other schools of pharmacy for the promotion of mutual academic and research goals.”

The following **curriculum** is presented:

YEAR I SEMESTER I

COURSE	COURSE NAME	LH	PH	TH	CH	CU
MCP 6101	Pharmaco-epidemiology and vigilance	30	30	00	45	3
MPH 1102	Biostatistics.	45	30	00	60	4
MPH 1104	Survey Design and Research Methodology	30	30	00	45	3
MCP 6102	Clinical skills in pharmacy practice	00	60	30	45	3
MCP 6103	Principles of pharmaceutical care	45	30	30	75	5
MCP 6104	Entrepreneurship & Pharmaco-economics	15	30	30	45	3
TOTAL						21

YEAR I SEMESTER II

COURSE	COURSE NAME	LH	PH	TH	CH	CU
MPH 1204	Health Policy, Planning and Health Systems Management	45	00	00	60	3
MCP 6205	Advanced Clinical pharmacokinetics and Therapeutic drug monitoring	00	30	60	45	3
MCP 6206	Research Proposal development and presentation	00	150	00	75	5
MCP 6207	Pharmaceutical care - Infectious Diseases	15	60	30	60	4
MCP 6208	Pharmaceutical care - Non Communicable diseases	15	60	30	60	4
TOTAL						19

YEAR II SEMESTER I

COURSE	COURSE NAME	LH	PH	TH	CH	CU
MCP 7109	Pharmaceutical care in emergencies & critical care	30	30	30	60	4
MCP 7110	Role of a clinical pharmacist in the health Care system and Clinical trials	15	90	00	60	4
MCP 7111	Introduction to teaching, Learning, assessment and evaluation relevant for health care professionals	00	90	60	75	5
MCP 7112	Development and presentation of the Dissertation	00	150	00	75	5
MCP 7113	Scientific writing, responsible conduct of research & Research Communication	30	30	30	60	4
TOTAL						22

YEAR II SEMESTER II

COURSE	COURSE NAME	LH	PH	TH	CH	CU
MCP 7214	Complimentary medicines	30	60	30	75	5
MCP 7215	Clinical Oncology pharmacy	15	60	30	60	4
MCP 7216	Community health and pharmacy practice	30	30	00	45	3
MCP 7217	Defense of the Dissertation and manuscript writing	150	00	00	75	5
TOTAL						17
Graduation						79

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Pharmacognosy and Natural Medicine Science:

"Mission and Philosophy the Master of Pharmacognosy and Natural Medicine Science Program.

To provide the graduate with the relevant knowledge base, skills, attitudes, ethics and values to engage in advanced natural drugs and natural medicines level research, product development, production and business practice. The philosophy is 'Nature derived healthcare products the future of healthcare'.

Overall Aim of the Programme

The aim of the program is to prepare the graduates as specialist skilled human resource to exploit Africa's rich biodiversity to drive traditional/natural medicine industry in the African region. They will be able to employ their knowledge and skills to discover drugs from natural sources or living organisms and apply modern methods and tools such as biotechnology for their development and large-scale production in Africa.

Specific Objectives

To train scientists who are able to:

- Discover and develop natural drugs,
- Design and conduct experiments to test and identify the natural drugs.
- Extract, Isolate, purify and determine the active molecules from the natural drug source.
- To determine the molecular structure of the active molecules
- Apply biotechnology to produce or biosynthesize the drug molecules.
- Determine the preclinical efficacy and safety of the active molecules from the natural sources.
- Develop natural drug/traditional medicine formulas and their production methods into various modern dosage forms including tablets, capsules, syrups, inhalations, sprays, intravenous preparations.
- Understand the medicinal product value chain (including clinical trial phases) and pharmaceutical business world.
- Set up a medicinal product business along the value chain
- Understand and adhere to the laws, regulations, ethics, and agreements in the pharmaceutical business world.

Core competencies/Learning outcomes

Students should be able to

- Apply pharmacognostic methods to identify and classify natural drugs and traditional medicines
- Isolate, characterize, classify and quantify natural drug compounds
- Determine bioactivities, toxicities and safety of natural drug compounds and traditional medicine products.
- Produce raw materials, manufacture and manage distribution of natural drugs and traditional medicines
- Design quality assurance systems and carry out quality control tests for natural drugs and traditional medicines
- Interpret national and International laws and regulations governing natural drugs and tradition medicines
- Design and inspect facilities and equipment for natural drugs and traditional medicines
- Design and conduct research/experiments involving natural drugs
- Establish natural drugs and traditional medicines businesses”

The following **curriculum** is presented:

YEAR 1 SEMESTER 1: COURSE UNITS

Course code	Course name	LH	TH	PH	CH	CU
MPT6101	Introduction to Pharmacognosy and Natural medicine science	30	30	60	75	5
MPT6102	Pharmacobiotechnology	30	30	60	75	5
MPT6103	Chemistry of natural drugs I	30	30	60	75	5
MPH6104	Survey design and Research methods	30	0	30	45	3
MPH6102	Biostatistics	45	0	30	60	4
MPH 6101	Epidemiology	30	0	30	41	3
	Total:					**25**

YEAR 1 SEMESTER 2 COURSE UNITS

Course code	Course name	LH	TH	PH	CH	CU
MPT6203	Chemistry of natural drugs II	30	30	60	75	5
MPT6204	Pharmacology of Natural drugs	30	30	60	75	5
MPT6205	Complementary and Alternative Medicines	30	30	60	75	5
MPT6206	Production of natural drugs/medicines, supply chain and Regulations	30	45	60	60	4
MPT6207	Quality assurance and quality control of natural drugs/medicines products	15	30	30	45	3
MPH6206	Health Policy, Planning and Management (4 credit units)	45	0	0	45	3
	Total:					**25**

YEAR 2 SEMESTER 1 COURSE UNITS

Course code	course name	LH	TH	PH	CH	CU
MPT 7107	Industrial Placements	0	0	150	5	5
MPT7108	Research Proposal Development	30	90	00	75	5
RSR 7101	Responsible Conduct of Research, Scientific Writing & Research Communication	30	30	30	60	4
EDU7101	Introduction to teaching, Learning, assessment and evaluation	15	0	90	75	5
Total:		**75**	**120**	**210**	**255**	**19**

YEAR 2 SEMESTER 2 COURSE UNITS

Course code	course name	LH	TH	PH	CH	CU
MPT7208	Research Dissertation	00	60	90	75	5