FACULTY OF HEALTH SCIENCES &
VETERINARY MEDICINE

School of Pharmacy

Prospectus 2025

UNAM

PROSPECTUS 2025

SCHOOL OF PHARMACY

SCHOOL OF PHARMACY PREAMBLE

The mission of the School of Pharmacy is to be a Regional centre of excellence in preparing graduates for a life-long professional career in the provision of pharmaceutical care that is in tune with the needs of society. The School shall provide a quality learning environment conducive to the pursuit of professional competence, while providing services to the community and undertaking relevant translational research for the enhancement of health. The School will continually strive for the establishment of training programs in the field of pharmacy, lending support to the human resource development initiatives of the country; this will include the provision of Continuing Professional Development and postgraduate education of pharmacists, and the training and education of technical cadres and scientists. Finally, the School will seek pharmaceutical solutions in medicines access and supply through pharmaceutical production with research and development of existing medicines and novel agents particularly those derived from the rich natural resources of Namibia.

The key objectives of the School of Pharmacy are:

- To promote equity of access to health care services for all;
- To promote affordable health care service delivery by strengthening health care systems that are sustainable, cost-effective, efficient, culturally relevant and acceptable;
- To institute pharmaceutical care measures to counter major health risks including the prevailing communicable diseases;
- To develop academically and professionally qualified pharmacists in sufficient numbers to support the health care infrastructure of Namibia;
- To conduct research directed to the health care needs of the Namibian society at large, and which is instrumental in ensuring quality health care service delivery;
- To utilise the natural resources available and the skills and research generated in producing commercially viable quality pharmaceutical products.

SCHOOL OF PHARMACY OATH

All (Students and Faculty):

We pledge to serve our patients, their families, our community and each other with respect, competence, compassion, and humility. We hold as our ideal to care and treat all of our patients. From them we will learn. We hold as our ideal the advancement of knowledge. Through it disease will be understood, prevented and cured. We hold as our ideal open-minded collaboration. To this we are collectively committed.

We hold as our ideal critical self-evaluation. Through this we will grow.

Faculty:

We, your faculty, promise to serve as worthy role models, as our own teachers have before us.

Students:

We, your students, recognize the excellence and commitment of those from whom we learn.

Faculty:

We promise to support your personal and professional growth, in healthcare settings, in the laboratory, in the community, and through your own teaching.

Students:

We promise to pursue responsibly our calling to patient care, to service, and to research.

Faculty:

We promise to maintain an environment where scientific integrity and ethical standards sustain your trust in us.

Students:

We commit ourselves to the highest standards of academic honesty, scientific integrity and ethical practice as students and in our professional lives.

All (students and faculty members):

We honour The University of Namibia, the Health Professions Councils of Namibia and our Government's history of service to the people of this nation. We accept the challenges and opportunities of those alumni whom we follow. We vow to be professional, punctual and courteous. We vow to honour and respect life on earth, in all forms, crawling and reasoning, with intellect or with handicap, to be ambassadors of healthy living and a prosperous future. We vow to take to heart and mind that all men are created equal. We vow to uphold this pledge and our assistance to others who do the same.

UNIVERSITY OF NAMIBIA
FACULTY OF HEALTH SCIENCES AND VETERINARY MEDICINE
STRUCTURE AND PERSONNEL

OFFICE OF THE DEAN

Executive Dean	Prof J Hall
Associate Dean: School of Pharmacy	Mr B Singu
Faculty Manager	Mr A Fledersbacher
Campus Administrator	Ms D Titus
Faculty Officer	Ms A Shipanga
Administration Officer	Ms S Amia
Examination Officer	Mr M Kandukua
Student Records Officer	Mr M Nowaseb
Student Support Officer	Mr A Ngwangwama
Security Officer	Mr M Nakanyala
ICT Officer	Mr A Shikongo
Network Administrator	Mr S Shilongo

General enquiries regarding the school of Pharmacy and the qualifications offered by the School should be directed to:

Ms A Shipanga
The Faculty Officer
School of Pharmacy
University of Namibia
Private Bag 13301
WINDHOEK
Telephone: +264-61-2065145
Fax: +264 61- 2065093
E-mail: anshipanga@unam.na

Matters regarding specific subjects and departments should be addressed to the relevant Head of Department.

ACADEMIC CALENDAR – UNAM CORE DATES 2025

UNAM 2025 CORE DATES

SEMESTER 1	
09 January	University Open
21 January	Academic Staff Resumes Office Duties
17 April	First Semester Break commences for students (Until 23 April)
17 April	Vacation School Commerce for Distance Student (Until 28 March)
24 April	Lectures resume After FIRST SEMESTER BREAK
27 May	Institutional Holiday
11 July	End of FIRST SEMESTER
14-18 July	Mid-Year Break
SEMESTER 2	
25 August	Second semester BREAK for student commences (Until 29 August)
25 August	Vacation School commence for distance student (Until 29 August)
01 September	Lectures resume after SECOND SEMESTER BREAK
05 December	End of Second Semester
12 December	End of Academic Year
2026 ACADEMIC YEAR	
8 January	University opens for 2026 academic year
20 January	Academic staff resumes office duty for 2026 academic year

CANCELLATION DATES

DATE	DESCRIPTION
31 January	Last day to cancel Core Semester modules with 100% credit
05 February	Last day to cancel core semester modules with 100% credit – New curriculum students
14 February	Last day to cancel Core Semester modules with 50% credit
21 February	Last day to cancel Core Semester modules
21 February	Last day to cancel Semester 1 and Year modules with 100% credit (Old curriculum students)
14 March	Last day to cancel Semester 1 and Year modules with 100% credit (New curriculum students)
14 March	Last day to cancel Semester 1 modules with 50% credit (Old curriculum students)
14 April	Last day to cancel Semester 1 modules with 50% credit (New curriculum students)
28 April	Last day to cancel Semester 1 modules (All students) with 0% credit
7 July	Last day to cancel Year modules with 50% credit (All students)
11 August	Last day to cancel Semester 2 modules with 100% credit (All students)
1 September	Last day to cancel second semester modules with 50% credit – All students
29 September	Last day to cancel second semester and year modules (All Students) with 0% credit

Due Dates for the 2025 Academic Year

DATE	DESCRIPTION
24 January	Last day to apply for promotional exams (Final year students repeating one module to graduate in spring)
3 February	Last day to apply for re-mark for second semester and year modules.
7 February	Last day for approval of module(s) and qualification mode changes of First year students
14 February	Application for module(s) exemptions ends for First year students
14 March	Last day for approval of module(s) and qualification mode changes of Senior students
28 April	Last day to change offering types
25 July	Last day to apply for addition and cancellation of SECOND SEMESTER modules (starting 21 July)
1 August	Last day to apply for remark of first semester modules (starting 21 July)
1 September	Last day to submit outstanding documentation (please ensure you submit outstanding documents or you will be deregistered after deadline)
29 September	Last day to change offering types of second semester and year modules.
31 October	Last day to submit Theses and Dissertations for examinations (Postgraduate/High Degree Students)

UNAM DUE DATES FOR THE 2025 ACADEMIC YEAR

(i)	**GENERAL**	
	Last day for application of module(s) exemptions – New Curriculum Students	**14 February**
	Last day for application for exemption(s) for first year students	**14 February**
	Last day for application for exemption(s) old Curriculum	**14 February**
	Last day for approval of module exemption(s) Senior students	**14 March**
	Last day for approval of module(s) & qualification changes New Curriculum	**14 March**
	Last day for approval of module(s) & qualification changes Old Curriculum /Senior students	**14 March**
	Promotional Examinations	**14 February**
	Last day to apply for Promotional Examinations	**18 January**
	Last day for change of offering types	**28 April**
	Last day to change offering types at Regional Centres (Semester 2 modules)	**28 September**
	Last day to cancel enrolment	
	Last day to submit Theses and Dissertations for examinations	**31 October**
	Last day to apply for remark of first semester modules	**01 August**
(ii)	**ACADEMIC ADMINISTRATION**	
	CANCELLATIONS	
	• **Last date for cancellation for First Semester modules all students**	**30 April**
	• **Last day for approval of module(s) and qualification changes – New Curriculum students**	**09 February**
(iii)	**FINANCE**	
	Core Modules	
	• **Last day to cancel Core Semester modules with 100% credit – New Curriculum Students (SC)**	**31 January**
	• **Last date to cancel Core Semester modules with 50% credit – New Curriculum Students (SC)**	**14 February**
	Semester 1 Modules	
	• **Last day to cancel Semester 1 and Year modules with 100% credit – Old Curriculum Students**	**21 February**
	• **Last day to cancel Semester 1 and Year modules with 100% credit – New Curriculum Students (S0 and S1)**	**14 March**
	• **Last day to cancel Semester 1 modules with 50% credit – Old Curriculum Students**	**28 March**
	• **Last day to cancel Semester 1 modules with 50% credit – New Curriculum Students (S1)**	**14 April**
	• **Last day to cancel FIRST SEMESTER MODULES – All Students**	**28 April**
	• **Last day to cancel Year modules with 50% credit – All Students**	**07 July**
	Semester 2 Modules	
	• **Last day to cancel Semester 2 modules with 100% credit – All Students (S2)**	**11 August**
	• **Last day to cancel Semester 2 modules with 50% credit – All Students (S2)**	**01 September**
	• **Last day to cancel Semester 2 modules and Year modules - All Students**	**29 September**
	• **Addition and cancellation of Second Semester modules ends**	**30 July**

SCHOOL OF PHARMACY PLANNED ACTIVITIES 2025

January	
09-Jan	• **University Opens**
13-Jan	• Lectures commence for First Semester for Old and New curriculum Professional Programmes (BPharm 3 and BPharm 4) (16 weeks) (until 14 May)
20-Jan	• Core Semester lectures commence for BPharm 2 students (New curriculum) (Until 28 February)
27-Jan	• Core Semester lecture commences for BPharm 1 students (New curriculum) (Until 28 February)
February	
28-Feb	• Core Semester lectures end for BPharm 1 & 2 students
March	
03-Mar	• Lectures commence for First Semester for New curriculum Professional programmes (BPharm 1 & 2 students) (13 weeks) (until 13 June)
April	
17-Apr	• Semester break commences (until 22 Apr)
23-Apr	• Lectures resume after the First Semester break
May	
14-May	• Lectures end for First Semester for Old and New curriculum Professional Programmes (BPharm 3 and BPharm 4) (16 weeks) • Announcement of final CA Marks New curriculum Professional programs (BPharm 3 and BPharm 4)
19-May	• First opportunity Examinations commence for Old and New curriculum Professional Programmes (BPharm 3 and BPharm 4) (until 3 June)
June	
02 June	• Industrial placements commence for BPharm 3 students (until 27 June)
03-Jun	• First opportunity Examinations end for Old and New curriculum Professional Programmes (BPharm 3 and BPharm 4)
04-Jun	• Second opportunity Examinations commence for Old and New curriculum Professional Programmes (BPharm 3 and BPharm 4) (until 13 June)
13-Jun	• Lectures end for First Semester New Curriculum Professional programmes (BPharm 1 & 2 students) • Announcement of final CA Marks for New Curriculum Professional programmes (BPharm 1 & 2 students) • Second opportunity Examinations end for Old and New curriculum Professional Programmes (BPharm 3 and BPharm 4)
17-Jun	• First opportunity Examinations commence for New Professional programmes (BPharm 1 & 2 students) (until 30 June)
27 Jun	• Industrial placements end for BPharm 3 students
30-Jun	• First opportunity Examinations end for New curriculum Professional programmes (BPharm 1 & 2 students) • Rural Hospital placements commence for BPharm 2 students • Lectures commence for Second Semester end for Old and New curriculum Professional Programmes (BPharm 3 and BPharm 4) (16 weeks) (until 31 October)
July	
01-Jul	• Second opportunity Examinations commence for New Professional programmes (BPharm 1 & 2 students) (until 08 July)
08-Jul	• Second opportunity Examinations end for New Professional programmes (BPharm 1 & 2 students)
14-18 Jul	• **MID-YEAR BREAK**
25-Jul	• Rural Hospital placements end for BPharm 2 students
28-Jul	• Lectures commence for Second Semester for New curriculum Professional programmes (BPharm 1 & 2 students) (13 weeks) (until 31 October)
August	
25-Aug	• Semester Break starts (until 29 August)
29 Aug	• Semester Break ends
September	
01-Sept	• Lectures resume after Semester break (all BPharm students)
25-Sept	• World Pharmacy Day
October	
31- October	• Lectures end for Second Semester for Old & New curriculum Professional programmes (all BPharm students) • Announcement of final CA Marks for Old & New curriculum Professional programmes (all BPharm students)
November	
05-Nov	• First opportunity Examinations commence Old & New curriculum Professional programmes (all BPharm students) (until 18 November)
18-Nov	• First opportunity Examinations end for Old & New curriculum Professional programmes (all BPharm students)
19-Nov	• Second opportunity Examinations commence for Old & New curriculum Professional programmes (all BPharm students) (until 28 November)
24-Nov	• Community Pharmacy placements commence for BPharm 2 students (until 12 December)
28-Nov	• Second opportunity Examinations end for Old & New curriculum Professional programmes (all BPharm students)
December	
12-Dec	• **END OF ACADEMIC YEAR** • Community Pharmacy placements end for BPharm 2 students
January 2026	
08-Jan	• **University Opens**

ACADEMIC DEPARTMENTS

DEPARTMENT OF PHARMACOLOGY AND THERAPEUTICS

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Head of Department:	Mr. M. Mubita, BPharm, The University of Zambia; MSc (Clinical Pharmacy), Queen's University Belfast, UK; PhD (candidate), University of Namibia; Registered Pharmacist (HPCZ/HPCNA).
Professor:	Vacant
Senior Lecturer:	Mr. BS. Singu, BSc (Chemistry; Molecular& Physiological Biology); BPharm, University of Nairobi; MPharm (Clinical Pharmacology), University of Namibia; PhD (candidate), University of Namibia; Registered Pharmacist (HPCNA).
Lecturer:	Mr. DF. Chuma, BPharm (University of Zimbabwe); MSc (Clinical Pharmacology), University of Zimbabwe; PhD (candidate), University of Western Cape, SA; Registered Pharmacist (PCZ/MCAZ).
Lecturer:	Mr. MM. Thikukutu, BPharm (Hons), University of Namibia; Master of Pharmacy (Clinical Pharmacology), University of Namibia; Registered Pharmacist (HPCNA)
Senior Technologist:	Ms. NK. Ananias, BSc (Chemistry; Molecular & Physiological Biology), University of Namibia; MSc Chemistry, University of Namibia.
Part-Time Technologist:	Mr. JM. Ortmann, BSc (Hons)(Chemistry) University of Namibia; MSc (Chemistry), University of Namibia.
Visiting Professor:	Professor E Ette, BS (Pharmacology), BS (Pharmacy), MS (Pharmacology), MBA, PhD (Clinical Pharmacology), FCP, FCCP, FAAPS, FNAPharm

DEPARTMENT OF PHARMACEUTICAL SCIENCES

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Head of Department:	Dr A. Ishola, B. Sc. (Hons.) Applied Chemistry; Post Graduate Diploma in Education; M Phil HIV/AIDS Management, University of Stellenbosch; PhD Pharmaceutical Chemistry) University of Namibia
Professor:	Vacant
Associate Professor:	Prof. Edet F. Archibong, B.Sc. (Hons) Chemistry, University of Nigeria; M.Sc. - Inorganic Chemistry, University of Ibadan; Ph.D –Physical (Theoretical/Computational) Chemistry, University of New Brunswick, Fredericton, Canada.
Associate Professor:	Prof. M Knott, B. Pharm, MSc (Pharmacy) dist, PhD (Rhodes), MPS (SA), PSN Registered Pharmacist: HPCNA (Namibia), SAPC (South Africa), PCM (Malta / EU)
Senior Lecturer:	Mr. D. Mavu, BSc (Chemistry/Biology) The University of Zambia, BPharm The University of Zambia, MPharm (Pharmaceutics) University of the Western Cape, Member of Pharmacy Council Namibia, Member of health Professions Council Zambia
Lecturer	Mr. S !Nowaseb, BSc (Pharmacology) University College London, MSc (Pharmaceutical Technology), Kings College London
Lecturer:	Ms. S. Ilonga, MSc (Chemistry), University of Namibia; BSc (Chemistry and Molecular & Physiological Biology), University of Namibia
Assistant Lecturer:	Vacant
Assistant Lecturer:	Ms P Aiases, BPham (University of Namibia)
Senior Technologist:	Ms K. Angula, Chemistry, University of Stellenbosch; BSc (Chemistry and Molecular and Physiological Biology) University of Namibia. MSc Pharmaceutical Chemistry. North West University, Potchefstroom.
Senior Technologist:	Ms R Pick, BSc Biomedical Sciences, Cape Peninsula University of Technology
Technologist:	Ms. M. Lusepani, BSc (Chemistry and Molecular and Physiological Biology) University of Namibia.

DEPARTMENT OF PHARMACY PRACTICE AND POLICY

☎ (+264 61) 2065050 jlates@unam.na ✉ Private bag 13301, Windhoek, Namibia

Head of Department:	Ms. Jennie Lates, BPharm (Hons), University of Bradford; PGDip Clinical Pharmacy, University of Keele, MRPharmS; PGDip Higher Education, University of Namibia, MPharm (Pharmacy Practice), University of Namibia
Associate Professor:	Prof. Lauren Jonkman, PharmD, University of Pittsburgh (USA); Master of Public Health; University of Pittsburgh (USA); ASHP-Accredited 2-Year Post-Graduate Pharmacy Practice and Family Medicine Residency, UPMC St. Margaret (USA); Board-Certified Ambulatory Care Pharmacist (BC-ACP) by the Board of Pharmacy Specialties; Member of the International Pharmaceutical Federation (FIP), the American College of Clinical Pharmacy, and the American Association of Colleges of Pharmacy
Senior Lecturer:	Ms. Ester Hango, BPharm, University of Nairobi; MPH, University of Namibia; Registered Pharmacist, Pharmacy Council of Namibia; Member of Pharmaceutical Society of Namibia
Lecturer:	Ms Vulika Nangombe, BPharm (Hons), University of Namibia, MPharm (Clinical), University of Namibia; Registered Pharmacist, Pharmacy Council of Namibia; Member of International Pharmaceutical Federation; Member of Pharmaceutical Society of Namibia
Lecturer:	Ms Martha Kampanza, BPharm (Hons), University of Namibia; MPharm (Clinical), University of Namibia; Registered Pharmacist, Pharmacy Council of Namibia; Member of Pharmaceutical Society of Namibia
Lecturer:	Ms. Pia Simeon, BPharm (Hons), University of Namibia, MPharm (Clinical), University of Namibia; Registered Pharmacist, Pharmacy Council of Namibia; Member of Pharmaceutical Society of Namibia
Assistant Lecturer:	Ms Irene Brinkmann, BPharm (Hons), University of Namibia; Registered Pharmacist, Pharmacy Council of Namibia; Member of Pharmaceutical Society of Namibia
Pharmaceutical technologist:	Ms. Selma Moongo, Diploma in Pharmacy, University of Namibia
Visiting Professor:	Professor D. Hachey, PharmD, AAHIVP, Idaho State University, United States of America

REGULATIONS

The regulations should be read in conjunction with the General Information and Regulations prospectus

PROGRAMMES

BACHELOR OF PHARMACY (HONOURS)	**PHASED OUT AS OF 2023**	**18BPHA**
BACHELOR OF PHARMACY (HONOURS)	**NEW INTAKE AS OF 2023**	**27BPHA**
MASTER OF PHARMACY (CLINICAL)		**18MPHM**

THE 7 STAR PHARMACIST

The School of Pharmacy aspires to produce a pharmacy graduate with the following qualities and characteristics herein referred to as the 7 Star Pharmacist.

- Care Provider
- Decision-maker
- Communicator
- Community Leader
- Manager
- Researcher
- Life-long Learner

CURRICULUM FOR THE BACHELOR OF PHARMACY HONOURS

BPHARM (HONOURS)

NEW INTAKE AS OF 2023

COURSE CODE: 27BPHA

INTRODUCTION

The purpose of the transformed Bachelor of Pharmacy Honours curriculum is to enhance students with competences and skills relevant to the practice of pharmacy in fourth industrial revolution (4IR). In particular undertake roles to meet the national and global pharmaceutical development goals specified by the International Federation of Pharmacy and Pharmaceutical Sciences (FIP, goal 1-24), the SDGs (goal 3 and 9), and Namibia's Fifth National Development Plan, that call for industrialisation, digitalized pharmacy and innovation, leadership, among others. Thus, new components pertaining to 4IR skills have been integrated in the curriculum e.g. such as digital pharmacy, research and innovation design, management and leadership as well as emphasis on work integrated learning. The curriculum focusses more on approaches to assess for competences rather than knowledge, through work-based assessments, research and innovation projects and case-based discussions. Also, a blended mode of learning, teaching and assessments is emphasized throughout the curriculum, with student-centred learning and internationalisation.

MAJOR LEARNING OUTCOMES AND CONTENT OF THE COURSE

1. Practice pharmacy within legal requirements in a professional and ethical manner
2. Promote and support primary health care pharmaceutical services at health facilities and in the community
3. Provide up to date and relevant information to healthcare workers and community members on medicines used in the prevention, control and treatment of human and veterinary diseases
4. Analyse, interpret and dispense prescriptions and medication orders pertaining to human and veterinary medicines
5. Provide high quality patient-centred pharmaceutical care to optimise patient care and inter-professional relationships in the human and veterinary healthcare settings in public and private healthcare settings
6. Manage the manufacture of pharmaceuticals and related substances in a industry
7. Manage pharmaceutical supply chain systems, physical facilities, budget and human resources to advance pharmaceutical operations in various sectors of the pharmaceutical sector
8. Apply information and communication technology to manage pharmaceutical information systems in provision pharmaceutical services in all sectors
9. Innovate pharmaceutical solutions to resolve problems in the workplace and community
10. Conduct pharmaceutical and related research and audits to inform best practices

ADMISSION REQUIREMENTS

In order to be admitted to the Bachelor of Pharmacy Honours programme, applicants must satisfy at least one of the following requirements:

1. A candidate must be in possession of a School Leaving Certificate with at least:
   i) Thirty-four (34) points in five subjects on the UNAM Evaluation scale,
   Subject to the above;
   - The five subjects should include; Mathematics, Biology, Chemistry, Physics and English
   - With three (3) subjects on NSSCAS level, two of which must be Chemistry and Biology,
   - Chemistry with a minimum "b" or better at NSSCAS Level
   - Biology with a "c" or better at NSSCAS Level
   - Two (2) subjects on NSSCO level, must include Mathematics, if the candidate does not have Mathematics at NSSCAS level, each with a Grade B or better, AND
   - A grade B or better in NSSCO level English, OR a grade C in NSSCO level English with 36 points

   OR

   ii) Thirty-four (34) points in five subjects on the UNAM Evaluation scale,
   subject to the above:
   - With two (2) subjects, Chemistry and Biology, on NSSCAS level, with a Grade b,
   - Three (3) subjects on NSSCO level, with a B or better, (must include Mathematics, Physics and English) AND
   - A grade B or better in NSSCO level English, OR a grade C in NSSCO level English with 36 points

   OR

2. Admission criteria based on School Leaving Certificates prior to 2021
   A minimum of 34 points in five subjects on the UNAM Evaluation Scale.
   Subject to the above;
   - English with a minimum B symbol or better at NSSC Ordinary Level (or C symbol with a minimum of 36 points) or a score of grade 3 or better at NSSC Higher Level
   - Biology (or Life Science) with a minimum B symbol at NSSC Ordinary Level, or a grade 2 or better at NSSC Higher Level
   - Mathematics with a minimum B symbol or better at NSSC Ordinary Level, or a grade 2 or better at NSSC Higher Level
   - Physical Science or Chemistry with a minimum B symbol or better at NSSC Ordinary Level, or a grade 2 or better at NSSC Higher Level

   OR

3. To be admitted to the Bachelor of Pharmacy Honours programme, a candidate must have successfully completed a Science or Health Science degree (minimum NQF level 7) from a recognized University with passes in Science subjects including at least chemistry and biology OR biochemistry (if no chemistry and biology) AND mathematics, at least first year level.

OR

4. To be admitted to the Bachelor of Pharmacy Honours programme, a candidate must have successfully completed at least one year of a science or health science university Bachelor's degree or higher, with an average mark of at least 65% across all subjects in the first year, which must include a minimum of 60% in chemistry, biology AND mathematics

OR

5. To be admitted to the Bachelor of Pharmacy Honours programme, a candidate must be in possession of a Diploma in Pharmacy (NQF level 6) qualification with at least a lower second grade and have a score of 60% or more in each of the following topics: pharmaceutical sciences, pharmacology and pharmacy practice. In addition, the candidate should be registered with the HPCNA and have practiced for at least two (2) years as a Pharmacist's Assistant or Pharmaceutical Technologist.

Meeting the above student admission criteria DOES NOT necessarily ensure admission. Admission is awarded on merit and inclusivity based on places available on the programme and any other conditions that may be determined from time to time. The Faculty/School reserves the right to administer special written entry tests and interviews before admission.
The selection of applicants is done by the School of Pharmacy admissions committee that is inclusive of academics and other members from the public and registrar's office.

This programme will not take candidates from the Mature Age Entry or Recognition of Prior Learning (RPL) pathways.

5. Additional Selection Criteria
The selection for the Bachelor of Pharmacy Honours programme will constitute the following criteria;

a) First choice applicants: applicants who have applied for admission into the Bachelor Pharmacy Honours as a first choice will be prioritised during the selection for admission into the School of Pharmacy
b) Admissions will be based on a quota system; regional selection (based on the census) of high school leavers, international students, holders of Diploma in Pharmacy, Science or Health Science degree holders, and marginalized populations. Regional selection will use the region of the last school the applicant attended, to allocate an applicant to a specific region.
c) Highest points: all admissions into the Bachelor of Pharmacy Honours will be done on MERIT, that is among applicants that meet the minimum admission requirements, those with the highest points will be admitted, subject to the quota allocations and UNAM policies.
d) Admissions to the Bachelor of Pharmacy Honours is subject to the annual maximum intake determined by the University of Namibia and the Health Professions Councils of Namibia, as well as the number of students repeating year one of the programme.
e) Transfer of students from other programmes in other Schools in the UNAM Faculty of Health Sciences and Veterinary Medicine, including Medicine, Dentistry, Nursing and public health, Allied health and veterinary medicine, will be subjected to the approval by both Associate Deans of the concerned schools, as well as approval by the School and if they have obtained the minimum UNAM points as outlined above.

Transfer of students from other degree Pharmacy programmes from other institutions or universities, may be considered by the School based on availability of space and meeting the requirements.

6. Articulation Options
Graduates of the Bachelor of Pharmacy Honours programme may articulate into relevant postgraduate diploma and master's programmes.

7. Assessment Criteria
The assessment criteria for the Bachelor of Pharmacy Honours programme will constitute the following:
For modules assessed with Continuous Assessment (CA) and Examination:

a) a minimum CA mark of 50% is required to gain entrance into the relevant module examination.
b) In addition, the candidate should have regularly and satisfactorily participated in the module of study, by
    - attending not less than 80% of classes (both online and/or face-to-face classes).
    - full attendance of all clinical and practical classes is COMPULSORY.
c) the final mark for each module shall be calculated as 50% CA mark and 50% Exam mark unless stated otherwise in the module descriptor and,
d) a student shall be declared to have passed a module if they attain a final mark of at least 50% in the module, subject to getting a sub-minimum of 50% in the examination.

For modules assessed by 100% Continuous Assessment, a final aggregate mark of 50% shall be required to pass the module.

8. Quality Assurance Arrangements
The School of Pharmacy implements the university's policies and procedures regarding monitoring student progression and monitoring impact of the programme. Student progress at the school is monitored through various structures including:

a) Monitoring of student progress is undertaken by the individual lecturers, Heads of Department, the School of Pharmacy management, School of Pharmacy Board, School of Pharmacy Examinations Board, a student-lecturer forum, and a quality assurance committee.
b) The school has a functional student mentorship programme to support students' academic pursuits.
c) There is a university wide peer and student evaluation system to assess the effectiveness of teaching and learning administration for every module and lecturer.
d) All examinations papers and scripts are moderated internally and externally based on a standardised moderation criterion as outlined in the UNAM policy on assessments.
e) The impact of the programme is regularly evaluated through stakeholder's consultative meetings and needs assessments or tracer surveys.
f) The accreditation of the professional programme will be sought from the Health Professions Councils of Namibia (HPCNA), National Council of Higher Education (NCHE), and registration from the National Qualification Authority (NQA). The School will pursue international accreditation of the Bachelor of Pharmacy Honours programme through the Accreditation Council for Pharmacy Education (ACPE).

9. Minimum requirements for re-admission into the School / Programme

A student will not be re-admitted into the Bachelor Pharmacy Honours degree they have not earned:

a) At least 60 credits (of which 54 must be non-core) by the end of the First year of registration
b) At least 148 credits (of which 124 must be non-core) by the end of the Second year of registration
c) At least 274 credits (of which 239 must be non-core) by the end of the Third year of registration
d) At least 395 credits (of which 347 must be non-core) by the end of the Fourth Year of registration
e) At least 555 credits (of which 507 must be non-core) by the end of the Fifth Year of registration

The programme must be completed after a maximum of 6 years of registration

10. Advancement and progression rules

First year to second year of pharmacy

1. To advance to the second year a student must have obtained at least 138 credits of the 160 credits prescribed for first year modules.
2. If any of the failed modules is a pre-requisite for a second year module, the student cannot register for the affected second year module until the pre-requisite is passed.
3. Furthermore, a student who is repeating one or more modules in the first year cannot register for any second year module that has a timetable clash with the repeated module/s.

Second year to third year of pharmacy

1. To advance to the third year a student must have passed ALL the prescribed first year modules.
2. In addition, the student must have obtained at least 187 credits of the 219 credits prescribed for second year modules.
3. If any of the failed modules is a pre-requisite for a third year module, the student cannot register for the affected third year module until the pre-requisite is passed.
4. Furthermore, a student who is repeating one or more modules in the second year cannot register for any third year module that has a timetable clash with the repeated module/s.

Third year to fourth year of pharmacy

1. To advance to the fourth year a student must have passed ALL the prescribed first year and second year modules.
2. In addition, the student must have passed and obtained at least 142 credits of the 178 credits prescribed for third year modules.
3. If any of the failed modules is a pre-requisite for a fourth year module, the student cannot register for the affected fourth year module until the pre-requisite is passed.
4. Furthermore, a student who is repeating one or more modules in the third year cannot register for any fourth-year module that has a timetable clash with the repeated module/s.

11. Requirements for Qualification Award

Award of the Degree of Bachelor of Pharmacy Honours

A student can ONLY graduate with a Bachelor Pharmacy Honours degree if she/he has passed the entire prescribed modules and attained credits (712 credits) of the programme.

A student must meet all relevant UNAM requirements of this programme to be awarded the Bachelor of Pharmacy Honours Degree, including up-to-date financial and academic records.

12. Career Opportunities

Upon completion of the Bachelor of Pharmacy Honours Degree and registration with the Health Professional Council, the graduates of the programme may be able to:

a) Practice industrial pharmacy: manufacture medicines and comply to good manufacturing practices in a pharmaceutical industry.
b) Practice hospital and clinical pharmacy; advance pharmaceutical care and clinical trial research, manage pharmaceutical supplies in the hospital setting and promote rational use of medicines as a medicine expert.
c) Practice regulatory pharmacy: apply the provisions of acts and regulations relevant to pharmaceuticals and pharmacy practice, including registration, inspection, post-market surveillance of pharmaceuticals and provide medicines information.
d) Practice community and public health pharmacy: provide comprehensive primary healthcare services including diagnosis, health education and promotion, give medicine related information to other health professionals.
e) Pharmaceutical administration/management; as a leader to manage pharmaceutical services, supply chains, human resources, and finances, and medical aid schemes
f) Pharmaceutical sales and marketing; to promote the rational marketing and use medicines on behalf of the pharmaceutical manufacturers and distributor companies.
g) Manage pharmaceutical management information systems to enhance service delivery in all sectors of the industry
h) Establish self-employment and entrepreneurship opportunities in various sectors of the pharmaceutical industry including community pharmacy, small scale manufacture and quality control, veterinary pharmacy, medicine logistics, pharmaceutical sales and marketing, product research and development.

13. Implementation strategy

The old and transformed Bachelor of Pharmacy Honours curriculum will be administered in parallel, until the old curriculum is phased out, as below;

Implementation of the transformed and old Bachelor of Pharmacy Honours curriculum

Activity	Year of implementation				
	2023	2024	2025	2026	2027
New: Students on the transformed curriculum repeating modules					
Year I (1st year)					
Year II (2nd year)					
Year III (3rd year)					
Year IV (4th year)					
Old: Students repeating modules in the old curriculum					
Repeating Year I modules					
Repeating Year I & II modules					
Repeating Year II & III modules					
Repeating Year II, III & IV modules					
Repeating Year III & IV modules					

Students repeating modules in old Bachelor or Pharmacy Honours curriculum will repeat the equivalent modules (credits, content) in the new-transformed curriculum as below. Where there is no equivalent, the old module will be repeated for students who require it.

14. Course equivalents

Old Bachelor of Pharmacy Honours curriculum				**Transformed Bachelor of Pharmacy Honours curriculum**			
Name	**Code**	**NQF**	**Credits**	**Name**	**Code**	**NQF**	**Credits**
Year I							
Organic Chemistry	PCMO3511	5	16	Organic Chemistry	P3511SO	5	14
Mathematics	PCTM3511	5	16	Pharmaceutical Mathematics	P3511SM	5	12
Anatomy I	PPHA3511	5	16	Embryology & Introduction to Anatomy	M3511BA	5	14
Physiology I	PPHP3511	5	16	Integrated Physiology & Pathophysiology I	M3511BP	5	14
Sociology of Health & Disease	PCSS3511	5	16	Sociology of Health & Disease	M3511HS	5	14
English for Academic Purposes	ULEA3519	5	16	Academic literacy I	U3583AL	5	8
Computer Literacy	UCLC3509	5	16	Digital Literacy	U3583DD	5	8
Physical Chemistry	PCMO3512	5	16	Physical Chemistry	P3512SC	5	14
Anatomy II	PPHA3512	5	16	Human Anatomy	M3512HP	5	14
Physiology II	PPHP3512	5	16	Integrated Physiology & Pathophysiology II	M3512BP	5	14
Biochemistry I	PPHB3512	5	16	Medical biochemistry I	M3512BB	5	14
Biostatistics	PCSB3512	5	16	Statistics for Health Sciences	M3512BS	5	12
Introduction to Pharmacology	PPHH3632	6	16	Pharmacology I	P3632CO	6	16
Primary Health Care: Health Promotion	PCSP3512	5	16	No equivalent			
Contemporary Social Issues	UCSI3580	5	8	No equivalent			
Year 2							
Introduction to Pharmacy & Dispensing	PCTI3631	6	16	Pharmacy Practice I	P3683PP	6	16
Physiology III	PPHP3631	6	16	Integrated Physiology & Pathophysiology III	M3611BP	6	16
Biochemistry II	PPHB3631	6	16	Medical Biochemistry II	M3611BB	6	16
Inorganic Chemistry	PCMI3611	6	16	No equivalent			
General Pharmaceutics	PCTG3631	6	16	General Pharmaceutics & Biopharmaceutics	P3631SG	6	16
Introduction to Clinical and Nursing Skills	PCSN3632	6	16	COBES 1	M3613FC	6	14
Pharmaceutical Analysis	PCTA3632	6	16	Physical Pharmacy & Pharmaceutical Analysis	P3632SP	6	16
Pharmaceutical Organic Chemistry	PCMO3632	6	16	Pharmaceutical Organic Chemistry	P3632ST	6	16
Pharmacy Practice I	PCSP3622	6	8	Pharmacy Practice I	P3683PP	6	16
Physical Pharmacy	PCTP3632	6	16	Physical Pharmacy & Pharmaceutical Analysis	P3632SP	6	16

Old Bachelor of Pharmacy Honours curriculum				Transformed Bachelor of Pharmacy Honours curriculum			
Name	**Code**	**NQF**	**Credits**	**Name**	**Code**	**NQF**	**Credits**
Research Methods	PCSR3632	6	16	Research Methods and Proposal Writing	M3713TR	6	16
Community Pharmacy	PCSC3739	7	16	No equivalent			
Rural Attachment	PCSU3739	7	16	No equivalent			
Year 3							
Pharmacognosy and Phytochemistry	PCMH3751	7	16	Pharmacognosy & Complementary Medicines	P3751SY	7	18
Pharmaceutical Microbiology	PCTM3751	7	16	No equivalent			
Systems Pharmacology I	PPHS3732	7	16	Pharmacology II	P3751CO	7	18
Biopharmaceutics & Pharmacokinetics	PCTK3721	7	8	No equivalent			
Pharmacy Law & Ethics	PCSL3721	7	8	No equivalent			
Veterinary Pharmacy & Agrochemicals	PPHV3721	7	8	No Equivalent			
Chemotherapy	PPHC3751	7	16	Pharmacology III	P3752CO	7	18
Medicinal Chemistry I	PCMM3752	7	16	Medicinal Chemistry I	P3751MM	7	18
Applied Pharmaceutical Microbiology	PCTA3752	7	16	Applied Pharmaceutical Microbiology	P3752SA	7	18
Environmental & Occupational Health	PCSO3722	7	8	No equivalent			
Pathophysiology & Pharmacotherapeutics I	PCST3752	7	16	Clinical Pharmacy & Pharmacotherapeutics I	P3751CS	7	18
Pharmaceutical Technology I	PCTT3752	7	16	Pharmaceutical Technology I	P3751ST	7	18
Systems Pharmacology II	PPHS3751	7	16	Pharmacology IV	P3871CO	8	18
No equivalent				Medical Microbiology II	M3612TM	6	16
Pharmacy Practice II	PCSP3742	7	8	No equivalent			
Hospital Pharmacy	PCSY3859	8	16	No equivalent			
Industrial/Manufacturing Facility	PCSF3859	8	16	No equivalent			
Year 4							
Medicinal Chemistry II	PCMM3871	8	16	No equivalent			
Pathophysiology & Pharmacotherapeutics II	PCST3871	8	16	Clinical Pharmacy & Pharmacotherapeutics II	P3872CT	8	20
Pharmaceutical Technology II	PCTT3871	8	16	Pharmaceutical Technology II	P3871ST	8	20
Complementary and Alternative Medicine	PCSA3861	8	8	No equivalent			
Research Project	PCSR3870	8	32	Research & Innovation Project	P3893PI	8	32
Pharmacy Management	PCSM3872	8	16	Pharmacy Practice III	P3872PP	8	18
Clinical Pharmacokinetics and Therapeutic Drug Monitoring	PCSD3872	8	16	Clinical Pharmacokinetics	P3871CD	8	18
Pharmacoepidemiology & Pharmacoeconomics	PCSE3872	8	16	No equivalent			
Clinical Toxicology	PPHT3862	8	8	No equivalent			

15. Curriculum Framework: Summary table for all Modules in the Bachelor of Pharmacy Honours Programme

Module code	Module name	NQF level	NQF credits	Contact hours per week (L / P / T)	Pre-requisites / (Co-requisites)	Compulsory (C) / Elective (E)
Year 1: Core Semester						
U3583AL	Academic Literacy I	5	8	4L	None	C
U3583DD	Digital Literacy	5	8	2L+1T	None	C
U3403FS	Skills Portfolio	N/A	N/A	N/A	None	C
U3420SE	Sustainability and Environmental Awareness	4	2	2L	None	C
U3420CN	National and Global Citizenship	4	2	1L	None	C
U3420EM	Ethics and morality	4	2	2L	None	C
U3520LP	Leadership skills	5	2	2L	None	C
Total credits Core Semester						**24**
Year 1: Semester 1						
U3583AL	Academic Literacy I	5	0	2L	None	C
U3583DD	Digital Literacy	5	0	2L	None	C
P3511SM	Pharmaceutical Mathematics	5	12	3L+1T	None	C
P3511SO	Organic Chemistry	5	14	4L+3P	None	C
M3511BA	Embryology & Introduction to Anatomy	5	14	3L+4P	None	C
M3511HS	Sociology of Health and Disease	5	14	3L+4P	None	C
M3511BP	Integrated Physiology & Pathophysiology I	5	14	3L+4P	None	C
Total credits Semester 1						**68**
Year 1: Semester 2						
U3583AL	Academic Literacy I	5	0	2L	None	C
P3512SC	Physical Chemistry	5	14	4L+3P	(P3511SM)	C
M3512BS	Statistics for Health Sciences	5	12	4L	(P3511SM)	C
M3512HP	Human Anatomy	5	14	3L+4P	(M3511BA)	C
M3512BP	Integrated Physiology & Pathophysiology II	5	14	3L+4P	(M3511BP)	C
M3512BB	Medical Biochemistry I	5	14	3L+4P	(P3511SO)	C
Total credits Semester 2						**68**
Total Credits YEAR 1						**160**
Year 2: Core Semester						
H3513NM	Medical Anthropology	5	12	4L	None	C
U3683AL	Academic Literacy II	6	8	4L	U3583AL	C
U3420RT	Entrepreneurial skills	4	2	2L	None	C
U3420PJ	Project management skills	5	2	2L	None	C
Total credits Core Semester						**24**
Year 2: Semester 1						
U3683AL	Academic Literacy II	6	0	2L	U3583AL	C
P3631SG	General Pharmaceutics & Biopharmaceutics	6	16	4L+3P	P3512SC	C
M3611BP	Integrated Physiology & Pathophysiology III	6	16	3L+4P	M3511BP and M3512BP	C
M3611BB	Medical Biochemistry II	6	16	3L+4P	M3512BB	C

Module code	Module name	NQF level	NQF credits	Contact hours per week (L / P / T)	Pre-requisites / (Co-requisites)	Compulsory (C) / Elective (E)
M3631TM	Medical Microbiology I	6	16	3L+4P	None	C
P3671PU	Rural Hospital Placement	6	16	40 hours per week x 4 weeks =160 hrs	(P3683PP)	C
Total credits Semester 1						**80**
Year 2: Semester 2						
U3683AL	Academic Literacy II	6	0	2L	U3583AL	C
P3632SP	Physical Pharmacy & Pharmaceutical Analysis	6	16	4L+3P	P3512SC, P3511SM, P3511SO (P3631SG)	C
P3622PL	Pharmacy Law & Ethics	6	7	2L	(P3683PP)	C
P3632ST	Pharmaceutical Organic Chemistry	6	16	4L+3P	P3511SO	C
P3632CO	Pharmacology I	6	16	4L+3P+1T	(M3611BP)	C
M3612TM	Medical Microbiology II	6	16	3L+4P	(M3631TM)	C
P3682RC	Community Pharmacy Placement	6	12	40 hours per week x 3 weeks =120 hours	(P3683PP) and (P3632PL)	C
Total credits Semester 2						**83**
Year 2: Year module						
P3683PP	Pharmacy Practice I	6	18	5hrs/week integrated learning	P3511SM	C
M3683FC	COBES 1	6	14	5 hrs /week integrated learning	None	C
Total credits YEAR 2						**219**
Year 3: Semester 1						
P3751ST	Pharmaceutical Technology	7	18	3L+3P	P3631SG	C
P3751SY	Pharmacognosy & Complementary Medicines	7	18	3L+3P	P3632ST	C
P3751MM	Medicinal Chemistry I	7	18	4L+3P	P3632SP	C
P3751CO	Pharmacology II	7	18	3L+3P+ 2T	P3632CO	C
P3761SI	Pharmaceutical Industrial Placement	7	9	40hrs x 2wks (80hrs)	(P3751ST)	C
Total credits Semester 1						**81**
Year 3: Semester 2						
P3752SA	Applied Pharmaceutical Microbiology	7	18	3L+3P	P3631SG	C
P3762MM	Medicinal Chemistry II	7	9	2L+2P	(P3751MM)	C
P3752CO	Pharmacology III	7	16	4L	(P3751CO)	C
P3752CS	Clinical Pharmacy & Pharmacotherapy I	7	18	3L+4P	M3613FC and (P3751CO)	C
Total credits Semester 2						**61**
Year 3: Year module						
P3783PP	Pharmacy Practice II	7	20	5hrs/week integrated learning	P3683PP	C
M3713TR	Research Methods and Proposal Writing	7	16	4L	M3512BS and U3583DD	C
Total credits YEAR 3						**178**

Module code	Module name	NQF level	NQF credits	Contact hours per week (L / P / T)	Pre-requisites / (Co-requisites)	Compulsory (C) / Elective (E)
Year 4: Semester 1						
P3871ST	Pharmaceutical Technology II	8	20	3L+3P	P3751ST	C
P3871CT	Clinical Pharmacy & Pharmacotherapy II	8	20	3L+3P	P3752CS	C
P3871CO	Pharmacology IV	8	18	3L	P3752CO	C
P3861RR	Clinical Pharmacy Rotations I	8	10	5 hours per wk x 8 wks (minimum 40hrs)	P3752CS (P3871CT)	C
Total credits Semester 1						**68**
Year 4: Semester 2						
P3872CD	Clinical Pharmacokinetics	8	18	3L+2T	(P3871CO)	C
P3862PV	Veterinary Pharmacy Practice	8	10	2L+1T	P3753PP	C
P3872PP	Pharmacy Practice III	8	18	3L+1T	P3753PP	C
P3862RR	Clinical Pharmacy Rotations II	8	10	5hrs/wk x 8 weeks (minimum 40hrs)	(P3871RR) and (P3871CT)	C
Total credits Semester 2						**55**
Year 4: Year module						
P3893PI	Research/ Innovation Project	8	32	Supervision by appointment	M3713TR	C
Total credits YEAR 4						**155**
Total credits in Transformed curriculum (Bachelor of Pharmacy Honours Programme)						**712**

BPHARM MODULES

APPLIED PHARMACEUTICAL MICROBIOLOGY **P3752SA**

NQF level : 7
Contact Hours : 2L+2P
Credits: : 18
Pre-requisites : **P3631SG** – General Pharmaceutics and Biopharmaceutics
Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of assignments, Assignments = 20 %, Laboratory practical = 30 %, Tests = 50 %. The exam will be for a maximum of three (3) hours written paper.

Module Content:

Disinfectants, antiseptics, sanitisers, preservatives: classification, preparation of WHO formular I & II and others, evaluation of disinfectant activity, sterilization: Dry heat, moist heat, filtration, Pasteurisation, Tyndallisation, Radiation, chemical sterilization, kinetics of microbial inactivation. Aseptic manufacture of medicines: aseptic hand washing, grabbing according to USP 797 standards, pharmaceutical clean rooms, lamina flow hoods and biological safety cabinets, purified water vs distilled water. Pharmaceutical water treatment plant: multimedia filtration, degassing, ion exchange, reverse osmosis, UV light treatment .Pyrogens and depyrogenation: production water for injections, methods of depyrogenation, Pharmacopeial tests for pyrogens, Vaccines development: Variolation, types of vaccines, conventional propagation by egg embryo, cell cultured propagation, rDNA technology in vaccine development, down stream processing and formulation development, Cryopreservation and cell Banking: cryogenic temperatures, challenges of crystal formation, strategies to prevent crystal formation, Master cell bank, working cell Bank, Sterile pharmaceutical preparations: crystalloids, colloids, parenteral nutrition; Fermentation Technology: microbial sources of carbon, energy and electrons, types of nutrition of microbes, Batch mode, fedbatch mode and continuous fermentation, microbial growth curves, generation time.

CLINICAL PHARMACOKINETICS **P3872CD**

NQF level : 8
Contact Hours : 3L+2T x 16 weeks
Credits : 18
Co-requisites : **(P3871CO) -** Pharmacology IV
Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% and 50% to the final mark, respectively. The continuous assessments will consist of Assignments (20%) and Tests (80%). The exam will be one three (3) hours written paper.

Module Content:

Clinical Pharmacokinetics: Introduction to Clinical pharmacokinetics, Design of dosage regimens, Pharmacokinetics of Drug Interaction, Therapeutic Drug monitoring: Dosage adjustment in Renal and hepatic Disease, and Pharmacogenetics.

CLINICAL PHARMACY & PHARMACOTHERAPY I **P3752CS**

NQF level : 7
Contact Hours : 3L+4P x 16 weeks
Credits : 18
Pre-requisites : **M3613FC –** COBES 1
Co-requisites : **(P3751CO) –** Pharmacology II
Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of Tests: 80%, Practicals (including case presentations and quizzes): 20% The exam will be one written paper for a maximum of three (3) hours.

Module Content:

Cardiology: essential hypertension, hypertensive emergencies, resistant hypertension, atherosclerosis and atherosclerotic diseases, acute coronary syndromes, heart failure, acute rheumatic fever and rheumatic heart disease, arrythmias, stroke and transient ischemic attack, venous thromboembolism, and anticoagulation principles. Nephrology: electrolyte disorders, acid-base disorders, acute kidney injury, chronic kidney disease and its complications, anaemia. Endocrinology I: thyroid disorders, type 1 and type 2 diabetes, diabetic emergencies. Pulmonology: asthma, chronic obstructive pulmonary disease, smoking cessation. Gastroenterology: gastro-oesophageal reflux disease, peptic ulcer disease and H. pylori, pancreatitis, infectious hepatitis (A,B,C,E), cirrhosis, and end stage liver disease and its complications. Infectious disease I: lower respiratory tract infections, upper respiratory tract infections, sexually transmitted infections, genitourinary tract infections, skin and bone infections, endocarditis, meningitis, and sepsis.
For each condition covered, students will learn signs/symptoms, diagnostic criteria and appropriate laboratory criteria, first line pharmacotherapy management, patient education/self-care, and monitoring.

CLINICAL PHARMACY & PHARMACOTHERAPY II **P3871CT**

NQF level : 8
Contact Hours : 3L+3P x 16 weeks
Credits : 20
Pre-requisites : **P3752CS – Clinical Pharmacy & Pharmacotherapy I**
Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of Tests: 80%, Practicals (including quizzes): 20%. The exam will be one written paper for a maximum of three (3) hours.

Module Content:

Infectious disease II: sepsis and shock, HIV, tuberculosis, opportunistic infections, invasive fungal infections, gastrointestinal infections, common viral infections, malaria, parasitic infections. Psychiatry/neurology: anxiety disorders, unipolar and bipolar depression, schizophrenia and psychosis, substance use disorder, withdrawal, ADHD, dementia and delirium, Parkinson's disease, epilepsy and status epilepticus, headache, and pain. Men and women's health: contraception, menopause, infertility, benign prostatic hyperplasia, urinary incontinence, sexual dysfunction. Oncology: oncologic supportive care, oncologic emergencies, leukaemias, lymphomas, hormone-related cancers, solid organ tumours, Kaposi sarcoma, melanoma. Rheumatology: arthritis, gout, lupus, osteoporosis, drug-induced hypersensitivity reactions, inflammatory bowel disease, sickle cell disease, glaucoma. For each condition covered, students will learn signs/symptoms, diagnostic criteria and appropriate laboratory criteria, first line pharmacotherapy management, patient education/self-care, and monitoring.

CLINICAL PHARMACY ROTATIONS I **P3861RR**

NQF level : 8
Contact Hours : 5 practical hours/week x 8 weeks (min 40 hours)
Credits : 10
Pre-requisites : **P3752CS – Clinical Pharmacy & Pharmacotherapy I**
Co-requisites : **(P3871CT) Clinical Pharmacy & Pharmacotherapy II**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of Case presentations – 50% SOAP notes – 20%, Quizzes – 10%, Active participation and engagement – 20%. The exam will be an OSCE for a maximum of three (3) hours.
Module Content:
Clinical rotations: introduction to clinical pharmacy, pharmaceutical care, pharmaceutical care planning; cardiology; nephrology; gastroenterology; endocrinology; pulmonology; and infectious diseases.

CLINICAL PHARMACY ROTATIONS II **P3862RR**

NQF level : 8
Contact Hours : 5 practical hours/week x 8 weeks (min 40 hours)
Credits : 10
Co-requisites : **(P3861RR) – Clinical Pharmacy Rotations I, and (P3871CT) – Clinical Pharmacy & Pharmacotherapy II**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of Case presentations – 50% SOAP notes – 20%, Quizzes – 10%, Active participation and engagement – 20%. The exam will be an OSCE for a maximum of three (3) hours.
Module Content:
Clinical rotations including HIV, opportunistic infections, and tuberculosis; haematological malignancies and solid organ tumours; and psychiatry.

COMMUNITY BASED EDUCATION & SERVICE (COBES) I **M3683FC**

NQF level : 6
Contact Hours : 5 hours of integrated learning and household attachment per week
Credits : 14
Assessment : Assessment Strategies Continuous assessment 100% made of Logbook 20%, · Theory test 20%, Observed Structured Clinical Examination (OSCE) 20% , Family visit project 20%, Basic Life Support test (BLS) 20%.
Pre-requisites : **NONE**
Module Content : Teaching of basic clinical skills will facilitate the immersion of the student into the clinic setting. Following principles of patient safety, original teaching and performance of skills will occur in the skills laboratory setting under supervision. Eventually with exposure to the clinics and health centre at the primary care level, the student will participate in aspects of basic service delivery to patients. The learning will be re-enforced by assessment through observation of skills and assignments related to the patient's illness in the context of the family and community.

COMMUNITY PHARMACY PLACEMENT **P3682RC**

NQF level : 6
Contact Hours : 40 placement hours per week for 3 weeks
Credits : 12
Co-requisites : **(P3683PP) – Pharmacy Practice I & (P3622PL) – Pharmacy Law & Ethic**
Assessment:
The assessment of this module will include continuous assessments (CA) which will contribute 100% to the final mark. The continuous assessments will consist of; The placement workbook 30%, Placement report 30%, End of placement quiz 16%, Viva voce 24%.
Module Content:
Interprofessional interactions, Patient counselling and medicines information, Prescription screening and pharmacy law, Responding to symptoms of minor ailments and selection of over the counter (OTC) medicines, Compounding and calculations, Community pharmacy management, Inventory control in community pharmacy and information technology.

EMBRYOLOGY AND INTRODUCTION TO ANATOMY **M3511BA**

NQF level : 5
Contact Hours : 40 placement hours per week for 3 weeks
Credits : 14
Pre-requisites : **NONE**
Assessment:
Continuous assessment: Written assessment Class Test 1 25%, Written assessment Class Test 2 25%, Written assessment Class Test 3 25% and Assignments and Professionalism 25%. Examination: One 3-hour written examination paper. Final mark: 40% Exam mark and 60% of Continuous assessment mark.
Module Content:
Man's place in the organismic kingdom. Bioethics: history of Anatomy and the Anatomy and Human Tissue Acts. Basic embryological concepts. Histological structure: function of the primary tissues in relation to the primary organ systems. Terminology: definitions in anatomy. Introduction to systems and microscopy: methods in microscopy.

GENERAL PHARMACEUTICS & BIOPHARMACEUTICS **P3631SG**

NQF level : 6
Contact Hours : 4L + 3P
Credits : 16
Pre-requisites : **P3512SC -** Physical Chemistry
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessment marks will consist of, tests 50 %, assignments 20 %, practicals 30%. The exam will be one written paper of three (3) hours.
Module Content:
Scientific principles of dosage form design: Dissolution and solubility, properties of solutions, pharmaceutical calculation, surfaces and interfaces, disperse systems and rheology. Biopharmaceutical principles of drug delivery: Gastrointestinal tract physiology and drug absorption, bioavailability, physicochemical and dosage form factors and assessment of biopharmaceutical properties.

HUMAN ANATOMY **M3512HP**

NQF level : 5
Contact Hours : 3L + 4P
Credits : 14
Pre-requisites : **NONE**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessment marks will consist of Four Theory (60%) and Practical (40%) test which will, contribute (24% each) to the final CA mark; Class attendance and quizzes will contribute 4% to the final CA mark. The exam will be one written paper of three (3) hours.
Module Content:
Cardiovascular: Heart, Lungs, Osteology of the thoracic cage, Muscles for the thoracic cage and breathing, Histology and Embryology. Gastrointestinal system: Osteology, Histology and embryology, Alimentary canal, Accessory organs, Blood supply and venous drainage, Abdominal wall muscles, Inguinal canal. Urogenital: Posterior abdominal wall, Urinary system, Female reproductive system, Male reproductive system, Perineum Blood supply/venous drainage, Osteology, Embryology and Histology. Neuroanatomy: Osteology and paranasal sinuses, Anatomy of the brain, Ventricles and CSF, Blood supply venous drainage, Cranial nerves, Eye, orbit and ears

INTEGRATED PHYSIOLOGY AND PATHOPHYSIOLOGY I **M3511BP**

NQF level : 5
Contact Hours : 3L + 4P
Credits : 14
Pre-requisites : **NONE**
Assessment:
The continuous assessment (CA): 50 % and Examination: 50 % (one written, 3-hour paper) The continuous assessment mark will consist of Tests (75%) Lecture quizzes (5%) Practical assignments/quizzes (20%)
Module Content:
The module covers content on General physiology and pathophysiology: molecular interactions as integral to the generation; signalling and cellular dynamics and cellular adaptation and injury. Cellular and tissue compartmentation, and how information flows within a cellular and mass context. Genetics: gene expression; DNA structure and function. Homeostasis: internal environment; steady state; feedback mechanisms; disruptions of homeostasis. Body fluid compartments: extracellular, intracellular compartments; water distribution in the body; blood volume; tonicity; osmotic equilibrium; regulation of thirst; fluid movement between compartments; alterations in fluids and electrolytes. Energy and cellular metabolism: energy utilisation; laws of thermodynamics; metabolic reactions and enzymatic reactions. Endocrine physiology and disorders: the endocrine system and its collaboration with the nervous system; hormone regulation; hormone structure and function; disorders of endocrine function. Neurophysiology: general principles of neurophysiology; principles of excitable tissues (neurons, skeletal & smooth muscles); action potentials; contraction and excitation coupling; Guillain Barré syndrome; myasthenia gravis and rigor mortis.

INTEGRATED PHYSIOLOGY AND PATHOPHYSIOLOGY II **M3512BP**

NQF level : 5
Contact Hours : 3L + 4P
Credits : 14
Co-requisites : **(M3511BP) - Integrated Physiology and Pathophysiology I**
Assessment:
The continuous assessment (CA): 50 % and Examination: 50 % (one written, 3-hour paper). The continuous assessment mark will consist of: Tests (75%) Lecture quizzes (5%) Practical assignments/quizzes (20%)
Module Content:
The module covers content on autonomic nervous system: sympathetic and parasympathetic systems; autonomic and synaptic transmission; autonomic reflex centers, adrenal medulla; gastroparesis and pure autonomic failure. Sensory physiology: sensory coding; sensory receptors; somatic sensations; sensory perception, ascending neural pathways; referred pain; mechanisms of pain relief and pathophysiology of headaches. Special senses: vision; hearing; balance; smell and taste. Higher brain function: limbic system; reward and punishment centers; biological rhythms; consciousness; learning and memory; hippocampus; language and speech; cerebral hemispheres; electroencephalography; Alzheimers; amnesia; Wernicke's aphasia; Broca's aphasia; stroke and seizure disorders. Motor system: reflexes and voluntary movements; motor functions of the spinal cord; proprioceptors; control of skeletal muscles; alpha-gamma coactivation; muscle tone and fatigue; reciprocal innovation; upper and lower motor neurons; pyramidal and extrapyramidal tracts; brainstem; cerebellum, thalamus and basal ganglia; decerebrate and decorticate rigidity; Parkinsons disease; spinal shock. Blood and immunity: composition and function of blood; anaemia and polycythaemia; haemostasis; haemophilia; ABO blood group system; Erythroblastosis faetalis; immune system; leukaemia; alloimmune disease.

INTEGRATED PHYSIOLOGY AND PATHOPHYSIOLOGY III **M3611BP**

NQF level : 6
Contact Hours : 3L + 4P
Credits : 16

Pre-requisites : **M3511BP AND M3512BP - Integrated Physiology and Pathophysiology I & II**
Assessment : The continuous assessment (CA): 50 % and Examination: 50 % (one written, 3-hour paper) The continuous assessment mark will consist of: Tests (75%) Lecture quizzes (5%) Practical assignments/quizzes (20%)

Module Content:
The body systems to be covered in this module will include: Respiratory system: conducting and respiratory zones; gas laws; lung mechanics; muscles of breathing; pleural membrane; pulmonary ventilation; alveolar ventilation; alveolar dead space; lung compliance; pulmonary function tests; gaseous exchange; gas transport; control of respiration; pulmonary embolism; pneumonia; restrictive and obstructive lung diseases. Cardiovascular system: principles of haemodynamics; neural control of circulation; atherosclerosis; hypertension; structure and function of the heart; cardiomyopathy; endocarditis and heart failure. Gastrointestinal system: general principles of gastrointestinal function; innervation and blood supply of gastrointestinal system; secretory function; motility; metabolic functions of the liver and gall bladder; gastro-oesophageal reflux; gastritis; peptic ulcer disease; inflammatory bowel syndrome; diarrhea; vomiting; hepatitis; jaundice; cirrhosis; liver failure; hepatic encephalopathy. Renal system: renal structure and function; renal circulation; glomerular filtration; tubular reabsorption and secretion; clearance; fluid and acid-base balance; micturition; renal function tests; dialysis. along with their associated pathophysiology. Reproductive system: principles of human reproduction; hypothalamic-pituitary-gonadal axis; puberty; male sexual development; female sexual development; pregnancy; menopause and andropause.

MEDICAL BIOCHEMISTRY I **M3512BB**

NQF level : 5
Contact Hours : 3L + 4P
Credits : 14
Co-requisites : **(P3511SO) - Organic Chemistry**
Assessment : Continuous assessment (CA): 60%, 60% tests, 30% laboratory reports/assignments and 10% assignments/quizzes. Examination: 40% (1 x 3 hours written paper).)

Module Content:
The module will cover the following topics: Cell biology - Introduction to Medical Biochemistry and its relationship to cell biology, Cellular diversity, function and compartmentalisation. Protein structure and function - Structure and properties of amino acids, peptides and proteins, Peptides and Protein function (glutathione, globular proteins and fibrous proteins), Protein purification and separation methods/techniques. Enzymes - Enzyme properties and mechanism of action, Enzyme kinetics, inhibition and regulation Diagnostic and therapeutic uses of enzymes. Lipid chemistry and lipoproteins - Definition, Structure and biomedical importance of various lipids and complex lipids, Steroids and Prostaglandins, Structure and function of lipoproteins; Chemistry of vitamins and minerals - Chemistry of vitamins, minerals and dietary sources, Role of vitamins in metabolism, growth and development (implication of vitamin deficiency), Role of minerals in metabolism, growth and development (implication of minerals deficiency). Carbohydrate chemistry - Structure and function of carbohydrates, Carbohydrates in living systems, Glycoconjugates. Signalling Pathways - Signalling molecules and modes of cell signalling, G-protein coupled receptors and G-protein signalling, Second messengers, signal transduction and disease. Nucleic acid chemistry and genetic information transfer - Nucleic acid structure and properties, DNA organisation, synthesis and repair, RNA synthesis – Transcription Protein synthesis - Protein synthesis – Translation, Post-translational processes: Folding and modification, Regulation of gene expression. Introductory medical genetics - Mechanisms of genetic variation, Mendelian inheritance, Introductory cytogenetics, genetics and disease. Recombinant DNA technology - Principles of DNA isolation and cloning, Principles of DNA amplification and sequencing, Principles of hybridization and microarrays. Introduction to bioinformatics - Principles of bioinformatics and biologic databases, Assessing pairwise sequence similarity, Introduction to phylogenetics.

MEDICAL BIOCHEMISTRY II **M3611BB**

NQF level : 6
Contact Hours : 3L + 4P
Credits : 16
Pre-requisites : **M3512BB – Medical Biochemistry I**
Assessment : Continuous assessment (CA): 60%, consisting of 60% tests, 30% laboratory reports/assignments and 10% assignments/quizzes. Examination: 40% (1 x 3 hours written paper).

Module Content:
This module covers the following topics: Principles of bioenergetics - Principles of bioenergetics. Oxidative metabolism - Cellular redox systems, Mitochondrial electron transport system, Inhibitors and regulation of oxidative metabolism, Mitochondrial dysfunction and disease. Carbohydrate metabolism and the TCA cycle – Glycolysis, Gluconeogenesis, Tricarboxylic Acid cycle, Metabolism of non-glucose sugars, Pentose phosphate pathway, Metabolism of glycogen. Lipid metabolism - Oxidation of fatty acids in the liver and extrahepatic tissues, Ketogenesis and impaired oxidation of fatty acids, Biosynthesis and storage of fatty acids, Eicosanoids and health, Disorders of lipoprotein metabolism. Steroid and bile metabolism - Cholesterol synthesis and transport, Bile acid biosynthesis, Steroid hormones and CYP enzymes. Metabolism of proteins and amino acid nitrogen - Amino acid degradation and the urea cycle, Inborn errors of metabolism.
Principles of metabolic regulation and biochemical basis of cancer - Principles of metabolic regulation, Integration of metabolism, Biochemical basis of cancer. Control of food intake and regulation of energy balance - Food intake control mechanisms, Energy balance regulation, Kwashiorkor and marasmus. Nutrition in health and disease - Overview of nutrition in health and disease, Nutrigenetics and nutrigenomics, Nutrition in metabolic and cardiovascular disease and their prevention, Steroid and bile metabolism; Nutrition in health and disease. Xenobiotic metabolism - Xenobiotics, sites of metabolism and the process of biotransformation, Cytochrome P450 (CYP) enzymes in biotransformation, Clinical correlations in xenobiotic metabolism.

MEDICAL MICROBIOLOGY I **M3631TM**

NQF level : 6
Contact Hours : 3L + 4P
Credits : 16
Pre-requisites : **NONE**
Assessment:
The module mark will be made up of continuous assessments (CA) 40% and summative assessments 60%. Continuous assessment will consist of: Tests 60%, Practical 30% Assignment 10%, The final exam will consist of: 1 x written exam for three hours (50%) and 1 x practical exam for two hours (50%)

Module Content:
This module covers content on: Bacterial Morphology and Physiology: Bacterial cell; Bacterial cell Processes; Bacterial virulence Bacterial Genetics, Culture media and methods Microbial flora, Sterilization and Disinfection: Physical and chemical prevention, Spread and Control of microorganisms, sterilizing agents; disinfectants. Immunology: Humoral and cell-mediated immunity; Cytokines, Immunological tolerance; Autoimmunity,

Hypersensitivity reactions, Transplantation and malignancies. Systemic Bacteriology: Staphylococcus, Streptococcus, Pneumococcus, Neisseria, Enterobactericiae, Clostridium, Mycobacterium, Acinetobacter etc. Mechanisms of action of major classes of antimicrobial agents; drug resistance; multidrug resistant organisms.

MEDICAL MICROBIOLOGY II		**M3612TM**
NQF level	:	6
Contact Hours	:	3L + 4P
Credits	:	16
Co-requisites	:	**(M3631TM) - Medical Microbiology I**

Assessment:
The module mark will be made up of continuous assessments (CA) 40% and summative assessments 60%. Continuous assessment will consist of: Tests 60%, Practical 30%, Assignment 10%. The final exam will consist of 1 x written exam for three hours (50%) and 1 x practical exam for two hours (50%)
Module Content :
The module will cover content on Medical Parasitology, Mycology, Virology and Entomology. Parasitology: major branches of protozoology and helminthology; classification by site (intestinal, systemic- tissue and blood). Parasitic diseases: Entamoebiasis, Giardioses, Cryptosporidioses, Soil transmitted helminths, Trypanasomiasis, Taeniosis, Schistosomiasis. Medical Mycology: General properties of important fungi, Growth and isolation of fungi. Mycoses: Superficial-, cutaneous-, deep or systemic-, opportunistic-mycoses, fungal toxin, allergies, diagnostic laboratory test, antifungals. Medical entomology (insects and arachnids) Virology: principles of virology; Taxonomy and replication strategies of various viruses and Bacteriophages; Oncogenic virus; prions; Antiviral drugs; Technique of Diagnostic virology.

MEDICINAL CHEMISTRY I		**P3751MM**
NQF level	:	7
Contact Hours	:	4L + 3P x 16 weeks
Credits	:	18
Pre-requisites	:	**P3632ST – Pharmaceutical Organic Chemistry**

Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of assignments (20%), tests (50%), practical assessments (30%). The exam will be three (3) hours written paper.
Module Content:
The five themes are; Introduction to medicinal chemistry and drug discovery, Physicochemical principles of drug action, Drug metabolism and bio-transformation: mechanisms, therapeutics significance and mechanism of drug actions and drug metabolisms, Optimisation and drug design techniques, and SARs, QSARs, CADD and Combinatorial Chemistry.

MEDICINAL CHEMISTRY II		**P3751MM**
NQF level	:	7
Contact Hours	:	2L+ 2P x 16 weeks
Credits	:	9
Co-requisites	:	**(P3751MM) - Medicinal Chemistry I**

Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of assignments (20%), tests (50%) and practical assessments (30%). The exam will be a two (2) hour written paper.
Module Content:
Drug discovery or design process, nomenclature, the synthesis of the drug, it's structure activity relationships (SAR's), physico-chemical properties, methods of administration, mode of action, chemical reactions and side effects of various drug molecules. Themes include antibiotics, analgesics, hormones and CNS compounds as relevant examples. In addition, this module also has a focus on pharmaceutical biotechnology and radiopharmaceuticals.

ORGANIC CHEMISTRY		**P3511SO**
NQF level	:	5
Contact Hours	:	4L + 3P
Credits	:	14
Pre-requisites	:	**NONE**

Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of tests 50%, assignments 20% and practical assessments 30%. The exam will be for a maximum of three (3) hours written paper.
Module Content:
Review of valences, atomic and Molecular orbital theories. Introduction to Organic Chemistry: Functional groups, physical properties, intermolecular forces, acids and bases. Molecular representation: Shapes, resonance structures, alkanes, alkenes, alkynes, arenes, alcohols & phenols, carboxylic acids and derivatives. Major organic molecules: Proteins & nucleic acids, lipids carbohydrates, heterocyclic compounds and nomenclature. Stereochemistry: Classification, stereoisomers, enantiomers, diastereomers, optical activity R/S nomenclature. Introduction to Organic reactions: Reaction mechanism, electrophiles, nucleophile electrophilic addition reactions and nucleophilic substitution & eliminations of halo-alkanes.

PHARMACEUTICAL INDUSTRIAL PLACEMENT		**P3761SI**
NQF level	:	7
Contact Hours	:	40 placement hours per week for 2 weeks
Credits	:	9
Co-requisites	:	**(P3751ST) - Pharmaceutical Technology I**

Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of: Placement workbook 25 %, Placement report 25 %, Quiz/Test 25 % and Viva voce 25 %.

Module Content:
Design of pharmaceutical manufacturing plants: site selection, aims of plant design, clean room technology, layout, product/personal movement, materials used in fabrication, corrosion; Pharmaceutical manufacturing plant organogram: the various departments and their roles; Unit operations in Pharmaceutical Manufacturing and equipment: drying, evaporation, particle size reduction, particle size separation, granulation, coating, heat transfer, mixing, tabletting, capsule making, and Packaging and labelling; Documentation: Batch Manufacturing Record (BMR), Dosiers, Pharmaceutical Quality Control: hardness, friability, assays, dissolution, disintegration; Pharmaceutical Quality Assurance: Development of a quality management system (QMS), developments of standard operating procedures (SOPs), ensuring compliance with cGMPs, Training, conducting audits and continuous improvement; pharmaceutical water treatment plant: multimedia filtration, degassing, ion exchange, reverse osmosis, UV light treatment; Pharmaceutical stability and shelf life: importance of storage conditions, cold chain, WHO zones; Pharmaceutical waste disposal: 3Rs of Reduce, Reuse and Recycle.

PHARMACEUTICAL MATHEMATICS **P3511SM**

NQF level : 5
Contact Hours : 3L + 1T
Credits : 12
Pre-requisites : **NONE**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of tests 50%, and quizzes and assignments 50%. The exam will be one written paper of two (2) hours.
Module Content:
Rounding: rounding to a number of decimal places, rounding to significant figures; Simple proportions and ratios: basic fractions, ratios and percentages; Metric system: metric conversions lengths, weights, volumes (kilo to milli), drug calculations. Introduction to Pharmaceutical Calculations: drug calculations, w/w (weight per weight), v/v (volume per volume), w/v (weight per volume), simple dilution problems. Functions: one-to-one and onto functions, horizontal line test, composition of functions, inverse of a function. Piece wise defined functions, Introduction to exponential and logarithmic functions. Limit of a function: definition of limit, left and right limits, infinite limits and improper limits. Differentiation: rules of differentiation, chain rule, increasing and decreasing functions and graph sketching. Trigonometry: further trigonometric identities, derivatives and integrals of trigonometric functions.

PHARMACEUTICAL ORGANIC CHEMISTRY **P3632ST**

NQF level : 6
Contact Hours : 4L+3P
Credits : 16
Pre-requisites : **P3511SO - Organic Chemistry**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of: 20% assignments,50% tests and quizzes and 30% practical assessments. The final examination will be one 3-hour written paper.
Module Content:
Basics of organic reactions and reaction mechanisms: Lewis acid/ base, octet rule, formal charge, electronegativity, inductive effect, resonance, bond polarity, use of arrows to show bond cleavage and formation Conformations of alkanes: conformations of acyclic alkane: eclipsed, gauche and anti staggered conformer, conformations of cyclic alkanes, stability of conformers of unsubstituted and substituted cyclohexane Stereochemistry: Cahn-Ingold-Prelog system; R/ S isomers, Z/E isomers, stereocenters, chirality, optical activity, enantiomeric access Nucleophilic reactions: unimolecular and bimolecular nucleophilic substitutions and eliminations (SN1, SN2, E1,E2) Alcohols and ethers: synthesis and reactions Electrophilic reactions: synthesis and reactions of aromatic compounds Carboxylic acid: synthesis and reaction of carboxylic acid and carboxylic acid derivatives, Amines: synthesis and reaction heterocyclic compound of medicinal importance: synthesis and reactions of heterocyclic compounds.

PHARMACEUTICAL TECHNOLOGY I **P3751ST**

NQF level : 7
Contact Hours : 3L + 3P x 16 weeks
Credits : 18
Pre-requisites : **P3631SG – General Pharmaceutics & Biopharmaceutics**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: 2 Assignments = 20%, 2 Tests and quizzes = 50%, 8 Laboratory practical = 30%. The final examination will be 1 x 3 hours written paper.
Module Content:
Design of pharmaceutical manufacturing plants: site selection, aims of plant design, layout, product/personal movement, materials used in fabrication, corrosion; Unit operations in pharmaceutical manufacturing and equipment: drying, evaporation, particle size reduction, particle size separation, granulation, coating, heat transfer, mixing, tabletting, capsule making, and Packaging and labelling; Technology to generate pharmaceutical powders from liquids: Precipitation and crystallization, spray drying, spray freeze drying, supercritical fluid method. Powder technology: particle size analysis, bulk density vs true density, particle properties and bulk flow, characterisation of powder flow – Angle of Repose, hopper design, Hausner's ratio, Carr's index. Documentation: Batch Manufacturing Record (BMR), Dossiers, certificate of analysis. Manufacture of pharmaceutical products: Good laboratory practices (GLP), Laboratory scale, pilot and large scale; good manufacturing practices (cGMP). Pharmaceutical quality control: raw materials, in-process quality test of assays, tablet hardness, friability, dissolution, disintegration. Pharmaceutical quality assurance: development of a quality management system (QMS), developments of standard operating procedures (SOPs), ensuring compliance with cGMPs, Training, conducting audits and continuous improvement. Drug and product stability: importance of storage conditions, cold chain, WHO zones.

PHARMACEUTICAL TECHNOLOGY II **P3871ST**

NQF level : 8
Contact Hours : 3L + 3P x 16 weeks
Credits : 20
Pre-requisites : **P3751ST – Pharmaceutical Technology I**
Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following Assignments = 20%, tests and quizzes = 50%, laboratory practical = 30%. The final examination will be 1 x 3 hours written paper.

Module Content:

Pharmaceutical compounding of medicines: official and magistral preparations, liquid, semi-solid and solid dosage forms; compounding and reconstitution of sterile hospital unit dose systems: parenteral preparations, cancer chemotherapy, parenteral nutrition, and radiopharmacy; Advanced drug delivery systems: foams, nano particle technology, modified release dosage formulations; Pharmaceutical manufacturing: detailed exposition of tableting (dry, wet and direct compression), capsule making, semi-solid and liquid dosage form production, Quality control: assays, tablet hardness, friability, dissolution, disintegration; Pharmaceutical business models: Big Pharma, Biotech. Companies, drug delivery companies, contract manufacturing companies; The drug development process: drug discovery, preclinical studies, and clinical studies.

PHARMACOGNOSY & COMPLEMENTARY MEDICINES **P3751SY**

NQF level : 7
Contact Hours : 3L + 3P x 16 weeks
Credits : 18
Pre-requisites : **P3632ST - Pharmaceutical Organic Chemistry**

Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: 20% assignments, 50% tests and quizzes and 30% practical assessments. The final examination will be 3 hours written paper.

Module Content:

Medicinal plant taxonomy, morphology and families, forms of crude drugs: organised and unorganised drugs, synthesis of plant phytochemicals, regulation and quality control of medicinal plant materials, application of phytotherapy medicines in clinical practice, indigenous knowledge systems of Namibia and around the globe, Phytonutrients, nutraceuticals & supplements.

PHARMACOLOGY I **P3632CO**

NQF level : 6
Contact Hours : 4L + 3P + 1T
Credits : 16
Co-requisites : **(M3611BP) - Integrated Physiology & Pathophysiology III**
Assessment :

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: practicals (20%) and tests (80%). The exam will be one three (3) hours written paper.

Module Content:

Pharmacodynamics: Mechanisms and equations of drug receptor interactions; nature and types of drug dose response curves; pharmacodynamic terms describing drug dose effectiveness and safety; agonist and antagonist drug dose response curves and spare receptor theory; drug receptor families, cellular signal transduction pathways and second messengers; drug formulations and routes of drug administration; drug transport process, drug absorption, distribution and elimination; drug extraction ratio and clearance; effects of organ perfusion, protein binding and enzymatic activity on rates of drug elimination; pharmacokinetic compartment models. Pharmacokinetics: pharmacokinetic parameters – their definitions and implications in drug therapy; drug plasma concentration time curves; pharmacokinetic models and equations and the use of semi-logarithmic graphs for determining pharmacokinetic parameters; drug metabolism and drug metabolising enzymes; enzyme induction and inhibition; Fundamental principles of drug interactions.

PHARMACOLOGY II **P3751CO**

NQF level : 7
Contact Hours : 3L + 3P + 2T x 16 weeks
Credits : 18
Pre-requisites : **P3632CO – Pharmacology I**

Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: practicals (20%) and tests (80%). The exam will be one three (3) hours written paper.

Module Content:

This module covers the theoretical and practical contents on the principles of pharmacology as applicable to the physiological systems under six themes: Pharmacology of the cardiovascular system, Respiratory system pharmacology, Gastrointestinal system pharmacology, Renal system pharmacology, Endocrine system pharmacology, and Musculoskeletal system pharmacology.

PHARMACOLOGY III **P3752CO**

NQF level : 7
Contact Hours : 4L x 16 weeks
Credits : 16
Co-requisites : **(P3751CO) - Pharmacology II**

Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: assignments (20%) and tests (80%). The exam will be one three (3) hours written paper.

Module Content:

The module content will cover principles of antimicrobial therapy; cell wall inhibitors; protein synthesis inhibitors; quinolones, folic acid antagonists, and urinary tract antiseptics; antimycobacterial drugs; antifungal drugs; antiviral drugs; antiprotozoal drugs; anthelmintic drugs & anticancer drugs.

PHARMACOLOGY IV **P3871CO**

NQF level : 8
Contact Hours : 3L x 16 weeks
Credits : 18

Pre-requisites : **P3752CO – Pharmacology III**

Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: assignments (20%) and tests (80%). The exam will be one three (3) hours written paper.

Module Content:

Central nervous system pharmacology: antidepressants, antipsychotics, mood-stabilising agents, antiepileptics, sedative/hypnotic drugs, drugs used to treat neurodegenerative disorders, opioid analgesics, drugs to treat migraine, drugs of abuse and dependence. Clinical toxicology: general principles, treatment of specific poisoning, environmental poisoning, poisoning relating to drugs of abuse, poisoning relating to flora and fauna.

PHARMACY LAW & ETHICS **P3622PL**

NQF level : 6
Contact Hours : 2L
Credits : 7
Co-requisites : **(P3683PP) – Pharmacy Practice I**

Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: assignments 30%, tests 50% and quizzes 20%. The exam will be one written paper for a maximum of two (2) hours.

Module Content:

Pharmacy profession: characteristics and core features of a profession, pharmacists as professionals. Ethics in pharmacy practice: principles of ethics, ethical dilemmas, unprofessional conduct, professional negligence. Pharmacy law: Namibian legal framework, laws governing healthcare delivery, laws governing pharmaceuticals, patent and intellectual laws.

PHARMACY PRACTICE I **P3683PP**

NQF level : 6
Contact Hours : 5 hours / week of integrated learning
Credits : 18
Pre-requisites : **P3511SM – Pharmaceutical Mathematics**

Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: tests 40%, MyDispense activities 20%, OSCE 40%. The exam will be for a maximum of three (3) hours written paper.

Module Content:

Primary Healthcare & Pharmacy Practice: Introduction to primary health care, Namibian healthcare systems, primary healthcare services, Community oriented primary health care, rational medicine use. Medicines information: reference materials, responding to medication information queries, routes of administration, dosage forms, medication storage. Pharmaceutical care planning: patient care process, SOAP notes, collecting patient information. Dispensing: dispensing and patient compounding, pharmaceutical calculations, prescription validation. Patient communication: cultural competence, social determinants of health, patient counselling, adherence. Responding to symptoms: over the counter consultation, fever, headaches, migraines, insomnia, eye conditions, ear conditions, constipation, dyspepsia, skin conditions, respiratory infections, women health conditions, family planning, drugs in pregnancy and dispensing.

PHARMACY PRACTICE II **P3783PP**

NQF level : 7
Contact Hours : 4 hours per week (x 16 weeks) of integrated learning
Credits : 20
Pre-requisites : **P3683PP – Pharmacy Practice I**

Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: Problem-based learning assessments 10%, Tests 80%, Assignments 10%. The exam will be one written paper for a maximum of three (3) hours.

Module Content:

Rational use of medicines: Medicine Use Process, WHO Medicine use indicators, Strategies for RUM, Medicine use surveys and evaluations, Consequences of medicine use surveys. Pharmacoepidemiology and pharmacovigilance: Introduction to pharmacoepidemiology and pharmacovigilance, Pharmacovigilance risk identification, causality assessment and methods used in pharmacovigilance, patient safety, risk management and risk communication, pharmacovigilance and public health programs. Pharmacoeconomics: Introduction to health economics and pharmacoeconomics, The numerator in cost-effectiveness analysis, The denominator-measuring health outcomes, quantitative synthesis of clinical evidence Good clinical practices in research: Role of Pharmacist in clinical trials, Rationale of clinical trials, pharmacokinetics.

PHARMACY PRACTICE III **P3872PP**

NQF level : 8
Contact Hours : 3L+1T
Credits : 18
Pre-requisites : **P3783PP – Pharmacy Practice II**

Assessment:

The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: Team project 30%, Tests 40%, Completion of variety of tasks on the Learning Management System 20%, Attendance in class (both face-to-face and virtual) 10%. The exam will be one three (3) hours written paper.

Module Content:

Pharmaceutical supply chain management: supply management cycle, selection of medicines, forecasting/quantification, procurement of medicines, distribution of medicines, pharmaceutical waste management, tools used in management of medicine supplies. Medicines regulation and policies: Medicine registration, Medicine imports and exports, Inspection and surveillance, quality assurance tests, and dossier application. Leadership and human resources management for success: leadership, teamwork, time management, motivation, recruitment. Entrepreneurship and marketing: idea

generation and development of a value proposition, competitiveness, social responsibility, funding sources, analysis of target market, principles of marketing.

PHYSICAL CHEMISTRY **P3512SC**

NQF level : 5
Contact Hours : 4L + 3P
Credits : 14
Co-requisites : **(P3511SM) - Pharmaceutical Mathematics**
Assessment:
The module mark consists of 50% continuous assessment (CA) and 50% Examination mark. The CA mark is made up of: A minimum of three tests - 50% towards CA, A minimum of eight (8) graded quizzes - 20% towards the CA, A minimum of ten (10) graded laboratory work - 30% towards the CA, One three (3) hour examination at the end of the semester. To pass this course the student must obtain a minimum final mark of 50%.
Module Content:
Solution chemistry: Types of solutions; Solvation process, Concentration Units (Molarity, Molality, Normality, Percent by mass, Percent by volume, Parts per thousand, Parts per million, Parts per billion); Colligative Properties (Lowering of vapour pressure; Raoult's law; Boiling point elevation, Freezing point depression, Osmotic pressure), Solubility and Henry's law. Colloids. Classification of colloids. Acids, bases and salts: Classification (Arrhenius, Bronsted-Lowry, Lewis concepts); Acid dissociation constants, Base ionization constants, pKa, pKb, pKw, pH, pOH, pKw; Henderson-Hassalbalch equation; Molecular structure and strength of acids; Acidic, Basic, and Neutral salts and the determination of the pH of their aqueous solutions. Elementary chemical thermodynamics: Distinguishing between a system and its surrounding; Classification of systems and walls; 0th Law and temperature scale; 1st Law, heat, work, isothermal systems, enthalpy of reactions; 2nd Law, spontaneity, entropy, Gibbs energy, Helmholtz energy; 3rd Law, Nernst equation, third law entropy). Elementary chemical kinetics: The rate of chemical reactions, differential rate laws, integrated rate laws, Arrhenius equation, Collision theory, Transition state theory, Mechanism of chemical reactions (reaction intermediates, steady state approximation), Biological catalysts (Michaelis-Menten equation) and inhibitors.

PHYSICAL PHARMACY & PHARMACEUTICAL ANALYSIS **P3632SP**

NQF level : 6
Contact Hours : 4L + 3P
Credits : 16
Pre-requisites : **P3512SC - Physical Chemistry, P3511SM - Pharmaceutical Mathematics & P3511SO - Organic Chemistry**
Co-requisites : **(P3631SG) - General Pharmaceutics & Biopharmaceutics**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessment marks will consist of: tests 50 %, assignments 20 %, and practicals 30%. The exam will be one written paper of three (3) hours.
Module Content :
Physical Pharmacy: intermolecular forces and states of matter, physical properties of solutions, isotonic solutions, solubility phenomena, complexation and protein binding and mass transport. Pharmaceutical Analysis: an in-depth understanding of the fundamental principles of chemical analysis such as various titration methods, pKa, partition coefficient), as well as different instrumentation methods such as HPLC, UV-VIS, IR, atomic emission/absorption, NMR, and various extraction methods are studied.

RESEARCH AND INNOVATION PROJECT **P3893PI**

NQF level : 8
Contact Hours : Supervision by appointment
Credits : 32
Pre-requisites : **M3713TR – Research Methods and Proposal Writing**
Assessment:
The assessment of this module will include continuous assessments (CA) which will contribute 100% to the final mark. The continuous assessment mark will consist of: Manuscript / Innovation report 50%, Supervisor evaluation 30%, Presentation 20%.
Module Content:
Develop a research or innovation proposal; navigate the approval process; collect and manage data as applicable; analyse data using appropriate analytic techniques and software; develop a manuscript, present a poster or a pitch.

RESEARCH METHODS AND PROPOSAL WRITING **M3713TR**

NQF level : 7
Contact Hours : 4L x 16 weeks
Credits : 16
Pre-requisites : **M3512BS – Statistics for Health Sciences; U3583DD – Digital Literacy**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessment mark will consist of: tests 40%, assignment 20%, research proposal 40%. The exam will be one written paper of three (3) hours.
Module Content:
Introduction to quantitative research and qualitative research: abstract writing, literature review, identification, selection, analysis and formulation of the research problem; Identification and formulation of the research question; Hypotheses formulation. Formulate a problem statement and justification of the study, formulation of the study objectives. Classification of study types: Descriptive studies - Exploratory Studies, Cross-sectional studies, Case report, case series, correlational studies. Analytical studies - Cohort studies, Case control studies, Comparative Cross-sectional studies. Intervention studies: Clinical trials, Experimental studies, Quasi-experimental studies, fields interventional studies. The advantages and disadvantages of the difference of study designs. Introduction to statistics and data analysis. Sampling Methods: Non-probability sampling, Probabilistic or random sampling; sample size determination. Study population, Specification study variables, and types of variables. Data collection methods – Data collection techniques, development of data collection tools and/or questionnaires. Report writing: Citation of references and referencing styles - The Harvard system, Vancouver style, APA. Ethical Considerations in health research, Research project administration. Research proposal development.

RURAL HOSPITAL PLACEMENT **P3671PU**

NQF level : 6
Contact Hours : 40 hours per week x 4 weeks
Credits : 16
Co-requisites : **(P3683PP) – Pharmacy Practice I**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessment mark will consist of: placement workbook 20%, report 30%, quiz 10% and viva voce 40%.
Module Content:
This experiential learning module is structured around a 4-week placement at a Public Sector District Hospital. Inventory and Pharmacy Management: ordering, supply, storage, ward supplies, medicine expiry. Good Dispensing Practices: dispensing process, prescription screening, patient counselling. Primary Health Care: PHC services, medicines management in PHC, cold chain, immunisations. Rational Medicine Use: survey of patients leaving pharmacy Anti-retroviral & TB services: patient monitoring, treatment regimens, adherence and counselling. Pharmacy Management & Professionalism: therapeutics committees, budget control, management information systems.

SOCIOLOGY OF HEALTH AND DISEASE **M3511HS**

NQF level : 5
Contact Hours : 3L + 4P
Credits : 14
Pre-requisites : **NONE**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessment mark will consist of: Student-directed seminars 20%, Class test (1)20%, Assignment (1), 20% and Group projects (2) 40%. One three hour written examination.
Module Content:
Describe the sociological definition of health, illness and disease by considering the structural and social factors of health and disease. The structural emphasis entails the political, economic and social cultural elements that foster ill/ health, as well as the forces that allows/ constrain individuals' responses to illness and the healthcare system. Examine the indirect pathway between sociology and health/disease. Explore key theoretical perspectives in health, health behaviour and sociology. Examine how social determinants of health/disease (such as class, gender, addiction, gender-based violence, cultural beliefs and practices) contribute to the distribution and spread of diseases within different population groups. Assess the role and objectives of health promotion, community/public health services and alternative medicine in the prevention, spread and treatment of diseases. Explain how societal attitudes and individual health-seeking behaviour influence health. Explore medicine as an institution of social control to ensure adherence to social norms, specifically, by using medical means to minimise, eliminate, or normalise unhealthy behaviour. Analyse and describe the patient-healthcare provider relationship in relation to illness behaviour. Evaluate the effectiveness of placebos in the context of managing chronic diseases (i.e., HIV/AIDS, cancer, obesity and coronary heart disease). Identify the challenges with measuring health status and quality of the life of patients.

STATISTICS FOR HEALTH SCIENCES **M3512BS**

NQF level : 5
Contact Hours : 4L
Credits : 12
Pre-requisites : **NONE**
Assessment:
The module will be assessed through continuous assessment (CA) 40% and examination 60%. The CA mark will be made up of: Two tests and one make-up test - two highest test scores contribute 35% each = 70%; three assignments contributing 8% each = 24% and one practical contributing 6%. Examination will be one x 3 hours written paper.
Module Content:
Describing Univariate Data: Central Tendency, Spread, shape and graphs. Describing Bivariate Data: Scatterplots and Correlation. Introduction to Probability (elementary): Simple probability, Conditional probability, Probability of A and B, Probability of A or B. Normal Distribution: Standard normal distribution, Converting to percentiles and back, and area under portions of the curve. Sampling Distributions: Sampling distribution of the mean, Standard error, Central limit theorem, Difference between means, Proportion, Difference between proportions. Confidence Intervals: Overview, Mean, σ known, Mean, σ estimated, General formula. Difference between means of independent groups, σ known, Difference between means of independent groups, σ estimated, Pearson's correlation, Difference between correlations. The Logic of Hypothesis Testing: Ruling out chance as an explanation, The null hypothesis, Steps in hypothesis testing and conclusion, The precise meaning of the p value, Statistical and practical significance, Type I and II errors, One- and two-tailed tests, Confidence intervals and hypothesis testing following a non-significant finding. Testing Hypotheses with Standard Errors: General formula Tests of μ, σ known, Tests of μ σ estimated, μ1 - μ2, independent groups, σ estimated, μ1 - μ2, dependent means, σ estimated. Chi square: Test for independence and goodness-of-fit and equality of proportion. Power: Factors affecting power, Size of difference between means, Significance level, Sample size, Variance.

VETERINARY PHARMACY PRACTICE **P3862PV**

NQF level : 8
Contact Hours : 2L+1T x 16 weeks
Credits : 9
Pre-requisites : **P3783PP – Pharmacy Practice II**
Assessment:
The assessments will include continuous assessments (CA) and summative assessments, which will each contribute 50% to the final mark. The continuous assessments will consist of the following: Assignments 20%, tests 70% and practical excursions 10%. The exam will be one two (2) hour written paper.
Module Content:
Good veterinary pharmacy practice handling veterinary prescription orders, admixtures and dosage calculations, compounding and labelling, prescriptions for multiple or singe animals, veterinary management information systems, storage, dosage, reconstitution and admixtures in veterinary care, inventory, registration of veterinary drugs, measurements used in veterinary medicine, veterinary dosage regimes. medications labels and controlled substance labelling, drug interactions and incompatibilities. Veterinary Logistics Management: Selection, procurement, storage, distribution

quality control and rational use, Veterinary Essential medicine list, treatment guidelines. Legislation veterinary pharmaceutical in Namibia: Registration, licensing, use, distribution, selling, common malpractices, Schedules and classes of veterinary medicines, Medicines and related substances act. Veterinary nutrition topics including vitamins, water and micronutrients in veterinary care, calcium, phosphorus; macro elements; trace elements, fat – soluble vitamins; water – soluble vitamins. Growth promoters and husbandry; basic comparative veterinary physiology topics including classification of animals for veterinary purposes, anatomy and physiology differences from humans; classes of animal diseases, aetiology and pathophysiology of diseases, clinical signs in diseased animals; Veterinary medicines and agrochemicals prescription only medicines in veterinary care; OTC medicines in general veterinary care. Veterinary anti-infectives: antibiotics, anticoccidials, antifungals, antivirals; anthelminthics, endoparasitics ectoparasitics & endectocides; fungicides, insecticides, disinfectants. Veterinary biologics: vaccines, hormones and antisera, toxoids; analgesics and anti-inflammatory drugs corticosteroids, NSAIDs, immobilizations, anaesthetics, antidotes. Antihistamines, counterirritants, emollients, dermatology preparations and antiseptics. Mastitis remedies, tear supplements. One health concept, public health; and pharmacotherapy of common animal diseases cattle; east coast fever, contagious bovine pleuropneumonia, hemorrhagic septicaemia and trypanosomiasis; goats and sheep: peste des petits ruminants, contagious caprine pleuropneumonia, sheep & goat pox; swine: porcine cysticercosis, African swine fever, classical swine fever and poultry: Newcastle disease and highly pathogenic avian influenza. the following sub-themes will be covered: poultry diseases; veterinary therapeutics: ruminants; veterinary therapeutics: non-ruminants; and (pet diseases.

CURRICULUM FOR THE BACHELOR OF PHARMACY DEGREE

BPHARM (HONOURS)

PHASED OUT AS OF 2023

COURSE CODE: 18BPHA

INTRODUCTION

The education and training of pharmacists for award of the Bachelor of Pharmacy of the University of Namibia is conducted over a 4-year period. During the course a variety of instructional methodologies are used. Instructional strategies at the School combine didactic methods (lectures and seminars), practical work (laboratory, pre-clinical practice, and fieldwork), clinical apprentice, independent study and student scientific work. The overall goal of the degree program is to produce a graduate who has sound understanding of the scientific foundations for the practice of pharmacy, possesses a high standard of pharmacy practice and is able to provide leadership in the community. The graduates are also adequately prepared for future specialization in own area of interest and have the desire for lifelong learning

MAJOR LEARNING OUTCOMES AND CONTENT OF THE COURSE

At the end of the BPharm degree programme, the graduates will be able to demonstrate the following major learning outcomes:

1. Practise pharmacy within legal requirements in a professional and ethical manner
2. Provide high quality patient-centred pharmaceutical care
3. Interpret and dispense prescriptions and medication orders
4. Provide information on medicines
5. Promote and support Primary Health care
6. Manage the manufacture of pharmaceuticals and related substances
7. Manage the pharmaceutical supply chain system
8. Manage pharmaceutical human resources
9. Manage pharmacy budget and financial operations
10. Manage physical facilities for pharmaceutical operations
11. Manage pharmaceutical information systems
12. Conduct pharmaceutical and related research
13. Optimize patient care and inter-professional relationships
14. Apply information and communication technology

The content of the curriculum comprises but is not limited to the following:

- *Biomedical sciences:* anatomy, physiology, pathophysiology, microbiology, immunology, biochemistry, molecular biology, and biostatistics.
- *Pharmaceutical sciences*: medicinal and pharmaceutical chemistry, pharmacognosy and phytochemistry, pharmacology, toxicology, and pharmaceutics which encompasses physical and chemical characteristics of drugs and excipients, principles of dosage forms and drug delivery systems, biopharmaceutics, and pharmacokinetics.
- *Behavioral, social, and administrative pharmacy sciences*: pharmacoeconomics, communications applicable to pharmacy, the history of pharmacy, legal and ethical foundations to practice, management of pharmaceutical systems.
- *Pharmacy practice*: prescription processing, compounding and preparation of dosage forms, including parenteral products, drug distribution and drug administration, epidemiology, health promotion and disease prevention, clinical laboratory medicine, clinical pharmacokinetics, patient evaluation and ordering medications, pharmacotherapeutics, and drug information and literature evaluation.
- *Professional experience*: field attachments including rural, community, hospital and industrial practice attachments.

INTERNSHIP AND REGISTRATION

After graduating, candidates will have to complete a one year internship programme under the supervision of the Pharmacy Council of Namibia, the statutory body responsible for the registration of pharmacists. The internship is supervised by mentors registered with the Pharmacy Council of Namibia. Successful completion of the internship is a condition for registration to practise as a pharmacist in Namibia.

STUDENT ADMISSION

COMMITTEE ON ADMISSIONS

Admission to the pharmacy degree course shall be administered by a Committee on Admissions, which shall be composed of members of the School and the Administrative Officer in charge of admissions to the School. All committee members shall be appointed by the Dean for a term of three years and may be reappointed for additional terms. The Committee shall have the authority to select students entering the School on condition that they fulfil the minimum admission requirements as set out below. The School shall exercise the responsibility of reviewing the requirements for admissions and recommending any revisions to Senate for approval.

ADMISSION CRITERIA

In order to be admitted to the programme, candidates must satisfy at least one of the following requirements:

1. To apply for the BPharm degree, a candidate must be enrolled in Grade 12 studying towards a NSSC certificate or in possession of a NSSC certificate or any other equivalent qualification with at least:
   a) 30 points on the UNAM scale with a grade B or better in ordinary level English OR 32 points on the UNAM scale with a grade C or better in ordinary level English

b) A Score of "2" or better on higher level in Mathematics and Physical Sciences (or a 2 in Mathematics and a 3 in Physical Science) (or a 2 in Physical Science and a 3 in Mathematics) or a grade B or better in ordinary level Mathematics and Physical Sciences

c) Grade B or better in ordinary level Biology/Life Science

(Please refer to the scale used by the University to calculate the UNAM score);

OR

2. To apply for the BPharm degree, a candidate must have successfully completed the entire first year Science curriculum and must have passed chemistry, Biology and Mathematics/Physics modules with an aggregate of at least 55%.

OR

3. To apply for the BPharm degree, a candidate must have successfully completed a Science degree from a recognised University with passes in Sciences including Chemistry and Biology

OR

4. Mature Entry: Candidates aspiring for admission to UNAM's Bachelor of Pharmacy degree through the Mature Age Entry Scheme must satisfy the following conditions:
    a. They should be at least 25 years old on the first day of the academic year in which admission is sought
    b. They should have successfully completed senior secondary education
    c. They should have proof of at least five years pharmacy relevant work experience (as determined by the School).
    d. They should pass all papers of the prescribed Mature Age Entry Tests with an overall average of 55%.
    e. Candidates who, in the opinion of the Faculty, merit further consideration, may be called for an oral interview before the final selection is made

Meeting the above student admission criteria DOES NOT necessarily ensure admission. Admission is awarded on merit based on places available on the programme and any other conditions that may be determined from time to time.

The Faculty reserves the right to administer special written entry tests and interviews before admission.
The admissions process **will not be re-opened** and a waiting list will be kept to choose from in the case of admitted student not turning up for registrations the following year.

DURATION OF STUDY

Each academic year shall comprise of two semesters each of 16 weeks of lectures and 2 weeks of examinations. The programme shall be completed in not less than four (4) years of full time academic study. The BPharm degree MUST be completed within six (6) years of full time study, unless special permission is granted for this period to be extended.

EXEMPTIONS

UNAM may give exemptions for equivalent modules taken at other recognized tertiary institutions but the exemptions shall not exceed 50% of the modules in the UNAM BPharm degree programme and shall be limited to the first two academic years only. An application for exemption from (a) module(s) must be accompanied by documentary proof issued by the examining body concerned that the student has passed the relevant module (not older than 5 years). For detailed rules on exemption, see the General University Information and Regulations.

EXAMINATION REGULATIONS

For detailed examination and promotion rules, see the General University Information and Regulations.

ELIGIBILITY FOR EXAMINATIONS

1. A candidate shall present himself/herself for the University examinations at such a time as indicated by the School Calendar of Examinations approved by the Senate.
2. A candidate will be eligible to write the examinations if he/she has attained the required minimum continuous assessment mark of 50% in each module. In addition, the candidate should have regularly and satisfactorily participated in the course of study, by attending not less than 80% of theory. Attendance of all practical classes is **COMPULSORY**.

MODE OF EXAMINATIONS

1. THEORY EXAMINATIONS shall be of three hours duration, unless specified otherwise.
2. Practical examinations shall not exceed three and a half hours duration.
3. A viva–voce (oral) examination shall be of not more than half hour duration for all modules, except the Project and the Field Attachment assessment.
4. The Project shall be examined by:
    a. Assessment of the dissertation by the Supervisor, and this shall constitute 50% of the mark
    b. Assessment of an oral defence by a panel, and this shall constitute 50% of the mark
5. Field Attachment assessment: The student shall be evaluated by lecturer(s) and preceptor(s) using student evaluation forms for each rotation upon completion of the attachment.
6. For each module, an external examiner shall moderate the examinations

CRITERIA FOR PASSING EXAMINATIONS

1. The examination in each module for any academic year shall constitute of:
    a. 60% Continuous assessment (CA, practicals, term papers)
    b. 40% Semester examination (Written theory papers, Practical and oral examinations where applicable)
2. A student shall be declared to have passed examination if he / she attain at least 50% mark in each of the modules. Where a module has a theory, practical and oral examination, the student must pass each examination with a minimum mark of 50%

ACADEMIC ADVANCEMENT RULES

FIRST YEAR TO SECOND YEAR OF PHARMACY

A student must have passed at least 12 of the prescribed First Year modules (192 credits) to register for Second Year modules. If any of the failed modules is a pre-requisite for a Second Year module, the student cannot register for the affected Second Year module until the pre-requisite is passed.

SECOND YEAR TO THIRD YEAR OF PHARMACY

A student must have passed **ALL** the prescribed First Year modules. In addition, the student must have passed at least 11 of the prescribed Second Year modules (408 credits). If any of the failed modules is a pre-requisite for a Third Year module, the student cannot register for the affected Third Year module until the pre-requisite is passed.

THIRD YEAR TO FOURTH YEAR OF PHARMACY

A student must have passed **ALL** the prescribed First Year and Second Year modules. In addition, the student must have passed at least 13 of the prescribed Third Year modules (648 credits). If any of the failed modules is a pre-requisite for a Fourth Year module, the student cannot register for the affected Fourth Year module until the pre-requisite is passed.

MINIMUM REQUIREMENTS FOR RE-ADMISSION

A student will not be re-admitted into the Bachelor Pharmacy (Honours) Degree if she/he has not earned:

- At least 96 credits by the end of the first year (at least 6 modules of Year 1)
- At least 272 credits by the end of the Second year (12 modules of year 1 plus 5 modules of Year 2)
- At least 488 credits by the end of the Third Year (All modules of Year 1, plus 11 modules of Year 2 and 5 modules of Year 3)
- At least 608 credits by the end of the Fourth Year (All modules of Year 1 and 2, plus 10 modules of Year 3)
- At least 680 credits by the end of the Fifth Year (All modules of Year 1,2,3, plus 2 modules of Year 4)

GRADUATION

A student can ONLY graduate with a Bachelor Pharmacy (Honours) Degree if she/he has passed the entire prescribed modules (1104 credits) of the program.

GRADING OF EXAMINATIONS

The UNAM grading system shall apply to all modules in the course including the Project.

AWARD OF THE DEGREE OF BACHELOR OF PHARMACY

A student must meet all requirements of this programme and the General University Information and Regulations in order to be awarded the Bachelor of Pharmacy Degree (BPharm).

DELIVERY MODE OF COURSES

Learning outcomes relate to the three domains: cognitive (knowledge), affective (attitudes), and psychomotor (skills). All modules include practical components. The delivery modes and techniques include, but are not limited to, case studies that will require students to use higher cognitive skills, role plays and real life experiences.

CURRICULUM STRUCTURE

The curriculum for the degree of Bachelor of Pharmacy (BPharm) consists of four years of learning spread over 8 semesters each of 16 weeks of lectures and 2 weeks of examinations, resulting in an 18-week semester. A full module carries 16 credits and is offered at three (3) contact hours plus two (2) hours of tutorial (or 3 hours of practical) per week for 16 weeks while a half-module carries 8 credits and is offered at two (2) contact hours plus one (1) hour of tutorial (or 2 hours of practical) per week for 16 weeks unless specified otherwise in the module. In addition, the curriculum includes 8 weeks of experiential learning in the form of field attachment at the end of years 2 and 3. The total number of credits for the degree is 792.

YEAR 1 SEMESTER 1 (16 WEEKS)					
Module Title	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Organic Chemistry	PCMO3511	5	16	3+3P	
Mathematics	PCTM3511	5	16	3+1P	
Anatomy I	PPHA3511	5	16	3+2P	
Physiology I	PPHP3511	5	16	3+2P	
Sociology of Health & Disease	PCSS3511	5	16	3	
English for Academic Purposes	ULEA3519	5	16	4	
Computer Literacy	UCLC3509	5	16	2+1P	

YEAR 1 SEMESTER 2 (16 WEEKS)					
Module Title	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Physical Chemistry	PCMO3512	5	16	3+3P	PCTM3511
Anatomy II	PPHA3512	5	16	3	PPHA3511
Physiology II	PPHP3512	5	16	3+2P	PPHP3511
Biochemistry I	PPHB3512	5	16	3+2P	PCMO3511
Biostatistics	PCSB3512	5	16	3+1P	
Primary Health Care: Health Promotion	PCSP3512	5	16	3+2P	
Introduction to Pharmacy & Dispensing	PCTI3632	6	16	3+3P	
Contemporary Social Issues	UCSI3580	5	8	2	
TOTAL CREDITS			**232**		

YEAR 2 SEMESTER 1 (16 WEEKS)					
Module Title	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Pharmacy Practice I	PCSP3621	6	8	2+2P	PCTI3632
Physiology III	PPHP3631	6	16	3+2P	PPHP3512
Biochemistry II	PPHB3631	6	16	3+2P	PPHB3512
Inorganic Chemistry	PCMI3611	6	16	3+3P	
General Pharmaceutics	PCTG3631	6	16	3+3P	PCMP3512
Introduction to Pharmacology	PPHH3631	6	16	3+3P	

YEAR 2 SEMESTER 2 (16 WEEKS)					
Module	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Introduction to Clinical and Nursing Skills	PCSN3632	6	16	3+4P	PPHA3512 PPHP3631
Pharmaceutical Analysis	PCTA3632	6	16	3+3P	PCMI3611 PCMO3512
Pharmaceutical Organic Chemistry	PCMO3632	6	16	3+3P	PCMO3511
Systems Pharmacology I	PPHS3732	7	16	3+3P	PPHH3631
Physical Pharmacy	PCTP3632	6	16	3+3P	PCMO3512 PCTG3631
Research Methods	PCSR3632	6	16	3+1P	PCSB3512

FIELD ATTACHMENT -YEAR 2 (2 X 4 WEEKS)					
Module	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Community Pharmacy	PCSC3739	7	16	35P	PCSP3622
Rural Attachment	PCSU3739	7	16	35P	PCSP3622
TOTAL CREDITS			**216**		

YEAR 3 SEMESTER 1 (16 WEEKS)					
Module Title	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Pharmacognosy and Phytochemistry	PCMH3751	7	16	3+3P	PCMO3511
Pharmaceutical Microbiology	PCTM3751	7	16	3+3P	
Systems Pharmacology II	PPHS3751	7	16	3+3P	PPHS3731
Biopharmaceutics & Pharmacokinetics	PCTK3721	7	8	2+1P	PCTM3511 PCTG3631
Pharmacy Law & Ethics	PCSL3721	7	8	2	
Veterinary Pharmacy & Agrochemicals	PPHV3721	7	8	2+1P	PPHH3632
Chemotherapy	PPHC3751	7	16	3	PCTM3751

YEAR 3 SEMESTER 2 (16 WEEKS)					
Module	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Medicinal Chemistry I	PCMM3752	7	16	3+3P	PCMO3511
Applied Pharmaceutical Microbiology	PCTA3752	7	16	3+3P	PCTM3751
Environmental & Occupational Health	PCSO3722	7	8	2+2P	
Pathophysiology & Pharmacotherapeutics I	PCST3752	7	16	3+4P	PPHS3751
Pharmaceutical Technology I	PCTT3752	7	16	3+3P	PCTP3632
Pharmacy Practice II	PCSP3742	7	8	2+2P	PCSP3622

FIELD ATTACHMENT -YEAR 3 (2 X 4 WEEKS)					
Module	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Hospital Pharmacy	PCSY3859	8	16	35P	PCSP3742
Industrial/Manufacturing Facility	PCSF3859	8	16	35P	PCTT3752
TOTAL CREDITS			**200**		

YEAR 4 SEMESTER 1 (16 WEEKS)					
Module Title	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Medicinal Chemistry II	PCMM3871	8	16	3+3P	PCMM3752
Pathophysiology & Pharmacotherapeutics II	PCST3871	8	16	3+4P	PCST3752
Pharmaceutical Technology II	PCTT3871	8	16	3+3P	PCTT3752
Complementary and Alternative Medicines	PCSA3861	8	8	2	PCMH3751
Research Project	PCSR3870	8	16	6P	PCSR3632

YEAR 4 SEMESTER 2 (16 WEEKS)					
Module	**Code**	**NQF Level**	**Credits**	**Hrs**	**Pre /Co-requisites**
Pharmacy Management	PCSM3872	8	16	3	
Clinical Pharmacokinetics and Therapeutic Drug Monitoring	PCSD3872	8	16	3+2P	PCTK3721
Pharmacoepidemiology & Pharmacoeconomics	PCSE3872	8	16	3+1P	PCSB3512
Clinical Toxicology	PPHT3862	8	8	2+1P	PPHS3731PPHS3751
Research Project	PCSR3870	8	16	6P	PCSR3632
TOTAL CREDITS			**144**		

COURSE EQUIVALENTS

BACHELOR OF PHARMACY (BPharm)		BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (MBChB)	
Module Title	**Code**	**Module Title**	**Code**
Organic Chemistry	PCMO3511	Biochemistry I	MBSB3511
Anatomy I	PPHA3511	Anatomy I	MBSA3511
Physiology I	PPHP3511	Physiology I	MBSP3511
Sociology of Health & Disease	PCSS3511	Behavioural Sciences I	MBSC3511
Primary Health Care –Health Promotion	PCSP3511	Family Medicine I	MBSF3514
Anatomy II	PPHA3512	Anatomy II	MBSA3512
Physiology II	PPHP3512	Physiology II	MBSP3512
Biochemistry I	PPHB3512	Biochemistry II	MBSB3512
Biostatistics	PCSB3512	Community Medicine I	MCMC3612
Physiology III	PPHP3631	Physiology III	MBSP3631
Biochemistry II	PPHB3631	Biochemistry III	MBSB3531
Introduction to Clinical and Nursing Skills	PCSN3632	Internal Medicine I	MCMM3732
Research Methods	PCSR3632	Community Medicine III	MCMC3632
Environmental & Occupational Health	PCSO3721	Family Medicine III	MBSF3652

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UNAM CORE MODULES

COMPUTER LITERACY **UCLC3509**

NQF level: 5
Contact hours: 4 Lectures, 1 Theory+6 Computer Practice/Week for 16 weeks;
Credits: 16
Module Assessment: Continuous Assessment 2 Practical tests 50% + 2 Theory tests 50%
Pre/Co-requisite: None

Module description: This module is aimed at assisting students to develop basic information technology skills that are necessary for studying at tertiary level. The module will impart skills necessary to communicate process documents, analyse and present data. The student will be better equipped to conduct literature searches. The module is necessary for future delivery of services by the pharmacy professional.

CONTEMPORARY SOCIAL ISSUES **UCSI3580**

NQF 5
Contact Hours 1 hour per week 2 semesters (offered Online)
Credits 8
Assessment Continuous 100%
Prerequisite None

Module Description:
Course Content: The module, Contemporary Social Issues (CSI3580), is designed to encourage behavioral change among UNAM students and inculcate the primacy of moral reasoning in their social relations and their academic lives. In providing students with critical and analytical thinking the module enables students to grow and develop into well rounded citizens, capable of solving contemporary social challenges experienced in their communities and societies. The teaching of the module takes three dimensions: the intellectual, the professional and the personal dimensions. The intellectual dimension is fostered through engaging students with subject knowledge, independent learning and module assessment. The professional dimension, on the other hand, is fostered through exposing students to real life situations of case studies and practical exercises that draws attention to social issues that attract ongoing political, public and media attention and/or debate. Finally, the professional dimension is fostered through group work and online discussions.

ENGLISH FOR ACADEMIC PURPOSES **ULEA3519**

NQF level: 5
Contact hours: 4 Lectures/Week
Credits: 16
Module Assessment: Continuous Assessment (40%) and Examination (60%) (1 X 3 hours written paper)
Pre/Co-requisite: None

Module Description:
This module develops a student's understanding and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies. Students are also required to do oral presentations based on their essays. The reading component of the course deals with academic level texts. This involves students in a detailed critical analysis of such texts. The main aim is therefore, to develop academic literacy in English.

BPHARM MODULES

ANATOMY I **PPHA3511**

NQF level: 5
Contact Hours 3 Lecture hours per week + 2 hours of tutorial (or 3 hours of practice)
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 × 3 hours written paper)
Pre-requisites None

Module description

Basic Human Histology: This course aims to provide a general introduction to cells, the structure of the developing human, as well as the histology of the resulting main tissue types. An overview will be provided to levels of organization of the human body which ranged from cells to organ systems. The primary focus will be structural embryology with emphasis on human reproduction, gametogenesis, fertilization, gastrulation and the derivatives of the three germ layers. Furthermore, the development of the placenta will also be studied and a general introduction to congenital defects and embryopathies will be provided. In addition, this course will also provide an introduction to the four basic tissue types namely, epithelium, connective tissue, muscle and nervous tissue. Histological slides will be used to examine tissues in context.

ANATOMY II **PPHA3512**

NQF level: 5
Contact Hours 3 Lecture hours per week
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Co-requisite: PPHA3511

Module description

Systemic Anatomy: This second module in anatomy will expose students to morphological and functional characteristics of the various organs and organ-systems of the human body. This module builds on the basic concepts that were acquired during the study of human development and the four basic tissue types. Both the macro and micro-anatomy of the human body systems will be scrutinized. Emphasis will be placed on the histology of the eye, ear, skin, circulatory system, nervous system, lymphoid system, gastrointestinal tract, gastrointestinal tract glands, respiratory system, urinary system, andrological and female reproductive systems and endocrine system. Relevant clinical anatomy will be studied. This will be achieved through the evaluation of case studies related to each system and use of relevant medical technology. Students will be exposed the morphological alterations and their manifestations in the normal variant and pathological states. Histological slides will be used to examine the various organ systems as well as their tissue constituents.

APPLIED PHARMACEUTICAL MICROBIOLOGY **PCTA3752**

NQF level: 7
Contact hours: 3 lecture hours/week for 16 weeks;
3 practical hours for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Co-requisite: PCTM3751
Assessment Methods: Assignment, tests, practicals, class presentation, student form evaluation

Module Description:

The module involves the application of basic microbiological principles in the production of clean and sterile pharmaceutical products in community and hospital pharmacies, and in industrial manufacture. This includes the principles and methods of sterilisation, aspects of disinfection and preservation; concepts of good manufacturing practice, aseptic techniques and infection control in health care settings.

BIOCHEMISTRY I **PPHB3512**

NQF: 5
Contact Hours: 3 lecture hours + 2hours of laboratory practical
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Co-requisite: PCMO3511

Module Description

Molecular Biology and Genetics: This module is the first of two, describing the biomolecules and biochemical processes that are required in all functioning cells. Building upon what they have learnt in organic chemistry, students will be acquainted with the chemistry of essential biomolecules and will also be able to explain the molecular basis underlying enzymatic reactions. The course gives an overview of cell structure and function and focuses on the metabolism and storage of macromolecules, energy transduction and the flow of information within cells and between individual cells. In this course, students will become acquainted with the central dogma of molecular biology and the interrelated roles that DNA, RNA and protein play. Students will study gene structure and expression, biochemistry of DNA and RNA, protein biosynthesis, genetic defects and inheritance and genetic recombination. Multifactorial genetic diseases will also be covered. Finally, genetic diseases will figure prominently in discussions of DNA testing, cloning, ethics and genetic counseling. At the end of this course, students will be able to describe the structural and functional relationships of the various components of a cell.

BIOCHEMISTRY II **PPHB3631**

NQF 6
Contact Hours: 3 lecture hours + 2 hours of practical per week
Credits: 16
Assessment: 60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite: None

Module Description:
Metabolism and nutrition: The course gives an overview of cell structure and function and focuses on the metabolism and storage of macromolecules, energy transduction and the flow of information within cells and between individual cells. The course will give an integrated overview of the functions of protein, carbohydrate and major vitamins and minerals as determinants of health and disease in human populations. The structure and function of vitamins and chemical carcinogenesis will be studied in this course. Students will be acquainted with the structure and role of the various immunoglobulins in the body's response to foreign materials. Students will be able to explain laboratory findings and disorders of metabolism and provide an overview of the major macro and micronutrients relevant to human health, the role of key nutrients in the prevention of disease and major nutrition related diseases.

BIOPHARMACEUTICS AND PHARMACOKINETICS **PCTK3721**

NQF level: 7
Contact hours: 2 lecture hours/week 1 hour practicals/week
Credits: 8
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisites:: PCTM3511, PCTG3631
Assessment Methods: Assignments, tests, student evaluation form

Module Description:
Biopharmaceutics: This module provides students with knowledge of drug dosage forms and drug delivery systems. The module develops the students understanding of the role of biopharmaceutics in the design of safe and effective medicines. It provides an understanding of the influence of formulation on the bioavailability of drugs. It covers routes of administration, biopharmaceutics, bioavailability, bioequivalence, rate and extent of availability, onset and duration of effect, getting to the site of absorption, dissolution, disintegration, first-pass effect, passive diffusion and active transport.
Pharmacokinetics: This module provides the students with an understanding of the process and kinetics of absorption, distribution and elimination of drugs and the application of such knowledge to the rational design of dosage regimens and to the *in vivo* evaluation of dosage forms. The module covers the quantitation of factors affecting absorption, distribution, and metabolism, and excretion of drugs; derivation of mathematical models to calculate the time course of drug concentrations following drug administration; analysis of drug concentration data sets graphically and using non-linear regression.

BIOSTATISTICS **PCSB3512**

NQF: 5
Contact Hours: 3 lecture hours + 1 hour of practice
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper
Pre/Co-requisite: None

Module description
Biostatistics - Biostatistics is a core science for all medical staff. Skills in statistical analysis are critical for research, evaluation and audit, as well as critical appraisal of the medical literature. The Biostatistics module presents a broad approach to evidence based decision making, statistical analysis, and concentrates particularly on areas which are likely to impact on Medical care or research.

CHEMOTHERAPY **PPHC3751**

NQF level: 7
Contact hours: 3 lecture hours per week
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 × 3 hours written paper)
Co-requisite: PCTM3751

Module Description:
This module is designed to provide students a basic understanding of the principles of chemotherapy including treatment of infections, infestations and cancer. It includes the rational use of specific drugs, problems of drug resistance, current anti-cancer and anti-infective drugs.

CLINICAL PHARMACOKINETICS AND THERAPEUTIC DRUG MONITORING **PCSD3872**

NQF level: 8
Contact hours: 3 lecture hours/week for 16 weeks;
2 practical hours for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 × 3 hours written paper)
Pre-requisite: PCTK3721
Assessment Methods: assignments, tests, practicals and student assessment forms

Module description:
This module develops the students' theoretical concepts acquired in the biopharmaceutics and Pharmacokinetics module. Emphasis is on practical and clinical applications**.**

CLINICAL TOXICOLOGY **PPHT3862**

NQF level: 8
Contact hours: 2 lecture hours/week for 16 weeks + 1 practical hour
Credits: 8
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PPHS3632, PPHS3751
Assessment Methods: assignments, tests, student evaluation

Module Description:
The module covers general toxicology and provides students with knowledge and understanding of basic toxicology relevant for drugs. The module covers the most common acute-toxic drugs and chemicals, poisoning symptoms, treatments and antidotes.

COMMUNITY PHARMACY **PCSC3739**

NQF level: 7
Contact hours: 35 attachment hours/week for 3 weeks
Credits: 16
Module Assessment: 100 % Continuous Assessment (Student evaluation form, problem based learning)
Pre-requisite:: PCSP3622

This module provides students with knowledge and hands-on skills in the main sectors of pharmacy – hospital, community and pharmaceutical industry. The module provides students with the opportunity to develop professional skills through interaction with role model professionals and to develop interpersonal communication skills in practice**.**

COMPLEMENTARY AND ALTERNATIVE MEDICINE **PCSA3861**

NQF level: 8
Contact hours: 2 lecture hours/week for 16 weeks;
Credits: 8
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCMH5715
Assessment Methods: assignments, tests, class presentation, student evaluation form

Module Description:
This module equips students with knowledge, skills and attitudes to provide unbiased information and advice to patients on complementary and alternative therapies including African traditional medicine the medicinal uses of various naturally occurring drugs and their history, sources, distribution, methods of cultivation, active constituents, medicinal uses, identification tests, preservation methods, substitutes and adulterants.

ENVIRONMENTAL AND OCCUPATIONAL HEALTH **PCSO3722**

NQF: 7
Contact Hours: 2 lecture hours + 2 hour of practice
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre/Co-requisite: None

Module description

Environmental and Occupational Health: This course, gives medical students the attitudes, skills and knowledge necessary to provide preventive health services to reduce the health impact of disease and injury resulting from workplace and community factors. The course caters for the special needs of medical practitioners, pharmacists, nurses, allied health personnel, scientists and occupational health and safety managers.

GENERAL PHARMACEUTICS **PCTG3631**

NQF level:	6
Contact hours:	3 lecture hours/Week for 16 weeks; 3 practical hours / week for 16 weeks
Credits:	16
Module Assessment:	60% Continuous assessment 40% final examination (1x 3 Hours written paper)
Pre-requisite:	PCMP3512
Assessment Methods:	assignments, tests, practicals, class presentations, student evaluation forms

Module Description:

This module builds on the foundation knowledge acquired from the module on the introduction to pharmacy and dispensing in the previous semester. It emphasises on properties of powders and other dosage forms and to do basic calculations related to the physical and chemical properties of drugs and common dosage forms

HOSPITAL PHARMACY **PCSY3859**

NQF level:	8
Contact hours:	35 attachment hours/week for 3 weeks for each rotation
Credits:	16 for each rotation
Module Assessment:	Student evaluation form
Co-requisite:	PCSP3742

Module Description:

This module provides students with knowledge and hands-on skills in the main sectors of pharmacy – hospital, community and pharmaceutical industry. The module provides students with the opportunity to develop professional skills through interaction with role model professionals and to develop interpersonal communication skills in practice**.**

INDUSTRIAL/MANUFACTURING FACILITY **PCSF3859**

NQF level:	8
Contact hours:	35 attachment hours/week for 3 weeks for each rotation
Credits:	16 for each rotation
Module Assessment:	Student evaluation form
Co-requisite:	PCTT3751

Module Description:

This module provides students with knowledge and hands-on skills in the main sectors of pharmacy – hospital, community and pharmaceutical industry. The module provides students with the opportunity to develop professional skills through interaction with role model professionals and to develop interpersonal communication skills in practice**.**

INORGANIC CHEMISTRY **PCMI3611**

NQF	6
Contact Hours:	3 lecture hours + 2 hours of practical per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite:	None

Module Description:

GENERAL CHEMISTRY: This is an introductory course to inorganic chemistry. It builds upon what is covered in the First Year chemistry courses. Students are expected to review the structure of the atom on their own, then the course progresses into its reactivity to form simple and complex molecule. The following topics are covered: In-depth studies of chemical bonding; (valence bond theory (VBT), shapes of molecules and hybridization; molecular orbital theory (MOT) in diatomic and polyatomic molecules); Delocalized multiple bonding. S-block elements: The chemistry of alkali and alkaline earth elements (groups 1 and 2); reactivity with hydrogen, oxygen, halogens, water, and liquid ammonia; Classification of oxides, and their

reaction with water; P-block elements (groups 13 to 18): Reactivity with oxygen and halogens; The hydrides of P block elements; Hydrolysis and ammonolysis of P-block halides

INTRODUCTION TO CLINICAL METHODS AND NURSING SKILLS **PCSN3632**

NQF: 6
Contact Hours: 3 lecture hours + 3 hours of practice per week
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Co-requisite: PPHP3631
Pre-requisite: PPHA3512,

Module description

Introduction to Clinical Methods and Nursing Skills: This module which is the mainstay and foundation of clinical medical practice is designed to introduce the students early on to the professional and technical skills, scientific knowledge, and human understanding necessary in the care of the sick, their families, and the community and build up on the art of medical practice to near perfection. The module also introduces students to basic nursing procedure through didactic teaching and hands-on practice. A student is also equipped with knowledge and skills for providing emergency First Aid resuscitation and support before arranging for secure and safe transfer to health facility. It emphasizes on the establishment of direct, one-to-one physician-patient relationships, the process of social communication, and the performance of physical examination based on competent use of professional skills. Topics covered include communication skills, medical ethics, general, regional, and systemic physical examination of patients; basic nursing skills; First Aid.

INTRODUCTION TO PHARMACOLOGY **PPHH3631**

NQF: 6
Contact hours: 3 lecture hours + 2 hours of practice
Credits: 16
Assessment: 60% Continuous assessment 40% Examination (1 X 3 hours written paper)
Pre-requisite: None
Co-requisite: None

Module Description

This module highlights the fundamental principles of action of all medicinal drugs and is semi-integrated with the module on Internal Medicine. The module focuses on pharmacodynamics, pharmacokinetics, and toxicity of drugs used in diagnosis, treatment, and prevention of disease, with emphasis on drugs frequently encountered in clinical practice. Special focus will be given to medicines influencing the autonomic nervous system (ANS) as knowledge gained is generalizable to pharmacology of other systems. Students will also develop a further understanding of experimental pharmacology and how it can be used as a tool in the development and/or reformulation of new drugs. Upon completing this unit students will be able to correlate drug effects with physiological function and explain a given drugs mode of action as well as side effects and the mechanisms by with these drugs modify the physiological system. Topics: compliance, rational drug use; risk benefit ratio in prescribing; prescribing; use of generics or trade (brand); selection of drugs; route of administration; formulation and dosage; classification of drugs; metabolism and elimination of drugs; side effects;

INTRODUCTION TO PHARMACY AND DISPENSING **PCTI3632**

NQF level: 6
Contact hours: 3 lecture hours / week for 16 weeks
3 practical hours / week for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: None
Assessment Methods: assignments, tests, practicals, class presentations and student assessment forms.

Module description:

The module is intended to introduce students to the history and practice of Pharmacy in general and in Namibia. The module covers basic skills and knowledge for dispensing medicinal products including the assessment of the validity of a prescription, the use of appropriate reference sources for the interpretation and dispensing of prescriptions.
Students are provided with basic skills and knowledge on the application of information and communication technology in pharmacy and dispensing.

MATHEMATICS **PCTM3511**

NQF level: 5
Contact hours: 3 lectures per week for 16 weeks
1 tutorial per week for 16 weeks

Credits: 16
Assessment: 60% Continuous assessment(at least 2 tests), 40% final examination (3 hours examination paper).
Pre/Co-requisite: None

Module description:
Functions: one-to-one and onto functions, horizontal line test, composition of functions, inverse of a function. Introduction to exponential and logarithmic functions. Limit of a function: definition, left and right limits, infinite limits, limits at infinity, continuity in terms of limits. Differentiation: rate of change, derivative of a function, rules of differentiation, increasing and decreasing functions and graph sketching. Integration: antiderivatives, the definite integral, area under a graph. Trigonometry: further trigonometric identities, area of a sector and segment of a circle, derivatives and integrals of trigonometric functions.

MEDICINAL CHEMISTRY I **PCMM3752**

NQF level: 7
Contact hours: 3 lecture hours/week for 16 weeks; 03 practical hours for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCMO3511
Assessment Methods: assignments, tests, practicals, class presentation, student evaluation form

Module Description:
This module covers modern concepts of rational drug design. This includes introduction to Quantitative Structure Activity Relationship (QSAR), combinatorial chemistry, computer aided drug design (CADD), drug metabolism and prodrugs.

MEDICINAL CHEMISTRY II **PCMM3871**

NQF level: 8
Contact hours: 3 lecture hours/week for 16 weeks; 3 practical hours for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCMM3752
Assessment Methods: assignments, tests, practicals, class presentation, student evaluation form

Module Description:
This module covers concepts of biotechnology and the medicinal chemistry of classes of drug molecules. Classes of drugs will be covered in detail with respect to their physico-chemical properties, mode of action, structure-activity relationship, synthesis, chemical, nomenclature, and their side effects.

ORGANIC CHEMISTRY **PCMO3511**

NQF Level: 5
Contact Hours: 3 lecture hours + 3 hours of laboratory practical per week
Credits: 16
Assessment: 60% Continuous assessment 40% final examination
Pre/Co-requisites: None

Module Description:
Organic Chemistry: This module administered over one semester is designed to acquaint students with the basic knowledge in the classification of organic compounds. This includes the analysis of the chemical and physical properties and the use of organic compounds in medicine. Topics covered include the chemistry of alkyl halides, alcohols, ethers, carbonyl compounds and amines; aromatic and aliphatic chemistry, heterocyclic compounds; isomerism, stereoisomerism and reaction mechanisms. Upon completion of this course students will be acquainted with the molecular interactions that drive biosynthesis and bioenergetics within cells.

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS I **PCST3752**

NQF level: 7
Contact hours: 3 lecture hours / week for 16 weeks;
4 practical hours / week for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Co-requisite: PPHS3751
Assessment Methods: assignments, tests, class presentation, student evaluation form, problem based learning

Module description:
This module introduces students to the structural changes of tissues and organs of the human body, which result in or from pathological changes, or are caused by excessive functional adaptation or accumulation of the same. The module also introduces students to clinical pharmacy, an increasingly important aspect of modern pharmacy practice. Emphasis will be placed on the integration of knowledge and skills gained from previous courses with pathophysiology and therapeutics to devise appropriate pharmaceutical care plans.

PATHOPHYSIOLOGY AND PHARMACOTHERAPEUTICS II **PCST3871**

NQF level: 8
Contact hours: 3 lecture hours/week for 16 weeks
4 practical hours / week for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCST3752
Assessment Methods: Assignments, tests, class presentation, student evaluation form, problem based learning

Module Description:
This module enables students to integrate knowledge and skills in pathophysiology and therapeutics to devise appropriate pharmaceutical care plans. It focuses on major body systems including: gastrointestinal, respiratory and cardiovascular; central nervous system; musculoskeletal system; endocrine system and infectious diseases. Students also develop skills in selecting drugs rationally**.**

PHARMACEUTICAL ANALYSIS **PCTA3632**

NQF level: 6
Contact hours: 3 lecture hours/week for 16 weeks;
3 practical hours for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCMO3512, PCMI3611
Assessment Methods: assignment, tests, practicals, class presentation, student form evaluation

Module Description:
This module provides students with the theoretical and practical foundation to assure the quality and efficacy of drugs. The module incorporates requirements for drug quality in connection with Good Laboratory Practices and Good Manufacturing Practices. It includes the use of official reference books for drug analysis.

PHARMACEUTICAL MICROBIOLOGY **PCTM3751**

NQF level: 7
Contact hours: 3 lecture hours/week for 16 weeks;
3 practical hours for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre/Co-requisite: None
Assessment methods: assignments, tests, practicals, class presentations, student evaluation forms

Module description:
This module covers the various aspects of microorganisms, their classification, morphology, laboratory cultivation identification and maintenance. It includes sterilization of pharmaceutical products, equipment and media.

PHARMACEUTICAL ORGANIC CHEMISTRY **PCMO3632**

NQF level: 6
Contact hours: 3 lecture hours/week for 16 weeks
3 practical hours / week for 16 weeks
Module Assessment: 60% Continuous assessment 40% final examination (1 × 3 hours written paper)
Credits: 16
Pre-requisite: PCMO3511
Assessment Methods: assignments, tests, practical, class presentation and student assessment.

Module Description:

This module covers the classification of organic compounds. It includes the analysis of the chemical and physical properties and the use of organic compounds in pharmacy and medicines.

PHARMACEUTICAL TECHNOLOGY I **PCTT3752**

NQF level: 7
Contact hours: 3 lecture hours/week for 16 weeks;
3 practical hours for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCTP3632
Assessment Methods: assignments, tests, practical, class presentations, student evaluation form

Module Description:
This module introduces students to the basics of industrial and small-scale manufacturing. This includes the application of the principles involved in the formulation and evaluation of various pharmaceutical dosage forms, the packaging, labelling and storage of pharmaceuticals and the safe use of tools, equipment and materials during manufacturing.

PHARMACEUTICAL TECHNOLOGY II **PCTT3871**

NQF level: 8
Contact hours: 3 lecture hours/week for 16 weeks;
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCTT3752
Assessment Methods: assignments, tests, practical, class presentations, student evaluation form, problem-based learning.

Module Description:
This module introduces students to the basics of industrial and small-scale manufacturing. This includes the application of the principles involved in analysis and quality assurance as applied to the development, manufacture, assembly and distribution of medicinal products. The module exposes the student to all stages of drug development from discovery of an active agent to launch. The varied components of the undergraduate core course in the context of Industrial Pharmacy and drug development will be consolidated.

PHARMACOGNOSY AND PHYTOCHEMISTRY **PCMH3751**

NQF level: 7
Contact hours: 3 lecture hours/week for 16 weeks;
3 practical hours for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite:: PCMO3511
Assessment Methods: assignments, tests, practicals, class presentation, student evaluation form

Module Description:
This module provides students with knowledge of the medicinal uses of various naturally occurring drugs and their history, sources, distribution, methods of cultivation, active constituents, identification tests, preservation methods, substitutes and adulterants.

PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS **PCSE3872**

NQF level: 8
Contact hours: 3 lecture hours/week for 16 weeks + 1 practical hour/week
Credits: 16
Module Assessment: Continuous 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCSB3512
Assessment Methods: assignments, tests, class presentations, student evaluation form

Module Description:
This module introduces students to various aspects of pharmacoepidemiology that play important roles in therapeutics, medicine and public health. The module will also introduce students to basic principles of pharmacoeconomics and how they are used in the economic evaluation of health care policies and programmes.

PHARMACY LAW AND ETHICS **PCSL3721**

NQF level: 7
Contact hours: 2 lecture hours/week for 16 weeks
Credits: 8
Module Assessment: 60% Continuous assessment 40% final examination
(1 X 3 hours written paper)
Pre/Co-requisite: None
Assessment Methods: assignments, tests, student evaluation form

Module Description:
This module exposes students to several important legislations related to the profession of pharmacy in Namibia. These includes the following: Pharmacy Act, No. 9, 2004, Medicine and Related Substances Control Act, No 13, 2003 and Amendment Act, No. 8, 2007; Medical Aid Funds Act, No. 23, 1995; Hospital and Health Facilities Act, No. 36, 1994; Hospital and Health Facilities Amendment Act, No. 1, 1998; Council for Health and Social Services Professional Repeal Act, No. 3, 2004; and Allied Health Professions Act, No. 7, 2004, Dangerous Drugs. The new Drug Policy, Professional Ethics, Patent and Design Act.

PHARMACY MANAGEMENT **PCSM3872**

NQF level: 8
Contact hours: 3 lecture hours/week for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre/Co-requisite: None
Assessment Methods: assignments, tests, student evaluation form

Module Description:
The aim of this module is to develop the foundation for the management of activities in all pharmacy practice settings. These activities include financial management, supervision and marketing. While some challenges will be related to the clinical aspects of patient care and the management of patients with complex and intractable medical conditions, other significant challenges include managing other health professionals, pharmacy staff and resources

PHARMACY PRACTICE I **PCSP3621**

NQF level: 6
Contact hours: 2 lecture hours/week for 12 weeks;
2 practical hours / week for 16 weeks
Credits: 8
Module Assessment: 60% Continuous assessment 40% final examination (1 × 3 hours written paper)
Co-requisite: PCTI3632
Assessment Methods: Assignments, tests, practicals, class presentations, student evaluation forms

Module Description:
This module provides students with the skills and knowledge to provide various pharmaceutical care services to the public in a community pharmacy setting. This includes the provision of pharmacist-initiated therapy, monitoring of patients, responding to minor ailments, counselling, provision of information to patients and the maintenance of all records. The students are introduced to the basics of pharmaceutical business management.

PHARMACY PRACTICE II **PCSP3742**

NQF level: 7
Contact hours: 2 lecture hours/week for 16 weeks;
2 practical hours / week for 16 weeks
Credits: 8
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCSP3622
Assessment Methods: Assignments, tests, practicals, class presentation, student evaluation form

Module Description:
This module focuses on equipping students with the knowledge and skills for managing health commodities and pharmacy personnel within the hospital environment and working in a multi-disciplinary health care team.

PHYSICAL CHEMISTRY **PCMO3512**

NQF level: 5
Contact hours: 3 lecture hours +3 practical hours
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Co-requisite: PCTM3511
Assessment Methods: Assignments, tests, practicals, class presentations, student evaluation forms

Module Description:
This module enables students to analyse the physicochemical properties of drugs from the perspective of pharmacy. The behavior of ions in solution and electrode potential and spectroscopy are discussed.

PHYSICAL PHARMACY **PCTP3632**

NQF level: 6
Contact hours: 4 lecture hours/week for 16 weeks;
3 practical hours / week for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Co-requisite: PCTG3631
Pre-requisite: PCMP3512
Assessment Methods: Assignments, tests, practicals, class presentations, student evaluation forms

Module Description:
This module provides students with an understanding of the physical and physicochemical principles, design, formulation, manufacture and evaluation of pharmaceutical dosage forms. It introduces students to concepts such as diffusion and dissolution of drugs, drug solubilisation, surface and interfacial tension, surface active materials, micelle formation and pharmaceutical complexes.

PHYSIOLOGY I **PPHP3511**

NQF: 5
Contact Hours: 3 lecture hours + 4 hours of tutorial (or 3 hours of practice)
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre/Co-requisite: None

Module description
Embryology and Developmental Biology: This course in physiology introduces students to the fundamental processes and concepts of embryonic development. These include the acquisition of multicellularity, organization of the early embryo, morphogenesis of tissues, major organ systems, foetal membranes, growth, differentiation and analysis of common developmental defects. Upon completion of this course students should be versed in the genetic aspects of early development as well as the interactions that occur in development leading to the formation of the ectoderm, mesoderm and endoderm and the further differentiation of these layers into tissues, organs and systems. Particular attention will be placed on cell-cell communication and the pivotal role signaling plays in development.

PHYSIOLOGY II **PPHP3512**

NQF 5
Contact Hours: 3 lecture hours + 2hours of tutorial (or 3 hours of practice)
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Co-requisite: PPHP3511

Module description
Basic Cell Process and Homeostasis, and Control: The study of physiology encompasses a number of fields of study; from molecules to ecosystems. The module begins with an investigation of basic cell processes. The students will be expected to understand how molecular interactions are integral to the generation, storage and utilization of energy, signalling and cellular dynamics. Building upon this importance of cellular and tissue compartmentation will be stressed including how information flows within a cellular and mass context. The integration of these systems and how they may impact homeostasis is of critical importance. By the end of the course students will also be familiar with the components and mechanics of the Endocrine system, the cellular and network properties of neurons and how they function within the context of the central and peripheral nervous systems. The module covers autonomic and somatic motor control. Finally, the module covers muscles and the integration of all of the aforementioned systems.

PHYSIOLOGY III **PPHP3631**

NQF: 6
Contact Hours: 3 lecture hours + 2hours of tutorial (or 3 hours of practice)
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PPHP3512

Module description

Integration of Function and Metabolism, Growth and Aging: This third course in physiology will expose students to the fundamental processes and mechanisms occurring in the remaining organ systems. They will leave the course with an in-depth understanding of cardiovascular physiology, blood flow and how it is regulated and blood. Students will understand fluid and electrolyte balance as well as gas exchange and transport. These processes integrate numerous organ systems. The students will investigate the integration of the respiratory, circulatory and urinary systems and their respective organ components. The remaining organ systems, the digestive, endocrine, immune and reproductive will also be covered and the interconnectivity of all the organ systems considered.

PRIMARY HEALTH CARE: HEALTH PROMOTION **PCSP3512**

NQF: 5
Contact Hours: 3 lecture hours + 2 hour of practice
Credits: 16
Assessment: **6**0% Continuous assessment 40% Examination (1 × 3 hours written paper)
Pre/Co-requisite None

Module Description

Health Promotion is the provision of information and education to individuals, families, and communities that-encourage family unity, community commitment, and traditional spirituality that make positive contributions to their health status. Health Promotion is the promotion of healthy ideas and concepts to motivate individuals to adopt healthy behaviours.

According to the World Health Organization, health promotion is the process of enabling people to increase control over, and to improve, their health.

Health promotion represents a comprehensive social and political process, it not only embraces actions directed at strengthening the skills and capabilities of individuals, but also action directed towards changing social, environmental and economic conditions so as to alleviate their impact on public and individual health. Health promotion is the process of enabling people to increase control over the determinants of health and thereby improve their health. Participation is essential to sustain health promotion action.
The Ottawa Charter identifies three basic strategies for health promotion. These are advocacy for health to create the essential conditions for health indicated above; enabling all people to achieve their full health potential; and mediating between the different interests in society in the pursuit of health. Every contact between a doctor and a patient can be seen as an opportunity for health promotion and disease prevention. It is therefore essential that the new graduate knows how to make the most of these opportunities through demonstrable knowledge of the principles involved both for individual patients and populations.

RESEARCH METHODS **PCSR3632**

NQF: 6
Contact Hours: 3 lecture hours + 1 hour of practice
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PCSB3512

Module description

Research Methods - The student is expected to be able to challenge the prevailing notion of a hierarchy of research methods from stronger experimental designs to weaker qualitative techniques and crude dichotomous thinking (hard versus soft, quantitative versus qualitative; understand that there is no right or wrong methodological approach - rather the central concern should be the appropriateness of the method to the problem being investigated, the knowledge base, the resources available (including both financial and person power), the socio-cultural context, and the level of analysis; recognize that most medical care and public health interventions still occur “downstream” and are unable to significantly affect the course of mortality, morbidity and disability in modern society and that "upstream" primary and secondary prevention is required, especially policy-level interventions designed to affect whole populations; understand that behavioural and social science research methods are particularly well suited to measuring, explaining and evaluating "upstream" public health activities; view quantitative and qualitative research methods as complementary partners in the public health research enterprise, rather than competing with each other.

RESEARCH PROJECT **PCSR3870**

NQF level: 8
Contact hours: 6 practical hours/week for 32 weeks
Credits: 32
Module Assessment: 50% assessment of dissertation by supervisor and 50% oral examination/defence of dissertation by a panel
Pre-requisite: PCSR3632
Assessment Methods: Assessment of written project and oral examination/defence of dissertation

Module Description:
Projects are intended to develop students' ability to evaluate scientific literature and engage in independent research. Projects will normally be of potential high impact value on health resource utilization and management of diseases relevant to Namibia. In this semester, students will focus more on literature search and research tool development. Data collection, analysis and write-up will be covered in the second semester.

RURAL ATTACHEMENT **PCSU3739**

NQF level: 7
Contact hours: 35 attachment hours/week for 3 weeks
Credits: 16
Module Assessment: 100 % Continuous Assessment (Student evaluation form, problem based learning)
Pre-requisite:: PCSP3622

Module Description:
This module provides students exposure to health care systems in rural areas based on the government's health policies. It gives the students an opportunity to explore the role of the pharmacist in the rural setting and to appreciate the potential problems encountered by the health care personnel in the rural areas. The module will involve students in projects and activities aimed at promoting primary health care and to identify possible interventions and solutions to problems in the rural health care service.

SOCIOLOGY OF HEALTH & DISEASES **PCSS3511**

NQFLevel: 5
Contact Hours: 3 lecture hours + 2 hours of practice
Credits: 16
Assessment: 60% Continuous assessment 40% final examination (1 × 3 hours written paper)
Pre/Co-requisite: None

Module Description
This module is offered in the first semester of the first academic year. It focuses on the indirect pathway between sociology and health/disease, and emphasizes the role that *beliefs* and *behaviours* play in health and illness. The introductory lectures in this module reflect this emphasis and illustrate how different sets of beliefs relate to behaviours and how both these factors are associated with illness. Students will learn about changes in the causes of death over the twentieth century and why this shift suggests an increasing role for beliefs and behaviours. Students will also master theories of health beliefs and the models that have been developed to describe beliefs and predict health behaviour. Beliefs that individuals have about illness will be examined, followed by health beliefs in the context of health professionals–patient communication, as well as health care worker counselling. Students will then examine health-related behaviours and apply many of the theories and constructs to specific behaviours, e.g., addictive behaviours and the factors that predict smoking and alcohol consumption; eating behaviour drawing upon developmental models, cognitive theories and the role of weight concern; exercise behaviour both in terms of its initiation and methods to encourage individuals to continue exercising; screening of health behaviours and assessment of the factors that relate to whether or not someone attends for a health check, as well as the psychological consequences of screening programs. Since this module also focuses on the direct pathway between sociology and health/disease, this will be the focus of the second half of the module. Students will master the following topics: stress (definition and measurement); the links between stress and illness via changes in both physiology and behaviour and the role of moderating variables; pain and the factors in exacerbating pain perception; how psychological interventions can be used to reduce pain and encourage pain acceptance; the interrelationships between beliefs, behaviour and health using the example of placebo effects; illustration of this interrelationship in the context of illness, focusing on HIV, cancer, obesity and coronary heart disease; aspects of women's health; the problems with measuring health status and the issues surrounding the measurement of quality of life; ethics involved in physician/patient interaction and counselling.

SYSTEMS PHARMACOLOGY I **PPHS3732**

NQF level: 7
Contact hours: 3 lecture hours/week for 16 weeks;
3 practical hours / week for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)

Co-requisite: PPHH3631
Assessment Methods: Assignment, tests, practicals, class presentation, student form evaluation

Module Description:
This module provides students with knowledge on the pharmacology of drugs used in disorders of body systems such as cardiovascular, renal, respiratory, and digestive and peripheral nervous systems. The module develops students' understanding of and skills in experimental pharmacology as a tool in the development of drugs. It develops their ability to conduct experimental investigations in accordance with established standards of scientific procedures and critical thinking.

SYSTEMS PHARMACOLOGY II **PPHS3751**

NQF level: 7
Contact hours: 3 lecture hours/week for 16 weeks;
3 practical hours / week for 16 weeks
Credits: 16
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite: PPHS3632
Assessment Methods: Assignments, tests, practicals, class presentation, student evaluation form

Module Description:
This module provides students with knowledge on the pharmacology of drugs used in the treatment of conditions of the CNS and in chemotherapy of infections and cancers. It includes and actions for the restoration of physiological functions in the endocrine systems and control of inflammation and immune responses.

VETERINARY PHARMACY AND AGROCHEMICALS **PPHV3721**

NQF level: 7
Contact hours: 2 lecture hours / week for 16 weeks + 1 practical work
Credits: 8
Module Assessment: 60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Prerequisite: PPHI3631
Assessment Methods: Assignments, tests, class presentation, student evaluation form

Module Description:
This module will provide students with the basic knowledge of common animal diseases and their drug treatment. The manufacture and storage of common veterinary drugs will be covered.

CURRICULUM FOR THE MASTER OF PHARMACY (CLINICAL)

MPHARM (CLINICAL)

PHASED OUT AS OF 2023 & NEW INTAKE IN 2026 ONLY

COURSE CODE: 18MPHM

INTRODUCTION:

MAJOR LEARNING OUTCOMES AND CONTENT OF THE COURSE

Holders of the Master of Pharmacy (Clinical) qualification will be able to:

- Consult effectively with patients, carers and the multidisciplinary healthcare team, respecting diversity and confidentiality;
- Independently develop clinical pharmacy knowledge and skills in order to identify, prioritise and resolve complex pharmaceutical problems in a range of common conditions;
- Critically review the overall management and monitoring of patients with a range of common disease states;
- Recognise the evidence-based approach to management of a range of common conditions and apply evidence-based medicine to individualised patient care;
- Identify, prioritise and resolve the medicines management needs of patients, carers and other social and health care professionals;
- Demonstrate a systematic approach to medicines management for patients with a range of common conditions;
- Apply pharmacokinetic and pharmacodynamic principles to the design of appropriate medicine regimens;
- Conceptual understanding of the initiative required when taking responsibility for clinical decision making;
- Ability to make decisions in complex situations where patients present with co-morbidities and/or poly-pharmacy;
- Comprehensive understanding of the role of independent learning when engaging in personal continuing professional development;
- In-depth understanding of the pharmacist's role and responsibilities with respect to contributing actively to the planning and delivery of pharmaceutical care in the workplace setting;
- Advance knowledge and understanding through continuing professional development and lifelong learning;
- To critically evaluate the drug treatment of general medical and surgical patients, in order to provide competent advice on the safe and effective use of medicines;
- To demonstrate systematic and critical understanding of the knowledge and skills required to work independently within a specific area of pharmacy practice.

STUDENT ADMISSION

Committee on Admissions

Admission to the Master of Pharmacy (Clinical) shall be administered by a Committee on Admissions, which shall be composed of members of the School of Pharmacy and the Administrative Officer in charge of admissions to the School. All committee members shall be appointed by the Dean of the Faculty of Health Sciences for a term of three years and may be reappointed for additional terms. The Committee shall have the authority to select students entering the School on condition that they fulfil the minimum admission requirements as set out below. The School shall exercise the responsibility of reviewing the requirements for admissions and recommending any revisions to Senate for approval.

ADMISSION CRITERIA

Candidates may be admitted to this programme if they meet the General Admission Requirements of the University of Namibia and comply with the additional requirements below:

- A candidate must have a good Bachelor of Pharmacy (Honours) degree with at least a C-grade average, from the University of Namibia or equivalent
- A candidate must be a qualified pharmacist, and if practicing/studying in Namibia, registered with the Health Professions Councils of Namibia, specifically the Pharmacy Council of Namibia.
- Students must be registered as pharmacists or in pursuance of registration within Namibia (or relevant country in the future) and be practising in either hospital or community pharmacy.
- A prospective student may be interviewed and assessed by the School of Pharmacy prior to admission.

DURATION OF STUDY

The duration of study for the programme will usually be three years, with a maximum duration of five years. An extension beyond three years' study must be granted by the Faculty on the recommendation of the School of Pharmacy and with the consent of the supervisor(s) involved.

EXEMPTIONS

UNAM may give exemptions for equivalent modules taken at other recognized tertiary institutions but the exemptions shall not exceed 50% of the modules in the UNAM MPharm programme and shall be limited to the first two academic years only. An application for exemption from (a) module(s)

must be accompanied by documentary proof issued by the examining body concerned that the student has passed the relevant module (not older than 5 years). For detailed rules on exemption, see the General University Information and Regulations.

EXAMINATION REGULATIONS

For detailed examination and promotion rules, see the General University Information and Regulations.

Eligibility for Examinations

1. A candidate shall present himself/herself for the University examinations at such a time as indicated by the School Calendar of Examinations approved by the Senate.

2. A candidate will be eligible to write the examinations if he/she has attained the required minimum continuous assessment mark of 50% in each module. In addition, the candidate should have regularly and satisfactorily participated in the course of study, by attending not less than 80% of theory where applicable.

Mode of Examinations

1. Theory examinations shall be of three hours duration.
2. Practical examinations shall not exceed three and a half hours duration.
3. A viva–voce (oral) examination shall be of not more than half hour duration for all modules.
4. Field Attachment assessment: The student shall be evaluated by lecturer(s) and preceptor(s) using student evaluation forms for each rotation upon completion of the attachment and/or viva–voce.
5. For each examinable module, an external examiner shall moderate the examinations

Criteria for passing examinations

1. A The examination in each examinable module for any academic year shall constitute of:
    a. 50% Continuous assessment (CA, practicals, term papers)
    b. 50% Semester examination (Written theory papers, Practical and oral examinations where applicable)
2. A student shall be declared to have passed examination if he / she attain at least 50% mark in each of the modules. Where a module has a theory, practical and oral examination, the student must pass each examination with a minimum mark of 50%

ACADEMIC ADVANCEMENT RULES

First year to second year of Master of Pharmacy

A student must have passed at least three of the prescribed first year modules (72 credits) to register for second year modules. If any of the failed modules is a pre-requisite for a second year module, the student cannot register for the affected second year module until the pre-requisite is passed.

Second year to third year of Master of Pharmacy

A student must have passed ALL the prescribed first year modules. In addition, the student must have passed at least two of the prescribed second year modules (144 credits). If any of the failed modules is a pre-requisite for a third year module, the student cannot register for the affected third year module until the pre-requisite is passed.

Minimum requirements for re-admission

A student will not be re-admitted into the Master of Pharmacy (Clinical) if she/he has not earned:

- At least 48 credits by the end of the first year (at least two modules of year 1)
- At least 96 credits by the end of the second year (three modules of year 1 plus one module of year 2)
- At least 144 credits by the end of the third year (all modules of year 1, plus all modules of year 2 and one modules of year 3)

GRADUATION

A student can only graduate with an MPharm if she / he has passed the entire prescribed modules (276 credits) of the programme.

GRADING OF EXAMINATIONS

The UNAM grading system shall apply to all modules in the course including the project.

AWARD OF THE MASTER OF PHARMACY

A student can only graduate with an MPharm if she / he has passed the entire prescribed modules (276 credits) of the programme.

DELIVERY MODE OF COURSES

The MPharm will be delivered as a part-time, block-release programme.

CURRICULUM STRUCTURE

Year One					
Module Title	**Code**	**NQF Level**	**Credits**	**Hours per Week**	**Pre /Co-requisites**
Academic Writing for Postgraduate Students	UAE 5819	8	*	4	
Infectious diseases and infection control	CID 5920	9	24	2 (+4P)	
Field placement and portfolio I	CFP 5920	9	24	2	
Research methodology and scientific communication	CRM 5920	9	24	2	
Epidemiology and monitoring of priority public health conditions	CEM 5920	9	24	2	
Total credits year 1			**96**		

Year Two					
Module	**Code**	**NQF**	**Credits**	**Hours per Week**	**Pre /Co-requisites**
Clinical services rotation	CSS 5920	9	24	2	
Operational services rotation	COS 5920	9	24	2	
Field placement and portfolio II*	CFP 5940	9	24	2	
Total credits year 2			**72**		

*Includes audit/critical appraisal

Year Three					
Module	**Code**	**NQF**	**Credits**	**Hours per Week**	**Pre /Co-requisites**
Defined area of practice	CDP 5920	9	24	2	
Field placement and portfolio III	CFP 5960	9	24	2	
Pharmacy thesis	CMT 5910	9	60		All taught courses
Total credits year 3			**108**		
Total credits for this programme			**276**		

	INFECTIOUS DISEASES AND INFECTION CONTROL
Course Code	CID5920
NQF Level	9
Notional Hours	240
Contact hours	2 hours lecture plus 4 hours practicals per week for 28 weeks
NQF Credits	24
Pre-requisites	None
Compulsory/Elective	Compulsory
Semester Offered	Both semesters

Assessment: Examination 40% (1 x 3 hours paper); **Continuous 60%** (at least two written test plus assignments/ reports)

Course Content

This module reinforces basic pathophysiology and management of HIV and TB and introduces advanced concepts, such as management of side effects, drug resistance, co-infection, opportunistic and multi-drug-resistant (MDR) TB management, including extremely-drug-resistant (XDR). Students are encouraged to work in a multidisciplinary team in a clinical environment and pharmacist students will further develop their skills in pharmaceutical care plan development, drug history taking and medicines reconciliation, pharmacovigilance, and the management of complex patients and those on polypharmacy. Students will embark on their research project during this module.

	FIELD PLACEMENT AND PORTFOLIO I
Course Code	CFP5920
NQF Level	9
Notional Hours	240
Contact hours	2 hours lecture per week for 28 weeks
NQF Credits	24
Pre-requisites	None
Compulsory/Elective	Compulsory
Semester Offered	Both semesters

Assessment: Portfolio, interventions log, mini-PAT, CBD

Course Content

This module will enable to student to put into practice the various learning of other modules in clinical pharmacy but with particular emphasis on concurrent modules such as infectious disease. It will also provide an opportunity for students to build their portfolio of evidence around learning activities. Students will be expected to generate ideas for audit, research and change management topics as well as examples of critical appraisal and interventions.

	FIELD PLACEMENT AND PORTFOLIO II
Course Code	CFP5940
NQF Level	9
Notional Hours	240
Contact hours	2 hours lecture per week for 28 weeks
NQF Credits	24
Pre-requisites	None
Compulsory/Elective	Compulsory
Semester Offered	Both semesters

Assessment: Portfolio, interventions log, mini-PAT, CBD

Course Content

This module will enable to student to put into practice the various learning of other modules in clinical pharmacy but with particular emphasis on concurrent modules such as clinical and operational services. It will also provide an opportunity for students to build their portfolio of evidence around learning activities. Students will be expected to generate data for audit, research and change management topics as well as examples of critical appraisal and interventions.

	FIELD PLACEMENT AND PORTFOLIO III
Course Code	CFP5960
NQF Level	9
Notional Hours	240
Contact hours	2 hours lecture per week for 28 weeks
NQF Credits	24
Pre-requisites	None
Compulsory/Elective	Compulsory
Semester Offered	Both semesters

Assessment: Portfolio, interventions log, mini-PAT, CBD

Course Content

This module will enable to student to put into practice the various learning of other modules in clinical pharmacy but with particular emphasis on concurrent modules in defined areas of practice. It will also provide an opportunity for students to build their portfolio of evidence around learning activities. Students will be expected to analyse and present data for audit, research and change management topics as well as examples of critical appraisal and interventions.

	RESEARCH METHODOLOGY AND SCIENTIFIC COMMUNICATION
Course Code	CRM5920
NQF Level	9
Notional Hours	240
Contact hours	2 hours lecture per week for 28 weeks
NQF Credits	24
Pre-requisites	None
Compulsory/Elective	Compulsory
Semester Offered	Both semesters

Assessment: Examination 40% (1 x 3 hours paper); Continuous 60% (at least two written test plus assignments/ reports including audit, critical appraisal, drug use review)

Course Content

Students will be taught how to accurately write up research and present it in a format acceptable for publication. The ultimate aim is to prepare students to provide evidence-based practice that promotes quality outcomes for the population, the healthcare providers and the health system. Additionally, students should be able to use research findings in promoting and understanding health and illness and to implement effective interventions to promote health. As part of this module, students will complete a critical appraisal/drug use review and an audit, before choosing a research project which will then continue throughout their three years of study.

	EPIDEMIOLOGY AND MONITORING OF PRIORITY PUBLIC HEALTH CONDITIONS
Course Code	CEM5920
NQF Level	9
Notional Hours	240
Contact hours	2 hours lecture per week for 28 weeks
NQF Credits	24
Pre-requisites	None
Compulsory/Elective	Compulsory
Semester Offered	Both semesters

Assessment: Examination 40% (1 x 3 hours paper); **Continuous 60%** (at least two written tests plus assignments/ reports including portfolio review)

Course Content

Descriptive epidemiology will be covered in this course. Students will learn to use epidemiologic practices to conduct studies that improve healthcare delivery. Students will learn to structure research from problem framing to findings, dissemination through study design methods and data management and processing. This course will also refresh students on biostatistics, allowing them to apply these concepts to statistical tests and study designs. Students will cover the monitoring of infectious diseases patients as related to their pharmacotherapy, including therapeutic drug monitoring of antibiotics.

	CLINICAL SERVICES ROTATION
Course Code	CCS5920
NQF Level	9
Notional Hours	240
Contact hours	2 hours lecture per week for 28 weeks
NQF Credits	24
Pre-requisites	None
Compulsory/Elective	Compulsory
Semester Offered	Both semesters

Assessment: Portfolio, interventions log, mini-PAT, CBD, OSCEs

Course Content

The clinical services rotations build on skills gained during the first year, and focus on pharmacy practice, teaching a systematic approach to pharmaceutical care and incorporating all aspects of patient care, including disease states. Learning is both work-based to enable core skill development and online to provide essential clinical knowledge. Evidence-based practice and interprofessional collaboration is reinforced to ensure a strong and effective future workforce.

	OPERATIONAL SERVICES ROTATION
Course Code	COS5920
NQF Level	9
Notional Hours	240
Contact hours	2 hours lecture per week for 28 weeks
NQF Credits	24
Pre-requisites	None
Compulsory/Elective	Compulsory

Semester Offered Both semesters
Assessment: Portfolio, interventions log, mini-PAT, CBD, OSCEs

Course Content

Operational services focus on essential operational skills required for the safe and efficient running of a pharmacy. Rotations such as medicines information, quality control and assurance, dispensary, supply chain management and central medical stores all reinforce and build on basic pharmacy skills, placing emphasis on robust processes and good decision making, evidence-based practice and risk management.

	DEFINED AREA OF PRACTICE
Course Code	CDP5920
NQF Level	9
Notional Hours	240
Contact hours	2 hours lecture per week for 28 weeks
NQF Credits	24
Pre-requisites	None
Compulsory/Elective	Compulsory
Semester Offered	Both semesters

Assessment: Portfolio, interventions log, mini-PAT, CBD, change management task

Course Content

The specialist area is chosen by the student and approved by the university. It focuses on an area of specialist interest, relevant to the student's workplace, for example a pharmacist working in a hospital may choose infectious diseases, pain management or management of surgical patients.

	MASTER'S THESIS
Course Code	CMT5910
NQF Level	9
Notional Hours	600
Contact hours	Regular sessions with supervisor
NQF Credits	60
Pre-requisites	All taught courses
Compulsory/Elective	Compulsory
Semester Offered	Both semesters

Assessment: Examination (100%). The thesis will be examined by one Internal Examiner and one External Examiner.

Course Content

The student will be required to undertake research activities in a selected topic of clinical or operational pharmacy and to submit a thesis. Students will work under the supervision on a researcher of their own choice which will enable the candidate to gain theoretical and analytical knowledge in course work to a substantive problem relevant to their area of specialization.

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