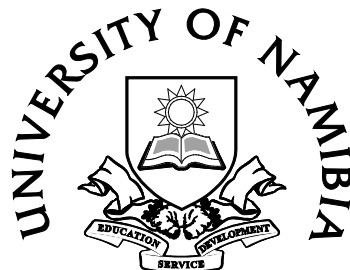

PROSPECTUS 2011

Faculty of Health Sciences

SCHOOL OF MEDICINE



— Inspiring minds & shaping the future —

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Edited & Published by the School of Medicine,
University of Namibia, Windhoek

NOTE

This Prospectus is only valid for 2011 as regulations and syllabi may be amended for 2012. The general regulations and further information appear in the General Information and Regulation Prospectus.

Although the information contained in this Prospectus has been compiled as accurately as possible, it is possible that errors and omissions have inadvertently occurred, for which we apologise in advance. The University reserves the right to amend any regulation or stipulation without notice. The information is correct up to 30 October 2010.

The fact that particulars of a specific module or programme have been included in this Prospectus does not necessarily mean that the module or programme will be offered in 2011.

This Prospectus must be read in conjunction with the *General Information and Regulations Prospectus 2011*.

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SCHOOL OF MEDICINE PREAMBLE

The mission of the School of Medicine is to produce health professionals whose knowledge, professional skills, and practice in medicine are in tune with the needs of society (practice patterns, and scientific advancements). The School shall provide a learning environment conducive to the pursuit of professional competence by health workers, while providing quality services to the community and undertaking relevant translational research for enhancement of health. The School will continually strive for the establishment of training programs in a wide spectrum of health disciplines and lending support to the human resource development initiatives of the country, including post-graduate education of physicians and scientists. The School is mandated to prepare graduates for the medical degree of the University of Namibia.

The key objectives of the School of Medicine are:

- To promote equity of access to health care services for all;
- To promote affordable health care service delivery by strengthening health care systems which are sustainable, cost-effective, efficient and culturally relevant and acceptable;
- To institute measures to counter major health risks including the prevailing communicable diseases;
- To develop academically and professionally qualified medical doctors in sufficient numbers for manning various health care delivery systems;
- To contribute to the development of a national health care system that is capable of providing a fully comprehensive range of preventive, curative and rehabilitative health care that is cost-effective, sustainable and acceptable to the recipients of such health care services;
- 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.

SCHOOL OF MEDICINE 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 health care 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 honor The University of Namibia, the Medical Board 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 honor 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.

ACADEMIC CALENDAR

FIRST SEMESTER

10 January	University opens
20 January	Academic staff resumes office duties
31 January	Registration: MBChb and B Pharm Students
01 – 04 February	Academic Orientation (1 st year students)
7 February	Lectures commence for FIRST SEMESTER
26 April	EASTER BREAK starts
03 May	Institutional Holiday
05 May	Lectures resume after Easter Break
17 June	Lectures end for FIRST SEMESTER
20 June	First Opportunity Examinations commence (Semester I modules)
28 June	First Opportunity Examinations end (Semester I modules)
08 July	Announcement of Examination Results

SECOND SEMESTER

11 July	Lectures commence for 2nd year students for SECOND SEMESTER
18 July	Lectures commence for 1st year students for SECOND SEMESTER
18 July	2 nd Opportunity/Supplementary Examinations commence
18 July	2 nd Opportunity/Supplementary Examinations End
04 November	Lectures end for SECOND SEMESTER
07 November	First Opportunity Examinations commence (Sem II & Double modules)
25 November	First Opportunity Examinations end (Sem II & Double modules)
25 November	End of 2nd Semester
13 December	Academic Year ends & University closes (until 09 January 2012)
09 January 2012	University opens (2012 academic year)
10 January 2012	Second Opportunity Exams commence (Sem I, II & Double modules)
19 January 2012	Academic staff resumes office duties
20 January 2012	Second Opportunity Examinations end (Sem I, II & Double modules)

DUE DATES FOR THE 2011 ACADEMIC YEAR

(i) GENERAL

Last day for application of retention of continuous assessment mark.....	18 February
Last day for application for exemption(s)	18 February
Last day for Late Registration (<i>Late fee payable</i>)	23 February
Last day for approval of exemption(s).....	23 February
Last day for approval of retention of continuous assessment mark	23 February
Last day for approval of module(s) & qualification changes.....	23 February
Last day to change Examination Centres at Regional Centres (Semester I modules)	29 April
Last day for appeals (First Opportunity Examinations) (Semester I)	29 July
Last day to submit outstanding documentation	19 August
Last day to change Examination Centres at Regional Centres (Semester II modules – 1 st & 2 nd Opportunity Examinations).....	23 Sept
Last day to cancel enrolment	30 Sept
Last day for submission of Theses and Dissertations for examination	18 Nov

(ii) CANCELLATIONS

Semester I modules

Last day to cancel Semester I modules06 May

Semester II modules

Last day to cancel Semester II modules30 Sept

Double modules (A double module normally extends over one academic year)

Last day to cancel Double modules30 Sept

(iii) FINANCE

Semester I modules

Last day to cancel with 100 % credit.....11 March

Last day to cancel with 50 % credit.....20 April

Semester II modules

Last day to cancel with 100 % credit.....05 August

Last day to cancel with 50 % credit.....02 Sept

Double modules (a double module normally extends over one academic year)

Last day to cancel with 100 % credit.....11 March

Last day to cancel with 50 % credit.....03 June

STRUCTURE AND PERSONNEL

OFFICE OF THE DEAN

Founding Dean	Prof P Nyarango
Deputy Dean	Prof P Odonkor
Faculty Officer	Mrs M J Marthinussen
Faculty Secretary	Vacant
Typist	Vacant

General enquiries regarding the school of Medicine and the qualifications offered by the School should be directed to:
Mrs Sanet Marthinussen
The Faculty Officer
School of Medicine
University of Namibia
Private Bag 13301
WINDHOEK

Telephone: +264-61-2063928
Fax: +264 61- 2064586
E-mail: smarthinussen@unam.na

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

ACADEMIC DEPARTMENTS

DEPARTMENT OF ANATOMY

☎ (+264 61) 2063671

☎ (+264 61) 2064586

✉ Private bag 13301, Windhoek, Namibia

Head of Department:	Vacant
Associate Professor	Prof W Vorster BSc University of Stellenbosch; BSc (Hons) University of Stellenbosch; MSc University of Stellenbosch; PhD University of Stellenbosch; TDPE University of Stellenbosch
Lecturer	Dr. Q. Wessels PhD (Anatomy) University of Pretoria; MSc (Anatomy) University of Pretoria; BSc Hons (Anatomy) University of Pretoria; BSc (Medical Sciences) University of Pretoria; N.Dipl. Medical Technology (Tshwane University of Technology)
Lecturer	Dr M M M Morkel BSc (Hons) University of Western Cape; MBChB University of Stellenbosch; DOH University of Stellenbosch.

DEPARTMENT OF PHYSIOLOGICAL CHEMISTRY AND PHARMACOLOGY

☎ (+264 61) 2063671

☎ (+264 61) 2064586

✉ Private bag 13301, Windhoek, Namibia

Head of Department: Prof. C. Jacobson
Professor: Prof P Odonkor BSc (Hons) University of Ghana; MBChB University of Ghana; PhD McGill University Canada
Associate Professor: Prof. C. Jacobson PhD (Neuroscience) McGill University; MSc (Biology) University of Waterloo; BSc (Microbiology) McGill University
Lecturer Dr. J A Sheehama PhD Biology (Medical Microbiology and Medical Biochemistry) Kazan State University; Masters in Biology (Microbiology and Molecular Biology) Kazan State University

DEPARTMENT OF PATHOLOGY

☎ (+264 61) 2063928

💻 (+264 61) 2064586

✉ Private bag 13301, Windhoek, Namibia

Head of Department: Vacant

Lecturer: Vacant

DEPARTMENT OF MICROBIOLOGY

☎ (+264 61) 2063928

💻 (+264 61) 2064586

✉ Private bag 13301, Windhoek, Namibia

Head of Department: Vacant

Lecturer: Vacant

DEPARTMENT OF INTERNAL MEDICINE

☎ (+264 61) 2063928

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✉ Private bag 13301, Windhoek, Namibia

Head of Department: Vacant

Lecturer: Vacant

DEPARTMENT OF SURGERY

☎ (+264 61) 2063928

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✉ Private bag 13301, Windhoek, Namibia

Head of Department: Vacant

Lecturer: Vacant

DEPARTMENT OF COMMUNITY MEDICINE

☎ (+264 61) 2063928

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✉ Private bag 13301, Windhoek, Namibia

Head of Department: Prof L Barongo
Associate Professor: Prof L Barongo Doctor of Medicine (MD) University of Dar es Salaam; M.Med Internal Medicine University of Dar es Salaam; Advanced Diploma in Epidemiology (DLSHTM) London School of Hygiene and Tropical Medicine; MSc University of London
Lecturer: Dr. M Goraseb M Public Health Oklahoma Univ. USA Med Degree Silisian Med School Poland

DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

☎ (+264 61) 2063928

💻 (+264 61) 2064586

✉ Private bag 13301, Windhoek, Namibia

Head of Department: Vacant

Lecturer: Vacant

DEPARTMENT OF PAEDIATRICS

☎ (+264 61) 2063928

💻 (+264 61) 2064586

✉ Private bag 13301, Windhoek, Namibia

Head of Department: Vacant

Lecturer: Vacant

DEPARTMENT OF PSYCHIATRY AND BEHAVIOURAL SCIENCES

☎ (+264 61) 2063928

💻 (+264 61) 2064586

✉ Private bag 13301, Windhoek, Namibia

Head of Department: Vacant

Professor: Prof. H. Thirion Naudé D.Ed. Psych (UNISA); MED Psych (University Stellenbosch);
BED Hons Psych (University Stellenbosch); BA (Psych) (University Pretoria); HDE Post graduate
(University Pretoria); IAC (Institute of Administration and Commerce of Southern Africa); N.Dipl.
Computer Science (Technicon Stellenbosch).

Lecturer Prof. H. Thirion Naudé D.Ed. Psych (UNISA); MED Psych (University Stellenbosch);
BED Hons Psych (University Stellenbosch); BA (Psych) (University Pretoria); HDE Post graduate
(University Pretoria); IAC (Institute of Administration and Commerce of Southern Africa); N.Dipl.
Computer Science (Technicon Stellenbosch)

DEPARTMENT OF RESEARCH AND INSTITUTIONAL DEVELOPMENT

☎ (+264 61) 2063928

💻 (+264 61) 2064586

✉ Private bag 13301, Windhoek, Namibia

Head of Department: Vacant

Lecturer: Vacant

DEPARTMENT OF PHARMACY

☎ (+264 61) 2063928

💻 (+264 61) 2064586

✉ Private bag 13301, Windhoek, Namibia

Head of Department: Vacant

Lecturer: Vacant

REGULATIONS

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

PROGRAMMES

Bachelor of Medicine and Bachelor of Surgery	15MBChB
Bachelor of Pharmacy (Honours)	15BPharm

UNDERGRADUATE PROGRAMME OBJECTIVES

At the end of the training, the graduate is expected to demonstrate the following professional skills and characteristics:

1. **Altruistic and professional skills.**

The graduate should:

- i. Be caring, compassionate, and respectful to the privacy and dignity of patients and families.
- ii. Apply ethical standards in every medical practice.
- iii. Have honesty, reliability, and integrity in all interactions with patients, families, colleagues, and all others with whom the physician interacts in all professional dealings.
- iv. Be sensitive to the needs and concerns of others, always aware of the limitations of their understanding of health and illnesses as well as material possessions.
- v. At all times advocate for patients over one's own interests.
- vi. Be effective in communicating with and gaining cooperation from patients, professional colleagues and other health members of the community.
- vii. Be aware of potential threats from conflicts between one's medical profession and own interests.
- viii. Have the respect for other members of the health team and collaborate with others in caring for patients, their families, population groups, and the community.
- ix. Apply logical and probabilistic approach to clinical and other health problems as well as to dealing with uncertainty and ambiguous situations.
- x. Be able to obtain clinical history, write accurate clinical records, and carry out tasks medical graduates are required to handle during internship and post-graduation engagements.

2. **Scientific knowledge as a basis for medicine**

The graduate should be able to grasp:

- i. Normal structure and function of the body, every organ and system.
- ii. Molecular, biochemical, and cellular mechanisms that are important in maintaining the body's homeostasis.
- iii. The various causes (genetic, developmental, metabolic, toxic, microbiologic, autoimmune, neoplastic, degenerative, traumatic, psychological and environmental factors) of diseases and the ways they operate (pathogenesis).
- iv. Altered structure and function (pathology and pathophysiology) of the body and its major organ systems that are seen in various diseases and conditions.
- v. The power of scientific method in establishing the causation of diseases and the efficacy of traditional and non-traditional therapies.

3. **Critical reasoning and evidence based practice in clinical and health situations (Translational research)**

With regard to individual, population, or community medicine and health, the graduate should be able to:

- i. Precisely define a health problem, state the required information to solve the problem, efficiently search for the information, and select the best and most appropriate investigative approach.
- ii. Apply the techniques, procedures, goals and results of biomedical research, including laboratory research and population or community-based studies.
- iii. Interpret results of clinical and laboratory tests, in terms of their likely contribution to diagnosis, prognosis, and management of health problems and evaluating the validity of such tests.
- iv. Interpret and evaluate data generated by studies of medical and other health services provided to communities.

- v. Assess the degree to which assertions made in medical journals and lay press is based on scientific evidence.
- vi. Disseminate the findings from biomedical research through print media, electronic media, scientific conferences and other public forums with a view to reaching the most in need for the benefits from the study;
- vii. Integrate the findings from research into the practice of medicine, the management of healthcare delivery services and health policy development;
- viii. Design advocacy strategy which is relevant to the societal needs and is a direct outcome of the evidence from the research;

4. Identification, prevention, and management of illness.

The graduate should be able to:

- i. Apply knowledge on biological, psychological, behavioral, social, developmental, and environmental factors in the diagnosis, management, and prevention of illnesses.
- ii. Obtain an accurate medical history, covering all essential aspects of age, gender, environmental, and socio-economic status.
- iii. Perform a complete and organ system-specific examination, including mental status assessment.
- iv. Plan and interpret a program of investigations appropriate to the clinical problem at hand with due regard to patient comfort, safety, and economic factors.
- v. Assess the significance and limitations of the findings of standard laboratory tests and investigations.
- vi. Evaluate information obtained from 4(i)-4(v) in making diagnosis on a range of clinical problems
- vii. Apply principles of therapeutics, including complications and human costs of treatment, in the management of a defined range of health conditions
- viii. Take responsibility in the management of a defined range of common, acute, chronic, intractable, and terminal clinical conditions and community health problems.
- ix. Apply principles and techniques of behavior formation and behavior change communication and counseling in the diagnosis, prevention, treatment, and management of a defined range of clinical conditions and health problems of individuals and populations.
- x. Perform primary health care category surgical interventions in emergency and life-saving situations
- xi. Carry out the basic psychomotor tasks required of medical students to perform during their professional lives.

5. Population medicine and dutiful to society.

The graduate should be able to:

- i. Apply the knowledge on biological and non-biological determinants of illness and health and determine the economic, social, cultural, and psychological factors that contribute to the development and/or continuation of diseases.
- ii. Apply the knowledge on the epidemiology of common health problems in any given Namibian community and carry on systematic approaches to reducing and/or eliminating the incidence and prevalence of health problems in the country.
- iii. Identify factors that place individuals at risk for diseases or injury, select appropriate tests in examining individuals at risk for specific diseases, and determine the strategies in responding appropriately.
- iv. Evaluate health care needs of individuals, groups, and communities and the efficacy and quality of healthcare provision services.
- v. Assess the impact of illness upon families and the importance of family factors in the prevention, treatment, and rehabilitation of patients.
- vi. Apply positive, consistent, and informed approaches to the promotion and maintenance of health as well as prevention of illnesses both at the individual and population levels.
- vii. Engage in the behavior change of the individual, the family, and the community in promoting the health of the population in relation of the environment.
- viii. Identify the role of a physician as a member of a team and work cooperatively within a team.

6. Self-directed and life-long learning.

The graduate should be able to:

- i. Assess his/her learning needs, develop self-directional objectives and device appropriate means to meet those objectives.

- ii. Find, retrieve, and use biomedical information from electronic databases, media, and other technologies and resources.
- iii. Monitor his/her progress in acquisition of information and skills.
- iv. Interact with professional colleagues to monitor and evaluate one's performances
- v. Critically evaluate the School's educational program
- vi. Recognize that medical education is a lifelong learning process, invest time and other resources in furthering own knowledge and skills, and seek for higher professional achievements.

7. Participation in and management of change.

The graduate should be able to:

- i. Assess the relevancy, efficacy, quality, cost-effectiveness, and sustainability of health service provisions in a community;
- ii. Evaluate health policies and community participation in health service development and provisions;
- iii. Identify appropriate medical practices, new paradigms, and factors that contribute to effective, efficient, sustainable, and equitable health service provisions;
- iv. Carryout stakeholder analysis and mobilize resources essential in improving health as well as in implementing and managing changes in health practices;
- v. Implement, monitor, and evaluate the outcome as well as the impact of new and innovative approaches to health service provisions.

8. Administration and management of health service provisions.

The graduate should be able to:

- i. Apply appropriate management practices in the administration of health services at health facilities in a community, district and region;
- ii. Carryout participatory health needs assessment at the community, community, district and region levels;
- iii. Carryout analysis of strengths, weaknesses, opportunities, and threats of healthcare management systems;
- iv. Develop strategies and objectives as part of a comprehensive plan for health service interventions in a community, district and region.
- v. Devise a logical health service-planning framework for a proper presentation and management of a health plan.
- vi. Assess the organization and management systems at the community, district and regional levels.
- vii. Develop a budget and mobilize resources in support of health service activities and interventions.
- viii. Implement, monitor, and evaluate the execution of a Plan of Action.

THE 7 STAR- DOCTOR

The School of Medicine aspires to produce a medical graduate with the following qualities and characteristics herein referred to the 7-Star Doctor¹.

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

¹The concept of the 7-Star Doctor is adapted from the WHO definition of a 5-Star Doctor (Boelen C, 1996). The stakeholder workshop 2008 identified researcher and life-long learner as additional competencies for the Namibian doctor.

CURRICULUM FOR THE BACHELOR OF MEDICINE AND BACHELOR SURGERY

MBChB

COURSE CODE: 15BMChB

STUDENT ADMISSION

COMMITTEE ON ADMISSIONS

Admission to the School of Medicine shall be administered by a Committee on Admissions, which shall be composed of members of the School, a community member, the Administrative Officer in charge of admissions to the School, and the Registrar of the University. The School on consultation with the Vice-chancellor shall nominate a community member to sit on the admissions committee. All committee members shall be appointed by the Dean for three (3) years and may be reappointed for additional terms. The Committee shall have the authority to select students entering the School on condition that they fulfill 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

Admission to the School of Medicine is based on the applicant's academic standing (see admission requirements below), essay writing skills, letters of recommendation, and a successful interview. All admissions are made collectively by the Committee on Admissions and must be approved by the Faculty Board of the School of Medicine, as well as the Registrar's Office.

ADMISSION REQUIREMENTS

- (i) To apply for the MBChB degree, a candidate must hold a valid NSSC (Namibian Senior Secondary Certificate) or any other equivalent qualification with at least **35 points** on the UNAM scale with a **grade 2** or better on higher level **OR** a **grade B** or better on ordinary level for **Mathematics** and **Physical Sciences**, and a **grade B** or better on ordinary level for **Biology** and **English** (*please refer to the scale used by the University to calculate the UNAM score*);
OR
- (ii) To apply for the MBChB degree, a candidate must have successfully completed the entire first year BSc curriculum with **at least 60% in each of the Mathematics, Chemistry and Physics modules**;
OR
- (iii) To apply for the MBChB degree, a candidate must have successfully completed a **relevant² degree** program such as Pharmacy or Dentistry.
- (iv) Mature Entry: Candidates aspiring for admission to the MBChB 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 related work experience
 - d. They should pass the prescribed Mature Age Entry Test
 - 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.

ESSAY WRITING

An applicant shall be required to submit an essay on a topic or topics so determined by the Committee on Admissions of the School of Medicine. The main objective of an essay so demanded of an applicant, besides evaluating one's writing skills and ability of formulating thoughts, is to have some sense of the candidate's potential as a health service provider to the sick and disabled. During essay writing all applicants are required to also complete the School of Medicine Health Questionnaire.

² "relevant" means any degree requiring the same Grade 12 subjects as the MBChB, i.e. Mathematics Higher level, Physical Science Higher level, Biology Ordinary level and English Ordinary level.

LETTERS OF RECOMMENDATION

An applicant seeking admission to the School of Medicine shall submit three (3) letters of recommendation from his/her teachers, professors and/or employer(s). A special form is available for this purpose, and all recommendations submitted shall strictly follow the guidelines so provided in the form. It is the responsibility of the applicant to avail the form to his/her teachers/professors or employers and ensure that all recommendations are submitted on time.

INTERVIEWS

Eligible applicants shall normally be invited for interviews to be conducted by the Committee on Admissions. Special interviews including the use of video conferencing may be considered for students outside Namibia. All interviews shall be conducted in order to assess the following attributes of the candidates:

- 1) **Academic standing:** An interview shall seek to determine the candidate's academic competitiveness plus communication skills;
- 2) **Extra-curricular activity:** An interview shall also look into the candidate's records on extra-curricular activities and, if applicable, in job performances. Extra-curricular engagements in civic and community works shall be examined. Direct patient-care experience can be helpful but not essential.
- 3) **General awareness and sense of values:** A candidate's awareness of the community he/she lives in and the sense of values, sensitivities, and concerns he/she might have on social and cultural issues shall be assessed.
- 4) **General physical/mental condition of the aspiring student:** The candidate's overall physical and mental status will be made without conducting a formal medical examination.

UNAM EVALUATION SCALE:

POINTS	NSSC		CAMBRIDGE		SENIOR CERTIFICATE		GCE	
	H	O	HIGCSE	IGCSE	HG	SG	A-level	O-level
10							A	
9	1		1		A		B	
8	2	A*	2	A*	B		C	
7	3	A	3	A	C	A	D	A
6	4	B	4	B	D	B	E	B
5		C		C	E	C	N/O/Subsidiary	C
4		D		D	F	D		D
3		E		E		E		E
2		F		F		F		F
1		G		G				G

DURATION OF STUDY

The minimum duration for the Bachelor of Medicine and Bachelor of Surgery (MBChB) degrees is five years. The MBChB degrees must be completed within seven (7) years of full-time study unless there is an exceptionally motivated reason.

EXEMPTIONS:

UNAM will give exemptions for equivalent modules taken at other tertiary institutions but the exemptions shall not exceed 50% of the modules in the MBChB degree program.

CURRICULUM REQUIREMENTS

BASIC STRUCTURE OF THE DEGREE

The curriculum for the degrees of Bachelor of Medicine and Bachelor of Surgery degrees (Medicinae Baccalaureus et Chirurgiae Baccalaureus) MBChB consists of five years of Medicine training spread over 10 semesters.

The 10 semesters of the MBChB degrees have been structured using the UNAM degree format, while satisfying accreditation requirements of the Medical and Dental Professions Council of Namibia. At the UNAM School of Medicine, a semester is made up 16 weeks of lectures and 2 weeks of examinations, resulting in an 18 week semester. For each semester that a module is offered at 3 lecture hours plus 2 hours of tutorial/laboratory practical (or 4-8 hours of practice) per week for 16 weeks, 16 credits will be accumulated. The total number of credits for the degree is 1048.

EXAMINATION REGULATIONS

For detailed examination and promotion rules see the General Information and Regulations Prospectus. The Continuous Assessment Mark (CA mark) will count 60% towards the final mark while the examination mark will contribute 40%. A candidate will be eligible to write the examination if he/she has obtained a Continuous Assessment Mark of 50%. However, the regular UNAM regulations will apply to the 4 UNAM core modules.

At the end of each semester there shall be a written, practical/clinical and/or oral examination which shall contribute to the 40% to the final examination mark. A team of examiners shall administer the oral and clinical examinations at the end of every semester.

In the clinical years (years 3-5) students are required to pass the clinical examination in addition to passing the written examinations. Students who pass the written component of the examination but do not pass the clinical examination/practical examinations are deemed to have failed the module.

A student who fails less than 3 modules of the prescribed modules for a specific year will be eligible for a supplementary examination if he/she obtained between 45 and 49% in the final mark subject to the subminimum rule. The supplementary examination shall be conducted within 4 weeks (but not less than 48 hours) of the release of the final examination results.

University thresholds for Supplementary Examination, Repeating the Year and Discontinuation apply. There will be **NO** 'Carry-over' Courses or Modules to the Next Academic Year.

ACADEMIC ADVANCEMENT RULES

First Year to Second Year of Medicine

A student must pass all the first year modules to be eligible for registering for the Second Year of Medicine.

Second Year to Third Year Medicine

A student must pass all the second year modules to be eligible for registering for the Third Year of Medicine.

Third Year to Fourth Year Medicine

A student must pass all the third year modules to be eligible for registering for the Fourth Year of Medicine.

Fourth Year to Fifth Year Medicine

A student must pass all the fourth year modules to be eligible for registering for the Fifth Year of Medicine.

Fifth Year to Internship

A student must pass all the fifth year modules before proceeding to the Internship.

RE-ADMISSION REGULATIONS

A student who fails only one module in a specific year shall repeat the year but is exempted from the passed modules. A student shall only be allowed to repeat a module once. Failure to clear the module after repeating it once shall result in the discontinuation of the studies.

GRADUATION

A student can graduate with a Bachelor of Medicine and Bachelor of Surgery degree if he/she has passed the entire prescribed modules for the programme

CURRICULUM STRUCTURE

The curriculum of the MBChB is made up of the following components:

YEAR 1					
SEMESTER 1					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
English for Academic Purposes	ULEA3419	4	16	4	
Computer Literacy	UCLC3409	4	8	2 + 1P	
Anatomy I	MBSA3511	5	16	3 + 4P	
Behavioral Sciences I	MBSC3511	5	16	3 + 2P	
Biochemistry I	MBSB3511	5	16	3+3P	
Physiology I	MBSP3511	5	16	3 + 2P	
COBES 1	MBCC3620	6	8	4P	

SEMESTER 2					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
Contemporary Social Issues	UCSI3429	4	8	2	
Community Medicine I	MCMC3612	6	16	3+ 1P	
Anatomy II	MBSA3512	5	16	3+ 4P	
Behavioral Sciences II	MBSC3512	5	16	3 + 2P	
Biochemistry II	MBSB3512	5	16	3+ 2P	
Physiology II	MBSP3512	5	16	3 + 2P	
COBES 1	MBCC3620	6	8	4P	
TOTAL CREDITS			192		

YEAR 2					
SEMESTER1					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
Anatomy III	MBSA3531	5	16	3+ 4P	
Behavioral Sciences III	MBSC3531	5	16	3 + 2P	
Biochemistry III	MBSB3531	5	16	3+ 2P	
Community Medicine II	MCMC3631	6	16	3+ 2P	
Medical Imaging I	MCM13521	5	8	2 + 2P	
Medical Microbiology I	MPCM3631	6	16	3 + 2P	

Physiology III	MBSP3631	6	16	3 + 2P	
COBES 1	MBCC3620	6	8	4P	

SEMESTER 2					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
Pathology I	MPCP3732	7	16	3 + 2P	
Internal Medicine I	MCMM3732	7	16	3 + 4P	
Medical Microbiology II	MPCM3632	6	16	3 + 2P	MBSB3531
Independent Research Studies I	MCMR3732	7	16	4P	
Community Medicine III	MCMC3632	6	16	3+ 2P	
Pharmacology I	MCMP3732	7	16	3 + 2P	Pre –MBSP3631 MBSB3531 Co- MPCP3732 MPCM3631 MCMM3732
Family Medicine I	MBSF3532	5	16	3+ 2P	
COBES 1	MBCC3620	6	8	4P	
TOTAL CREDITS			232		

YEAR 3					
SEMESTER 1					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
Family Medicine II	MBSF3551	5	16	3 + 2P	
Independent Research Studies: II	MCMR3730	7	16	4P	
Community Medicine IV	MCMC3651	6	16	3 + 2P	
Internal Medicine: II	MCMM3751	7	16	3 + 8P	
Medical Microbiology: III	MPCM3651	6	16	3+ 2P	
Pathology II	MPCP3751	7	16	3 + 2P	
Pharmacology II	MCMP3751	7	16	3 +2 P	Pre –MBSP3631 MBSB3531 Co- MPCP3732 MPCM3631 MCMM3732

SEMESTER 2					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
Family Medicine III	MBSF3652	6	16	3+ 2P	
Independent Research Studies II	MCMR3730	7	16	4P	
Anesthesiology I	MCMA3752	7	16	3 + 2P	
Obstetrics & Gynaecology I	MCMO3852	8	16	3 + 8P	
Paediatrics I	MCMP3852	8	16	3 + 8P	
Surgery I	MCMS3752	7	16	3 + 8P	
Professional Ethics I	MCME3642	6	8	2	

FIELD WORK (2 X 4 weeks)*					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
COBES II	MBCC3753	7	16	35P	
Electives	MPCE3753	7	16	35P	
TOTAL CREDITS			248		

*- Means 2 consecutive units of 4 weeks each

In 3rd year students will be on rotation in Internal Medicine II, Obstetrics & Gynaecology, Paediatrics I and Surgery I.

During 3rd year a student will spend 4 hours every second day in the ward between 18h00 and 22h00 = 16 hours of practice
Final Examinations in Community Medicine, Medical Microbiology, Pathology and Pharmacology only.

YEAR 4					
SEMESTER 1					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
Independent Research Studies III	MCMR3750	7	16	4P	
Psychiatry I	MCMH3771	7	16	3 +4P	
Surgery II	MCMS3771	7	16	3 +8P	
Obstetrics & Gynaecology II	MCMO3871	8	16	3 + 8P	
Paediatrics II	MCMP3871	8	16	3 + 8P	
Family Medicine: IV	MBSF3771	7	16	2	

SEMESTER 2					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
Independent Research Studies III	MCMR3750	7	16	4P	
Psychiatry II	MCMH3772	7	16	3 + 4P	
Surgery III	MCMS3772	7	16	3 + 8P	
Anaesthesiology II	MCMA3772	7	16	3 + 4P	
Internal Medicine III	MCMM3772	7	16	3 + 8P	
Medical Imaging II	MCMI3562	5	8	2 + 2P	

FIELD WORK (2 X 4 weeks)*					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
COBES III	MBCC3773	7	16	35P	
Electives	MPCE3773	7	16	35P	
TOTAL CREDITS			216		

- Means 2 consecutive units of 4 weeks each

In 4th year students will be on rotation in Psychiatry II, Obstetrics & Gynaecology, Paediatrics II and Surgery II.

During 4th year a student will spend at least 4 hours per day for at least 4 days a week in the ward between 18h00 and 22h00 = >16 hours of practice

YEAR 5					
SEMESTER 1					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
Independent Research Studies IV	MCMR3870	8	16	3 + 2P	
Internal Medicine IV	MCMM3870	8	16	3+ 32P	
Obstetrics and Gynaecology III	MCMO3870	8	16	3+ 32P	
Paediatrics III	MCMP3870	8	16	3+ 32P	
Surgery IV	MCMS3870	8	16	3+ 32P	

SEMESTER 2					
Module Title	Code	NQF Level	Credits	Hrs	Pre/Co requisites
Independent Research Studies IV	MCMR3870	8	16	3 + 2P	
Internal Medicine IV	MCMM3870	8	16	3+ 32P	
Obstetrics & Gynaecology III	MCMO3870	8	16	3+ 32P	
Paediatrics III	MCMP3870	8	16	3+ 32P	

Surgery IV	MCMS3870	8	16	3+	
TOTAL CREDITS			160		

In 5th year students will be on rotation in Internal Medicine IV, Obstetrics & Gynaecology III, Paediatrics III and Surgery IV (Blocks).
Clinical Examination at the end of the academic year

THE SYLLABI

UNAM CORE MODULES

ENGLISH FOR ACADEMIC PURPOSES

ULEA3419

NQF level	4
Contact hours	4 Contact hours per week for 14 weeks
Credits	16
Assessment	Continuous 60%; Examination 40% (1 x 3 hour paper)
Prerequisites	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.

Learning Outcomes:

Upon completion of this module, the students will be able to:

- Apply academic and formal writing conventions within the context of their studies
- Integrate advanced reading strategies in reading an academic context
- Employ oral and presentation skills in an academic context
- Employ academic listening techniques in an academic context

CONTEMPORARY SOCIAL ISSUES

UCSI3429

NQF	4
Contact Hours	2 Contact hours per week for 14 weeks
Credits	8
Assessment	Continuous 50%, Examination 50% (1 x 2 hour paper)
Prerequisite	None

Module Description: The module raises awareness on the need for a personal, national and global ethics. The main objective of the course is to help students reflect on the social moral issues; to discover themselves in a learner-centered, contextual, religious and life related setting. It also stimulates students' critical thinking and help them to appreciate their values, standards and attitudes. Furthermore it orientates students with regards to the epidemiology of HIV/AIDS; the prevalence of the disease in Namibia, Africa and Internationally. It also informs students on the psycho social and environmental factors that contribute to the spread of the disease, the impact of HIV/AIDS on their individual lives, family and communities at large. The unit further seeks to enhance HIV/AIDS preventive skills among students by means of paradigm shift and behaviour change and also to impart general introductory knowledge on gender, to make students aware, as well as sensitize them towards gender issues and how they affect our society, Sub-Region and continent at large.

Learning Outcomes:

Upon completion of this module the students should be able to:

- Identify social issues affecting the Namibian Society
- Describe the characteristics of these issues and to design a plan of action
- Assess the challenges facing the society in a multi-cultural, multi-faith and secular setting
- Develop respect for humanity, nature and cosmos
- Describe the physical-medical aspects of HIV/AIDS
- Demonstrate knowledge of the following social factors that can contribute towards the spread of HIV/AIDS; Relationships; Social conditions; Attitudes; Cultural influences; Myths about HIV/AIDS
- Explain behaviour change towards HIV/AIDS
- Construct HIV/AIDS prevention strategies, continuum of care and support among students
- Identify with, and use gender concepts with ease
- Utilize gender-sensitive language and live a life that reflects gender exposure
- Reflect on gender relations between women and men in society, and the impact on society
- Reduce gender stereotypes in their home and community at large
- Examine the impact of gender unequal relations on the spread of HIV/AIDS, gender based violence, myths, stereotypes and beliefs about males and females, resource distribution, the education system and many other issues that affect society and community at large

COMPUTER LITERACY

UCLC3409

NQF Level	4
Contact Hours	2L + 1PS/Week
Credits	8
Assessment	Continuous 60%; Examination 40% (1 x 2 hour paper)
Pre-requisites	None

Content: Understanding computer systems and technology: The problem-solving approach. Structure and components of a modern computer - processor, memory, hard drives, disk drives, interfaces. The Windows environment. **Principles of information processing:** word-processing, spreadsheets, presentations, databases. nature and use of software. **Practical exercises:** Use of MS Word, Excel, PowerPoint. Communication using email. Overview of Internet.

Learning Outcomes

Upon completion of this module, students will be able to:

- Distinguish between the functions of various computer components and peripherals
- Use a computer under the Windows operating system
- Differentiate between word processors, spreadsheets, presentations and databases
- Perform practical exercises using MS Word, Excel and PowerPoint
- Be able to create own email address, communicate with email and use the Internet

MBCHhB MODULES

ANATOMY

This course administered over three consecutive semesters, is designed to start with basic structure and increase in depth with horizontal integration with physiology, and the advancement to cover the clinical application of anatomical principles to health and disease states. The modules are designed to focus on concepts and details of human anatomy and anatomical terminologies and acquaint students with the structures of the locomotive apparatus: the skeletal and muscular systems as well as the structures of the human body in relation to normal and abnormal processes of pregnancy, defects in fetal development and the external factors that interfere with the basic mechanisms of tissue morphogenesis are discussed. The additional focus of this module is on the structure and function of the cells and tissues of the human body. Students will be introduced to histological techniques essential in the identification and characterization of cells and tissues, normal histological characteristics of cells, tissues, and organs of the nervous, endocrine, and reproductive systems, and reviews the pathological changes that manifest in disease situations. Cell models, and where appropriate cadavers tissue histological slides, and electronic photomicrographs will be used and examined using the optic microscope.

ANATOMY I

MBSA3511

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% Examination (1 x 3 hours written paper + 1½ practical examination)
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.

Learning Outcomes:

At the end of the modules, a student is expected to be able to:

- Discuss structure and function of the cells and tissues of the human body
- Demonstrate the approaches to naming anatomical structures
- Demonstrate skills in the different methods and histological techniques frequently used in the study of cells and tissues
- Discuss normal development with emphasis on the reproductive cycle, gametogenesis, fertilization, gastrulation and the derivatives of the three germ layers.
- Interpret developmental defects of the embryo, fetus, placenta, and the amniotic fluid
- Identify preventive actions that contribute to decreasing the rate of birth of premature, retarded, or genetically defective children
- Explain the potential causes of infertility and the value of technological choices as solutions to the problem
- Explain the signs of normal and risky pregnancies from the standpoint of the embryo, fetus, amniotic fluid, and the mother
- Explain the concepts of cell potentiation, differentiation, proliferation, and death, and characterize the structure of the different types of cells and tissues according to function
- Discuss the transformations that take place during the development of different systems, Analyze the actions taken in preventing and detecting defects in a fetus
- Explain how modern techniques are used in the diagnosis of malformations

- Evaluate the normal fetal development and the effects of fetal, maternal, and placental factors on the growth and development of the fetus

ANATOMY II
MBSA3512

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% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisites	None

Module Description

SYSTEMIC ANATOMY: The 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 in conjunction. This will be achieved through the evaluation of case studies related to each system and use of relevant medical technology. Students will also 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.

Learning Outcomes:

At the end of the modules, a student is expected to be able to:

- Discuss the morphological and functional characteristics of the main structures of the nervous, circulatory system, lymphoid system, gastrointestinal tract, the glands of the gastrointestinal tract, respiratory system, urinary system, andrological and female reproductive systems, endocrine system, as well as the organs of vision and hearing
- Interpret the symptoms of frequent diseases
- Compare the morphological characteristics of the structures of components of circulatory, urinary, respiratory, and digestive systems, and interpret the symptoms of frequent diseases produced by alterations of the components of these systems under the microscope, explain their functions
- Distinguish pathological specimens from normal ones
- Compare and contrast the morphological and functional characteristics of the main structures of the cell
- Relate the principal histological characteristics of different organs and systems of the human body in relation with their functions and identify these structures in both health and disease

ANATOMY III
MBSA3531

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% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisites	None

Module Description

GROSS ANATOMY: This module will employ a regional approach to human anatomy with the integration of clinical anatomy and medical imaging. Human osteology will be integrated into the subject matter. Cadaver dissection will be used as a teaching aid. The regions of interest will be the thorax, abdomen, pelvis, lower limb, upper limb, back, the head and neck, as well as neuroanatomy. In addition, Clinical aspects will also be integrated through the use of relevant case studies and medical imaging. This module also aims to equip students with a macroscopic understanding of the structure of the human body in health and disease and requires the integration of system human anatomy. The relationship of the various tissues, organs and systems will be scrutinized.

Learning Outcomes:

At the end of the modules, a student is expected to be able to:

- Explain the morphological and functional characteristics of the locomotive apparatus in relation to age, sex, and the environment;
- Identify the various bones and muscle origins and insertions of the human skeleton;
- Identify the cadaver as a person in both the psycho-social and ethical senses;
- Gain an appreciation of general body form and structure as well as knowledge of specified anatomical structures and regions;
- Identify the structural component of the regions of interest namely, thorax, abdomen, pelvis, lower limb, upper limb, back, the head and neck, as well as neuroanatomical structures;
- Relate gross anatomical morphology to the underlying constituent cellular, tissue and organ-system anatomy;
- Appreciate the implications of normal anatomical variability
- Gain sufficient structural knowledge to appreciate the anatomical basis of physical examination
- Develop the ability to integrate anatomical information with clinical data;
- Identify the normal structure of deep tissues, organs and systems through visualization using various clinical diagnostic techniques and technologies;
- Further develop self-directed and problem solving learning skills as well as acquire an additional manual skill
- Understand the importance of team work in both the social and medical context

ANESTHESIOLOGY

Anaesthesia for medical students is a course designed to acquaint a student with the essential knowledge on the subject and gain practical experience necessary to be competent in safely administering local, regional and general anaesthesia. The course prepares the doctor to select and independently manage inhalational, anaesthetic for a patient who does not suffer from metabolic disorder or condition(s) that may lead to complications or require specialist anaesthesiologist. The newly graduating doctor will be able to manage anaesthesia during emergency, routine surgical procedures and during postgraduate studies special in the subject. The course is given in two modules but a student is given sufficient time during the fourth and final year of study to accumulate the requisite experience.

ANESTHESIOLOGY I

MCMA3752

NQF:	7
Contact Hours:	3 Lecture hours and 2 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written)
Pre-requisite:	None

Module Description

INTRODUCTION TO ANAESTHESIA: This course reviews the physiology and anatomy of the respiratory, cardiovascular and hematological systems as well as the pharmacology of drugs used for anesthesia. Students grasp physics of gas, fluid mechanics; compliance, blood gas and haemoglobin dissociation. A student is expected to be acquainted with pre-operative preparation of the patient and family, the choice of drugs for induction, intravenous and inhalational anaesthesia; monitoring during anesthesia; complications of anaesthesia particularly, apnoea. Topics: Gass laws , fluid mechanics, elasticity laplace law, Sterling law, thermodynamics as they relate to gasses: anatomy and physiology respiratory system including concepts of shunting, dead space and compliance; the cardiovascular system: pulse, rate, rhythm, contractility, preload and afterload; the pharmacology of drugs used for local anaesthesia, regional and inhalational anaesthesia, pain management; interpretation of blood gas analysis results. During this module a student will be introduced to practical aspects in the use of local anaesthesia. This course integrated with general surgery and obstetrics and gynaecology.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Relate the applied anatomy, physiology and pharmacology to the use of anesthetics;
- Explain the mechanism of action of the commonly used drugs for anesthesia and the complications;
- Explain the pathophysiology, apnoea, hypoxia, hypotension, ischaemia and dysarrhythmia;
- Describe techniques of airway management;
- Describe the various stages of anaesthesia;
- Interpret findings from blood gas analysis;
- Carry out a professional pre-anaesthesia interview of a patient;
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy;
- Accurately record and present to clinical faculty
- Assess the findings of the medical interview and the physical examination to establish possible contra-indications for any drugs used for anaesthesia;
- Differentiate the anaesthetic drugs and techniques;
- Perform selected operative procedures under local anaesthesia;
- Monitor a patient during inhalational anaesthesia;
- Perform cardio-pulmonary resuscitation.

ANESTHESIOLOGY II

MCMA3772

NQF:	7
Contact Hours:	3 Lecture hours and 2 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written)
Pre-requisite:	None

Module Description

ANAESTHESIA PRACTICE: This course discusses the practice of anaesthesia in different settings (newborn, infancy, childhood adulthood, the aged and under different medical conditions). A student shadows an anaesthesiologist, in conducting pre-operative assessment and pre-medication, during induction, in-tubation and monitoring during operation theatre procedures, ex-tubation and post-operation monitoring. The student will gain experience in administering all forms of anaesthesia. Topics: Pre-operative evaluation; fluid management; massive transfusion; invasive hemodynamic monitoring; sedation; recovery room management; post-operative nausea and vomiting; critical care medicine; assisted respiration; pain management; anesthesia during pregnancy and labour; anesthesia for cardiac; neurosurgery, ear nose and throat surgery; anesthesia neuropharmacology; adverse drug reaction, coagulation and coagulopathy; anesthesia during infancy, childhood and the aged; ultra sound guided vascular techniques. A student will satisfactorily perform all the listed practical procedures in the Anaesthesia log.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Perform the practical procedures of induction, in-tubation and ex-tubation;
- Conduct pre-operative pulmonary and cardiac risk assessment;
- Identify patients on endocrine, anti-coagulants or patients with physiologic or hematological disorders;
- Identify high risk patients and advise on suitable anaesthetic procedure;
- Interpret results of blood gas analysis and the various readings from intensive care monitors;
- Prepare patients for operations under inhalational anesthesia;
- Shadow attending anaesthesiologist in the operating room;
- Manage fluids and electrolytes during the intra-operative and postoperative periods;
- Identify complications of anaesthesia and initiate treatment before consultation;
- Explain the pathophysiology of complications;
- Perform operations under local and regional anesthesia.

BEHAVIORAL SCIENCE

The focus of these three modules is on the interaction between society and health. The objective is to examine how social life has an impact on morbidity and mortality rate, and vice versa. The sociology of health and illness covers sociological pathology (causes of disease and illness), reasons for seeking particular types of medical aid, and patient compliance or noncompliance with medical regimes. Health, or lack of health, was once merely attributed to biological or natural conditions. Sociologists have demonstrated that the spread of diseases is heavily influenced by the socioeconomic status of individuals, ethnic traditions or beliefs, and other cultural factors. This topic requires a global approach of analysis because the influence of societal factors varies throughout the world. This will be demonstrated through discussion of the major diseases of each continent. These diseases are sociologically examined and compared based on the traditional medicine, economics, religion, and culture specific to each region. There are obvious differences in patterns of health and illness across societies, over time, and within particular societies. There has historically been a long-term decline in mortality within industrialized societies, and on average, life-expectancies are considerably higher in developed, rather than developing or undeveloped, societies. Patterns of global change in health care systems make it more imperative than ever to research and comprehend the sociology of health and disease. Continuous changes in economy, therapy, technology and insurance can affect the way individual communities view and respond to the medical care available. This course is organised into 3 hours didactic lectures, tutorials and 4 hours of family and urban health centre attachment (COBES I).

BEHAVIORAL SCIENCE I

MBSC3511

NQF:	5
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

Module Description:

SOCIOLOGY OF HEALTH AND DISEASE: This module is offered in the 1st semester of the first academic year. It focuses on the indirect pathway between sociology and health/disease, and emphasizes the role that *beliefs* and *behaviors* play in health and illness. The introductory lectures in this module reflect this emphasis and illustrate how different sets of beliefs relate to behaviors 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 behaviors. Students will also master theories of health beliefs and the models that have been developed to describe beliefs and predict health behavior. 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 counseling. Students will then examine health-related behaviors and apply many of the theories and constructs to specific behaviors, e.g., addictive behaviors and the factors that predict smoking and alcohol consumption; eating behavior drawing upon developmental models, cognitive theories and the role of weight concern; exercise behavior both in terms of its initiation and methods to encourage individuals to continue exercising; screening of health behaviors 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 behavior 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, behavior 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 counseling.

Learning Outcomes: At the end of this module students are expected to be able to:

- Conceptualize Sociology of Health and Disease
- Conceptualize “health beliefs”
- Discuss illness cognitions
- Discuss health care worker/patient communication and counseling, the role of health beliefs in communication and counseling, as well as the ethics involved in communication and counseling

- Discuss health-defying behaviors: smoking and alcohol
- Conceptualize eating behavior
- Discuss the role of exercise in promoting health
- Discuss screening in health and disease: primary, secondary and tertiary prevention
- Conceptualize stress and discuss stress and illness
- Explain early models of pain and their description of pain as a sensation
- Discuss placebos and the interrelationship among beliefs, behavior and health
- Examine the role that sociology plays at each stage of an illness: HIV and Cancer
- Examine the role that sociology plays at each stage of an illness: Obesity and Coronary Heart Disease
- Discuss the sociology of Women's Health Issues
- Discuss measurement of Health Status and Quality of Life

BEHAVIORAL SCIENCE II
MBSC3512

NQF:	5
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

Module Description:

DEVELOPMENTAL PSYCHOLOGY: This module is offered in the 2nd semester of the first academic year. It focuses on applicable developmental theories (psychosocial developmental theory (Erickson), cognitive developmental theory (Piaget), moral development theory (Kohlberg), normal developmental milestones and developmental disorders first evident in infancy, childhood and adolescence. Students will develop understanding of stereotyped movement disorders; learning, speech and communication disorders; social attainment and relations disorders; other pervasive developmental disorders first evident in infancy, childhood and adolescence. Topics: locomotion, cognition, speech and communication, cognitive, emotional and social development, social attachment, primary bonding and belonging, development of relations; mental retardation, motor-skills disorders, pervasive development disorder, attention deficit and disruptive behavior; feeding and eating disorders of infancy or early childhood; tics, elimination disorders, separation disorders, phobia and a selection of disorders commonly associated with infancy, childhood and adolescence.

Learning Outcomes:

At the end of this module students are expected to be able to:

- Explain applicable developmental theories such as the psychosocial developmental theory (Erickson), cognitive developmental theory (Piaget), moral development theory (Kohlberg)
- Discuss normal developmental milestones: locomotion; cognition; speech and communication, cognitive, emotional and social development
- Distinguish between normal development and developmental delay
- Discuss stereotyped movement disorders in infancy, childhood and adolescence
- Conceptualize and discuss learning and learning difficulty
- Conceptualize and explain mental retardation, speech, communication, motor skills and tics disorders
- Explain social attainment, social attachment, primary bonding and belonging, development of relations, and disorders that may emerge as a result of disrupted/delayed development;
- Discuss a selection of pervasive developmental disorders first evident in infancy, childhood and adolescence, such as Autism, Asperger's syndrome, Fetal Alcohol syndrome, Childhood Disintegrative Disorder and Rett's Disorder
- Discuss attention deficit and other disruptive behaviors
- Explain feeding and eating disorders of infancy or early childhood
- Explain elimination disorders of infancy or early childhood

NQF:	5
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

Module Description:

CLINICAL PSYCHOLOGY: This module is offered in the 1st semester of the 2nd academic year and it defines and demarcates the study fields of Clinical Psychology and Psychiatry, with the main focus on Clinical Psychology, while Psychiatry follows in the 3rd and 4th academic years. The concept 'mental disorder' is defined and limitations of the categorical approach are discussed. Students are introduced to concepts of clinical judgment, as well as ethnic and cultural considerations applicable to Clinical Psychology. Students will be able to distinguish between 'mental disorder', 'general medical condition', conditions that may be a focus of clinical attention, e.g., psychological factors affecting medical condition, relational problems (parent/child; partner; sibling), problems related to abuse or neglect, noncompliance with treatment and malingering, bereavement, religious or spiritual problem, acculturation problem and phase of life problem, and psychosocial and environmental problems, e.g., problems with primary support group, social environment, occupational, housing, and economic problems, problems with access to health care services, and interaction with the legal system/crime; clusters of mental disorders are discussed at hand of diagnostic criteria, associated features, associated laboratory findings, associated physical examination findings and general medical conditions, specific culture and age features, prevalence, course and decision trees. Students will also be introduced to elementary concepts innate to neuroscience, e.g., neurotransmitters, the limbic system and other functional regions of the brain implicated in clusters of mental disorders. The aim is for students to recognize atypical behavior and mental states, and not to diagnose and treat.

Learning Outcomes:

At the end of this module students are expected to be able to:

- Conceptualize the study field of Clinical Psychology
- Discuss conditions that may be a focus of clinical attention without meeting the diagnostic criteria for a mental disorder
- Discuss psychosocial and environmental problems that may be a focus of clinical attention (jointly with multi-professional collaboration)
- Conceptualize human cognition and deficits in cognition
- Conceptualize disturbed states of consciousness and changes in cognition that develop over a short period of time
- Discuss multiple cognitive deficits (including memory impairment) that are due to the direct physiological effects of a general medical condition, to the persisting effects of a substance, or to multiple etiologies
- Explain and discuss substance abuse and substance-related disorders;
- Conceptualize Schizophrenia, Psychotic Disorders and Dissociative Disorders
- Conceptualize and describe a selection of Mood and Anxiety Disorders
- Define and explain Somatoform and Factitious Disorders;
- Conceptualize Sexual and Gender Identity, as well as Sexual and Gender Identity Disorders;
- Explain a range of Eating Disorders, Sleep Disorders, and Impulse-Control Disorders;
- Conceptualize and discuss Adjustment Disorders;
- Conceptualize Personality Development, Personality Disorders and Defense Mechanisms
- Apply basic screening tools within a health setting

BIOCHEMISTRY

This course is administered over three consecutive semesters, designed to acquaint students with the basic structures and functions of cells and the human organism as a whole in both health and disease situations in terms of the properties of individual molecules by

applying one of the most unifying and important concepts: the principle of complementarity of structure and function. This course commences with the foundation module on organic chemistry and thereafter subsequent modules focus on how the cell synthesizes, catabolizes, and stores macromolecules, generates energy and regulates its metabolic and information pathways in addition to reviewing the basic principles of genetics and frequent genetic diseases encountered in medical practice.

BIOCHEMISTRY I**MBSB3511**

NQF	5
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:

ORGANIC CHEMISTRY: This module administered over one semester, is designed to acquaint students to the basic knowledge in classification of organic compounds. This includes the analysis of the chemical and physical properties and the use of organic compounds in medicine. Topics: 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. This unit includes an initial block dedicated to review of basic chemistry (the state of matter, atoms, molecules, ions, atomic mass, molar and molecular mass, chemical reactions. Acid-base reactions, quantum numbers, periodic table, ionic bonding, rate of reaction, catalysts, enthalpy, equilibrium constant and solubility).

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Classify organic compounds into chemical groups;
- Identify the chemical and physical properties of organic compounds;
- Discuss the use of organic compounds in medicine;
- Apply concepts and basic techniques of simple synthesis and re-crystallization;
- Perform solvent extraction, identification and characterization of compounds;

BIOCHEMISTRY II**MBSB3512**

NQF	5
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:

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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Relate the structural and functional organization of the eukaryotic cell.
- Explain the properties and functions of the components of macromolecules that contribute to the structural and functional characteristics of substances crucial in life processes.
- Discuss the biological functions of the different types of macromolecules.
- Explain the molecular basis of the main mechanisms at play in regulating enzyme activities and various metabolic processes.
- Describe the molecular mechanisms that allow the exchange of substances, energy, and signaling across the cell membrane.
- Discuss the molecular events that occur during the conservation, transmission, and expression processes of the genetic information and the consequences of their variations due to the action of internal and external agents.
- Explain the molecular basis of genetics.
- Interpret the inheritance of genetic diseases.
- Discuss the abnormalities of human chromosomes and phenotypic characteristics of genetic diseases.
- Explain the importance of the interaction of the genome with the environment.

BIOCHEMISTRY III**MBSB3531**

NQF	5
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 also 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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Describe the molecular mechanisms that allow the exchange of substances;
- Explain energy exchange, and signaling across the cell membrane;
- Explain the events of cellular respiration, their basic molecular mechanisms;
- Describe the cell metabolism regulation and how the cell synthesizes, catabolizes, and stores macromolecules;
- Demonstrate a dynamic understanding of the interrelations between the main metabolic pathways and their regulations;
- Explain the quantitative and qualitative nutritional necessities of carbohydrates, lipids, proteins and vitamins;
- Relate some metabolic dysfunctions of carbohydrates, lipids, vitamins and nitrogenous compounds with the molecular origin of such defects;
- Explain laboratory findings in disorders of metabolism
- Describe the metabolic and nutritional determinants of health and disease in individuals, families and human populations;

COMMUNITY BASED EDUCATION (COBES)

The education and training of students at the School of Medicine sits on a tripod: students; patient and the community. Much as the patient is the clinical 'laboratory' so is the community the laboratory for learning and practice of social skills, health systems management, primary care, health promotion, disease prevention, rehabilitation and restoration. The community laboratory is the bedrock for translational research. Graduates of the School of Medicine are well grounded on community action skills though continual exposure to real situations obtaining in the households, population groups and the various communities in Namibia.

During the community attachment, students gain understanding of the important concepts and principles of social justice, equity, social action for health on the one hand and strategies for realizing national as well as international goals for high standards of health for all the people. In particular the course acquaints students with national policies, the organizational and management of health services, leadership and governance issues, and community participation, strategies for assuring access to quality healthcare services that are acceptable, affordable and cost-effective. Students are also exposed to the principles and the practice of family medicine as an emerging field of specialization. Topics include, health policy development; community participation; community organization; Rights Based Approaches; planning; action research; evidence based advocacy; communicable and non-communicable disease; screening; immunization; nutrition; maternal and child health; control of epidemics and emergencies; treatment of common diseases; essential drugs; rational use of drugs; district health services; health service management; health economics; environmental and occupational health.

Community attachment follows a logical sequence beginning from the household, urban Primary Care facilities before proceeding to the rural Primary Care attachment (living and working in rural facility and community) and finally attachment to the District Hospital / District Medical Office.

COMMUNITY BASED EDUCATION (COBES) I**MBCC3620**

NQF:	7
Contact Hours:	35 hours per week
Credits:	32
Assessment:	100% Continuous Assessment
Pre-requisite:	None

Module Description:

COMMUNITY BASED EDUCATION URBAN HEALTH CENTRE/ HOUSEHOLD: The student is exposed to a family at household level in urban settings to understand the socio-economic and cultural determinants of health at household setting i.e. the basic unit of society. In particular, the student gains insight into health seeking behavior, access and demand factors as well as culturally mandated disposal of household income and allocation to health. A student visits a family weekly over a period of 24 months to discuss and observe health seeking behavior, health outcomes for pregnancy, childhood and in chronic disease as well among the elderly or aged persons. Observation on care should include among others persons with disabilities and mental illness or other vulnerable groups. During this longitudinal rotation a group students is attached to an urban health centre or high volume where each student participates in primary care activities such as health education, health promotion, antenatal care, well bay and well mother clinics as well as making observation such as DOTS. In this way a student will apply holistic approach to healthcare delivery. This is also value-based approach that emphasizes on the role of family members in assessing and analyzing their own health problems, allocate resources to health and develop solutions. The module gives opportunities for the students to address the root causes of health conditions to improve the well-being of the family. The experience gained will help the students to identify resources in the household and leverage this for health in support health promotion, prevention, control, treatment and rehabilitation. Application of principles and practice of Community Based Education leads to transforming of individuals, families and communities into well-informed, self-reliant and empowered society.

Contents: Household, families, environment, influencing factors, community strengths, resources available at household levels, socio-economic conditions, cultural practices, educational levels, use information to develop intervention strategies, assist in identification of health problems, identify appropriate tools to sustain programmes developed, application of principles and practice of community based education approach, health promotion theories, integrated health education application.

Learning Outcomes:

At the end of the module student is expected to be able to:

- Correlate theory with actual practical situation;
- Understand individual's health seeking behavior;
- Explain impact of individual's health seeking behavior at the household level;
- Identify factors at household level that promote or inhibit health and health outcomes;
- Identify social networks and their role in healthcare
- Use information obtained to inform policy and develop intervention programmes.
- Empower families to identify their own potential, health problems and their solution;
- Access health outcomes of mothers, children and people with chronic or terminal illness;
- Develop understanding of the application of the principles of Primary Health Care;
- Demonstrate understanding of the referral system and its challenges;
- Contribute to the improvement of healthcare to vulnerable and ,arnilaised population groups;
- Transform ideas of the household into sustainable actions.

COMMUNITY BASED EDUCATION (COBES) II
MBCC3753

NQF:	7
Contact Hours:	35 hours per week
Credits:	16
Assessment:	100% Continuous Assessment
Pre-requisite:	None

Module Description:

RURAL HEALTH CENTER/ COMMUNITY ATTACHMENT: In this module students gain insight into economic and socio-cultural determinants of health in a community and the structural factors that affect access to quality healthcare services. During a period of four weeks students acquaint themselves with principles of community engagement, community entry strategies before they travel to the rural health facility where they will live for three weeks investigating the health status of the community, community organizational institutions and their capacities; role of the community in managing their own health and facilitate a process of needs assessment. Rural Health Centers are expected to provide comprehensive, culturally competent, quality primary health care services to medically underserved communities and vulnerable populations. Health centers are community-based and patient-directed organizations that serve populations with limited access to health care. These include low income populations, the uninsured, those with limited English proficiency, migrant and seasonal farmworkers, individuals and families experiencing homelessness, and those living in public housing. Health center provides all required primary, preventive, enabling health services and additional health services as appropriate and necessary, either directly or through established written arrangements and referrals. Rural Health Centres are the cornerstone of rural healthcare.

The first of four cycles in the community leads to community diagnosis, while the subsequent attachment of new groups of students will work with the community to design and intervention, plan its implementation and lastly conduct an evaluation. This attachment is co-supervised with the Ministry of Health and Social Services health works in the health centre. Similar to the COBES I attachment, students will be engaged in Primary Care Services at the rural health centre where they live and operate from. Topics: health promotion; education; and knowledge of the disease profile in the community. Communicable and non communicable disease management, childhood illnesses, maternal and infant mortality assessment, existing prevention and control programmes, communication, and behavioral impact activities; School and Place Health Programs; mental healthcare and rehabilitation; sources of data, evaluation methods implemented; categories of indicators used, such as infant mortality rate, maternal mortality rate, child mortality rate, sanitation morbidity (incidence/ prevalence rate); leadership in the community, development of health services, infrastructure, budget allocation for sustainability, human resources, referral system and catchment area; healthcare management

Learning Outcomes:

At the end of this module each student will be able to:

- Promote community engagement and action;
- Conduct community capacity assessment;
- Facilitate community led interventions;
- Monitor health promotion/education programmes
- Evaluate outcome of interventions;
- Train and motivate health workers
- Improve and maintain the quality life of the community.
- Manage health care services at this level.
- Identify resources needed at that specific level.
- Manage specific Primary Care health conditions.
- Refer patients to the next level of care;
- Lead the health team and community members in prevention and control activities.

COMMUNITY BASED EDUCATION (COBES) III
MBCC3773

NQF:	7
Contact Hours:	35 hours per week
Credits:	16
Assessment:	100% Continuous Assessment
Pre-requisite:	None

Module Description:

DISTRICT HEALTH SERVICES: District Hospital Rotation: During the District Hospital Rotation students grasp the essence of the health system and in particular the healthcare benefits the District Hospital confers on the citizenry.

The District Health System: In developing countries, a well-functioning district health system includes community health centers offering primary care services and outreach, and district hospitals that receive referrals from health centers. This organizational structure is fundamental to effective health care, and failure to recognize the interrelationship between local- and district-level facilities has resulted in high health costs and inefficiency. District hospitals form the apex of the pyramid of primary care. They play a critical role in providing individuals and families with timely medical care, including surgery for the conditions that typically account for a large share of a population's disease burden.

District hospitals are community supported governmental entities charged with delivering health care to their communities. They fulfill a vital role in Namibia's health care system because without them, many people would be unable to receive health care in their own communities. District hospitals are authorized not only to operate a hospital care, but to deliver any service to help people stay healthy-physically, socially and mentally. Because they are owned and governed by local citizens, district hospitals tailor their services to meet the unique needs of their individual communities. It is this community-based mission that defines and distinguishes district hospitals from other health care entities. The powers of a district hospital are those things which a public district hospital may do, as expressly or implicitly granted by state law. Duties, on the other hand, are those things which a district hospital must do, as required by state law. Of course, there are also things which a public district hospital may not do, which then falls outside the range of both powers and duties. This distinction may prove useful in thinking about a specific activity of a public district hospital. In exchange for meeting these procedural barriers and requirements, which may be viewed as the tools for assuring that a community truly derives from a public district hospital, the benefits associated with being such an entity, such as to access healthcare, access to tax revenues, low cost bonds, exclusions from payment of certain taxes, and the like.

During the rotation, students shadow District Medical Officer, various hospital managers and departmental heads as an understudy and gain management skills. Students will also gain understanding on the roles and functions of the District Hospital being the apex of the District Health System.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Demonstrate understanding of common ambulation problems seen by doctors in the district hospital;
- Demonstrate understanding of the outpatient and inpatient procedures performed by a district medical officers;

- Perform the duties and responsibilities of a district medical officer and coping mechanisms in managing community health centers offering primary care services and outreach activities in the whole districts;
- Demonstrate understanding of the concept of "Continuity of Care" "Comprehensive" and "primary" care;
- Acquainted with the depth of training which medical doctors in Africa receive, the unique knowledge, skills and attitude required by the practicing doctors;
- Distinguish primary health care as a means of delivery of cost effective health care;
- Utilize effective patient education technique;
- Demonstrate understanding of the role of each member of the health care team (attendants, nurses, laboratory technologists, dieticians and office personnel) in providing comprehensive and a coordinated health care;
- Improve history taking and physical examination skills;
- Define the problems of the patients visit in an independent setting with direct supervision;
- Acquainted with to a variety of medical problems seen in a busy outpatient clinics (casualty)
- To develop an appreciation of some of the ancillary disciplines that a medical doctor in a district uses that is: nutrition, home based care, and other sub-specialties
- Explain the management roles and functions of the District Medical Officer in operational running of the District Health System (the management of resources and assets of the public healthcare system);
- Evaluate the performance of management outcomes with particular emphasis on quality, efficiency, governance and community engagement.

COMMUNITY MEDICINE

In a developing country like Namibia where there is a lot of demand on available services the need for relevance in decision making, in the provision of health services, and in particular and in the education and training of professionals such as doctors become paramount. In order for the training of future doctors to be relevant to national issues and to address the societal needs, it is imperative that education and training should be based on issues that are pertinent to the generality of the population. Such issues are found in the community. Therefore the School of Medicine has positioned itself to respond to societal needs and to be relevant for the socio-economic and the human capital development of Namibia by basing its training programmes in the community as well as the in the hospitals and related settings. The doctors from this programme would be competent in the provision of comprehensive, integrated, family orientated and community based quality health care using bio-psychosocial modules of health care. This is within the framework of community and family medicine. Community medicine is the practice that is derived from and driven by issues in the community/society. It is therefore dependent on evidence derived or obtained from the community and used to find solutions to health challenges in the community amongst individuals and families in the community. These solutions take the form of curative, preventive, promotive and rehabilitative care. The strategy for making healthcare services available and accessible to all in the community is Primary Health Care. Consequently, the education and training of doctors in the School of Medicine will concentrate heavily on Primary Health Care approaches for the provision of equitable in the spirit of social justice. The graduates of the School of Medicine will be trained and educated to be able to provide primary care, secondary and tertiary care where required.

Students will be acquainted with biostatistics, epidemiology and research methods which form the foundations of community medicine. Within the context of Namibia this will also include nutrition. Students will also be introduced to the practice of family medicine through modules in health promotion, environmental and occupational health, communicable and non communicable diseases (including emergency preparedness and management) and health services management. As a result of education and training in community and family medicine, graduates of the School of Medicine will be competent caregivers (primary care), decision makers, communicators, managers and community leaders. The graduates will appreciate the importance of community diagnosis and the design of strategies for health promotion, treatment, restoration, rehabilitation in conditions affecting individuals, families and the community. The course is offered in 4 modules of family medicine and 4 modules of community medicine.

COMMUNITY MEDICINE I

MCMC3612

NQF:	6
Contact Hours:	3 lecture hours + 1 hour of practice
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper)

Pre-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.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Distinguish between categorical and quantitative variables or data and, within each type, respectively, to distinguish between ordinal and non-ordinal categorical variables and between discrete and continuous quantitative variables;
- Define distributions and frequency tables;
- Distinguish between bimodal, unimodal, normal, leptokurtic, platykurtic, skewed, and symmetric distributions;
- Construct histograms from raw data, including setting category boundaries for continuous data (or discrete data with low frequencies within data classes);
- Calculate the value of a summation notation expression;
- Calculate summary statistics (mean, mode, median, range, interquartile range, standard deviation, and variance) from raw data;
- Distinguish between a parameter and a statistic;
- Define sampling error and be able to identify both bias and homogeneity in samples;
- Explain the difference between a symmetric and a skewed distribution and apply these concepts to the normal curve;
- Describe the relationship between probability and the area under the normal curve.
- Calculate z-scores;
- Calculate the appropriate probabilities and z-scores from actual data as an answer to a question about the data, assuming the data is normally distributed;
- Define and calculate the expected mean and standard deviation of sample means drawn from a quantitative variable;
- Calculate the standard deviation of sample means;
- Correctly reject or accept the null and alternative hypotheses from a comparison of the p value with a given critical (alpha) value (both one- and two-way);
- Give the conditions of validity for the use of the t-test for testing the significance of a difference between two sample means;
- Determine if it is appropriate to use the t-test for testing the significance of a difference between two sample means for a given scenario;
- Describe both type I and II errors for a given scenario;
- Define significant effect size and calculate it for a given scenario;
- Define the power of a statistical test and determine, using the tables in the textbook, the minimum sample size that will provide for a specified level of power given an expected standard deviation and an alpha level;

COMMUNITY MEDICINE II

MCMC3631

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

Module Description

EPIDEMIOLOGY: Clinical epidemiology is the science of making predictions about individual patients by counting clinical events in similar patients, using strong scientific methods for studies of groups of patients to ensure that the predictions are accurate. The purpose of clinical epidemiology is to develop and apply methods of clinical observation that will lead to valid conclusions by avoiding being misled by systemic error and chance. It is one important approach to obtaining the kind of information clinicians need to make good decisions in the care of patients. More recently clinicians and epidemiologists have become increasingly aware that their fields interrelate and that each is limited without the other. For clinicians who intend to make up their own minds about the soundness of

clinical information, understanding of clinical epidemiology is as necessary as an understanding of anatomy, pathology, biochemistry and pharmacology. Indeed, clinical epidemiology is one of the basic sciences, a foundation on which modern medicine is practiced. Topics: Definition, functions, and characteristics of epidemiology; Definition, functions, and characteristics of epidemiology; Definition, functions, and characteristics of epidemiology; Measuring Disease and Exposure; Measuring Disease and Exposure; Standardization of rates and ratio; Relating risk factors to health outcome; Analytic study designs; Causal inference; Sources of error; Multicausality — Confounding; Practical aspects of epidemiologic research; Data analysis and interpretations

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Discuss, apply, and interpret basic epidemiologic concepts and measures of disease occurrence in populations: incidence, prevalence, relative risk, attributable risk, standardization.
- Use basic methods for investigating an outbreak of a health problem in a community, making use of the concepts of disease variation in time, person and place.
- Explain the relative strengths and limitations of epidemiological strategies (e.g., cohort, case-control, cross-sectional, ecological and intervention studies) for studying associations between risk factors or exposures in populations and rates of disease occurrence or death.
- Identify the major sources of random and non-random error in community and multinational health studies and suggest strategies to reduce error.
- Evaluate epidemiologic evidence by applying criteria for causal inference to information about an association between a population exposure and health outcome.
- Use epidemiologic methods in evaluating effectiveness of public health intervention programs in varying geopolitical contexts.
- Comprehend basic ethical and legal principles pertaining to the collection, maintenance, use and dissemination of epidemiologic data in different cultures.
- Appreciate some of the complexities in applying scientific evidence on health and disease to the making of public policy in diverse societies.

COMMUNITY MEDICINE III

MCMC3632

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

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 behavioral 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.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Explain the purpose of clinical research.
- Differentiate types of research (clinical, basic science, health services).

- Describe the different types of research designs.
- Design research instruments.
- Apply research methods in designing a research proposal.
- Develop an understanding of research methodology
- Critically review literature,
- Identify research question,
- Formulate hypotheses, problem statement and justification of the study,
- Formulate objectives,
- Select study design and strategy
- Define the study population, sampling and sample size determination;
- Specify variables, data collecting tools and data collection methods,
- Develop data management and analysis plan,
- Determine the budget and research project administration
- Interpret results and write report;
- Apply principles of medical ethics in research

COMMUNITY MEDICINE IV
MCMC3651

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

Module Description

NUTRITION: This module will provide an overview of the importance of nutrition in health and will enable students to gain a general foundation on the different types of malnutrition both under and over nutrition including micronutrient deficiencies. Topics: Low birth weight and neonatal mortality; Infant mortality; Child growth and development; Link between nutrition and tuberculosis, respiratory tract infections, malaria, HIV, Measles, and diarrheal diseases; Maternal mortality in developing countries; Malnutrition; Vitamin A, B, C, D deficiencies, Iron deficiency and anemia; Multiple micronutrient malnutrition including zinc deficiencies; Emergency of obesity in developing countries; Nutritional assessment systems

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Describe the key indicators of nutritional problems
- Describe the importance of nutrition throughout the lifecycle with an emphasis on pregnancy infancy and early childhood
- Explain the prevalence and distribution of different nutritional problems in Namibia
- Describe current intervention programs to improve nutrition
- Describe the link between nutrition and acute and chronic diseases
- The role of nutrition in disease management and treatment
- Analysis between macroeconomic, food supply and household food security

ELECTIVES

Electives are flexible in context and allow the student to explore future career options. The purpose of an elective is to give students an opportunity to work and gain experience in any clinical, pre-clinical or para-clinical subject of special interest to them. An elective may be in any subject of the medical curriculum or in a subject closely related to medicine. During the elective period of the programme the student will have the opportunity to acquire clinical and professional experiences either in Namibia or elsewhere.

NQF:	7
Contact Hours:	35 hours per week
Credits:	32
Assessment:	100% Continuous Assessment
Pre-requisite:	None

Module Description

Three elective blocks of 8 weeks each have been established within the School of Medicine program in the second, third and fourth years (24 weeks total). This time is allocated within the MBChB program to allow students to investigate elements of medicine that are outside the core curriculum, that complement an area of interest or to study subjects in greater detail. In all, it is expected that students will complete 16 weeks of training in the allotted elective time. The established eight-week blocks may be broken into blocks of four weeks (not smaller) but electives cannot run concurrently. Upon completing an elective the student is responsible for ensuring that his or her evaluation form is completed and submitted to the School of Medicine for credit. *The School of Medicine recognizes the importance rural practice and as such requires that at least two four week blocks must be undertaken as rural attachments domestically.* In all cases students must seek approval of a specific elective and the School reserves the right to approve and or cancel chosen electives. We will also actively discourage students from scheduling electives during periods the School has designated for vacation.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Manage self-directed learning;
- Negotiate for a placement for experiential learning;
- Work as a member of a team;
- Raise funds for self-development;
- Manage time and financial resources;
- Experience other cultures (regional, international) including business culture;
- Extend knowledge and skills in an area of choice, research or future specialization;
- Write a report clearly explaining the benefits of the elective period;

FAMILY MEDICINE (PHC)

The course on family medicine is given in four modules over a period of four years. Family medicine is a field of medicine that treats most of the medical needs across the live-span of human being from birth to death. Family medicine is a one-stop –shop for all medical needs and the doctor can refer the patient to doctors with more specialized expert if need arises. The family medicine doctor's job is to help a person stay health with regular basic check-ups and screening tests for various medical conditions such as high blood pressure, diabetes, cancer etc. He is also able to make diagnosis and appropriate treatment. He has a broad knowledge of medicine and can coordinate the care of his patients to optimize the medicine regimens and the care that may be needed from specialist. A student with family medicine knowledge is privileged because he/she can get a chance to know her/his patients on a more intimate level than doctors without this background knowledge. He/she treats both the patient emotion as well as physical needs. The course on family medicine is given in four modules over a period of four years. The course focuses on the difference between family medicine and other clinical disciplines. A student gains skills and experience in doctor-patient communication and is aware of the most important screening methods in prevention of social and health problems. This is realized through didactic teaching and actual practice. This course is organised into 3 hours didactic lectures, tutorials and 4 hours of family and urban health centre attachment (COBES I).

FAMILY MEDICINE (PHC) I

MBSF3532

NQF:	5
Contact Hours:	3 lecture hours + 2 hour of practice

Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper)
Pre-requisite	None

Module Description

HEALTH PROMOTION: Health Promotion is the provision of information and/or 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 also the promotion of healthy ideas and concepts to motivate individuals to adopt healthy behaviors.

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.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Recognize the causes of disease and the threats to the health of individuals and populations at risk:
 - Definition of health, disease and disability.
 - Assessment of distribution of risk factors in the population.
 - Risk identification and reduction policies for populations taking into account diversity, ethnicity and social inequality
- Implement, where appropriate, risk reduction strategies for individual patients;
 - Knowing how to change risk factors.
 - The use of evidence-based medicine and effective interventions.
 - Helping patients to modify behavior whilst respecting their autonomy.
 - Managing and implementing change.
- Demonstrate understanding that health promotion and disease prevention depend on collaboration with many other professionals and agencies
 - Identify who the other professionals and agencies are and what their role;
- Plan health promotion interventions, taking into account barriers to preventing disease and promoting health both in the individual and the population
 - Consideration of; political, economic, behavioral and organisational barriers.
 - Importance of audit of health promotion and disease prevention activities
- Implement Screening programs
 - Criteria for determining appropriate implementation of screening programmes;

FAMILY MEDICINE (PHC) II

MBSF3551

NQF:	5
Contact Hours:	3 lecture hours + 2 hour of practice
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper)
Pre-requisite	None

Module Description

COMMUNICABLE AND NON COMMUNICABLE DISEASE: The module will explore the evidence and the frameworks used to address the burden of non-communicable diseases through action on the conventional risk factors (lifestyle factors such as tobacco use, unhealthy diet, physical inactivity, and high blood pressure etc) but also more 'upstream factors' and the social determinants of health (e.g. urbanization, income, education, trade, health transitions). This course aims also at providing students with an in-depth theoretical and practical insight into how national NCD programmes can be developed, integrated and maintained in a local, national and global perspective. The Module will allow students to strengthen their skills in analyzing the determinants and burden of NCD, in working across sectors and in promoting interventions to reduce the burden of NCD and health inequities.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Define Non-communicable disease (NCD);
- Compare and contrast them with Chronic Diseases;
- Describe the burden of NCD globally and at a national level in terms of the magnitude of the problem; (economic burden, social burden and future impact);
- Understand global strategies addressing NCD;
- Understand the importance of cultural sensitivity when addressing NCD;
- Understand the concept of NCD surveillance, evaluation and monitoring of NCD programmes;
- Understand the processes towards establishment of a National NCD Prevention and Control Program as part of an existing national response in a given country.

FAMILY MEDICINE (PHC) III

MBSF3652

NQF:	5
Contact Hours:	3 lecture hours + 2 hour of practice
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper)
Pre-requisite	None

Module Description

ENVIRONMENTAL AND OCCUPATIONAL HEALTH: This course, offered by the Department of Community, 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, nurses, allied health personnel, scientists and occupational health and safety managers.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Demonstrate an understanding of the legal and ethical framework which governs occupational health and safety practice and the obligations of industry in regard to the environment
- Critically appraise and integrate hazard information from published studies and other relevant sources in the occupational and environmental health literature
- Recognise and evaluate the level of exposure and assess the degree of risk to health from workplace and environmental hazards and provide advice on appropriate control measures in the workplace and the community
- Demonstrate an understanding of the factors underlying risk perception and be able to effectively and sensitively communicate - in both written reports and oral presentations - these risks to exposed people in the workplace and the community
- Provide occupational health services, including preventative programs and environmental advice to industry

FAMILY MEDICINE (PHC) IV

MBSF3771

NQF:	5
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Contact Hours:	3 lecture hours + 2 hour of practice
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper)
Pre-requisite	None

Module Description

HEALTH SYSTEMS MANAGEMENT: This module will cover the health information and health care management systems which will include includes (a) a clear measurement strategy including data collection , synthesis of data from different sources and estimation, (b) developing indicators and management systems (c) integration of monitoring of health systems and their performance into health information systems(d) concepts of healthcare financing and health economics (costs, budgeting and financing systems including health insurance); application of economics to decision making process (notions of efficiency, equity); public private mix. The emphasis will be on the ability to detect changes and to show improvement in health care system. The student will understand the basic health system monitoring focusing on the inputs, processes and outputs of the health system. These inputs and processes include human resources, finances, governance and leadership, information, infrastructure, procurement, logistics and supplies, which influence the outputs: service delivery, including availability and quality of services. These outputs affect the utilization of the services by those who need it (coverage) which, if the interventions are effective, should lead to improvements in health outcomes.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

Health policy development

- Demonstrate understanding in the health policy, health care planning and management in Namibia: Specifically:
 - Describe the National health policy framework of Namibia
 - Describe the health care planning;
 - Discuss the types of plans (strategic, operational and incremental), their definitions and applications; advantages and disadvantages.
 - Describe the planning cycle (situation analysis, problem identification, priority setting, formulation of goals and objectives, strategies, activities, activity budget and writing a work plan;
 - Define health care management;
 - Explain management principles, functions of management, management processes, decision-making, communication and co-ordination.

Management of personnel in a health care organization

- Apply the principles and processes of the management of human resources as follows:
 - Explain recruitment function and process (management of entry -identification, selection, recruitment, induction, job descriptions);
 - Explain retention and function (management of stay: leadership, motivation of staff, group dynamics;
 - Discuss the principles of teamwork, supervision, performance appraisal, delegation, development and continuing medical education, discipline, conflict management, management of change, time management and managing meetings)
 - Explain attrition and processes (management of exit: dismissal, resignation, exit interview, retirement, benefits and pensions schemes);

Management of materials

- Demonstrate understanding of the basic concepts in managing materials and logistics management, 'logistics cycle' selection, procurement, transportation; storage; inventory; and distribution).
- Demonstrate understanding of the principles of management and maintenance for capital assets such as building, vehicles, equipment and other structures.
- Apply the concept of "Rational drug use" its indicators and approaches;

Information systems and basic performance indicators

- Define 'Health management information system',

- Describe the indicators and how they are used in Namibia;
- Demonstrate understanding of the management and analyses of service records, in-patient days (IPD), average length of stay (ALOS), bed occupancy rate (BOR);
- Apply the concepts of monitoring and evaluation;
- Explain 'Quality improvement' – as a philosophy and aspiration in health care delivery, 'quality' – definition, principles, dimensions and tools of quality assurance;

Healthcare Financial management

- Analyze healthcare financing systems (sources, pooling, purchasing and provision of services);
- Demonstrate understanding of the organization and financing of the health care systems;
- Assess the effect of the financing system on health outcomes;
- Demonstrate understanding of the effect of health financing policies on equity, access and demand for healthcare services;
- Identify socio-economic determinants of health and disease;
- Evaluate theoretical and conceptual models relevant to healthcare seeking, access, use, quality, costs, health policy and healthcare decision making;
- Conduct simple research /study on healthcare financing system.

INDEPENDENT RESEARCH STUDIES

This module is offered during each of the semesters from the first semester of second year medicine until the tenth and final semester of the degree program. Every medical student has to write a thesis on any given topic of national interest as partial fulfillment towards earning the medical degree is expected to produce doctors with a sound scientific training necessary for the life-long practice of continuing learning and evidence based clinical practice. Research activities are carried over the five years of schooling and these include literature review, fieldwork, practicum, and when appropriate laboratory investigations. In each semester a student is expected to present his/her findings in a class seminar and submit them in writing for evaluation purposes. The module intensifies students on the use of computer programs for storing and analyzing data, and accessing information via the network and discusses basic statistics, probability theory and distribution, principles of sampling, data presentation, measurements of central tendency and dispersion, health statistics, demography, principles and methods of research methodology. Each semester a student is expected to present his/her findings in a public seminar and submit them in writing for evaluation purposes. A student will be assigned a mentor(s) primarily from the Faculty of Health Sciences, or the Ministry of Health and Social Services or other Namibian institutions, and, when appropriate, from outside the country. Topics: Literature review, reference citations, journal article critique, journal article presentation, research proposal development, tool of data collection, questionnaire development, quantitative or qualitative research, sampling techniques and sample size determination, descriptive and analytical statistics, application of spread sheets and other statistical packages for data analysis and presentation (e.g. Excel, EPI Info, STATA, SPSS), manuscript development and publication; application of skills and methods of knowledge management (including telemedicine, and virtual library); practical and evidence-based application of skills in research methodology, descriptive and analytical statistics, demography and health statistics, association, causality and statistical inference.

INDEPENDENT RESEARCH STUDIES I

MCMR3732

NQF:	7
Contact Hours:	4 hours of practice per week
Credits:	16
Assessment:	100% continuous assessment
Pre-requisite:	None

Module Description

INTRODUCTION TO KNOWLEDGE MANAGEMENT: This course introduces students to principles and methods of knowledge management, use of internet and intranet as well web based literature. Students will be able to search for current evidence from the literature, determine the study methods used and test the validity of the conclusions. Through analysis of available literature, each student will select a topic of interest in the context of Namibia, carry out in-depth literature (published and non-published) and write

the chapters on introduction, Literature Review and Problem Statement of the proposal. At the end of the semester a student is expected to present his/her findings in a public seminar and submit them in writing for evaluation purposes. Each student will be assigned a member of the Faculty to be a mentor.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Efficiently conduct information search using a variety of media including internet based sources;
- Interpret conclusions from a scientific journal;
- Assess the public health implications of the findings from research;
- Identify a subject and /or topic of public health interest Namibia;
- Carry out in-depth literature search on the selected topic and write the initial chapters with satisfactory bibliography using the Harvard system;
- Make presentation at a seminar and receive feedback;
- Revise the chapters in line of comments or new information.

INDEPENDENT RESEARCH STUDIES II

MCMR3730

NQF:	7
Contact Hours:	4 hours of practice per week
Credits:	32
Assessment:	100% continuous assessment
Pre-requisite:	None

Module Description

PROPOSAL WRITING: The course builds on the first module and during the space of two semesters, a student gains competence in writing a research proposal with guidance from the mentor. This module allows the student to study a selected subject through active participation in research project and/or in-depth literature review of existing data. The research project may be based on secondary or primary data or data generated from the student’s involvement in laboratory or clinical exercises. One month before the end of the second semester, the student will hand in the proposal for review and comments before the final evaluation at the end of the semester. The grading of the proposal is done by a team of mentors from the faculty who are present during the student presentation at the Faculty Conference convened for this purpose. Students can improve the proposal following comments or questions that the peer raise during the presentation.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Apply knowledge of epidemiology to develop a research proposal;
- Design a research study including sample size calculations;
- Develop and pretest tools with clearly defined variables and outcome measures;
- Cost a proposal;
- Develop a data analysis plan and administration plan for the research;
- Secure funding for the study;

INDEPENDENT RESEARCH STUDIES III

MCMR3750

NQF:	7
Contact Hours:	4 hours of practice per week
Credits:	32
Assessment:	100% continuous assessment
Pre-requisite:	None

Module Description

DATA COLLECTION AND ANALYSIS: The student focuses on data collection during the first semester of the fourth year as a longitudinal module from primary or secondary sources in Windhoek /Khomas region. According to the proposal, the data can be from the clinics, hospital, City Council, Ministry of Health and Social Services or its institutions or from the community in a specified income cluster. The student will apply the skills of research methodology and epidemiology to clean and process the data using a suitable software package. At the end of the semester, the student will make a presentation detailing the results of the field work, summary tables and preliminary findings. Feedback from the student conference assists the student to review the analytical framework and finalize the data analysis. The conference presentation rating will constitute the continuous assessment for the semester. The student can then proceed to write the thesis using the UNAM format. Optionally, students can write a scientific paper to be submitted in refereed journal.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Collect data using the preferred technique(s);
- Select the appropriate program (SPSS or STATA) for data analysis;
- Clean the data, enter the data using appropriate program (preferably Epi Info) and generate frequency tables;
- Present preliminary results at a seminar;
- Finalize data analysis and where necessary create new variables and approach for controlling confounding.

INDEPENDENT RESEARCH STUDIES IV

MCMR3870

NQF:	8
Contact Hours:	4 hours of practice per week
Credits:	32
Assessment:	100% continuous assessment
Pre-requisite:	None

Module Description

WRITING AND PRESENTATION OF THESIS: This final module is for the student to write the Thesis with regular advice from the Faculty mentor. The student will be able to make revisions using advice from the mentor aiming at producing the final revised copy one month before the end of the tenth semester (end of year 5 academic year). The Thesis will be graded by two faculty appointed evaluators. The student will also make a presentation of the research study at the final student conference to be held before graduation. The mentor will assist a student who requests to prepare a manuscript for publication in a referred scientific journal.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Write the Thesis and present to Faculty for comments;
- Present Results of study at the final seminar;
- Submit an independent study report for evaluation
- Compose manuscripts targeted at journals on health issues

INTERNAL MEDICINE

The course on internal medicine is given in four modules beginning in year two of the course with the final module being offered in year five. During this period the student progressively grasps a body of scientific knowledge on the individual disease causality, epidemiology, natural history of frequent or rare but life threatening medical conditions, the clinical presentation of each disease, its diagnosis and treatment, prognosis and rehabilitation. The student, through shadowing a physician, gains competence in professionalism, clinical reasoning and executing the necessary clinical skills expected of a newly graduated doctor. The modules emphasize on evidence based medical practice, integration of prior knowledge of basic sciences, microbiology, pathology, and pharmacology and laboratory medicine.

NQF:	7
Contact Hours:	3 lecture hours + 4 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	MBSC1533

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.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Be able to carry out a medical interview;
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy;
- Accurately record and present to clinical faculty;
- Methodologically perform basic nursing procedures with full consideration of a patient's comfort, confidentiality, and privacy;
- Competently administer First Aid during a medical emergency, make effective referral and follow-up of a patient who requires life-saving care;

NQF:	7
Contact Hours:	3 lecture hours + 4 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	MBSC1533

Module description

JUNIOR CLERKSHIP IN GENERAL MEDICINE: This module is organized in clinical clerkships and clinical practice carried out in the ambulatory care settings and in medical wards of teaching hospitals. 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 and introduces students to different diseases that affect the human resulting from different aetiological causes. This course acquaints students with the aetiology, pathogenesis, natural history, treatment and prognosis of disorders of respiratory system, the cardiovascular system, endocrine disorders, neurological disorder; disorders of the lymphoreticular tissues and locomotor system; haematological conditions, cancer and other growths; ageing and development; organic dysfunction, or injury. This course also acquaints students with clinical signs and symptoms of various diseases and the pathophysiological explanation of those signs and symptoms. Students will develop professional skills and experience in conducting a medical interview, examining adult patients, preparing patient record and presenting the findings to clinical faculty. Students will also learn how to make clinical follow-up of patients and their discharge, use laboratory and diagnostic tools, interpret results and use evidence to make clinical decisions. This course integrates laboratory medicine and evidence based clinical decision-making. At the

end of the course students will be able to evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures, interpret laboratory findings and explain patient signs, symptoms, and disease progression on the basis of laboratory test results and pathophysiology. Topics: The course covers topics in general medicine (homeostasis, fluid and electrolyte balance; diseases of blood, blood vessels, lymphoid tissues and the heart; heart failure; lung disease and respiratory failure; renal conditions and renal failure; diseases of metabolism; endocrine dysfunction in states of hypo and hyper-function; liver disorders and failure, gastrointestinal malignancy and disorders of the pancreas and digestive system; stroke and tumors /space occupying lesions of the brain and meninges; hemi and paraplegia; allergy and autoimmune disease). Topics in laboratory management: basic chemistry of body fluids, enzymatic, biochemical, and hematological tests on respiratory, circulatory, hemolymphopoietic, and endocrine systems. This course is organized in clinical clerkships and clinical practice is carried out in the ambulatory care settings and in medical wards of teaching hospitals. Students will rotate through general medical wards, cardiology department, neurology department, renal unit /nephrology ward, ambulatory care and specialist clinics and follow up patients to the intensive care unit.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Carry out a medical interview,
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy,
- Accurately record and present to clinical faculty.
- Develop professional and clinical reasoning skills,
- Analyze and carry on differential diagnosis of diseases,
- Evaluate the results and develop treatment plan for individual patients and their families within a health facility or community setting.
- Explain the underlying mechanism(s), of abnormalities
- Develop and implement treatment plan or referral of patients,
- Explain the pharmacology of frequently used drugs for the treatment of medical conditions, their side effects and/or interactions as measures to counteract the deleterious effects;
- Develop professional skills and experience in conducting a medical interview,
- Make clinical follow-up of patients,
- Use laboratory and diagnostic tools, and interpret results
- Identify the indications for requesting for X-ray and other specialized imaging diagnostic procedures, initiate and prepare patients for the procedure,
- Examine X-rays, radiographs, or dynamic images for a patient in his/her care,;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures,
- Interpret laboratory findings and explain patient signs, symptoms, and disease progression on the basis of laboratory test results and pathophysiology;
- Initiate emergency treatment of medical patients;
- Make a medical consultation and referral;
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine

INTERNAL MEDICINE III

MCMM3772

NQF:	7
Contact Hours:	3 lecture hours + 4 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	MBSC1533

Module Description

JUNIOR CLERKSHIP - INFECTIOUS DISEASES AND DERMATOLOGY: This course introduces students to different diseases that affect the human organism resulting from different infectious agents and parasites as well as medical conditions affecting the skin. Students are expected to develop professional and clinical reasoning skills, analyze and carry on differential diagnosis of bacterial, viral, fungal and human parasitic diseases, evaluate the results and develop treatment plan for individual patients and their families within a health facility or community setting. The clinical practice will be carried out in medical wards or outpatient clinics at teaching hospitals or health centers. The course is organized around clinical clerkships. Topics covered include acute and chronic illnesses resulting from infectious agents affecting the digestive system, acute and chronic infections of the locomotor apparatus, neurological systems, respiratory system, cardiovascular, system skin and urinary system. The course integrates the patho-physiology of infectious diseases, and the epidemiology of frequent communicable disease with particular reference to Namibia and the Southern Africa region. The dermatology module is designed to describe the most common dermatological diseases, distinguishing normal skin from abnormal skin and significant abnormalities from insignificant ones, integrating pertinent signs and symptoms into an appropriate differential diagnosis. Students should recognize common dermatological conditions, explain the underlying mechanism(s), develop and implement treatment plan or referral of patients, and explain the pharmacology of frequently used drugs for the treatment of dermatological problems. Topics covered include: approach of patient with skin disorder; diagnostic techniques; common skin disorders; infectious dermatosis: superficial mycosis, dermatosis caused by viruses, including HIV manifestations, dermatosis caused by zooparasites, pyoderma, skin manifestations of sexually transmitted diseases, leprosy; immunologically mediated skin diseases, papulosquamous disorders: psoriasis, lichen planus; benign and malignant pigmented lesions; drugs and preparations in common use for the treatment of common skin conditions. The course also integrates clinical laboratory practice which acquaints students with cost-effective and rational use of laboratory tests in clinical reasoning and decision-making processes with respect to infectious diseases and dermatology. Students will also be required to correctly collect specimens and carry out simple laboratory tests. Students will rotate through the infectious diseases hospital or ward, isolation wards /hospital, dermatology and other specialized clinics.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Carry out a medical interview,
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy,
- Accurately record and present to clinical faculty.
- Develop professional and clinical reasoning skills,
- Analyze and carry on differential diagnosis of diseases,
- Evaluate the results and develop treatment plan for individual patients and their families within a health facility or community setting.
- Explain the underlying mechanism(s), of abnormalities
- Develop and implement treatment plan or referral of patients,
- Explain the pharmacology of frequently used drugs for the treatment of dermatological problems and infections; identify side effects and their treatment.
- Develop professional skills and experience in conducting a medical interview,
- Make clinical follow-up of patients,
- Use laboratory and diagnostic tools, and interpret results
- Identify the indications for requesting for X-ray and other specialized imaging diagnostic procedures, initiate and prepare patients for the procedure,
- Examine X-rays, radiographs, or dynamic images for a patient in his/her care,;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures,
- Interpret laboratory findings and explain patient signs, symptoms, and disease progression on the basis of laboratory test results and pathophysiology;
- Initiate emergency treatment of medical patients;
- Make a medical consultation and referral;
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine

NQF:	7
Contact Hours:	3 lecture hours + 4 hours of practice per week
Credits:	32
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	MBSC1533

Module Description

SENIOR CLERKSHIP: This course enables students to acquire clinical skills in Internal Medicine and, under the supervision of a qualified Internist(s), gain practical hands-on-experience and under supervision provide professional care to individual patients, their families, and population groups within the setting of a hospital, a household, or community. At the end of the course, a student will be able to independently carry out a professional interview and physical examination of an adult patient, suspect the presence of a medical condition(s), institute cost-effective investigative plan to confirm the diagnosis, develop safe and effective treatment plan, including therapeutic procedures, after-care management, and assess quality of care. The student should be able to acquire practical skills on the epidemiology, pathogenesis, preclinical and clinical manifestations of communicable and non-communicable diseases, including mental health conditions. The student should be eligible to perform the professional tasks of a newly graduated physician in the management of illnesses resulting from physical agents, chemicals, infectious agents, physiological and anatomical abnormalities, and degenerative processes affecting the nervous, respiratory, cardiovascular, urinary, digestive, and endocrine systems, haematological, locomotor apparatus, and epidemiological health problems. Student rotations will include emergency care unit and all the major departments of internal medicine.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Professionally carry out a medical interview, examine adult patients, prepare patient record and present the findings to clinical faculty;
- Apply professional and clinical reasoning skills,
- Consistently practice evidence based clinical decision making,,
- Analyze and carry on differential diagnosis of diseases,
- Evaluate the results and develop treatment plan for individual patients and their families within a health facility or community setting
- Implement the treatment plan or referral of patients under supervision
- Explain the underlying mechanism(s), of abnormalities
- Explain the pharmacology of frequently used drugs for the treatment of medical, infections or dermatological problems, prescribe under supervision and identify side effects and their management;
- Perform clinical follow-up of patients and change treatment plan on the basis of new evidence,
- Use laboratory and diagnostic tools, and interpret results
- Identify the indications for requesting for X-ray and other specialized imaging diagnostic procedures, and make a request for the procedure,
- Examine X-rays, radiographs, or dynamic images,
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures,
- Interpret laboratory findings and explain patient signs, symptoms, and disease progression on the basis of laboratory test results and pathophysiology
- Assess radiographs and other forms of diagnostic imaging modalities,
- Identify abnormal images, and explain the pathogenesis of the diseases and the mechanisms thereof leading to changes observed in radio-images
- Request cost-effective and rational use of laboratory tests in clinical reasoning and decision-making processes
- Prepare a patient discharge and follow-up plan;

- Request for postmortem examination, participate the examination as necessary and explain the findings and introspect of the clinical presentation and treatment;
- Evaluate clinical care outcomes for individual patients, for the clinical unit or health facility
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine
- Select Internal Medicine for future specialization.

MEDICAL IMAGING

Medical Imaging is taught in two semesters first at the onset of the clinical skills method and during the junior clerkship years. This approach provides sufficient opportunity to a student to integrate the learning of imaging with its application in clinical settings. Thus while the first course provides the foundations of radiology and radiation, correlating it with normal anatomy, the second course aims at consolidating vertical and horizontal integration and is patient centred. Medical imaging courses take the form of didactic, case based learning and bedside clinical education. The student grasps clinical reasoning skills necessary for interpreting radiological studies, understanding the role of imaging in clinical investigation and management guidelines and legislation on radiation and radiation protection.

MEDICAL IMAGING I

MCM13521

NQF:	6
Contact Hours:	2 lecture hours and 2 hours of practice per week
Credits:	8
Assessment:	60% Continuous assessment 40% Examination. (1 X 3 hours written paper)
Pre-requisite:	None

Module Description

INTRODUCTION TO IMAGING: This acquaints a student to medical physics, radiation and use of radioisotopes in medicine as a diagnostic tool and for treatment. The module discusses risks to radiation, radiation protection, and legislation on radiation, various imaging techniques, the normal appearance of various tissues and organs in plain films, angiography, contrast studies, tomography and resonance. At the end of the module, a student will be able to differentiate normal from abnormal findings in radiographs and diagnose common pathologies in the chest, abdomen, bone and the skeletal system. The student will also be able to institute due care practices in requesting for imaging investigations, be mindful of the comfort of the patient and obtain consent as necessary. Topics covered include principles of radiation physics and radiological technology; radiation protection; radiobiology; X-rays: normal systemic anatomy using plain X-rays (plain films, contrast studies); imaging modalities and their application; radio-isotope imaging, computerized tomography, magnetic resonance imaging, ultrasound, radiological, angiography, images of osteomyoarticular, respiratory, circulatory, digestive, urogenital, hemolymphopoietic, and endocrine systems; radio-therapeutics and bio-effects of radiation.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Explain the biophysics of radiation and radioisotopes;
- Describe the use of medical imaging and radiation in the investigation of disease conditions and treatment;
- Describe the radiation protection guidelines and legislation;
- Describe the normal anatomy of different organs and systems as seen in plain films, tomography, resonance or ultrasound;
- Differentiate normal from abnormal neuro-anatomy, anatomy of head and neck, chest, abdomen, pelvis and locomotor system, reproductive system, urogenital system and lymphoreticular system as seen in plain X-rays, tomography, magnetic resonance or ultrasound;
- Correlate findings of imaging to clinical manifestation of disease condition;
- Demonstrate systematic approach to the interpretation of radio-images;

- Describe the physical examination findings that correlate to radiological findings of consolidation, effusions in body cavities, congestive heart failure, heart sounds, lung oedema pneumothorax, pulmonary mass or intestinal obstruction;
- Identify fractures and relate these to mechanism of injury
- Interpret findings of Medical Images in a clinical setting

MEDICAL IMAGING II
MCMI3562

NQF:	7
Contact Hours:	2 lecture hours and 2 hours of practice per week
Credits:	8
Assessment:	60% Continuous assessment 40% Examination. (1 X 3 hours written paper)
Pre-requisite:	None

Module Description

SYSTEMIC IMAGING This is an applied system-based module on the use of different modalities of imaging to diagnose and manage common disease affecting different systems of the body. The gains experience and proficiency in cost-effective use of medical imaging, the use of plain films as a imaging primary technique for the general physician, actual working with the ultrasound in bedside care of patients, the benefits of tomography, angiography and radio-magnetic resonance. Topics in neuroscience include MRI, CT and plain films: hemorrhage, subarachnoid and subdural haemorrhage, infarct, oedema, mass and hydrocephaly; in the spine: metastatic mass, disc disease, compression; abdomen: bowel obstruction, aortic aneurysm, renal mass pancreatic mass, hepatic mass, abdominal mass; Chest: pneumonia, effusion, atelectasis, nodule, congestive heart failure, pulmonary oedema, pneumothorax; pelvis: prostate nodule, testicular mass; neck: thyroid nodule; indications of ECHO cardiograph, Doppler; bile duct ultra sound; use of ultra sound and radioisotopes in treatment.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Interpret basic radiological studies in chest radiographs abdominal radiographs, skeletal radiographs (and relate the latter to mechanism of injury);
- Demonstrate systematic approach to comprehensive interpretation of radiographs;
- Detect value of different projections in radiography;
- Demonstrate understanding of the value of different imaging techniques in the management of patients, their strengths and weaknesses;
- Demonstrate knowledge of risks in children and during pregnancy;
- Evaluate the need for requesting investigations and the interrelationships of various imaging techniques;
- Identify the use of radioisotopes in oncological and marrow disease;
- Identify potential complications in the use of radioisotopes;
- Demonstrate understanding of the hazards of cumulative radiation;
- Use ultrasound as a tool for bedside imaging and diagnosis.

MEDICAL MICROBIOLOGY

The Microbiology course is given in three consecutive modules of (i) Bacteriology, virology and Immunology, (b) Parasitology, Mycology and Entomology (c) Systemic Microbiology. The course discusses the nature, metabolism, nutrition, growth, pathogenicity, and prevention of microorganisms and their interactions with the human host, to review bacteria, fungi, viruses and parasites of medical importance and highlight the mechanisms of action of major classes of anti-microbial agents and the drug resistance that develop in the process, and the physical and chemical methods thereof in preventing infectious microorganisms. The modules also focus on reviewing the basic characteristics and functions of the immune system and its responses to intrusion of pathogens and foreign bodies into the body and discusses the nature, metabolism, nutrition, life-cycles, and pathogenicity of parasites of medical importance, their interactions with hosts, their vectors, their diagnoses, prevention, and treatments, particularly those of the protozoa, helminth, cestode, trematode, and nematode classes, which are quite prevalent in the tropics.

NQF:	6
Contact Hours	3 lecture hours + 2 hours of laboratory practical per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite:	MBSB1533

Module Description

BACTERIOLOGY, VIROLOGY AND IMMUNOLOGY: This course examines the nature, metabolism, nutrition, growth, pathogenicity, and prevention of microorganisms and their interactions with the human host. Students will grasp the structure, metabolism, pathogenicity and pathophysiological changes resulting from bacterial infections as well as the immunological response to infection. The course emphasizes on bacteria and viruses of medical importance and highlights the mechanisms of action of major classes of anti-microbial agents and the drug resistance that develop in the process, and the physical and chemical methods thereof in preventing infectious microorganisms. The course also focuses on understanding the basic characteristics and functions of the immune system and its responses to intrusion of pathogens and foreign bodies into the body, normal and abnormal immune response and the application of immune factors in the prevention and treatment of disease. Topics covered include: dynamics of the immune response, immunity, immune tolerance, allergy and hypersensitivity, autoimmunity, immunodeficiency, immunosuppression, tissue transplant, immune-surveillance, tumor immunity, principles of blood transfusion, immunotherapy and immunization.

Learning Outcomes:

At the end of the modules, a student is expected to be able to:

- Identify and classify bacteria, and viruses of clinical importance
- Describe life cycles, modes of transmission and epidemiology of microorganisms, and the pathologies associated with their residence in the human host
- Implement control and preventive measures against microorganisms commonly encountered in Namibia
- Characterize the different types of bacteria and viruses of medical importance in the tropics in general
- Discuss the distinctive signs and symptoms of patients with bacterial or viral infection
- Describe the laboratory tests used in the diagnosis of bacterial /viral infections;
- Perform simple laboratory tests on samples with bacteria /virus;
- Interpret findings from laboratory tests on samples with bacteria / virus;
- Describe measures used in the clinical control, prevention and treatment of bacterial /viral infections;
- Differentiate innate from adaptive immunity,
- Explain the mechanisms at play in triggering immune responses or disorders by emphasizing their relationship to normal immune responses,
- Apply knowledge on immune-responses and immune-factors in the prevention and treatment of diseases.

NQF:	6
Contact Hours	3 lecture hours + 2 hours of laboratory practical per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite:	MBSB1533

Module Description

PARASITOLOGY, MYCOLOGY AND ENTOMOLOGY: This course examines the nature, metabolism, nutrition, growth, reproduction and pathogenicity of parasites and fungi, and the human host response. Students will grasp the structure, metabolism, pathogenicity and pathophysiological changes resulting from parasitic and fungal infection. The course emphasizes on the mechanisms of action of major classes of drugs used to treat parasitic and fungal infections. Topics: nature, metabolism, and nutrition of parasites and fungi; life-cycles, and pathogenicity of parasites of medical importance, immune response to parasitic invasion, escape mechanism;

diagnosis, prevention, control and treatment, particularly those of the protozoa, helminthic, cestode, trematode, and nematode classes; arthropod-borne infections due to protozoa (malaria, African trypanosomiasis, South American trypanosomiasis, leishmaniasis), and helminthes (filariases, loiasis, onchocerciasis); external, deep and visceral mycoses.

Learning Outcomes:

At the end of the modules, a student is expected to be able to:

- Identify and classify fungi, parasites and parasites of clinical importance;
- Describe life cycles, modes of transmission and epidemiology of microorganisms (fungi, parasites and parasites), and the pathologies associated with their residence in the human host;
- Implement control and preventive measures against fungi and parasites commonly encountered in Namibia;
- Characterize the different types of fungi, parasites and parasites of medical importance in the tropics in general;
- Discuss the distinctive signs and symptoms of patients with fungi, parasites and parasites infection or infestation;
- Perform simple laboratory tests on samples with fungi or parasite (culture, microscopy, serological or tissue preparation);
- Interpret findings from laboratory tests on samples with fungi or parasite;
- Describe measures used in the clinical control, prevention and treatment of fungal infection parasitic infestation;
- Describe morphology and life cycles of common vectors of bacteria, viruses and parasites and the mode of infection (infestation) transmission;
- Implement vector control and preventive measures;
- Demonstrate clinical skills essential for physical examination and analysis of results from laboratory tests of fungi, parasites and parasites infections or infestations;

MEDICAL MICROBIOLOGY III

MPCM3651

NQF:	6
Contact Hours	3 lecture hours + 2 hours of laboratory practical per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite:	MBSB1533

Module Description

SYSTEMIC MICROBIOLOGY: The course discusses pathogenicity, pathogenesis and pathophysiology of frequently encountered bacterial, viral, fungal and parasitic infections using an organ-system approach. The epidemiology, transmission, natural history of the common infections; clinical manifestations and their scientific mechanism; diagnosis and treatment of the common bacterial, viral, and fungal infections; laboratory diagnosis and treatment of common parasitic infections. Students will be able to elicit history, symptoms and clinical signs of infections in various organ-systems, perform laboratory tests and grasp the principles of their treatment. Topics: infectious disease; skin infections; infections of the chest, respiratory and cardiovascular systems; infections of the biliary, and gastrointestinal system, infections of the urogenital system, infections of the locomotor system, the nervous system and meninges. Use of imaging and immunological techniques in the diagnosis of common infections will be used during this course.

Learning Outcomes:

At the end of the module the student is expected to be able to

:

- Discuss the distinctive signs and symptoms of patients with bacterial, viral, fungal infection or parasitic infestation;
- Analyze the clinical manifestations in the history and physical examination that point to infection
- Describe pathogenesis of the clinical skills signs resulting from bacterial, viral, fungal infection or parasitic infestation;
- Differentiate among laboratory testing methods used to diagnose infections, including appropriate specimen collection;
- Request for laboratory tests, collect and transport specimens;
- Perform simple laboratory tests and microscopic examination;
- Identify the different types of bacteria, viruses and parasites of medical importance in the tropics in general
- Interpret findings from microbiological laboratory tests;
- Correlate microbial infection with radiologic imaging findings

- Propose a differential diagnosis for infectious diseases common to each organ system;
- Implement measures used in the clinical control, prevention and treatment of bacterial /viral infections;
- Explain mechanism of disease causation in states of immunodeficiency;
- Explain mechanism of allergy and autoimmune disease;
- Apply knowledge on immune-responses and immune-factors in the prevention and treatment of diseases
- Demonstrate clinical skills essential for physical examination and analysis of results from laboratory tests of parasite infestations;
- Identify the effect of age on the types of infections seen in the life-cycle, including those seen in perinatal, pediatric, and geriatric patients
- Implement simple measures for prevention, control and treatment of bacterial and viral infections, and parasite infestation;
- Practice simple case management of diseases bacteria and viruses, and parasite infestation
- Differentiate the general categories of therapeutic modalities available to treat infections.

OBSTETRICS AND GYNAECOLOGY

This course introduces students to the diagnoses and treatments of abnormalities and diseases of the female reproductive system and the normal processes of pregnancy and puerperium and the management of common obstetrical and gynecological conditions and their complications (including the management of fertility and infertility). The course is offered in three consecutive modules during the third, fourth and final year of study.

OBSTETRICS AND GYNAECOLOGY I

MCMO3852

NQF:	8
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

PREGNANCY AND LABOUR: This course is designed to introduce students to the management of common obstetrical conditions and their complications. Students will be able to evaluate normal and suspected high risk or abnormal pregnancy, carryout selected diagnostic investigations, develop an intervention plan, perform practical and surgical interventions independently or as an assistant to clinical faculty member, prepare patient record, present findings to clinical faculty members, and make proper referrals of patients. Topics covered include : Anatomy and physiology of the female reproductive system; conception, pregnancy, the management of normal pregnancy; high-risk pregnancy; abnormal pregnancy; medical conditions and HIV in pregnancy; abnormal stages of labor; ectopic pregnancy; patho-physiology of high risk and abnormal pregnancy; obstetric operations, e.g. caesarean section and curettage; supervision of other caregivers within a health facility or home visits; ethical issues in Obstetrics- all with specific reference to practicing in Namibia; Miscellaneous medical disorders. Haematological problems in pregnancy: Renal disease, Diabetes and endocrine disease, Heart disease, hypertensive disorders; malpresentation; malposition; cephalopelvic disproportion and obstetric procedures; induction and augmentation of labour; prolonged pregnancy; preterm labour; multiple pregnancy; disorders of fetal growth and assessment of fetal well-being; obstetric emergencies; Trophoblast disease; ectopic pregnancy; recurrent miscarriage; spontaneous miscarriage; neonatal care for obstetricians; puerperium and lactation; analgesia and anaesthesia; fetal monitoring during labour; antenatal care; pre-conception counseling; Normal fetal growth; the placenta and fetal membranes; prenatal diagnosis and genetics.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Carry out a medical interview of a woman who is pregnant or suspects to be pregnant, or is in labour;
- Develop professional skills and experience in conducting a medical interview,

- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy,
- Accurately record and present to clinical faculty.
- Analyze and generate the differential diagnosis of the condition;
- Evaluate the results and develop treatment plan for the individual patient, spouse and their families within a health facility or community setting.
- Explain the underlying mechanism(s), in normal pregnancy or abnormal pregnancy;
- Develop and implement treatment plan or referral of a pregnant woman (or suspected pregnancy);
- Explain the pharmacology of frequently used drugs used during pregnancy and labour including anti-retroviral drugs, pain management, and anaesthetics; their side effects and counter measures; contraindications of drugs and medicines during pregnancy;
- Develop professional and clinical reasoning skills;
- Shadow a midwife or obstetrician in the monitoring of pregnancy, management of normal labour, including the resuscitation of the new born child;
- Use laboratory and other diagnostic tools, and interpret results with respect to pregnancy evaluation or complications of labour;
- Identify the indications and contra-indications of requesting for X-ray and other specialized imaging diagnostic procedures during pregnancy;
- Initiate and prepare patients for the procedure diagnostic procedures;
- Examine X-rays, radiographs, or dynamic images for a pregnant patient in his/her care;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures during pregnancy;
- Interpret laboratory findings and explain patient signs, symptoms, and pregnancy 'labour progression on the basis of laboratory test results and pathophysiology;
- Diagnose normal pregnancy, high risk pregnancy, concomitant medical conditions during pregnancy and grasp the approaches to their management during the periods of pregnancy and labour;
- Monitor labour, identify complications and initiate emergency treatment or consultation;
- Initiate emergency treatment of during pregnancy and labour;
- Attend operation theatre and assist in surgical intervention for pregnant women including Caesarean section;
- Make a medical consultation and referral;
- Make clinical follow-up of patients,
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine

OBSTETRICS AND GYNAECOLOGY II
MCMO3871

NQF:	8
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

GYNAECOLOGY: Students will be able to use their professional skills to identify diseases affecting the reproductive system, conduct appropriate investigations, interpret results, explain the underlying patho-physiological processes, and develop a management plan. The course will be semi-integrated with Community Medicine and Primary Health Care. Topics covered include anatomy and physiology of the female reproductive system; The menstrual cycle; Normal and abnormal development of the genital tract; gynaecologic exploration; major gynaecologic syndromes: leucorrhoea, pelvic pain and menstrual abnormalities; affections of vulva and vagina; benign and malignant affections of uterus; ovarian tumors; pelvic inflammatory disease; affections of breasts; uterine prolapse; climacterium and menopause; contraception and infertility; sexual education and family planning; female genital mutilation; further complications; Hysteroscopy and laparoscopy; Urinary incontinence; Pelvic floor dysfunction; uterovaginal prolapsed; menopause and the postmenopausal woman.; assisted reproduction; infertility; endometriosis; chronic pelvic pain; menstrual

problems: menorrhagia and primary dysmenorrhagia; polycystic ovary syndrome and secondary amenorrhoea; primary amenorrhoea; Gynaecological disorders of childhood and adolescence; the role of ultrasound in gynaecology; termination of pregnancy.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Carry out a gynaecological interview;
- Develop professional skills and experience in conducting gynaecological interview
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy;
- Accurately record and present to clinical faculty.
- Analyze and generate the differential diagnosis of a gynaecological problem;
- Evaluate the results and develop treatment plan for the individual patient, spouse and their families within a health facility or community setting;
- Explain the underlying mechanism(s), of a gynaecological problem using knowledge of embryology, development, physiology, anatomy and pathogenesis;
- Develop and implement treatment plan or referral of a patient presenting a gynaecological problem
- Explain the pharmacology of frequently used drugs used for non-pregnant woman and their side effects, counter measures and contraindications of drugs and medicines for women;
- Develop professional and clinical reasoning skills;
- Shadow a physician in the care of non-pregnant woman, spouse and family within health facility, or community setting;
- Use laboratory and other diagnostic tools, and interpret results with respect to gynaecological problem;
- Identify the indications and contra-indications of requesting for X-ray and other specialized imaging diagnostic procedures for women;
- Initiate and prepare patients for the diagnostic procedure,;
- Examine X-rays, radiographs, or dynamic images for a non-pregnant woman in his/her care,;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures;
- Interpret laboratory findings and explain patient signs, symptoms, on the basis of laboratory test results and pathophysiology;
- Diagnose the common disease of the female reproductive system /organs (and relevant in male), gynaecological problems and reproductive health problems of adolescent and their management;
- Initiate emergency treatment;
- Attend operation theatre and assist in gynaecological surgical operations;
- Make a medical consultation and referral;
- Make clinical follow-up of patients,
- Advise individual, couple, family or community group on fertility, contraception, promotion of reproductive health rights and prevention reproductive health disease;
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine

OBSTETRICS AND GYNAECOLOGY III

MCMO3870

NQF:	8
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	32
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

SENIOR CLERKSHIP: This course enables students to practice gynaecological and obstetrical care of patients and, under the supervision of a Gynaecologist-Obstetrician, gain practical hands-on-experience in the care of individual patients with conditions

affecting the reproductive organ-systems and their functions in women during the entire reproductive cycle as well as during states of pregnancy and lactation and deliver reproductive health care in a health facility, household, or community. At the end of the course, a student will be able to independently conduct professional interview and physical examination of a patient, suspect the presence of health risk or medical condition(s) affecting sexuality and reproduction, institute emergency care and propose a cost-effective investigative plan to confirm a diagnosis, safe and effective treatment, including reproductive care for adolescents, a pregnant mother and her family, as well as other therapeutic procedures, and after-care management and rehabilitation of a patient. Perform the listed obstetrical procedures and assist in frequently performed surgical operations. Students acquire practical skills in the assessment of sexuality, hereditary conditions, normal pregnancy and high risk pregnancy, home delivery and institutional management of labour; complications during labour, caesarean section and assisted delivery, indications and contra-indications of frequently used procedures and interventions, puerperium, contraception, infertility, the epidemiology, pathogenesis, preclinical and clinical manifestations of communicable and non-communicable diseases that affect the reproductive system and functions including sexually transmitted diseases, and that are prevalent in Namibia and neighbouring countries, emergencies affecting pregnancy and the reproductive systems, evidence-based care for women and adolescents, invasive and non-invasive diagnostic and therapeutic procedures, cost-effective and rational use of drugs, surgical interventions and laboratory investigations, screening for disease markers, disease prevention and rehabilitation, health care for populations and health groups, ethical issues and the gate-keeping role of physicians, health resource allocation and management, and health systems research in gynaecological-obstetrical care.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Carry out a professional interview of a patient and suspect underlying problem;;
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy,
- Develop professional skills and experience in conducting a medical interview,
- Accurately record and present to clinical faculty.
- Analyze and generate the differential diagnosis of the condition;;
- Evaluate the results and develop treatment plan for the individual patient, spouse and their families within a health facility or community setting.
- Explain the underlying mechanism(s), of presenting complaints and /or health problem;
- Develop and implement treatment plan or referral;
- Explain the pharmacology of frequently used drugs used during gynaecology, pregnancy and labour including anti-retroviral drugs, pain management, and anaesthetics; their side effects and counter measures; contraindications of drugs and medicines for women and during pregnancy;
- Develop professional and clinical reasoning skills;
- Shadow a midwife or obstetrician in the treating a patient with gynaecological problem, monitoring of pregnancy, management of normal labour, including the resuscitation of the new born child;
- Use laboratory and other diagnostic tools, and interpret results with respect to the treatment of women in states of pregnancy or no pregnancy, and in the evaluation of labour;
- Identify the indications and contra-indications of requesting for X-ray and other specialized imaging diagnostic procedures for women;
- Initiate and prepare patients for the procedure diagnostic procedures;;
- Examine X-rays, radiographs, or dynamic images;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures;
- Interpret laboratory findings and explain patient signs, symptoms, pregnancy and labour progression on the basis of laboratory test results and pathophysiology;
- Diagnose normal pregnancy, high risk pregnancy, concomitant medical conditions during pregnancy and grasp the approaches to their management during the periods of pregnancy and labour;
- Monitor labour, identify complications and initiate emergency treatment or consultation;
- Initiate emergency treatment of during pregnancy and labour;
- Attend operation theatre and assist in surgical intervention for women including Caesarean section;
- Advise individual, couple, family or community group on fertility, contraception, promotion of reproductive health rights and prevention reproductive health disease;

- Identify domestic violence and initiate measures to prevent and protect individuals or families;
- Make a medical consultation and referral;
- Make clinical follow-up of patients,
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine;
- Select obstetrics and gynaecology as a field for future specialization

PAEDIATRICS

This course introduces students to the evaluation and management of the newborn, identification and management of diseases of infancy and childhood, and management of paediatric emergencies, evaluation and management of common paediatric conditions and emergencies. It prepares students in developing clinical reasoning in paediatrics, making laboratory and diagnostic requests, carrying out simple diagnostic procedures and laboratory tests, developing a management plan, advising children, adolescents and parents on a health problem, its prevention, and management in a health facility or community. This course is founded on the individuality and uniqueness of a child and the notion that a *child is not a small adult* and that an *adolescent is a child who thinks that s/he is an adult*.

The course is given in three modules during each of year three, four and the final year.

PAEDIATRICS I

MCM3852

NQF:	8
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

THE NEW BORN, INFANCY AND EARLY CHILDHOOD: This course acquaints students with professional skills for the resuscitation of the new born and child care during infancy and early childhood. Students will be able to recognise and manage diseases of infancy and early childhood, and paediatric emergencies. A student will be expected to be able to professionally interview parents or guardian of the new-born, an infant, or a child, carry out physical examination on patients, select diagnostic tests, and evaluate results before proposing an intervention plan. The student will present the patient to clinical supervisor for review and discussion of the differential diagnosis, treatment plan, the description of the pathogenesis, important concepts and prognosis. The clinical supervisor will then assign specific treatment actions for the student to perform with respect of each individual patient. The course will be partially integrated with Community Medicine and Primary Health Care. Topics covered include: Congenital malformation; neonatology, growth and development; nutrition; infectious diseases; HIV/AIDS; diseases of the upper respiratory tract; diseases of the lower respiratory tract; disorders of the immune system; acute and chronic digestive system disorders; disturbances of acid-base balance; cardiovascular diseases; renal diseases; nervous system diseases; hemolymphopoietic and endocrine diseases; integrated management of childhood illnesses (IMCI);. Emphasis will be on priority diseases in Namibia.

Learning Outcomes:

At the end of the module a student is expected to be able to:

- Professionally interview parents or guardian of the new-born, an infant, or a child,
- Carry out physical examination on patients, select diagnostic tests
- Evaluate results before proposing an intervention plan.
- Write patient record and present the case to clinical faculty member(s).
- Identify the presence of a health problem or acute emergency in a child through interview or by carrying out medical examination.
- Initiate life-saving interventions in emergency situations,

- Stabilize the clinical state of a patient, refer as necessary,
- Request for appropriate laboratory investigations,
- Develop professional skills and experience in conducting a medical interview,
- Make clinical follow-up of patients during surgical procedure, post-operatively and after discharge;
- Use laboratory and diagnostic tools, and interpret results;
- Identify the indications for requesting for X-ray and other specialized imaging diagnostic procedures, initiate and prepare patients for the procedure,
- Examine X-rays, radiographs, or dynamic images for a patient in his/her care,;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Interpret findings, explain the patho-physiology of an illness, and manage a patient while under supervision.
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical care of a patient to obtain for the patient the benefits of the most current scientific advances in medicine.

PAEDIATRICS II
MCMP3871

NQF:	8
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

CHILD HEALTH AND PAEDIATRICS: This course discusses the evaluation and management of common paediatric conditions and emergencies. It prepares students in developing clinical reasoning in paediatrics, making laboratory and diagnostic requests, carrying out simple diagnostic procedures and laboratory tests, developing a management plan, advising children, adolescents and parents on a health problem, its prevention, and management in a health facility or community. At the end of the course, students will be able to recognize the presence of a health problem or acute emergency in a child through interview or by carrying out medical examination. They will be able to initiate life-saving interventions in emergency situations, stabilize the clinical state of a patient, refer as necessary, request for appropriate laboratory investigations, interpret findings, explain the patho-physiology of an illness, and manage a patient independently while under supervision. Topics covered include differential diagnosis, management and prevention of emergency, acute or chronic illness in childhood and adolescence, medical documentation, management of terminally ill and bereavement, psycho-social aspects of diseases in children, resuscitation of new-born, counseling, HIV/AIDS, paediatric drug dosages and their side effects, rehabilitation, ethical and medico-legal issues in paediatrics.

Learning Outcomes:

At the end of the module a student is expected to be able to:

- Professionally interview a child (or parent or guardian)
- Carry out physical examination on patients, select diagnostic tests
- Evaluate results before proposing an intervention plan.
- Write patient record and present the case to clinical faculty member(s).
- Identify the presence of a health problem or acute emergency in a child through interview or by carrying out medical examination.
- Identify developmental deficit in a child and make a consultation or referral;
- Initiate life-saving interventions in emergency situations,
- Stabilize the clinical state of a patient, refer as necessary,
- Request for appropriate laboratory investigations,
- Develop professional skills and experience in conducting a medical interview,
- Use laboratory and diagnostic tools, and interpret results;
- Identify the indications for requesting for X-ray and other specialized imaging diagnostic procedures, initiate and prepare patients for the procedure,

- Examine X-rays, radiographs, or dynamic images for a patient in his/her care;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation based on the findings.
- Interpret findings, explain the patho-physiology of an illness, and manage a patient independently while under supervision;
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical care of a patient to obtain for the patient the benefits of the most current scientific advances in medicine;
- Provide treatment and care to a child and family under supervision.

PAEDIATRICS III
MCMP3870

NQF:	8
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	32
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

SENIOR CLERKSHIP: This course enables students to practice medical and health care of neonates, children and young adolescents and, under the supervision of a paediatrician, gain hands-on-experience in treating children from the time of conception to early adolescence and provide professional care to individual patients, their families, and population groups within the setting of a hospital, a household, or community. At the end of the course, a student will be able to independently obtain clinical history from a child, parents, or guardian, and perform physical examination on the newborn or child, confirm normal growth and development of a child or suspect the presence of a medical condition(s), institute cost-effective investigative plan to confirm the diagnosis, administer safe and effective emergency treatment; develop a comprehensive treatment plan including therapeutic procedures, counselling, after-care management, and assessment of the quality of care. The student will perform satisfactorily all the listed clinical procedures in the paediatric log for undergraduates. The student acquires practical skills in the assessment of pre-gestational states and conditions that affect normal growth and development of the unborn, the neonate, and during the childhood periods, resuscitation of the newborn, growth monitoring of a child, emergency paediatric care, epidemiology, pathogenesis, preclinical and clinical manifestations of communicable, non-communicable, and tropical diseases of children prevalent in Namibia and neighbouring countries, integrated management of childhood diseases, evidence-based practice in child and adolescent health care, simple invasive and non-invasive diagnostic and therapeutic procedures, cost-effective and rational use of drugs and laboratory investigations, disease prevention and rehabilitation, population and group health, medical ethics and gate-keeping role of a physician, health resource allocation and management, and health systems research.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Professionally interview a child, or parent or guardian;
- Carry out physical examination on patients, select diagnostic tests
- Evaluate results before proposing an intervention plan.
- Write patient record and present the case to clinical faculty member(s).
- Identify the presence of a health problem or acute emergency in a child through interview or by carrying out medical examination.
- Initiate life-saving interventions in emergency situations,
- Stabilize the clinical state of a patient, refer as necessary,
- Request for appropriate laboratory investigations,
- Interpret findings, explain the patho-physiology of an illness;
- Use laboratory and diagnostic tools, and interpret results;
- Identify the indications for requesting for X-ray and other specialized imaging diagnostic procedures, initiate and prepare patients for the procedure,
- Examine X-rays, radiographs, or dynamic images for a patient in his/her care;,
- Differentiate normal and abnormal X-ray and laboratory findings,

- Interpret patient clinical presentation based on the findings.
- Perform simple invasive diagnostic or treatment procedures on children;
- Manage a patient independently while under supervision.
- Monitor the normal growth and development of a child;
- Identify developmental problems in a child and in collaboration with clinical psychologist or other specialist manage the condition;
- Prepare a patient discharge and follow-up plan;
- Request for postmortem examination, participate the examination as necessary and explain the findings and introspect of the clinical presentation and treatment;
- Evaluate clinical care outcomes of individual patient, the clinical unit or health facility;
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine;
- Counsel and prepare a child for entry into adolescence and puberty;
- Select Child Health and paediatrics as a field for future specialization.

PATHOLOGY

The focus of these two modules is on 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.

PATHOLOGY I

MPCP3732

NQF:	7
Contact Hours:	3 lecture hours + 2 hours of practice
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite:	None

Module Description:

GENERAL PATHOLOGY: This course introduces structural changes affecting tissues, organs and systems of the human body which result from injury from biological, physical or chemical substances and the pathological changes thereof. The course also discusses cellular, molecular and organ-system changes as a result of excessive adaptations and accumulation. Students will identify and explain the related clinical manifestation of pathologies on the basis of the underlying pathological changes and pathogenesis. Topics: cell injury and death, inflammation, circulatory disorders, neoplasia, accumulations and pigmentation. Students identify pathological changes at the macro, tissue, organ and system as well as at the microscopic and molecular level.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Identify the fundamental morphological changes in cellular and sub-cellular structures
- Explain the mechanisms of pathological processes with cells
- Relate the morphological alterations with functional disorders
- Discuss features of hematological disorders;
- Explain and relate pathologies to their clinical manifestations
- Apply pathology as investigative tool in forensics

PATHOLOGY II

MPCP3751

NQF:	7
Contact Hours:	3 lecture hours + 2 hours of practice

Credits: 16
Assessment: 60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite: None

Module Description:

PATHOPHYSIOLOGY: This course focuses on systemic discussions of the various pathological lesions resulting from cell injury, acute and chronic inflammation, metabolic disorders, neoplasia and accumulation; non-infective disorders with emphasis on myocardial infarction, atheroma and autoimmune disease. Topics: cancer and other disorders of metabolism, circulatory system, chest and respiratory systems; haematological disorders; endocrine and neurological disorders, skin and integuments, locomotor and gastrointestinal system disorders; pancreatic and biliary tract disorders; urinary and other soft tissue disorders; forensic pathology; cytology and tumor markers and their use in diagnosis and disease prevention. Students will grasp the principles of serological studies, hormone assays, viral studies ELISA, Western Blot, organ specific function tests, liver function tests, thyroid function and their application in medicine.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Identify the fundamental morphological changes at the level of tissues and organs systems
- Explain the mechanisms of pathological processes at the organ level
- Relate the morphological alterations with functional disorders and sequel
- Compare and contrast different types of cancers, their epidemiology, routes of metastasis and sequel
- Interpret results of serological studies, hormone assays, viral studies, organ specific function tests, and explain their application in medicine.
- Apply pathology as investigative tool in forensics

PHARMACOLOGY

This course introduces the student to the scope and content of pharmacology: the knowledge of history, sources, physical and chemical properties; compounding, biochemical and physiological effects, mechanisms of action, absorption, distribution, metabolism and excretion. Students gain experience and skills in effective and safe use of drugs in the diagnosis, prevention, or treatment of disease, and rational use of drugs taking into account frequent inventions and new drugs or modifications thereof. Students are able to give concise elaboration on the standard / current treatment regimens in use (local and international), describe the progress in drug therapy, research, and clinical trials and investigations techniques with the help of other basic and clinical specialties such as molecular biology. Finally, a student is able to recognize reliable sources of drug information.

PHARMACOLOGY I

MCMP3732

NQF 7
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: MBSP3631 and MBSB3531
Co-requisite: MPCP3732, MPCM3631, MCMM3732

Module Description

INTRODUCTION TO PHARMACOLOGY: 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. 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 drug's mode of action as well as side effects and the mechanisms by which 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;

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Classify medicinal drugs;
- Explain the mode of action, excretion of different medicinal drugs;
- Explain the mechanisms of action, and excretion at molecular and biochemical level;
- Differentiate the choice and routes of drug administration including dynamics of absorption and bio-availability;
- Recognize the side effects of drugs;
- Explain the mechanisms of toxicity and therapeutic reversal of toxic effects;
- Develop and initiate emergency remedial measures;
- Explain resistance to medicinal drugs;
- Discuss medicinal and non-medicinal drugs abuse and doping in athletes
- Discuss the process of drug development (product research, scientific testing and inclusion in national formulary);
- Discuss the logistics management of pharmaceuticals (the drug supply chain)

PHARMACOLOGY II

MCMP3751

NQF	7
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:	MBSB3631 and MBSB3531
Co-requisite:	MPCP3732, MPCM3631, MCMM3732

Module Description

SYSTEMIC PHARMACOLOGY AND THERAPEUTICS: A continuation of Pharmacology I, this module looks at that pharmacology of drugs used in the treatment of the central nervous system (CNS), immunotherapy and the regulation of inflammation and autoimmunity and in the chemotherapy of infections and cancers. Upon completing this course students will understand the etiology of CNS diseases, commonly prescribed drugs, and the mechanisms by which these drugs modify this physiological system. Drug dependence will also be investigated with students developing an understanding of the mechanisms underlying this phenomenon. Immune dysfunction can have systemic effects. Here students will develop an understanding of both the innate and cellular immune systems and how drugs can be used to regulate them individually or in a coordinated fashion. This course introduces the pharmacology of drugs used in the treatment of systemic diseases of the cardiovascular, urinary, digestive and peripheral nervous systems. Finally, students will look at the agents of chemotherapy used in ameliorating infections and cancers.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Differentiate the choice of drugs in relation to body system infectious diseases, cardiovascular disorders, respiratory disorders, gastrointestinal, hepatic and biliary disorders, renal, urinary tract and prosthetic disorders, endocrine and metabolic disorders, blood disorders, disorders of bones and joints, neurological disorders, psychiatric disorders and pain management;
- Explain the mechanism of action and choice of drugs for local, regional and General Anaesthesia;
- Describe the principles of cancer chemotherapy;
- Describe clinical management of poisoning;
- Explain the factors and mechanisms of drug dependence and abuse;
- Explain the mechanisms of immune-suppression and drug therapy for allergies, connective tissue disorders and primary immune-deficiency;

- Discuss the process of drug discovery and development,
- Discuss the ethical considerations in relation to drug use for different age groups and population groups including minors and patients with psychiatric disorder;
- Evaluate the logistics management system for of pharmaceuticals (the drug supply chain)

PHYSIOLOGY

Three modules focus on the basic principles of Physiology and discuss in detail the development and normal functions of the ten physiological systems within the body. The courses undertaken over the first three semesters are designed to lay a solid foundation and review in detail concepts in Physiology essential in understanding the patho-physiology of diseases.

PHYSIOLOGY I

MBSP3511

NQF:	5
Contact Hours:	3 lecture hours + 2hours of tutorial (or 3 hours of practice)
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite:	None

Module Description

EMBRYOLOGY AND DEVELOPMENTAL BIOLOGY: This first 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, fetal 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 played throughout the course to cell-cell communication and the pivotal role signaling plays in development.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Demonstrate understanding of gene transcription and translation and how the regulation of these two processes results in differential gene expression and the differentiation of cell;
- Explain cellular movement, organization and role of cells and tissues;
- Demonstrate understanding of the establishment of the three layer body plan and the role cell-cell signaling plays in the establishment of the body plan and tissues;
- Describe the origins of the 10 organ systems and how signaling between these effects development;
- Relate the role of the environment to development;

PHYSIOLOGY II

MBSP3512

NQF:	5
Contact Hours:	3 lecture hours + 2hours of tutorial (or 3 hours of practice)
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite:	None

Module Description

BASIC CELL PROCESS AND HOMEOSTASIS, AND CONTROL: The study of physiology encompasses a number of fields of study; from molecules to ecosystems. Here we begin 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, signaling and cellular dynamics. Building upon this we will stress the importance of cellular and tissue compartmentation, and how information flows within a cellular and mass context. The integration of these systems and how they may impact homeostasis is also 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. We will look at autonomic and somatic motor control. Finally, we will cover muscles and the integration of all of the aforementioned systems.

Learning Outcomes: At the end of the module, a student is expected to be able to:

- Describe the structure and function of the various aspects of a cell;
- Explain the fundamental mechanisms underlying cell function.
- Explain how homeostasis is established and maintained in the face of disease and infection
- Demonstrate understanding of the structures and functions of the endocrine system and
- Demonstrate understanding of the structure/function relationship inherent in the central and peripheral nervous systems.
- Describe how the organ systems covered interact throughout the body to maintain homeostasis.

PHYSIOLOGY III

MBSP3531

NQF:	5
Contact Hours:	3 lecture hours + 2hours of tutorial (or 3 hours of practice)
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 x 3 hours written paper + 1½ practical examination)
Pre-requisite:	None

Module Description

INTEGRATION OF FUNCTION AND METABOLISM, GROWTH AND AGING: This second 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 also understand fluid and electrolyte balance as well as gas exchange and transport. These processes obviously integrate numerous organ systems. We 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.

Learning Outcomes: At the end of this module, a student is expected to be able to:

- Explain the functional organization of the human body as well as the biophysical base of the all ten organ systems
- Explain the major mechanisms by which hormones bring about the effects on their target tissues
- Discuss the mechanisms of deviation from normal physiological functions and development of diseases
- Discuss control and regulatory mechanisms of body function.

PROFESSIONAL ETHICS

Medical ethics is the cornerstone for the honorable practice of medicine. The philosophy of the School of Medicine is that during the entire MBChB degree program, students are guided and modeled to gain proficiency the tenets of medical practice, conduct on but most importantly on the resolution of moral issues in the holistic care of patients. Thus course on Medical Ethics should be viewed as an invisible strand running through each course of study. Specific units and modules on Medical Ethics build on the University Common Course on Gender, Ethics and HIV. During the course on Sociology of Health and Disease student gain further insight on professional ethics, focusing on doctor/patient relationships as well as principles, of human dignity, equity, social justice and human rights as fundamentals of the healthcare delivery system. In the third year of study, students receive teaching and training on how to make judgment and the decision making process for the health professional. In particular, students examine the four cardinal principles of: respect for **autonomy**, **beneficence**, **non-maleficence** and **justice**. In addition students explore issues on **double**

effect (conflict between autonomy, beneficence, and non- maleficence), **Codes on Medical ethics and Research, end of life decisions**, and **continual learning** as a means to remaining competent in the era of rapidly changing medical practice, genetic engineering and other technologic advances. The course on Medical Ethics is not finite but assists students to develop a personal philosophy for lifelong practice of medicine and ongoing professional growth.

PROFESSIONAL ETHICS I

MCME3642

NQF:	6
Contact Hours:	2 lecture hours
Credits:	8
Assessment:	100% Continuous assessment
Pre-requisite:	None

Module Description

MEDICAL ETHICS AND PHILOSOPHY: This course is designed to describe the basic principles of professional conduct, ethics, and legal practice in health, with particular emphasis on social values, norms, and culture of the Namibian society. A student will be able to professionally engage in his/her medical practice, observe professional conduct with regard to patients, their families, and professional colleagues, evaluate ethical dilemmas and give professional evidence in a court of law. Topics covered include: basic principles of ethics and philosophy in health; social obligations, values, and norms with the emphasis of the Namibian society regarding health; the patient-physician relationship; common ethical dilemmas: fundamental ethical guidelines, conflicts between beneficence and autonomy, patients who lack making-decision capacity, decision about life-sustaining interventions, conflicts of interest; basic principles of medico-legal practice, review of the health related Namibian legislative code; forensic pathology: traumatic injuries in forensic medicine, asphyxia of medico-legal interest, sexual abuse, criminal abortion, individual identification; toxins, poisons, venoms, drug overdose; epidemiology, diagnosis, and general principles of treatment of alcoholism and drug dependency; HIV/AIDS; research and ethics; international codes and declarations; Hippocratic and other oaths in medicine.

Learning Outcomes:

At the end of the module, a student is expected is expected to:

- Professionally carry out a medical interview, examine a patient (all age-groups –entire life cycle including during emotional conditions such as bereavement or assault)
- Maintain confidentiality;
- Work as a member of a team, with equal respect to others regardless of discipline or rank;
- Cope with ambiguity including in matters of faith;
- Advise patients, couples, family members on results from clinical finding or laboratory test;
- Make ethical choices for patients under his/her care;
- Advocate for the health rights of individuals, family or population group /community;
- Maintain professional discipline and conduct;
- Promote the image of the profession in personal life and avoid behavior /practices that might put the profession into disrepute;
- Observe the professional Code of Ethics for Namibia;
- Remain competent in medical practice and area of specialization through continuing medical education and self directed learning;
- Participate in change.

PSYCHIATRY

The focus of these two modules is on Psychiatry as a branch of medicine concerned with the study and application of bio-psycho-social principles to the etiology, assessment, diagnosis, treatment, rehabilitation and prevention of mental, emotional and behavioral disorders alone or as they coexist with other medical disorders across the life span. Students are trained to fulfill the following roles: *Psychiatric Expert/Clinical Decision Maker* able to conceptualize, understand and apply the diagnostic skills to

investigate, elicit, describe and define psychopathological and other clinical findings; apply therapeutic skills to effectively and ethically manage the spectrum of patient care problems diagnosed; apply psychiatric expertise in situations other than in direct patient care; consult effectively; *Communicator* able to establish a therapeutic relationship with patients; elicit and synthesize relevant information from the patient, their care givers and other relevant sources; discuss appropriate information with the patient, their care givers and health professionals that facilitate optimal care. This implies the ability to inform and counsel a patient in a sensitive and respectful manner while fostering understanding the patient's active participation in decisions about their care. *Collaborator* able to effectively consult with other physicians and healthcare professionals; contribute effectively to other interdisciplinary team activities; participate actively in shared decision making with patients and care givers; collaborate effectively with patient and care giving organizations; *Manager* able to allocate limited healthcare resources; manage personal resources; work in a healthcare organization; use information technology to optimize patient care; *Health Advocate* able to identify the determinants of mental disorder as well as the factors that may contribute to positive mental health so as to be able to prevent disorder and promote mental health; identify and address issues and circumstances when advocacy on behalf of patients, professions, or society is necessary; contribute to research and to the development of new knowledge; *Professional* able to deliver the highest quality of professional care; relate to co-workers in a professional manner; practice medicine in an ethically responsible manner that respects medical, legal and professional obligations.

PSYCHIATRY I

MCMH3771

NQF:	7
Contact Hours:	3 lecture hours + 4 hours of practice
Credits:	16
Assessment:	60% Continuous assessment 40% Examination + pass the Psychiatry component of COBES + pass all practical components of the module. 60% Continuous assessment 40% Examination(1 X 3 hours written paper + 30 minutes viva voce examination)
Pre-requisites:	MBSC1533

Module Description:

DIAGNOSTIC PSYCHIATRY: This module is offered in the 2nd semester of the 3rd academic year and focuses on Psychiatric diagnoses of patients with mental/psychiatric disorders, with a strong (but not exclusive) focus on neuropsychiatry, behavioral neurology and psychopharmacology. Students will apply medical and psychopathological knowledge and procedural skills that are used to collect and interpret data, make appropriate clinical decisions and carry out diagnostic procedures using an appropriate combination of biological, psychological and sociological methods, including up-to-date, ethical and cost-effective clinical practice and effective communication with patients, other health care providers and the community. Students will draw on the competencies included in the roles of communicator, collaborator, health advocate, manager, scholar and professional. Topics include neuropsychiatry and behavioral neurology; psychopharmacology, theories of personality and psychopathology; examination of the psychiatric patient; classification of mental/psychiatric disorders; Students are expected to draw on their already acquired knowledge of the clinical manifestations of mental disorders (clinical psychology), jointly with neuropsychiatry and behavioral neurology, internal medicine, general pharmacology, psychopharmacology and gross and functional anatomy of the brain (including neuro-imaging) to make psychiatric diagnoses. At the end of this module students should be able to perform a psychiatric interview, identify clinical signs of mental disorders, make differential diagnoses, interpret results of diagnostic investigation (including neuropsychiatry and behavioral neurology), explain the psycho-pathology, neuropsychiatry and behavioral neurology of psychiatric disorders, and present this to clinical faculty member(s). Students are expected to complete Junior Clerkship jointly with Internal Medicine (where applicable).

Learning outcomes:

At the end of this module students are expected to be able to:

- Conceptualize both mental/psychiatric health and mental/psychiatric disorders using different models such as biological models (including neuropsychiatry, behavioral neurology, neuro-imaging, psychopharmacology), developmental models (developmental psychology and developmental physiology, genetics), psychological models (clinical psychology), behavioral, sociological, and systemic models (sociology of health and disease);
- Explain the factors contributing to predisposition, precipitation and perpetuation of psychiatric disorders as well as protective factors;
- Explain the full range of psychopathology and international diagnostic systems;

- Obtain a comprehensive psychiatric history including information from other sources;
- Perform and document a psychiatric assessment with attention to cultural diversity;
- Carry out and document a mental state examination;
- Assess patients' capacity for decision making;
- Recognize general medical and neurological conditions that are incidental, consequential or contributory to mental/psychiatric disorder and its treatment;
- Interpret results of applicable laboratory findings that are incidental, consequential or contributory to mental/psychiatric disorder and its treatment;
- Consider applicable psychopharmacological treatment options;
- Perform and document a relevant physical examination;
- Understand and interpret the results of the main psychometric assessments and psychological tests relevant to mental/psychiatric disorders;
- Understand and interpret the results of the main neurophysiological and neuroimaging examinations relevant to mental/psychiatric disorders;
- Elicit and recognize signs and symptoms, and apply them to a multi-axial differential diagnosis;
- Identify and appraise the factors affecting the course and prognosis of mental/psychiatric disorders;
- Consider the interaction between the disorder and personal life;
- Determine and apply the necessary range of investigations to complete the diagnostic process;
- Draw up a diagnostic formulation including risk assessment;
- Review and revise a diagnosis over time;
- Present case studies / patient files to clinical faculty member(s).

PSYCHIATRY II
MCMH3772

NQF:	7
Contact Hours:	3 lecture hours + 4 hours of practice
Credits:	16
Assessment:	60% Continuous assessment 40% Examination + pass the Psychiatry component of COBES + pass all practical components of the module. 60% Continuous assessment 40% Examination (1 X 3 hours written paper + 30 minutes viva voce examination)
Pre-requisites:	MBSC1533

Module Description:

INTERVENTION, REHABILITATION AND PREVENTIVE PSYCHIATRY: This module is offered in the 2nd semester of the 4th academic year. It focuses on intervention, rehabilitation and prevention regimes used in psychiatric practice. Students will have mastered principles to a range of psychotherapies (e.g., psychoanalysis and psychoanalytic psychotherapy, behavior therapy, group psychotherapy, combined individual and group psychotherapy, family and couple therapy, cognitive therapy, interpersonal psychotherapy, brief psychotherapy, Eriksonian clinical theory and psychiatric treatment, evaluation of psychotherapy), combined psychotherapy and pharmacotherapy, biological therapies, and principles to electroconvulsive therapy and neurosurgical treatments, with applications to special populations such as Primary Health Care settings; psychiatric emergencies; adult and child in- and outpatient psychiatry; geriatric psychiatry; hospice and palliative care; and community psychiatry (including rural settings). Special topics include: consultation liaison psychiatry, adult ambulatory services, substance abuse and addiction services, prevention and public awareness services; and legal and ethical issues in Psychiatry. At the end of this module students should be able to perform a psychiatric interview, identify clinical signs of mental disorders, make differential diagnoses, interpret results of diagnostic investigation, explain the psycho-pathology of mental disorders, develop a treatment, rehabilitation and/or prevention plan and present this to clinical faculty member(s). Students are expected to complete Senior Clerkship jointly with Internal Medicine (where applicable).

Learning outcomes:

At the end of this module students are expected to be able to:

- Establish, maintain & repair a therapeutic alliance;
- Determine which available biological, psychotherapeutic and social psychiatric interventions are appropriate to patients' treatment expectations and circumstances;
- Draw up, document and implement an integrated and individualized biological, psychotherapeutic and social treatment plan, including risk management in consultation with patient, care givers and allied professionals;
- Use voluntary and involuntary admission and treatment measures appropriately in compliance with legal standards and ethical principles;
- Explain the theories that underpin biological treatments of mental disorders;
- Use safely and effectively biological treatment methods in psychiatry on the basis of values and the best evidence available in consultation with patients where possible;
- Explain the psychological aspects of using biological treatments, such as medicalization, labeling, placebo effects and the meaning that prescribed medication carries for the patient;
- Explain the theories that underpin standard accepted models of individual, group and family psychotherapies available for treatment of mental disorders;
- Practice psychotherapy safely and effectively on the basis of values and the best evidence available;
- Recognize, prevent, and address adverse effects associated with therapeutic interventions;
- Perform and monitor basic medical interventions for the physical health problems encountered in the treatment of mental disorder;
- Optimize concordance with the treatment plan including wherever possible, shared understanding and informed consent from patient or their care giver;
- Review, revise and document changes to a treatment plan over time;
- Systematically evaluate outcomes, know when to terminate a course of treatment and facilitate appropriate follow-up;
- Recognize and manage potential risk to self and others in a clinical encounter;
- Use preventive and rehabilitation methods safely and effectively on the basis of values and the best evidence available;
- Offer consultation and liaison services to medical and non-medical professionals;
- Present case studies / patient files to clinical faculty member(s).

SURGERY

This course begins with is an introduction to the basic principles of surgery and surgical procedures, both pre-operative and post-operative care, dealing with aseptic techniques, hospital infections, and emergency care and progresses to more advanced modules which review prevention, diagnosis, surgical, and non-surgical management of common conditions affecting bones, connective tissues, and joints, designed to prepare students to manage common surgical conditions and emergencies, including life-saving procedures. This course discusses diseases of the head and neck regions where some of the most common infectious diseases encountered by internists and other primary care physicians are found, structure, function, diseases, and basic remedies of the eye as well as common diseases of the urinary tract, their manifestation, causes, underlying patho-physiological mechanisms and their management. During the course students will be required to participate in the management of patients with surgical problems and their complications.

This course is offered in four modules during each of year three, four and the final year of study.

SURGERY I

MCMS3752

NQF:	7
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

GENERAL SURGERY: This is an introductory course to the basic principles of surgery and surgical procedures, both pre-operative and post-operative care, dealing with aseptic techniques, hospital infections, and anesthesia. This course is designed to prepare students to manage common surgical conditions and emergencies, including life-saving procedures. Students will be able to evaluate patients with surgical conditions, explain underlying patho-physiological changes, and identify indications for surgical interventions and need for changing of management or referral of patients; identify disorders affecting the urological system, select diagnostic investigations and interpret results as well as implement the necessary interventions. Topics covered include symptoms and signs urological conditions at different age groups; congenital malformations; internal and external urological malformations; urinary tract infections; nephrolithiasis; low urinary tract obstruction; lumbo-abdominal tumors; genital tumors; voiding dysfunction, incontinence, impotence and male infertility. Students should be able to identify indications for intervention and prepare patients for emergency surgery, manage surgical complications, death and bereavement. This course is organized as a clerkship, practical surgical management of simple procedures, assisting in surgical operations, and case presentation in clinico-pathological conferences. Topics covered include: At the end of the course a student will be able to diagnose and manage surgical emergencies under stringent surgical conditions. Students will be able to suspect surgical condition by carrying out an interview and physical examination, appropriately select laboratory investigations, interpret results of laboratory tests, explain underlying conditions, initiate preoperative management, carry out simple surgical interventions and assist during surgical operations. Topics covered include principles of surgery; introduction to surgical procedures; anesthesia; emergency surgical conditions of the abdomen, chest and blood vessels; shock, trauma and injury; surgical infection, healing and repair; non-visceral tumors; common diseases of the urinary tract, their manifestation, causes, underlying patho-physiological mechanisms and their management. During the course students will be required to participate in the management of patients with urological problems and their complications. Students will be able to identify the diagnosis and propose the management of frequent surgical conditions, pre- and post- operative care; independent management of minor surgical and live saving procedures, e.g. tracheostomy, thoracocentesis, abdominal puncture; assisting in elective surgery and surgical emergencies.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Carry out a professional interview of a patient and suspect underlying surgical problem including neurosurgical conditions;
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy,
- Accurately record and present to clinical faculty.
- Develop professional and clinical reasoning skills,
- Analyze and carry on differential diagnosis of diseases with surgical causes,
- Evaluate the results and develop treatment plan for individual patients and their families within a health facility or community setting.
- Explain the underlying mechanism(s), of abnormalities /phenomenon
- Develop and initiate treatment plan or referral of patients,
- Explain the pharmacology of frequently used drugs used during anaesthesia, identify side effects and their treatment;
- Explain the interaction between frequently used drugs for medical treatment of patients with drugs used during anaesthesia, adverse interaction and initiate treatment;
- Request for blood grouping, cross matching;
- Identify adverse blood transfusions reactions and initiate their treatment;
- Develop professional skills and experience in conducting a medical interview,
- Make clinical follow-up of patients during surgical procedure, post-operatively and after discharge;
- Use laboratory and diagnostic tools, and interpret results;
- Identify the indications for requesting for X-ray and other specialized imaging diagnostic procedures, initiate and prepare patients for the procedure,
- Examine X-rays, radiographs, or dynamic images for a patient in his/her care,;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures,
- Interpret laboratory findings and explain patient signs, symptoms, and disease progression on the basis of laboratory test results and pathophysiology;

- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine;
- Carry out simple surgical interventions under supervision;

SURGERY II
MCMS3771

NQF:	7
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

ORTHOPAEDICS AND TRAUMATOLOGY: This course reviews prevention, diagnosis, surgical, and non-surgical management of common conditions affecting bones, connective tissues, and joints. Students should be able to assess orthopaedic health conditions through medical interviews and clinical examination of a patient, select and request for appropriate diagnostic investigation, interpret findings, explain the underlying pathology, and outline a management plan of the case. Topics covered include clinical approach to articular and musculoskeletal disorders; interview and physical examination of patients; radiographic anatomy; diagnosis, treatment, rehabilitation, and prevention of traumatic and non-traumatic musculoskeletal disorders; underlying patho-physiological mechanisms; multiple injury and response to trauma; complications of traumatic lesions; external and internal immobilization methods; foreign body; snake and insect bites.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Carry out a professional interview of a patient and suspect underlying surgical problem;
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy,
- Assess orthopaedic health conditions through medical interviews and clinical examination of a patient,
- Assess injuries for individual patients or groups of patients through medical interviews and clinical examination of a patient,
- Accurately record and present to clinical faculty.
- Develop professional and clinical reasoning skills,
- Analyze and carry on differential diagnosis of diseases with surgical causes,
- Evaluate the results and develop treatment plan for individual patients and their families within a health facility or community setting.
- Explain the underlying mechanism(s), of abnormalities /phenomenon
- Develop and initiate treatment plan or referral of patients,
- Explain the pharmacology of frequently used drugs used during anaesthesia, identify side effects and their treatment;
- Explain the interaction between frequently used drugs for medical treatment of patients with drugs used during anaesthesia, adverse interaction and initiate treatment;
- Request for blood grouping, cross matching;
- Identify adverse blood transfusions reactions and initiate their treatment;
- Develop professional skills and experience in conducting a medical interview,
- Make clinical follow-up of patients during surgical procedure, post-operatively and after discharge;
- Use laboratory and diagnostic tools, and interpret results;
- Identify the indications for requesting for X-ray and other specialized imaging diagnostic procedures, initiate and prepare patients for the procedure,
- Examine X-rays, radiographs, or dynamic images for a patient in his/her care,;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures,
- Interpret laboratory findings and explain patient signs, symptoms, and disease progression on the basis of laboratory test results and pathophysiology;

- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine;
- Carry out simple surgical interventions under supervision;

SURGERY III
MCMS3772

NQF:	7
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	16
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

OTORHINOLARYNGOLOGY AND ORAL HEALTH: This module is offered in two units:

Otorhinolaryngology and Oral Health - This course discusses diseases of the head and neck regions where some of the most common infectious diseases encountered by internists and other primary care physicians are found. Although these infections are usually mild enough to be treated on an outpatient basis, the student has to recognize the serious complications that may arise from such diseases and therefore identification and treatment of these potentially life-threatening infections of the head and neck are crucial. At the end of the course, students should be able to recognize diseases affecting the head and neck, develop differential diagnoses, select appropriate diagnostic tests, interpret test results, and develop a treatment and disease prevention plan, as well as carryout live-saving and emergency procedures involving ENT conditions under supervision. Topics covered include: congenital ENT conditions, nasal hemorrhagic syndrome (epistaxis), nasal obstructive syndrome (sinusitis, foreign bodies, injury), nasal tumors, infections of the oral cavity and pharynx (adenoiditis, tonsillitis, pharyngitis), airway obstruction syndrome (laryngitis, croup, and epiglottitis), affections of vocal cords, neck tumors, ear and mastoid infections (auricular cellulitis, perichondritis, otitis externa, otitis media, mastoiditis), hypoacusia, vertiginous syndrome, oral pathology and dental health problem, including the diagnosis and their management.

Ophthalmology:- This course discusses the structure, function, diseases, and basic remedies of the eye. Students should be able to examine the eye, carryout tests for visual acuity and color, diagnose diseases of the eye and ocular manifestations of systemic diseases as well as carryout simple treatment procedures under supervision, or follow proper referral procedures. Topics covered include: anatomy and physiology of the eyeball, socket, and visual pathways; signs and symptoms of primary eye diseases; congenital, immunological, inflammatory, and infectious diseases of the eye; eye trauma and foreign bodies; neoplasia; causes, diagnosis, and treatment of progressive loss of vision; causes, diagnosis, and treatment of sudden visual loss; haemorrhages; alterations of the eyeballs position; ocular complications of systemic diseases; exploration of the ophthalmic patients; minor eye surgery; blindness prevention; Tests for visual acuity and colour; imaging for eye investigations.

Learning Outcomes:

At the end of the modules, a student is expected is expected to:

- Carry out a professional interview of a patient and suspect underlying condition affecting the ear, nose, throat, mouth, face or eye;
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy,
- Accurately record and present to clinical faculty.
- Develop professional and clinical reasoning skills,
- Analyze and carry on differential diagnosis of diseases with surgical causes,
- Evaluate the results and develop treatment plan for individual patients and their families within a health facility or community setting.
- Recognize diseases affecting the head, ear, nose throat, mouth and neck,
- Explain the underlying mechanism(s), of abnormalities /phenomenon
- Develop and initiate treatment plan or referral of patients,
- Explain the pharmacology of frequently used drugs used during anaesthesia, identify side effects and their treatment;

- Explain the interaction between frequently used drugs for medical treatment of patients with drugs used during anaesthesia, adverse interaction and initiate treatment;
- Request for blood grouping and cross matching;
- Identify adverse blood transfusions reactions and initiate their treatment;
- Develop professional skills and experience in conducting a medical interview,
- Make clinical follow-up of patients during surgical procedure, post-operatively and after discharge;
- Use laboratory and diagnostic tools, and interpret results;
- Identify the indications for requesting for X-ray and other specialized imaging diagnostic procedures, initiate and prepare patients for the procedure,
- Examine X-rays, radiographs, or dynamic images for a patient in his/her care,;
- Differentiate normal and abnormal X-ray and laboratory findings,
- Interpret patient clinical presentation on the basis of the findings.
- Evaluate the indications for laboratory requests, choice of diagnostic tests, and procedures,
- Interpret laboratory findings and explain patient signs, symptoms, and disease progression on the basis of laboratory test results and pathophysiology;
- Carry out simple surgical interventions under supervision;
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during medical treatment of a patient to obtain for the patient the benefits of the most current scientific advances in medicine;

SURGERY IV
MCMS3870

NQF:	7
Contact Hours:	3 hours of lecture + 8 hours of practice per week
Credits:	32
Assessment:	60% Continuous assessment 40% Examination (1 X 3 hours written paper + 2 hours clinical + 30 minutes viva voce examination)
Pre-requisite:	None

Module Description

SENIOR CLERKSHIP: This course enables students to practice surgical care of patients and, under the supervision of a specialist in surgery, gain hands-on-experience in general surgery, including performing selected operations and rehabilitation of individual patients of all ages, their families, and population groups in a health facility, household, or community. At the end of the course, a student will be able to independently conduct a professional interview and physical examination of a patient, suspect the presence of surgically treatable condition(s), propose emergency care plan and cost-effective investigative plan to confirm the diagnosis; propose a safe and effective surgical management plan, prepare patient for theatre, including arranging for anaesthetic pre-operative consultation; participate as second assistant during major operations, and perform under supervision the surgical procedures in the student practical skills log. The student acquires practical skills in the evaluation of the epidemiology, pathogenesis, preclinical and clinical manifestations of communicable, non-communicable, and tropical diseases of surgical importance that are prevalent in Namibia and neighbouring countries, surgical emergencies affecting the head, eye, ear, mouth, neck, chest, abdomen, pelvis, bones, and other body organs and tissues and their management, injury, and metabolic response to trauma. Students gain experience in evidence-based practice of surgery, choice, use, and administration of all forms of anaesthetics, invasive and non-invasive diagnostic and therapeutic procedures, cost-effective and rational use of drugs, surgical and non-surgical interventions, laboratory investigations, screening for disease markers, disease prevention, health promotion and rehabilitation, population and group health, ethics and gate-keeping role of physicians, health resource allocation and management, and health systems research in surgery.

Learning Outcomes:

At the end of the course, as student is expected to be able to:

- Evaluate patients with surgical conditions,
- Suspect a surgical condition by carrying out an interview and physical examination, appropriately select laboratory investigations, interpret results of laboratory tests,
- Explain underlying conditions, initiate preoperative management,

- Explain underlying patho-physiological changes,
- Identify indications for surgical interventions and need for changing of management or referral of patients. Identify indications for intervention
- Prepare patients for emergency surgery,
- Assess orthopaedic health conditions through medical interviews and clinical examination of a patient,
- Select and request for appropriate diagnostic investigation,
- Interpret findings, explain the underlying pathology, and outline a management plan of the case.
- Recognize diseases affecting the head and neck,
- Develop differential diagnoses,
- Select appropriate diagnostic tests and Interpret test results,
- Develop a treatment and disease prevention plan for head and neck disorders
- Examine the eye, carryout tests for visual acuity and color, diagnose diseases of the eye and ocular manifestations of systemic diseases as well as carryout simple treatment procedures under supervision, or follow proper referral procedures
- Identify disorders affecting the urological system,
- Select the best surgical or conservative treatment modality for each patient under his/her care and evaluate the outcome;
- Diagnose surgical emergencies for individual or groups of patients;
- Carryout live-saving and emergency surgical procedures conditions under supervision.
- Carry out simple surgical interventions
- Assist during surgical operations, prepare an accurate record of the conduct of each operation
- Make effective consultation and referral of patients.
- Interrogate a wide range of learning media especially online scientific journals to test hypothesis generated during surgical care of a patient /family to obtain for the patient the benefits of the most current scientific advances in medicine;
- Participate in the use of medical technology such as radio-imaging and anaesthesiology led surgical procedures.
- Select surgery as a field for future specialization.

COURSE CODE: 15BPHARM

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:

2. Hold a valid NSSC (Namibian Senior Secondary Certificate) or equivalent qualification with at least 35 points on the UNAM scale with a minimum of grade 2 or better on Higher level or a grade B or better on Ordinary level for Mathematics and Physical Sciences, and a grade B or better on Ordinary level in Biology and English

OR

3. Have successfully completed the entire first year Science curriculum with at least 60% in each of the Chemistry, Biology and Mathematics or Physics modules

OR

4. Have successfully completed a Science degree from a recognised University with passes in Sciences including Chemistry and Biology

OR

5. 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 related work experience
 - d. They should pass the prescribed Mature Age Entry Test
 - 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.

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. 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

A student must pass all modules in an academic year in order to be eligible for progression to the next academic year.

1. A candidate who fails any examination of a module by less than 50% shall, on the recommendation of the Examinations Committee and approval of the Faculty Board, be permitted to re-sit both theory and practical examinations of the same module.
2. A candidate who fails to satisfy the examiners in up to 50% of the modules sat at each semester shall, on the recommendation of the Examinations Committee and approval of the Faculty Board, be permitted to sit for supplementary examinations for the failed modules within a period determined by the School calendar of examinations, before the next academic year.
3. A pass obtained in any supplementary examination will be recorded as 50% on the candidate's academic record.
4. A candidate who fails to satisfy the examiners in more than 50% of modules sat OR who fails in any supplementary examination shall, on the recommendation of the Examinations Committee and approval of the Faculty Board, be required to repeat the academic year, but only in the failed modules.
5. A candidate who does not successfully complete any rotation in the Field attachments shall, on the recommendation of the Examinations Committee and approval of the Faculty Board, be required to repeat all the rotations during the next Field Attachments. Such a student shall not be allowed to proceed to the final year before successful completion of the Field attachments.
6. A candidate who fails in either the assessment of the project dissertation or project oral defence by less than 50% shall, on the recommendation of the Examinations Committee and approval of the Faculty Board, be permitted to re-sit the dissertation or the oral defence of the project within a time period prescribed by the Examinations Committee.

7. A candidate who fails after repeating a year shall be discontinued from the degree programme.

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	
Primary Health Care: Health Promotion	PCSP3511	5	16	3+2P	
Computer Literacy	UCLC3409	4	16	2+1P	

YEAR 1 SEMESTER 2 (16 WEEKS)					
Module Title	Code	NQF Level	Credits	Hrs	Pre /Co-requisites
Physical Chemistry	PCMP3512	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	
Inorganic Chemistry	PCMI3512	5	16	3+3P	
English for Academic Purposes	ULEA3419	4	16	4	
Contemporary Social Issues	UCSI3429	4	8	2	
TOTAL CREDITS			232		

YEAR 2 SEMESTER 1 (16 WEEKS)					
Module Title	Code	NQF Level	Credits	Hrs	Pre /Co-requisites
Pharmaceutical Organic Chemistry	PCMC3631	6	16	3+3P	PCMO3511
Introduction to Pharmacy & Dispensing	PCTI3631	6	16	3+3P	
Physiology III	PPHP3631	6	16	3+2P	PPHP3512
Biochemistry II	PPHB3631	6	16	3+2P	PPHB3512
Introduction to Pharmacology	PPHI3631	6	16	3+3P	PPHP3512
General Pharmaceutics	PCTG3631	6	16	3+3P	PCMP3512

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	PCMA3632	6	16	3+3P	PCMO3511 PCMI3512
Research Methods	PCSR3632	6	16	3+1P	PCSB3512
Physical Pharmacy	PCTP3632	6	16	3+3P	PCMP3512 PCTG3631
Systems Pharmacology I	PPHS3632	6	16	3+3P	PPHI3631
Pharmacy Practice I	PCSP3622	6	8	2+2P	PCTI3631

FIELD ATTACHMENT -YEAR 2 (2 X 4 WEEKS)					
Module	Code	NQF Level	Credits	Hrs	Pre /Co-requisites
Community Pharmacy	PCSC3732	7	16	35P	PCSP3622
Rural Attachment	PCSU3732	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	PPHS3632
Biopharmaceutics & Pharmacokinetics	PCTK3721	7	8	2+1P	PCTM3511 PCTG3631
Pharmacy Law & Ethics	PCSL3721	7	8	2	
Veterinary Pharmacy & Agrochemicals	PPHV3721	7	8	2+1P	PPHI3631
Environmental & Occupational Health	PCSO3721	7	8	2+2P	

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
Chemotherapy	PPHC3752	7	16	3	PCTM3751
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	PCSY3852	8	16	35P	PCSP3742
Industrial/Manufacturing Facility	PCSF3852	8	16	35P	PCTT3751
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 Medicine	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	PPHS3632 PPHS3751
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	Behavioral 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	MBCC3732
Research Methods	PCSR3632	Community Medicine III	MCMC3632
Environmental & Occupational Health	PCSO3721	Family Medicine II	MBSF3551

UNAM CORE MODULES

CONTEMPORARY SOCIAL ISSUES

UCSI3429

NQF level:	4
Contact Hours:	2 Lecture hours/week
Credits:	8
Assessment:	40% Continuous + 60% Final examination (1 X 3 hours written paper)
Pre/Co-requisite:	None

Module Description:

The module raises awareness on the need for a personal, national and global ethics. The main objectives of the course is to help students reflect on the social moral issues; to discover themselves in a learner-centered, contextual, religious and life related setting. It also stimulates students for critical thinking and helps them to appreciate their values, standards and attitudes. Furthermore it orientates students with regards to the epidemiology of HIV/AIDS; the prevalence of the disease in Namibia, Africa and internationally. It also informs students on the psycho social and environmental factors that contribute to the spread of the disease, the impact of HIV/AIDS on their individual lives, family and communities at large. The unit further seeks to enhance HIV/AIDS preventive skills among students by means of paradigm shift and behaviour change and to impart general introductory knowledge on gender, to make students aware, as well as sensitize them towards gender issues and how they affect our society, sub-region and continent at large.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Identify social issues affecting the Namibian Society.
- Describe the characteristics of these issues and to design a plan of action;
- Assess the challenges facing the society in a multi-cultural, multi-faith and secular setting;
- Develop respect for humanity, nature and cosmos.
- Describe the physical-medical aspects of HIV/AIDS
- Demonstrate knowledge of the following social factors that can contribute towards the spread of HIV/AIDS; relationships; social conditions; attitudes; cultural influences; myths about HIV/AIDS.
- Explain behaviour change towards HIV/AIDS;
- Construct HIV/AIDS prevention strategies, continuum of care and support among students.
- Identify with, and use gender concepts with ease
- Utilize gender-sensitive language and live a life that reflects gender exposure
- Reflect on gender relations between women and men in society, and the impact on society;
- Reduce gender stereotypes in their home and community at large;
- Examine the impact of gender unequal relations on the spread of HIV/AIDS, gender based violence, myths, stereotypes and believes about males and females, resource distribution, the education system and many other issues that affect society and community at large.

COMPUTER LITERACY

UCLC3409

NQF level:	4
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Contact hours:	4 Lectures, 1 Theory+6 Computer Practise/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.

Learning Outcomes

At the end of this module, a student is expected to be able to:

- Distinguish between the functions of various computer components and peripherals
- Use a computer under the Windows operating system
- Differentiate between word processors, spreadsheets, presentations and databases
- Perform practical exercises using MS Word, Excel and PowerPoint.
- Be able to create own email address, communicate with email and use the Internet.

ENGLISH FOR ACADEMIC PURPOSES

ULEA3419

NQF level:	4
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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Apply academic and formal writing conventions within the context of their studies
- Integrate advanced reading strategies in reading an academic context
- Employ oral and presentation skills in an academic context
- Employ academic listening techniques in an academic context

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.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Discuss structure and function of the cells and tissues of the human body
- Demonstrate the approaches to naming anatomical structures
- Demonstrate skills in the different methods and histological techniques frequently used in the study of cells and tissues
- Discuss normal development with emphasis on the reproductive cycle, gametogenesis, fertilization, gastrulation and the derivatives of the three germ layers.
- Interpret developmental defects of the embryo, foetus, placenta, and the amniotic fluid
- Identify preventive actions that contribute to decreasing the rate of birth of premature, retarded, or genetically defective children
- Explain the potential causes of infertility and the value of technological choices as solutions to the problem
- Explain the signs of normal and risky pregnancies from the standpoint of the embryo, foetus, amniotic fluid, and the mother
- Explain the concepts of cell potentiation, differentiation, proliferation, and death, and characterize the structure of the different types of cells and tissues according to function
- Discuss the transformations that take place during the development of different systems, Analyze the actions taken in preventing and detecting defects in a foetus
- Explain how modern techniques are used in the diagnosis of malformations
- Evaluate the normal foetal development and the effects of foetal, maternal, and placental factors on the growth and development of the foetus

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.

Learning Outcomes

At the end of the modules, a student is expected to be able to:

- Discuss the morphological and functional characteristics of the main structures of the nervous, circulatory system, lymphoid system, gastrointestinal tract, the glands of the gastrointestinal tract, respiratory system, urinary system, andrological and female reproductive systems, endocrine system, as well as the organs of vision and hearing
- Interpret the symptoms of frequent diseases
- Compare the morphological characteristics of the structures of components of circulatory, urinary, respiratory, and digestive systems
- Interpret the symptoms of frequent diseases produced by alterations of the components of these systems under the microscope
- Explain their functions
- Distinguish pathological specimens from normal ones
- Compare and contrast the morphological and functional characteristics of the main structures of the cell
- Relate the principal histological characteristics of different organs and systems of the human body in relation with their functions and identify these structures in both health and disease

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.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Describe the principles and applications of sterilisation and disinfection
- Apply knowledge of the process, methods and techniques of sterilization and disinfection
- Describe and apply the basic principles of preservation used in pharmaceuticals, foods and cosmetics
- Demonstrate knowledge and skills of fermentation
- Demonstrate knowledge of the kinetics of microbial growth
- Apply the principles of vaccine production, classification and DNA recombinant technology
- Demonstrate knowledge of infection control

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.

Learning Outcomes

At the end of this module, a student is expected to be able to:

- Relate the structural and functional organization of the eukaryotic cell
- Explain the properties and functions of the components of macromolecules that contribute to the structural and functional characteristics of substances crucial in life processes
- Discuss the biological functions of the different types of macromolecules
- Explain the molecular basis of the main mechanisms at play in regulating enzyme activities and various metabolic processes
- Describe the molecular mechanisms that allow the exchange of substances, energy, and signaling across the cell membrane
- Discuss the molecular events that occur during the conservation, transmission, and expression processes of the genetic information and the consequences of their variations due to the action of internal and external agents
- Explain the molecular basis of genetics
- Interpret the inheritance of genetic diseases
- Discuss the abnormalities of human chromosomes and phenotypic characteristics of genetic diseases
- Explain the importance of the interaction of the genome with the environment

BIOCHEMISTRY II

MBSB3512

NQF	5
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:

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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Relate the structural and functional organization of the eukaryotic cell.
- Explain the properties and functions of the components of macromolecules that contribute to the structural and functional characteristics of substances crucial in life processes.
- Discuss the biological functions of the different types of macromolecules.
- Explain the molecular basis of the main mechanisms at play in regulating enzyme activities and various metabolic processes.
- Describe the molecular mechanisms that allow the exchange of substances, energy, and signaling across the cell membrane.
- Discuss the molecular events that occur during the conservation, transmission, and expression processes of the genetic information and the consequences of their variations due to the action of internal and external agents.
- Explain the molecular basis of genetics.
- Interpret the inheritance of genetic diseases.
- Discuss the abnormalities of human chromosomes and phenotypic characteristics of genetic diseases.
- Explain the importance of the interaction of the genome with the environment.

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.

Learning Outcomes:

At the end of this module, a student will be able to:

- Describe mechanisms of pharmacokinetics
- Describe drug distribution in one- and multi-compartment models
- Appreciate the relevance of bioequivalence in therapeutics
- Demonstrate an understanding of the differential and integrated equations associated with pharmacokinetic models
- Demonstrate an understanding of factors which affect the absorption, distribution, metabolism and excretion of drugs
- Predict the changes in relevant pharmacokinetic parameters in presence of factors which affect the absorption, distribution, metabolism and excretion of drugs
- Calculate pharmacokinetic parameter values from appropriate data (e.g. patient data) using graphical techniques

- Calculate appropriate dosing regimens using appropriate criteria
- Analyze drug information literature including reference books, package inserts and research publications with regard to pharmacokinetics and pharmacodynamics of drugs

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.

Learning Outcomes

At the end of this module, a student is expected to be able to:

- Distinguish between categorical and quantitative variables or data and, within each type, respectively, to distinguish between ordinal and non-ordinal categorical variables and between discrete and continuous quantitative variables
- Define distributions and frequency tables
- Distinguish between bimodal, unimodal, normal, leptokurtic, platykurtic, skewed, and symmetric distributions
- Construct histograms from raw data, including setting category boundaries for continuous data (or discrete data with low frequencies within data classes)
- Calculate the value of a summation notation expression
- Calculate summary statistics (mean, mode, median, range, interquartile range, standard deviation, and variance) from raw data
- Distinguish between a parameter and a statistic
- Define sampling error and be able to identify both bias and homogeneity in samples
- Explain the difference between a symmetric and a skewed distribution and apply these concepts to the normal curve
- Describe the relationship between probability and the area under the normal curve
- Calculate z-scores
- Calculate the appropriate probabilities and z-scores from actual data as an answer to a question about the data, assuming the data is normally distributed
- Define and calculate the expected mean and standard deviation of sample means drawn from a quantitative variable
- Calculate the standard deviation of sample means
- Reject or accept the null and alternative hypotheses from a comparison of the p value with a given critical (alpha) value (both one- and two-way)
- Give the conditions of validity for the use of the t-test for testing the significance of a difference between two sample means
- Determine if it is appropriate to use the t-test for testing the significance of a difference between two sample means for a given scenario
- Describe both type I and II errors for a given scenario
- Define significant effect size and calculate it for a given scenario
- Define the power of a statistical test and determine, using the tables in the textbook, the minimum sample size that will provide for a specified level of power given an expected standard deviation and an alpha level

CHEMOTHERAPY
PPHC3752

NQF level:	7
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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.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Explain the rational use of drugs in the therapy of infections, infestations and cancers
- Demonstrate knowledge of drug resistance and its modulation
- Explain the classification, side-effects and complications of antimicrobials and chemotherapeutic agents
- Demonstrate an understanding of the development of cancer in man
- Describe the principles of chemotherapy used in various situations - cancer, infection and infestations

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.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Initiate drug dosing regimens individualized to specific patient needs and organ function
- Interpret drug serum concentration data
- Calculate individual pharmacokinetic parameters
- Calculate appropriate dosing regimens utilizing derived pharmacokinetic parameters
- Demonstrate an understanding of the appropriate application and limitations of selected pharmacokinetic models
- Recognize sources of individual pharmacokinetic variability due to physiological and disease factors
- Demonstrate understanding of the application and role of pharmacokinetic information generated for selected drugs and drug classes.
- Apply pharmacokinetic data generated from individual patients to develop appropriate therapeutic dosing regimens

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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Demonstrate knowledge of the types, mechanisms of action, clinical features, diagnosis, detection and management of poisons
- Integrate the results of laboratory tests for the diagnosis of types of poisons
- Demonstrate knowledge and skills required to determine the features, diagnosis and general management of drugs of abuse

COMMUNITY PHARMACY**PCSC3732**

NQF level:	7
Contact hours:	35 attachment hours/week for 3 weeks
Credits:	20
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.

Learning Outcomes:

Upon completion of the rural attachment a student is expected to be able:

- Equipped with knowledge of the health service in Namibia
- Able to explain problems faced by health personnel in medicine supply, communication, morbidity and mortality
- Equipped with knowledge, skills and attitudes necessary for working in a multi-disciplinary environment in delivering health care in rural areas.

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.

Learning Outcomes:

At the end of this module, a student is expected to be able to

:

- Demonstrate understanding and respect for cultural and ethnic influences on patients' health beliefs and health care choices
- Discuss patient's use of complementary therapies as a necessary part of finding a common ground when providing patient-centered care
- Collaborate with practitioners of complementary therapies to ensure patients' access to quality CAM
- Demonstrate understanding of the prevalence and patterns of CAM use within Namibia and the region.
- Demonstrate understanding of the conditions for which patients most commonly seek out complementary approaches
- Interpret information regarding safety, efficacy and cost of complementary therapy interventions and communicate this information clearly to the patient
- Describe the potential for adverse effects and herb-drug interactions and when using complementary therapies
- Demonstrate awareness of methodological issues and difficulties raised in studying efficacy of complementary therapies

ENVIRONMENTAL AND OCCUPATIONAL HEALTH

PCS03721

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.

Learning Outcomes

At the end of this module a student is expected to be able to:

- Demonstrate an understanding of the legal and ethical framework which governs occupational health and safety practice and the obligations of industry in regard to the environment
- Appraise and integrate hazard information from published studies and other relevant sources in the occupational and environmental health literature
- Recognise and evaluate the level of exposure and assess the degree of risk to health from workplace and environmental hazards and provide advice on appropriate control measures in the workplace and the community
- Demonstrate an understanding of the factors underlying risk perception and be able to effectively and sensitively communicate (in both written reports and oral presentations) these risks to exposed people in the workplace and the community
- Provide occupational health services, including preventative programs and environmental advice to industry

NQF level:	6
Contact hours:	3 lecture hours/Week for 16 weeks; 3 practical hours / week for 16 weeks
Credits:	20
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

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Perform complex pharmaceutical calculations;
- Formulate different types of dosage forms in relation to semi-solids and solids
- Describe the major physical and chemical properties of drugs and excipients which influence the performance of drugs and dosage forms

HOSPITAL PHARMACY

PCSY3852

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

INDUSTRIAL/MANUFACTURING FACILITY

PCSF3852

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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Manage medicines and pharmacy personnel in a hospital pharmacy.
- Provide pharmaceutical care services to the public
- Manage a community pharmacy
- Formulation and manufacture various pharmaceutical dosage forms

NQF level:	5
Contact hours:	3 hours lectures and 3 hours practicals
Credits:	16
Module Assessment:	CA: 60% (minimum 2 tests 80 %, laboratory component 15 %; assignments 5%) Final Exam: 40% (1 x 3 hour exam paper)
Pre/Co-requisite:	None

Module Description:

This is an introductory course to inorganic chemistry. It builds upon what is covered in the first Year chemistry courses. It begins with a revision of the structure of the atom and then progresses into its reactivity to form simple and complex molecules. The revision of the structure of an atom will cover atomic parameters radii, ionization energy, electronegativity, and electron affinity; Chemical bonding:- Valence Bond Theory (VBT), shapes of molecules and hybridization; molecular Orbital Theory (MOT):- 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. Brief introduction to the organometallic chemistry of s-block elements with emphasis on organometallic chemistry of lithium and magnesium; brief introduction to -block chemistry; occurrence, recovery and common oxidation states and compounds.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Analyse inorganic pharmaceuticals
- Describe the importance and use of inorganic pharmaceuticals in preventing and curing diseases
- Apply the principles and procedures of the analysis of drugs to the analysis of inorganic pharmaceuticals

NQF:	6
Contact Hours:	3 lecture hours + 3 hours of practice per week
Credits:	20
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.

Learning Outcomes

At the end of the modules, a student is expected to be able to:

- Carry out a medical interview
- Methodically perform a physical examination with full consideration of a patient's comfort, confidentiality, and privacy results
- Record and present to clinical faculty
- Perform basic nursing procedures with full consideration of a patient's comfort, confidentiality, and privacy in a methodical manner
- Administer First Aid during a medical emergency, make effective referral and follow-up of a patient who requires life-saving care

INTRODUCTION TO PHARMACOLOGY
PPHI3631

NQF level:	6
Contact hours:	3 lecture hours/week for 16 weeks; 3 practical hours for 16 weeks
Credits:	20
Module Assessment:	60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite:	PPHP3512
Assessment Methods:	assignments, tests, practicals, class presentations, student evaluation forms

Module Description:

This module introduces students to the basic mechanisms of drug action in relation both to drug-receptor interactions and to the operation of physiological and biochemical systems. It provides an introduction to the pharmacology of neuro-effector systems.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Demonstrate knowledge of basic drug receptor interactions
- Analyse drug action, from the molecular basis of receptors and cell signalling, to the effect of drugs on whole body systems
- Describe the major classes of drug receptors and sites of drug action within the body and pharmacological mechanisms by which drugs of various classes may alter biochemical, physiological and pathophysiological parameters to produce therapeutic or unwanted effects
- Demonstrate knowledge of drug antagonism and clinical applications

INTRODUCTION TO PHARMACY AND DISPENSING
PCTI3631

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.

Learning Outcomes:

At the end of the module a, student is expected to be able to:

- Outline the scope and history of pharmacy

- Apply information in standard reference books and materials
- Perform basic pharmaceutical calculations
- Formulate different types of dosage forms in relation to liquids and simple solutions
- Describe the major physical and chemical properties of drugs and excipients which influence the performance of drugs and dosage forms
- Describe the major properties and uses of solutions, dispersions, semi-solids, and solids in common dosage forms

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 40% final examination (at least 2 tests), (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.

Learning Outcomes

At the end of this module, a student is expected to be able to:

- Demonstrate understanding of basic mathematics and differential calculus
- Demonstrate understanding of the application of differentiation, integral calculus to life sciences.
- Recognise the importance of statistics in both private and public sectors
- Summarise the data using a few summary measures (e.g. mean and standard deviation)
- Do simple statistical analysis
- Use a computer to analyse the data

MEDICINAL CHEMISTRY I
PCMM3752

NQF level:	8
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.

Learning outcomes:

At the end of this module, a student is expected to be able to:

- Describe the intermolecular energies (forces) that allow drug molecules to bind to proteins and how these interactions dictate binding specificity
- Demonstrate understanding of structure-activity relationships defining the interaction of a drug with its receptor

- Describe the pharmacophoric functional groups that are important for receptor binding and biological activity
- Apply receptor binding models to predict the ability of a structural analogue of a characterized drug to bind to the target receptor
- Describe prodrugs and the design thereof, applying chemical techniques and drug metabolism aspects.

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.

Learning Outcomes

At the end of this module, a student is expected to be able to:

- Discuss biotechnological drugs and drug applications and give examples
- Relate the physicochemical properties, formulation aspects, action and side effects of a class of drugs to their chemical structure and properties

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.

Learning Outcomes

At the end of this module, a student is expected to be able to:

- Classify organic compounds into chemical groups;
- Identify the chemical and physical properties of organic compounds;
- Discuss the use of organic compounds in medicine;
- Apply concepts and basic techniques of simple synthesis and re-crystallization;
- Perform solvent extraction, identification and characterization of compounds;

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.

Learning outcomes:

At the end of this module a student is expected to be able to:

- Demonstrate an understanding of basic mechanisms of cellular pathology, including inflammation, injury, and wound healing.
- Describe features of immunological and haematological disorders
- Evaluate prescriptions for authenticity, completeness and appropriateness
- Review patient profile in relation to pharmacotherapy
- Communicate effectively with and counsel patients appropriately
- Interpret laboratory results of specific disease states

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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Demonstrate understanding of the pathophysiology and therapeutics of the different body systems
- Demonstrate understanding of the pathophysiology and therapeutics of HIV/AIDS and other common infections
- Compare and contrast different types of cancers, their epidemiology, routes of metastasis, treatment options and prognosis

- Set therapeutic objectives and justify drug selection
- Apply knowledge of pathophysiological mechanisms in devising appropriate pharmaceutical care plans
- Demonstrate problem solving skills in drug therapy of diseases

PHARMACEUTICAL ANALYSIS
PCMA3632

NQF level:	6
Contact hours:	3 lecture hours/week for 16 weeks; 3 practical hours for 16 weeks
Credits:	20
Module Assessment:	60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Pre-requisite:	PCMO3511, PCMI3512
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.

Learning outcomes:

At the end of this course a student is expected to be able to:

- Describe key concepts related to quality assurance of pharmaceuticals
- Apply the principles of spectroscopy and chromatography to the structural elucidation of drugs and other pharmaceuticals
- Apply spectroscopic and chromatographic techniques of analysis for structural determination and quantification of drugs

PHARMACEUTICAL MICROBIOLOGY
PCTM3751

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/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.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Analyse the anatomy, identification, growth factors and sterilization of microorganisms
- Describe the mode of transmission of disease causing microorganism, symptoms of disease and treatment
- Estimate of RNA and DNA and identify their source
- Cultivate microorganisms in the laboratory
- Perform diagnostic tests to identify diseases

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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Classify organic compounds into the different functional groups
- Analyse the chemical and physical properties of organic compounds
- Describe the use of organic compounds in pharmacy and medicine
- Apply basic techniques of simple synthesis, re- crystallisation, solvent extraction, identification and characterisation of compounds

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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Apply the principles involved in the formulation of various pharmaceutical dosage forms
- Monitor and apply procedures for the packaging, labelling and storage of pharmaceuticals
- Apply knowledge of equipment used in pharmaceutical operations
- Compile and maintain documentation
- Prepare various pharmaceutical formulations

- Evaluate pharmaceutical dosage forms
- Observe safety 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.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Obtain and interpret data in relation to standard pharmacopoeial monographs and Namibian Regulatory Authority regulations
- Design a drug formulation
- Test it in relation to pharmacopoeial monographs and pass it through the various regulatory bodies to the market
- Explain, the design of pharmaceutical production facilities

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.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Demonstrate understanding of the basic principles of cultivation, collection and storage of crude drugs
- Explain the source, active constituents and uses of crude drugs
- Describe the applications of primary and secondary metabolites of the plant in pharmacy.

- Evaluate herbal drugs in accordance with World Health Organization (WHO) guidelines for quality control of medicinal plants

PHARMACOEPIDEMOLOGY 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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Explain the definition of pharmacoepidemiology, its contribution, reasons for performing, the drug approval process and the risk tolerance
- Describe the perspectives on pharmacoepidemiology from the view of the pharmaceutical industry and the regulatory authorities
- Explain the statistical methods used in pharmacoepidemiologic study including the basic measurements used, causality assessment as well as the sensitivity and specificity tests in pharmacy practice
- Explain and apply the principles of clinical trials and post-marketing surveillance
- Investigate a clinically significant therapeutic problem using appropriate tools and recommend a solution to the problem
- Describe some special applications of pharmacoepidemiology such as pharmacoeconomics, Drug Use Evaluation (DUE) and study of therapeutic effects of drugs.
- Explain the basic theory, concepts and principles of economics and its applications in pharmacoeconomics
- Explain the definition and purposes of pharmacoeconomics
- Describe the applications of pharmacoeconomics in various aspects of pharmacy practice
- Demonstrate understanding of the importance and future role of pharmacoeconomics in health care

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.

Learning Outcomes:

At the end of this module, a student is expected to be able:

- Evaluating the requirements and implications of the different legislation impacting on pharmacy in Namibia
- Complying with legal requirements and code of ethics in pharmacy practice
- Participate in life-long learning activities
- Demonstrate an understanding of the Namibian healthcare system and the role of pharmacists and other professionals
- Practice as a pharmacist in the Namibian cultural framework
- Demonstrate understanding of labelling requirements and practising guidelines for drugs and cosmetics

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

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Demonstrate understanding of the principles of management
- Apply the principles of managerial problem solving to pharmacy practice problems
- Adapt and respond to changes in the practice setting
- Recruit and train staff
- Apply basic supervision principles including managing professional relationships, managerial decision making, motivation, leadership, conflict management, and negotiation
- Manage budget and financial operations
- Manage physical facilities for pharmaceutical operations
- Apply entrepreneurship and marketing principles

PHARMACY PRACTICE I
PCSP3622

NQF level:	6
Contact hours:	2 lecture hours/week for 12 weeks; 2 practical hours / week for 16 weeks
Credits:	10
Module Assessment:	60% Continuous assessment 40% final examination (1 × 3 hours written paper)
Co-requisite:	PCTI3631

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.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Demonstrate understanding of the operation and management of a community pharmacy
- Take patient history
- Identify and recommend treatment options including non-drug treatment measures
- Counsel patients
- Provide enhanced community pharmacy services to the public such as disease screening, immunization and reproductive health services
- Conduct point-of-care tests
- Monitor outcomes
- Maintain patient records
- Monitor self-medication
- Respond to minor ailments and provide appropriate advise and/or medication
- Apply business and professional practice management skills
- Show empathy and sympathy to patients

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.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Select medicines and related supplies according to patients needs using evidence-based and pharmaco-economic principles
- Quantify medicines and related supplies
- Conduct inventory management using various inventory control systems
- Procure, store and distribute medicines and related supplies
- Promote rational use of medicines in hospitals

- Manage unwanted, damaged and expired stock
- Handle spillages safe
- Dispose of medicines according to legal requirements and environmental guidelines
- Manage pharmaceutical information
- Provide medicine information services

PHYSICAL CHEMISTRY
PCMP3512

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.

Learning Outcomes:

At the end of this course, a student is expected to be able to

- Analyse the behaviour of ions in solution and their application in the measurement of electrode potentials and potentiometric titration
- Distinguish between different compounds and solutions
- Determine the order of reactions and reaction rates and their applications to drug stability in various formulations
- Apply the concept of thermodynamics in the explanation and deduction of spontaneity of reaction, maximum yields and general energetics of reactions
- Demonstrate an understanding of the basic concepts of spectroscopy

PHYSICAL PHARMACY
PCTP3632

NQF level:	6
Contact hours:	4 lecture hours/week for 16 weeks; 3 practical hours / week for 16 weeks
Credits:	20
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.

Learning Outcomes

At the end of the module, a student is expected to be able to:

- Analyse the physical and physicochemical properties of drugs and drug solutions in order to predict the solubility, ionisation and stability of a given drug under specified conditions
- Explain the principles underlying the formulation and properties of emulsions and suspensions and the role of surfactants in the stabilisation of these systems
- Demonstrate knowledge of the pharmaceutical properties of systems in solid and semi-solid state and their relevance to the design of efficient drug dosage forms

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.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Demonstrate understanding of gene transcription and translation and how the regulation of these two processes results in differential gene expression and the differentiation of cell;
- Explain cellular movement, organization and the role of cells and tissues;
- Demonstrate understanding of the establishment of the three layer body plan and the role cell-cell signaling plays in the establishment of the body plan and tissues;
- Describe the origins of the 10 organ systems and how signaling between these effects development;
- Relate the role of the environment to 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.

Learning Outcomes

At the end of the module, a student is expected to be able to:

- Describe the structure and function of the various aspects of a cell
- Explain the fundamental mechanisms underlying cell function
- Explain how homeostasis is established and maintained in the face of disease and infection
- Demonstrate understanding of the structures and functions of the endocrine system
- Demonstrate understanding of the structure-function relationship inherent in the central and peripheral nervous systems
- Describe how the organ systems covered interact throughout the body to maintain homeostasis

PHYSIOLOGY III

PPHP3631

NQF:	6
Contact Hours:	3 lecture hours + 2 hours of tutorial (or 3 hours of practice)
Credits:	20
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.

Learning Outcomes

At the end of this module, a student is expected to be able to:

- Explain the functional organization of the human body as well as the biophysical base of the all ten organ systems
- Explain the major mechanisms by which hormones bring about the effects on their target tissues
- Discuss the mechanisms of deviation from normal physiological functions and development of diseases
- Discuss control and regulatory mechanisms of body function.

PRIMARY HEALTH CARE: HEALTH PROMOTION

PCSP3511

NQF:	5
Contact Hours:	3 lecture hours + 2 hour of practice
Credits:	16
Assessment:	60% 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.

Learning Outcomes:

At the end of this module a student is expected to be able to:

- Recognize the causes of disease and the threats to the health of individuals and populations at risk
- Define of health, disease and disability
- Assess the distribution of risk factors in the population
- Evaluate risk identification and reduction policies for populations taking into account diversity, ethnicity and social inequality
- Implement where appropriate, risk reduction strategies for individual patients;
- Demonstrate an understanding of the changing of risk factors
- Demonstrate the use of evidence-based medicine and effective interventions
- Assist patients to modify behavior whilst respecting their autonomy
- Manage and implement change
- Demonstrate understanding the that health promotion and disease prevention depend on collaboration with many other professionals and agencies

RESEARCH METHODS

PCSR3632

NQF:	6
Contact Hours:	3 lecture hours + 1 hour of practice
Credits:	20
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.

Learning outcomes

At the end of this module a student is expected to be able to:

- Explain the purpose of clinical research
- Differentiate types of research (clinical, basic science, health services) and their applications
- Distinguish the different types of research designs
- Design research instruments
- Apply research methods in designing a research proposal
- Demonstrate an understanding of research methodology
- Critically review literature
- Identify the research question
- Formulate hypotheses, problem statement and justification of the study
- Formulate objectives
- Select study design and strategy
- Define the study population, sampling and sample size determination
- Specify variables, data collecting tools and data collection methods
- Develop data management and analysis plan
- Determine the budget and research project administration
- Interpret results and write report
- Apply principles of medical ethics in research

RESEARCH PROJECT
PCSR3880

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.

Learning Outcomes:

At the end of this module, a student is expected to be able to:

- Demonstrate ability to evaluate scientific literature
- Demonstrate problem identification and formulation of a solution or intervention.
- Demonstrate knowledge and skills in the chosen field of research
- Apply and interpret biostatistics in research
- Demonstrate a sound knowledge of statistics and its application in data analysis
- Demonstrate the critical appraisal of experimental design
- Communicate research findings
- Write a scientific report
- Present of a scientific report

NQF level:	7
Contact hours:	35 attachment hours/week for 3 weeks
Credits:	20
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.

Learning Outcomes:

Upon completion of the rural attachment a student is expected to be able:

- Equipped with knowledge of the health service in Namibia
- Able to explain problems faced by health personnel in medicine supply, communication, morbidity and mortality
- Equipped with knowledge, skills and attitudes necessary for working in a multi-disciplinary environment in delivering health care in rural areas.

NQF Level:	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.

Learning Outcomes

At the end of this module a student is expected to be able to:

- Conceptualize the Sociology of Health and Disease
 - Conceptualize “health beliefs”
 - Discuss illness cognitions
 - Discuss health care worker-patient communication and counseling, the role of health beliefs in communication and counseling, as well as the ethics involved in communication and counseling
 - Discuss health-defying behaviors: smoking and alcohol
 - Conceptualize eating behavior
 - Discuss the role of exercise in promoting health
 - Discuss screening in health and disease: primary, secondary and tertiary prevention
 - Conceptualize stress and discuss stress and illness
 - Explain early models of pain and their description of pain as a sensation
 - Discuss placebos and the interrelationship among beliefs, behavior and health
 - Examine the role that sociology plays at each stage of an illness: HIV and Cancer
 - Examine the role that sociology plays at each stage of an illness: Obesity and Coronary Heart Disease
 - Discuss the sociology of Women’s Health Issues
 - Discuss measurement of Health Status and Quality of Life
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- Identify other professionals and agencies and their roles
 - Plan health promotion interventions, taking into account barriers to preventing disease and promoting health both in the individual and the population
 - Describe political, economic, behavioral and organizational barriers to disease prevention and health promotion
 - Explain the importance of the auditing of health promotion and disease prevention activities
 - Implement screening programmes based on appropriate criteria

SYSTEMS PHARMACOLOGY I
PPHS3632

NQF level:	6
Contact hours:	3 lecture hours/week for 16 weeks; 3 practical hours / week for 16 weeks
Credits:	20
Module Assessment:	60% Continuous assessment 40% final examination (1 X 3 hours written paper)
Co-requisite:	PPHI3631
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, 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.

Learning Outcomes:

At the end of the course, a student is expected to be able to:

- Identify typical examples of drugs which are used to restore physiological functions in the cardiovascular, renal, respiratory, digestive and peripheral nervous systems
- Explain the mechanisms of drug action

- Describe the side effects and potential for interaction with other drugs and foods

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.

Learning Outcomes:

At the end of the module, a student is expected to be able to:

- Demonstrate understanding of the pharmacology of the drugs acting on the central nervous system and their use in the treatment of disorders of this system
- Analyse the biological and sociological issues of dependence
- Describe the principles underlying the actions drugs which are used to restore physiological functions in the endocrine systems and
- Demonstrate an understanding of the use of drugs to control 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.

Learning outcomes:

At the end of this module a student is expected to be able to:

- Describe the principles underlying the formulation and storage of veterinary drugs.
- Recognize signs and symptoms of common animal diseases.
- Recommend appropriate drugs for treatment