

# **STUDENT HANDBOOK**

**MEDICAL LABORATORY SCIENCES  
NURSING  
PHARMACY**

**UNIT OF ALLIED HEALTH SCIENCES  
FACULTY OF MEDICINE  
UNIVERSITY OF JAFFNA  
SRI LANKA  
FEBRUARY 2018**

## **INFORMATION FOR UNDERGRADUATES**

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## **Table of Contents**

<b>CHAPTER 1</b>	<b>01-10</b>
1.0. GENERAL ASPECTS	
1.1. The Crest of the University	01
1.2. History of the Unit of Allied Health Sciences	02-03
1.3. Vision, Mission and Objectives	03-04
1.4. Graduate Profile	04-05
1.5. Intended Learning outcomes	05-07
1.6. Organization chart of the Faculty of Medicine and the Unit of Allied Health Sciences	08
1.7. Administrative, Academic and Academic supportive staff Involved in the Allied Health Sciences Degree Programme	08-10
1.7.1. Administrative, Staff	08 -09
1.7.2 Academic Staff	09-10
1.7.3. Academic Supportive Staff	10
<b>CHAPTER 2</b>	<b>11-13</b>
2.0. ACADEMIC FACILITIES AT THE UNIT OF ALLIED HEALTH SCIENCES	
2.1 Infrastructure Facilities	11
2.2 Teaching Hospital, Jaffna	11 -12
2.3 Libraries	12 -13
2.4 IT Facilities	13
2.5 Laboratory Facilities	13

<b>CHAPTER 3</b>	<b>14 - 16</b>
3.0. GENERAL INFORMATION	
3.1. Entry requirements	14
3.2. General Considerations	14
3.3. Course Structure	15-16
3.4. Fees	16
<b>CHAPTER 4</b>	<b>17 - 20</b>
4.0. BASIC RULES FOR STUDENTS	
4.1. General	17
4.2. Record book	17
4.3. Leave and Illness	17-18
4.4. Student Attendance	18
4.5. Dress code for students of the Unit of Allied Health Sciences	18 -20
<b>CHAPTER 5</b>	<b>21 - 127</b>
5.0. CURRICULUM	
5.1. Curriculum for	
5.1.1. B.Sc. Medical Laboratory Sciences	22-26
5.1.2. B.Sc. Nursing	27-34
5.1.3. Pharmacy degree	35-42
5.2. Course Capsule	
5.2.1. Common for all three degree courses.	43-49
5.2.2. Subjects for Medical Laboratory Sciences	50-64
5.2.3. Subjects for Nursing	65-91
5.2.4. Subjects for Pharmacy	92-127

**CHAPTER 6** **128 -138**

BY – LAWS RELATING TO CONDITIONS OF  
RESIDENCE AND DISCIPLINE OF STUDENTS-

**CHAPTER 7** **139 -158**

**7.0 EVALUATION PROCEDURES AND  
EXAMINATIONS**

7.1	In - Course Assessments	139-140
7.2	End of Course Examination	140
7.3	Eligibility to sit the Examination	140-141
7.4	Barrier System for the Semester Exam	142
7.5	Conduct of the Examination	142-143
7.6	Requirement to pass a course unit	143
7.7	Releasing Results	143
7.8	Method of Evaluation	144
7.8.1	Medical Laboratory Sciences	144-147
7.8.2	Nursing	148-151
7.8.3	Pharmacy	152-155
7.9	Grading System	156
7.9.1	Completing the Course unit	156
7.9.2	Improving Grades	157
7.10	Award of Degree	157-158

**CHAPTER 8** **159-160**

**8.0 SERVICES AND FACILITIES FOR  
STUDENTS**

8.1	University Health centre	159
8.2	Hostel Accommodation	159
8.3	Students' Counselling Services	159

8.4	Recreation	160
8.5	Endowments scholarships, Prizes, Bursaries	160

## **CHAPTER 9** **161 -180**

### **9.0 STUDENT WELFARE**

9.1	University Act	161 -166
9.2	By - Laws relating to Elections	167-179
9.3	Allied Health Sciences Students' Union	179
9.4	Student Counselling	179
9.5	University Health Services	180
9.6	Hostel Accommodation	180
9.7	Medical Faculty Canteen	180

# CHAPTER 1

## 1.0. GENERAL ASPECTS

### 1.1. The Crest of the University



The figure of the sacred cow [Nanthi] comes from the flag of the Jaffna kingdom which prevailed in the period of around 16th and 17th centuries. The traditional lamp refers to the light of wisdom. The motto comes from the famous Tamil literature, “Thirukural” meaning ‘wisdom is finding the truth’. The flames in the outer circle refer to the 64 disciplines of learning in Tamil Culture.

குறள் 355 அதிகாரம் - மெய்யுணர்தல்  
எப்பொருள் எத்தன்மையாயினும் அப்பொருள்  
மெய்ப்பொருள் காண்பது அறிவு

**Finding the truth in everything whatever its nature is wisdom.**

குறள் 423 அதிகாரம் - அறிவுடமை  
எப்பொருள் யார்யார்வாய்க் கேட்பினும் அப்பொருள்  
மெய்ப்பொருள் காண்பது அறிவு

**Finding the truth in everything whoever said is wisdom.**

## **1.2. History of the Unit of Allied Health Sciences**

Since inception the University of Jaffna has recognized the need to offer courses in Allied Health Sciences and made provision for paramedical school in the corporate plan. Attempts were made from time to time to start Diploma and Certificate courses. Inadequate facilities and the unrest situation delayed commencing these courses.

In 2003, the University Grants Commission invited Faculties of Medicine to initiate discussions on commencing six degree courses at the universities in Sri Lanka.

The degree courses are as follows:

Medical Laboratory Sciences

Nursing

Pharmacy

Physiotherapy

Radiography

Occupational therapy

A special Faculty Board meeting held on 15th July 2004 at the Faculty of Medicine, University of Jaffna made the decision to commence the three degree courses including Medical Laboratory Sciences, Nursing, and Pharmacy at the beginning



and to commence the other courses in the years to come. This was approved by the Faculty Board, Senate and University Grants Commission (UGC).

Inauguration of the Allied Health Sciences degree programme was held on 7th August 2006 at the Faculty of Medicine, University of Jaffna. Students who sat for the G.C.E A/L Examination in the year 2005 were admitted for the academic year 2005/06. This first batch of students has completed their studies in year 2011 and seventh batch of students graduated from the faculty in 2016.

In September 2011, the UGC has approved the request made by the University of Jaffna to establish the Unit of Allied Health Sciences (UAHS). Staff recruited to teach Allied Health Sciences automatically absorbed to UAHS. The foundation stone for a separate building for Allied health Sciences has been laid by minister of Higher Education on 29th, August 2010, in the land attached to the Faculty of Medicine. The new building for UAHS was ceremonially opened by Honourable Minister S.B. Dissanayakae, Ministry of Higher Education, on 28th September 2012.

### **1.3. Vision, Mission and Objectives**

#### **Vision:**

to be the leading centre of excellence in the field of Allied Health Sciences.

**Mission:**

is to provide excellent training in the field of allied health sciences and generate new knowledge through research.

**Objectives:**

To produce highly competent and skilled professionals in the field of allied health sciences.

To engage in research and development in the field of allied health sciences.

To promote intellectuals to publish articles to promote extent the service of allied health staff to the community.

**1.4 Graduate Profile**

UAHS graduates are expected to play a leading role in the provision of health care to the patients and the upliftment of each professional standard of the country. To be able to develop such capabilities they have to develop qualities of self-learning, research and continuous professional development.

**The AHS graduates**

Should be able to construct and sustain arguments.

Should be able to solve problems using appropriate ideas and techniques in a professional context.

Should be able to demonstrate thorough and systematic understanding of core aspects of the allied health sciences.

Should be able to accurately use the established techniques of analysis in Allied Health Sciences.

Should be able to clearly communicate information, ideas, issues, problems and solutions to specialist as well as non-specialist audience.

Should be able to ready to exercise initiative, identify situations they need support from others.

Should be able to prepare to carry out further training and manage own learning.

## **1.5. Intended Learning outcomes**

### **1.5.1. Medical Laboratory Sciences**

At the completion of the study programme, the Medical Laboratory Sciences graduates should be able to:

be disciplined and honest in supporting the delivery of quality health care to the community.

possess the knowledge, skills and attitude towards the development of Medical Laboratory Sciences.

be able to implement and monitor quality laboratory procedures and principles of management and ensure proper safety in the laboratory.

dedicate himself/ herself for the welfare of the patient.

be able to keep proper records and maintain confidentiality.

exhibit good professional conduct and develop interpersonal communicative skills with patients and other health care

professionals and public

follow ethical and moral attitudes and principles which are essential for a healthcare worker.

be motivated to continue education to develop and maintain professional competency.

be able to carry out research projects in Bio Medical Sciences.

### **1.5.2. Nursing**

At the completion of the study programme, the nursing graduates should be able to:

demonstrate knowledge, skills and positive attitudes to perform nursing care at health institutions in Sri Lanka and abroad.

be a fully qualified nurse with the ability to apply nursing process; assess, identify the problems and needs, plan, implement and evaluate the care provided.

monitor the quality of nursing care and ensure safety of patients.

be an active member of the multidisciplinary health care team in managing patients in the hospital and in the community.

be able to communicate information, ideas, issues problems and solutions clearly to the specialized persons in health care as well as the patients, clients and their families.

be able to carry out health research

be prepared to obtain further training and a lifelong self and active learner.

have the capability in becoming a future trainer in nursing and contribute to the development of the field of nursing.

be capable of carrying out academic and practice based postgraduate studies.

### **1.5.3. Pharmacy**

At the completion of the study programme, the Pharmacy graduates should be able to:

Possess a broad knowledge, skill and attitudes in the field of Pharmacy.

Dispense prescribed medication and give appropriate instruction and advice to patients.

be able to maintain healthy relationship and effective communication with the patient and other health professionals.

contribute to the delivery of modern health care.

be able to understand the modern trends of pharmaceutical industry.

respect colleagues and other health professionals.

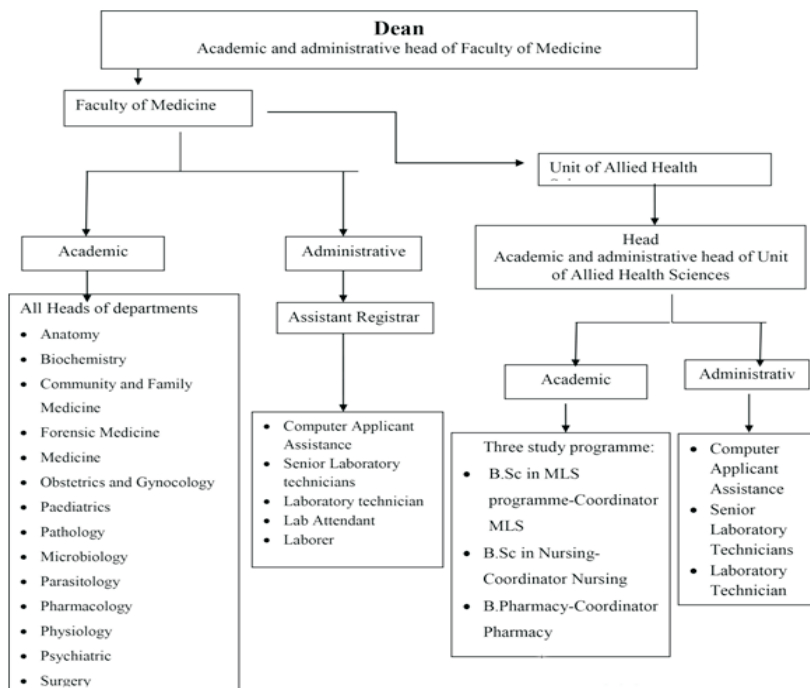
be able to design, implement and publish research article.

be able to keep proper records and maintain confidentiality.

be able to serve in any part of the country.

maintain continuous education and be conversant with latest advances in pharmacy to serve the community.

## 1.6. Organization chart of the Faculty of Medicine and the Unit of Allied Health Sciences



## 1.7. Administrative, Academic and Academic supportive staff Involved in the Allied Health Sciences Degree Programme

### 1.7.1 Administrative Staff

Dean, Faculty of Medicine

Dr. S. Raviraj

Head of the Unit

Mrs. Deivy Thabotharan

Assistant Registrar/Allied Health Sciences unit

Mrs. Kowsalya Tharmendra

Coordinators

B.Sc. in Medical Laboratory Sciences

Mrs. Thevaki Gnanakarunyan

Senior Lecturer

Unit of Allied Health Sciences

B.Sc. in Nursing

Mrs. Luxmi Kamalarupan

Senior Lecturer

Unit of Allied Health Sciences

B.Pharm

Mr. S. Thuvaragan

Senior Lecturer

Unit of Allied Health Sciences

Senior Treasurer:

Mr. Paramanathan Kalki

Student's Counsellor

Mrs. Luxmi Kamalarupan

Mrs. Thevaki Gnanakarunyan

### **1.7.2 Academic Staff**

The following academic staff members are attached to the Unit Allied Health Sciences:

#### **Bachelor of Science in Medical Laboratory Sciences**

Mrs. Thevaki Gnanakarunyan

Senior Lecturer

Mr. Rasathurai Karunaithas

Lecturer

Miss. Kumarasamy Sivagini

Lecturer

Miss. Sivalingam. Sumana

Lecturer

### **Bachelor of Science in Nursing**

Mrs. Deivy Thabotharan	Senior Lecturer
Mrs. Luxmi Kamalarupan	Senior Lecturer
Mrs. Viniththira Jeyapragash	Senior Lecturer
Mr. Santhalingam Sathees	Lecturer

### **Bachelor of Pharmacy**

Mr. Paramanathan Kalki	Senior Lecturer
Mr. Sinnadurai Thuvaragan	Senior Lecturer
Mr. Pratheesh Maheswaran	Lecturer
Miss. Paramasivam Sivasinthuja	Lecturer

### **Visiting Staff**

The academic staff from the Faculty of Medicine, other Faculties of the University of Jaffna, other Universities, Teaching Hospital and College of Nursing are involved in teaching activities.

### **1.7.3 Academic Supportive staff**

Academic supporting Staff of the Unit of Allied Health Sciences

Mrs. K. Tharmendra	Assistant Registrar
Mr. M. Sathiyaseelan	Technical Officer, Nursing
Mr. A. A. F. Thirukumaran	Technical Officer, Pharmacy
Mr. J. Muralikrishna	Technical Officer, MLS
Miss. K. Sivarajasundaram	Pharmacist
Mr. T. Nanthakobe	Computer Applications Assistant
Mr. I. Tharmarasa	Lab Attendant, Pharmacy
Mr. S. Sachiharan	Lab Attendant, MLS
Mr. T. Mayooran	Labourer



## **CHAPTER 2**

### **2.0 ACADMIC FACILITIES AT THE UNIT OF ALLIED HEALTH SCIENCES**

#### **2.1. Infrastructure Facilities**

Academic activities of Medical Laboratory Sciences, Nursing and Pharmacy are conducted within the premises of the Unit of Allied Health Sciences. The UAHS is housed in a three storey building; an administrative office, staff room for Nursing and the head's room are located in the ground floor, staff room for Pharmacy and a lecture hall are located in the first floor, staff room for MLS and two lecture halls are located in the second floor, one lecture hall, a cooking demonstration room and a skill laboratory for nursing students are located in the third floor. Laboratories from the Faculty of Medicine and the Teaching Hospital Jaffna are utilised by students of Allied Health Sciences.

#### **2.2 Teaching Hospital, Jaffna:**

The Teaching Hospital, Jaffna serves as the place for clinical teaching for the Faculty of Medicine and UAHS. This hospital is situated about 4 kilometres from the Faculty. It has 1015 beds with the following units. General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedic Surgery, Coronary Care Unit, Oncology, Ear, Nose and Throat Surgery, Ophthalmology, Anaesthesiology, Neurology, Psychiatry, Dermatology and Unit for Sexually Transmitted Diseases. In addition it has a Pathological Laboratory, Pharmacy Services

Blood Bank Service, Medical and Surgical Emergency Units, an Intensive Care Unit, Premature Baby Unit, Primary Health Care Unit. The Outpatients Department of this hospital has a daily turnover of about 1000 patients. In addition an average of 1000 patients are seen at specialist's clinics. An outpatient's clinic for leprosy patients is also conducted. The hospital is under the administrative control of a Director of the Teaching Hospital. Psychiatry Unit is functioning at the District Hospital, Tellippalai, but clinics are conducted both at the Teaching Hospital, Jaffna and the District Hospital, Tellippalai.

## **2.3 Libraries:**

### **Medical Library**

The Faculty of Medicine has its own Medical Library. It is located in the first floor of the Faculty. It has a collection of books of approximately 10,000 volumes and a good collection of periodicals for Medical and AHS Students. It has three sections – lending, reference and archives sections. The library has a capacity to accommodate 100 students at a time.

The Library is linked to the Health Literature Library Information Services Network (HELLIS), Sri Lanka, Organized under the aegis of the World Health Organization. The publications of the WHO are separately organized for the benefits of users. The Library also has a good collection of non – book materials such as cassettes both audio and visual, microfiche with their viewing and listening devices. (Television with deck, slide tape tutors, slide projector and microfiche reader).

There is also a section that contains books for Nursing, Pharmacy and Medical laboratory Sciences especially for the Allied Health Sciences Students. They also have a separate reading area.

**Library Opening Hours:**

Week days:	-	08.00am – 06.00pm
Week ends:	-	08.00am – 02.00pm
Sunday:	-	Closed
Public holidays:	-	Closed

**Main University Library**

This is situated in the university main premises about half kilometres from the Unit of Allied Health Sciences. There are ample materials for general reading.

**2.4 IT Facilities**

The UAHS has established a small computer section recently. In addition to this, the UAHS students have access to a well-established Computer Unit at the main University, which can be accessed by 10 minutes of cycling.

**2.5 Laboratory Facilities**

The UAHS students are using laboratory facilities available at Departments of Anatomy, Biochemistry, Pharmacology, Pathology, Physiology, Physics and Teaching hospital Jaffna. The discipline of Nursing has a skill lab for demonstration and cooking demonstration room

## **CHAPTER 3**

### **3.0. GENERAL INFORMATION**

#### **3.1. Entry requirement**

##### **Regular entry**

The University Grants Commission of Sri Lanka will admit the students on the basis of the G.C.E (A/L) Examination conducted by the Department of Examinations, Sri Lanka.

##### **Lateral entry**

This is to facilitate those who are in services in the respective field to gain University Degree. Entry criteria and the course structure for lateral entrees are under consideration of the UGC.

#### **3.2. General Considerations**

##### **Degrees awarded:**

Bachelor of Science (Honours) in Medical Laboratory Sciences

Bachelor of Science (Honours) in Nursing

Bachelor of Pharmacy (Honours)

This degree will be awarded for the candidates who successfully complete the four academic years of the Curriculum of Allied Health Sciences.

Honours degree will be awarded at the end of four academic years.

University of Jaffna, Sri Lanka will award the degree.

Each discipline admits about 70 students per academic year.

### **3.3. Course Structure**

#### **Duration of the Course**

The duration of the course is 4 year comprising of 8 semesters.

#### **Medium of instruction**

**English**

#### **Academic Year**

The academic year consists of 2 semesters, Semester I and Semester II. Each semester consists of approximately 26 weeks, 15 weeks for academic work, 1 week mid semester vacation, 3 weeks study leave and 7 weeks end of semester examination

#### **Credit valued course unit system**

The course content is designed using credit system. The full curricula structures for B.Sc. in MLS comprise 120 credits, B.Sc. in Nursing comprise 140 credits and the B.Pharm. degree comprises 131 credits. One credit is equal to 15 hours of lectures/tutorials and 30 hours of laboratory or practical and 50 hours of clinical practice/field activity. The student will earn each credit only:

if the student has a minimum of 80% attendance in lectures  
and

if the student has a minimum of 90% attendance in tutorial  
and

if the student has a minimum of 90% attendance in practical or clinical or field activity unless the period of absence is exempted by the Faculty Board and the Senate.

## Course Units

Certain course units of the first semester and second semester of the first academic year are common for all three courses (Medical Laboratory Sciences, Nursing and Pharmacy) in Unit of Allied Health Sciences (UAHS). The course units of the subsequent years will be conducted separately for the appropriate courses. A Research project will be carried out during the fourth year.

## 3.4. Fees

The following fees are payable by Sri Lankan students admitted to the Allied Health Science courses.

### New admission and Registration (Rs.)

Registration fee	250.00
Medical fee	250.00
Library Fee	250.00
Laboratory Deposit	500.00
Hand Book Fee	250.00
Student Charter Fee	100.00
Identity card Fee	250.00
Orientation Fee	250.00
Annual Hostel Fee	2400.00
<b>Total</b>	<b>4500.00</b>

### Renewal of Registration

Registration Fee	100.00
Medical Fee	50.00

### Examination and course fees

Examination fees for repeat students per subject 250.00

## **CHAPTER 4**

### **4.0. BASIC RULES FOR STUDENTS**

#### **4.1. General**

On admission to the University, students must obtain their identity cards from the Examination Branch. This card should be carried by the students at all times and produced when required.

Any change of address must be immediately brought to the notice of the Dean/Faculty of Medicine and Examination Branch.

Students should maintain proper standards of conduct and behaviour.

Students are requested to confirm to the rules of the hospital and other institutions they may visit during their course.

#### **4.2. Record book**

Students must obtain their record books from the Office of the UAHS. It is the responsibility of the students to see that the attendance at classes and clinical work is entered in the book at the end of each semester or clinical appointments and is certified by the appropriate teacher. A student will not be allowed to take an examination if the attendance at relevant teaching session is not certified as satisfactory.

#### **4.3. Leave and Illness**

A student should not be absent himself/herself without informing leave. Students who require leave should apply in writing to the

Dean through the Coordinator of the discipline and Head/UAHS in advance. If the absence is due to unforeseen circumstances, the leave application should be submitted at the earliest opportunity.

In case of illness of more than three days, a medical certificate issued by the University Medical Officer (UMO) or the Medical Certificate certified by the UMO should be submitted to the Dean.

#### **4.4. Student Attendance**

Student attendance will be marked in all teaching sessions. The attendance will be evaluated at the end of each semester. The student will be eligible to sit the examination only:

if the student has a minimum of 80% attendance in lectures  
and

if the student has a minimum of 90% attendance in tutorial  
and

if the student has a minimum of 90% attendance in practical or clinical or field activity unless the period of absence is exempted by the Faculty Board and the Senate.

#### **4.5. Dress code for Students of the Unit of Allied Health Sciences**

The dress and appearance of the students should be appropriate for the Allied Health Sciences students



**Within the Medical Faculty and unit of Allied Health Sciences premises**

Dress code to be applied during working hours (8.00am-5.00pm) on week days and for academic sessions on other days:

**Male students** should wear shirts, trousers, socks and shoes properly. Hair should be neatly combed and face should be shaved. T shirts, jeans and slippers should be avoided.

**Female students** can wear skirts, blouse, frocks, chudithar, veil (Islamic dress), saree and respectable footwear. T shirts, miniskirts, divided skirts and rubber slippers should be avoided. All length of skirts should be below the knee. Hair should be neatly combed and tied.

**In a field or peripheral hospitals/centers or institutional visit or in Laboratories:**

The above dress code should be applied at all time when students engage in academic work such as field community visits, field clinics, posting at peripheral hospitals or centers and any institutional visits. White coat should be worn over this dress in laboratories. Hair should be tied up without touching the coat (Nursing).

**At Teaching Hospital (Nursing)**

For male students: wear light blue shirt with black trouser. The white coat should be worn with name plate. Black shoes with socks should be worn.

**For female students:** Should wear the approved Nursing uniform with the name plate. Wear white shoes with white socks and white cap.

**Other requirements are as follows:**

Fingernails must be short and clean, no nail polish

Hair must be braided and wear it up for girls.

No any rings, only small plain ear studs are acceptable.

Watches should either be digital or analog, no sharp edges, fancy watchbands or large buckles.

Clean shave for boys

**At Examinations:**

**Theory papers:**

Student must follow usual dress code during examination. Face should not be covered for the identity of the student.

**For practical examinations**

Student must use dress code which they use during the hospital or laboratory posting. Instead of name plate the index number should be fixed. Theory exams regulations should be applied for practical exams also.

**For the evaluation for teaching practices (Nursing)**

Female: Wear saree and white coat with index number.

Male: light colour shirt and white coat with index number.

## **CHAPTER 5**

### **5.0. CURRICULUM**

#### **5.1. Curriculum for B.sc. Nursing, Medical Laboratory Sciences and Pharmacy degree- 12th batch**

During the first year first semester, basic sciences are common for the three, degree programmes. During the first year second semester, four subjects are common and other subjects are separately conducted by the relevant departments. Subjects in the second, third and final year are also separately conducted by the respective departments. A research project is carried out in the final year for all three degree programmes. The subjects and the relevant credits are summarized below.

### 5.1.1. Curriculum for B.Sc. in Medical Laboratory Sciences -12<sup>th</sup> Batch

YEAR	SEMESTER	CREDITS		TOTAL CREDITS
		THEORY	PRACTICAL	
FIRST YEAR	SEMESTER 1	12	03	15
	SEMESTER 2	12	04	16
SECOND YEAR	SEMESTER 1	12	05	17
	SEMESTER 2	09	06	15
THIRD YEAR	SEMESTER 1	10	04	14
	SEMESTER 2	09	05	14
FOURTH YEAR	SEMESTER 1	07	06	13
	SEMESTER 2 RESEARCH PROJECT	06	03 07	16
TOTAL CREDITS		77	43	120

**Table 1:**

**Curriculum for first year B.Sc. in Medical Laboratory Sciences**

Subject code	Subjects	Credits			Theory Hours	Practic Hours	Departments involved in Teaching
		Theory	Practical	Total			
Semester 1							
AHSBE 1110	Basic English #	P/F	-	-	60	-	ELTC
AHSBCL 1120	Basic Computer Literacy#	P/F	P/F	-	20	20	Computer Unit
AHSBA 1135	Basic Anatomy	3+1*	1	5	45+15*	30	Anatomy
AHSBB 1146	Basic Biochemistry	4+1*	1	6	60+15*	30	Biochemistry
AHSBPH 1154	Basic Physiology I	2.5+ 0.5*	1	4	39+13*	30	Physiology
	Total	12	3	15	267	110	
Semester 2							
AHSBS 1211	Basic Statistics	1	-	1	15	-	Mathematics & Statistics
AHSBP 1222	Basic Pathology	2	-	2	30	-	Pathology
AHSBCH 1231	Basic Community Health	1	-	1	15	-	Community & Family Medicine
AHSSEA 1240	Safety & First Aids	P/F	P/F	P/F	-	08	SLRC
AHSBPH 1253	Basic Physiology II	2.5+ 0.5*	-	3	36+13*	-	Physiology
MLSIA 1264	Instrumental Analysis	2	2	4	30	60	Biochemistry, MLS
MLSCB 1275	Clinical Biochemistry I	2+1*	2	5	30+15*	60	Biochemistry
	Total	12	4	16	184	128	
	Total credits for the year	24	7	31			

**Table 2:Curriculum for Second year B.Sc. in Medical Laboratory Sciences**

Subject Code	Subjects	Credits			Theory Hours	Practical	Departments involved in Teaching
		Theory	Practical	Total			
Semester 1							
MLSEC 2112	Ethics and Communication	2	-	2	30	-	H RM, Community & Family Medicine
MLSHE 2125	Haematology I	2+1*	2	5	30+15*	60	Pathology, Teaching Hospital
MLSMM 2136	Medical Microbiology	3+1*	2	6	45+15*	60	Pathology (Div. of Microbiology),MLS
MLSMT 2144	Medical Laboratory Technology I	2+1*	1	4	30+15*	30	Biochemistry, MLS, Physics, Teaching Hospital
	Total	12	5	17	180	150	
Semester 2							
MLSMP 2215	Medical Parasitology	2+1*	2	5	30+15*	60	Pathology (Div. of Parasitology),MLS
MLSIM 2225	Immunology	2+1*	2	5	30+15*	60	Pathology (Div. of Microbiology), MLS
MLSHE 2235	Haematology II	2+1*	2	5	30+15*	60	Pathology, Teaching Hospital
	Total	9	6	15	135	180	
	Total credits (year)	21	11	32			

**Table 3:Curriculum for Third Year B.Sc. in Medical Laboratory Sciences**

Subject Code	Subjects	Credits			Theory Hours	Practical Hours	Departments involved in Teaching
		Theory	Practical	Total			
Semester 1							
MLSMV 3115	Medical Mycology and Virology	2+1*	2	5	30+15*	60	Dip. Of Microbiology), MLS
MLSPA 3124	Pathology II	2+1*	1	4	30+15*	30	Pathology
MLSBM 3131	Biotechnology & Molecularbiology I	1	-	1	15	-	Biochemistry
MLSMT 3144	Medical Laboratory Technology II	2+1*	1	4	30+15*	30	MLS, Teaching Hospital
	Total	10	4	14	150	120	
Semester 2							
MLSLR 3213	Lab Management and Record keeping	2	1	3	30	30	MLS, HRM, Teaching Hospital
MLSTM 3226	Transfusion Medicine	3+1*	2	6	45+15*	60	Blood Bank, Teaching Hospital
MLSCH 3235	Clinical Histotechnology	2+1*	2	5	30+15*	60	Pathology
	Total	09	5	14	135	150	
	Total credits (year)	19	9	28			

**Table 4:Curriculum for Fourth Year B.Sc. in Medical Laboratory Sciences**

Subject Code	Subjects	Credits			Theory Hours	Prac-tical	Departments involved in Teaching
		Theory	Practical	Total			
Semester 1							
MLSRM 4113	Research Methodology & Medical Statistics	3	-	3	45	-	Community Medicine, Biochemistry,
MLSCM 4125	Clinical Microbiology	2	3	5	30	90	Dip. of Microbiology, MLS, Teaching Hospital
MLSCB 4135	Clinical Biochemistry II	2	3	5	30	90	Biochemistry, Pathology, Teaching Hospital
	Total	07	06	13	105	180	
Semester 2							
MLSRP 4217	Research Project	-	7	7	-	210	Appropriate Departments
MLSIH 4225	Immunohaematology	2+1*	2	5	30+15*	60	Teaching Hospital
MLSBM 4233	Biotechnology & Molecularbiology II	2	1	3	30	30	Biochemistry
MLSEP 4241	Epidemiology	1	-	1	15	-	Community & Family Medicine
	Total	6	10	16	90	300	
	Total credits (year)	13	16	29	195	480	



### 5.1.2. CURRICULUM FOR B.Sc. NURSING DEGREE- 12<sup>th</sup> Batch

YEAR	SEMESTER	CREDITS			TOTAL CREDITS
		THEORY	PRACTICAL	FIELD/ CLINICAL EXPERIENCE	
FIRST YEAR	SEMESTER I	12	03	00	15
	SEMESTER II	18	02	01	21
SECOND YEAR	SEMESTER I	12	03	02	17
	SEMESTER II	08	2.5	5.5	16
THIRD YEAR	SEMESTER I	11	3.5	5.5	20
	SEMESTER II	11	01	08	20
FOURTH YEAR	SEMESTER I	10	02	03	15
	SEMESTER II RESEARCH PROJECT	05	01 07	03	16
TOTAL CREDIT FOR SPECIAL DEGREE		87	25	28	140

## CURRICULUM FOR FIRST YEAR

Subject code	Subjects	Credits				First year first Semester					Practical Hour	Field/clinical experience (week*days* hrs)	Departments involved in Teaching
		Theory	Practical	Field/clinical experience	Total	Theory Hour	Field/clinical experience	ELTC	Computer Unit	Anatomy			
AHSBE 1110	Basic English	P/F	P/F	-	P/F	60	-	-	-	ELTC			
AHSBCL 1120	Basic Computer Literacy	P/F	P/F	-	P/F	20	20	-	-	Computer Unit			
AHSBA 1135	Basic Anatomy	3+1*	1	-	5	45+15*	30	-	-	Anatomy			
AHSBB 1146	Basic Biochemistry	4+1*	1	-	6	60+15*	30	-	-	Biochemistry			
AHSBPH 1154	Basic Physiology I	2.5+0.5	1	-	4	39+13	30	-	-	Physiology			
	<b>Total</b>	<b>12</b>	<b>3</b>	<b>-</b>	<b>15</b>	<b>267</b>	<b>110</b>	<b>-</b>	<b>-</b>				

First year second Semester - Nursing									
AHSBS 1211	Basic Statistics	1	-	1	15	-			Mathematics & Statistics
AHSBP 1222	Basic Pathology	2		2	30	-			Pathology
AHSBCH 1231	Basic Community Health	1	-	-	15	-			Community & Family Medicine
AHSSFA 1240	Safety & First Aid	P/F	P/F	-	-	8			SLRC
AHSBPH 1253	Basic Physiology II	2.5+0.5	-	-	36+13	-			Physiology
NURNP 1265	Nursing Principles & Procedures – I	3	1	1	45	30	45	(3* 5*3 )	Nursing, Teaching Hospital
NURNE 1272	Ethics & Professional Adjustment	2		2	30				Teaching Hospital
NURMP 1284	Microbiology & Parasitology	3	1	4	45	30			Pathology
	<b>Total</b>	<b>15</b>	<b>2</b>	<b>1</b>	<b>229</b>	<b>68</b>	<b>45</b>		

## CURRICULUM FOR SECOND YEAR

Subject code	Subjects	Credits				Theory Hours	Practical Hours	Field/clinical experience	(week*days * hrs)	Departments involved in Teaching	
		Theory	Practic al	Field/ Hospit al	Total						
Second year First Semester											
NURNP 2116	Nursing Principles & Procedures – II	3	1	3	6	45	30	90	(4*5*5)	Nursing Teaching Hospital	
NURCA 2123	Clinical Anatomy	2	1	-	3	30	30	-		Anatomy & Hospital	
NURPA 2133	Pathology	2	1		3	30	30	-		Pathology	
NURPH 2143	Pharmacology – I	3	-		3	45				Pharmacology	
NURIP 2152	Introduction to Psychology	2	-		2	30	-	-		Psychiatry, Nursing	
	<b>Total</b>	<b>12</b>	<b>3</b>	<b>3</b>	<b>17</b>	<b>180</b>	<b>90</b>	<b>90</b>			
Second year Second Semester											
NURNP 2215	Nursing Principles & Procedures – III	2	1	2	5	30	30	90	(4*5*5)	Nursing Teaching Hospital	
NURAH 2225	Adult Health Nursing I	2	1	2	5	30	30	90	(4*5*5)	Medicine, Surgery & Nursing	
NURCH 2234	Community Health Nursing I	2	0.5	1.5	4	30	15	70	(4*5*4)	Community & Family Medicine, Nursing	
NURPH 2243	Pharmacology – II	3	-		3	45	-	-		Pharmacology	
NURSO 2252	Introduction to Sociology	2	-	-	2	30	-	-		Sociology	
	<b>Total</b>	<b>11</b>	<b>2.5</b>	<b>5.5</b>	<b>19</b>	<b>165</b>	<b>75</b>	<b>250</b>			

# CURRICULUM FOR THIRD YEAR

Subject code	Subjects	Credits				Theory Hours	Practical Hours	Field/clinical experience (week*day)	Departments involved in Teaching
		Theory	Practical	Field / Hospital	Total				
Third yearFirst Semester									
NURNP 3114	Nursing Principles & Procedures IV	2	1	1	4	30	30	45 (2*5*5)	Nursing
NURAH 3125	Adult Health Nursing II	3	1	1	5	45	30	45 (2*5*5)	Medicine, Surgery & Nursing Teaching Hospital
NURCH 3134	Community Health Nursing II	2	-	2	4	30	-	90 (4*5*5)	Community Medicine & Nursing
NURCN 3144	Child Health Nursing I	2	1	2	4	30	15	70 (3*5*6)	Paediatrics & Nursing Teaching Hospital
NURDT 3153	Diet Therapy	2	1	-	3	30	30	-	Community Medicine, Nursing, Hospital
	Total	11	4	6	20	165	105	250	

**Third yearSecond Semester - Nursing**

NURPM 3216	Psychiatric & Mental Health Nursing	3	1	2	6	45	30	90	(4*5*5)	Psychiatry & Nursing Tollipalai Hospital
NURAH 3224	Adult Health Nursing III	2	1	2	4	30	-	90	(3*5*6)	Medicine, Surgery & Nursing Teaching Hospital
NURED3235	Emergency & Disaster Nursing	3	-	2	5	45	-	90	(3*5*6)	Nursing, RDHS
NURCN 3245	Child Health Nursing II	3	1	2	5	45	-	90	(3*5*6)	Paediatrics & Nursing Teaching Hospital
	<b>Total</b>	<b>11</b>	<b>3</b>	<b>08</b>	<b>20</b>	<b>165</b>	<b>30</b>	<b>360</b>		

# CURRICULUM FOR FOURTH YEAR

Subject code	Subjects	Credits				Theory Hours	Practical Hours	Field / Hospital experience	(Week*days* hrs)	Departments involved in Teaching
		Theory	Practical	Field / Hospital	Total					
Fourth year First Semester										
NURRM 4113	Research Methodology & Medical Statistics	3	-	-	3	45	-			Appropriate department Community & Family Medicine
NURMN 4123	Maternity Nursing I	3	-	-	3	45	-			Gynaecology & Obstetrics & Nursing Teaching Hospital
NURMN 4134/ NUREN 4134	Maternity Nursing Practice I/ Emergency Nursing Practice	-	1	3	4	-	30	135	(6*5 *5)	Teaching Hospital, Base Hospital Tellippalai
NURLM 4142	Leadership & Management in Nursing	2	-	-	2	30	-			Teaching Hospital & Management Studies
NURTL 4153	Teaching & Learning	2	1	-	3	30	30			Nursing, Education
Total		10	2	3	15	150	60	135		

Fourth yearSecondSemester - Nursing									
NURRP 4217	Research Project	-	7	-	7		210		Appropriate Dept.
NURMN 4223	Maternity Nursing II	3			3	45			Gynaecology & Obstetrics & Nursing Teaching Hospital
NURMN 4234/ NURGN 4234	Maternity Nursing Practice II/ Geriatric Nursing Practice	-	1	3	4		30	135 (6*5*5)	Teaching Hospital, Base Hospital Tellipalai
NURGN 4242	Geriatric Nursing	2			2	30			Nursing, Teaching Hospital
<b>Total</b>		<b>05</b>	<b>08</b>	<b>03</b>	<b>16</b>	<b>75</b>	<b>240</b>	<b>135</b>	



### 5.1.3.CURRICULUM FOR BACHELOR OF PHARMACY – 12<sup>th</sup> Batch

YEAR	SEMESTER	TOTAL CREDITS		
		THEORY	PRACTICAL	TOTAL
FIRST YEAR	SEMESTER I	12	3	15
	SEMESTER II	15	3	18
SECOND YEAR	SEMESTER I	15	4	19
	SEMESTER II	13	2	15
THIRD YEAR	SEMESTER I	15	3	18
	SEMESTER II	11	4	15
FOURTH YEAR	SEMESTER I	15	2	17
	SEMESTER II	6	8	14
TOTAL CREDIT FOR SPECIAL DEGREE		102	29	131

### Curriculum for First year Bachelor of Pharmacy

Subject code	Subjects	Credits			Theory Hours	Prac tical	Departments involved
		Theory	Prac tical	To tal			
Semester 1							
AHSBE 1110	Basic English	P/F	P/F	-	60	-	ELTC
AHSBCL 1120	Basic Computer Literacy	P/F	P/F	-	20	20	Computer Unit
AHSBA 1135	Basic Anatomy	3+1*	01	5	45+15*	30	Anatomy
AHSBB 1146	Basic Biochemistry	4+1*	01	6	60+15*	30	Biochemistry
AHSBPH 1154	Basic Physiology I	2.5 +0.5*	01	4	39 +13*	30	Physiology
	<b>Total</b>	<b>12</b>	<b>03</b>	<b>15</b>	<b>267</b>	<b>110</b>	
Semester 2							
AHSBS 1211	Basic Statistics	01	-	01	15	-	UAHS
AHSBP 1222	Basic Pathology	02	-	02	30	-	Pathology
AHSBCH 1231	Basic Community Health	01	-	01	15	-	Visiting
AHSSFA 1240	Safety & First Aids	P/F	P/F	-	-	08	Visiting
AHSBPH 1253	Basic Physiology II	2.5+ 0.5*		03	36+13*		Physiology
PHABMP 1264	Basic Microbiology and Parasitology	03	01	04	45	30	Microbiology & Parasitology
PHACH 1273	Pharmaceutical Chemistry	02	01	03	30	30	Pharmacy
PHACE 1284	Pharmaceutics I	03	01	04	45	30	Pharmacy
	<b>Total</b>	<b>15</b>	<b>03</b>	<b>18</b>	<b>229</b>	<b>98</b>	
	<b>Total credits for the year</b>	<b>27</b>	<b>06</b>	<b>33</b>			

### Curriculum for Second year Bachelor of Pharmacy

Subject code	Subjects	Credits			Theory Hours	Practical Hours	Departments Involved in teaching
		Theory	Practic al	Total			
Semester I							
PHAM M 2111	Pharmaceutical Mathematics	01	-	01	15	-	Mathematics & Statistics
PHACH 2124	Pharmaceutical Chemistry II	03	01	04	45	30	Pharmacy
PHACE 2134	Pharmaceutics II	03	01	04	45	30	Pharmacy
PHACL 2143	Pharmacology & Pharmacotherapy I	03	-	03	45	-	Pharmacology
PHACG 2154	Pharmacognosy	03	01	04	45	30	Pharmacy
PHAM B 2163	Pharmaceutical Microbiology	02	01	03	30	30	Pathology (Microbiology) & Pharmacy
	Total	15	04	19	225	120	

<b>Semester 2</b>								
PHACP 2212	Community Pharmacy	02	-	02	30	-	Pharmacy & Psychiatric	
PHACH 2224	Pharmaceutical Chemistry III	03	01	04	45	30	Pharmacy	
PHACE 2234	Pharmaceutics III	03	01	04	45	30	Pharmacy	
PHACL 2242	Pharmacology & Pharmacotherapy II	02	-	02	30	-	Pharmacology	
PHAJE 2253	Pharmaceutical Jurisprudence and Ethics	03	-	03	45	-	Pharmacy	
<b>Total</b>		<b>13</b>	<b>02</b>	<b>15</b>	<b>195</b>	<b>60</b>		
<b>Total credits for the year</b>		<b>28</b>	<b>06</b>	<b>34</b>				

**Curriculum for Third year Bachelor of Pharmacy**

Subject code	Subjects	Credits			Theory Hours	Practical Hours	Departments Involved in teaching
		Theory	Practical	Total			
Semester 1							
PHAMC 3114	Medicinal Chemistry I	03	01	04	45	30	Pharmacy
PHACN 3124	Chemistry of Natural Products	03	01	04	45	30	Pharmacy
PHACE 3134	Pharmaceutics IV	03	01	04	45	30	Pharmacy
PHACL 3143	Pharmacology & Pharmacotherapy III	03	-	03	45	-	Pharmacology
PHAPT 3153	Pharmaceutical Technology	03	-	03	45	-	Pharmacy
	Total	15	03	18	225	90	

<b>Semester 2</b>									
PHAMC 3214	Medicinal Chemistry II	03	01	04	45	30	Pharmacy		
PHAAM 3223	Pharmaceutical Administration and Marketing	03	-	03	45	-	Management Studies & Pharmacy		
PHAHP 3236	Hospital Pharmacy	03	03	06	45	90	Pharmacy & Hospital Pharmacies, Teaching Hospital, Jaffna		
PHACL 3242	Pharmacology & Pharmacotherapy IV	02	-	02	30	-	Pharmacology		
	<b>Total</b>	<b>11</b>	<b>04</b>	<b>15</b>	<b>165</b>	<b>120</b>			
	<b>Total credits for the year</b>	<b>26</b>	<b>07</b>	<b>33</b>					

**Curriculum for Fourth year Bachelor of Pharmacy**

Subject code	Subjects	Credits			Theory Hours	Practical Hours	Departments Involved in teaching
		Theory	Practical	Total			
Semester 1							
PHAPA 4114	Pharmaceutical Analysis	03	01	04	45	30	Pharmacy
PHANP 4124	Natural Product Chemistry	03	01	04	45	30	Pharmacy
PHACP 4132	Clinical Pharmacy	02	-	02	30	-	Pharmacology & Pharmacy
PHABT 4144	Pharmaceutical Biotechnology	04	-	04	60	-	Biochemistry & Pharmacy
PHARM 4153	Research Methodology and Medical Statistics	03	-	03	45	-	Community Medicine & Biochemistry
	Total	15	02	17	225	60	

<b>Semester 2</b>								
PHAAP 4214	Advanced Pharmaceutics	03	01	04	45	30	Pharmacy	
PHADD 4223	Drug discovery and Development	03	-	03	45	-	Pharmacy	
PHARP 4237	Project	-	07	07	-	210		
<b>Total</b>		<b>06</b>	<b>08</b>	<b>14</b>	<b>90</b>	<b>240</b>		
<b>Total credits for the year</b>		<b>21</b>	<b>10</b>	<b>31</b>				



## **5.2. Course Capsule**

### **5.2.1. Common for all three degree programmes**

#### **FIRST YEAR FIRST SEMESTER**

##### **AHSBE 1110 Basic English (60:00)**

###### ***General objective:***

- (i) To develop and enhance the ability to read and understand subject oriented materials.
- (ii) To improve the ability to communicate through speech and writing.

###### **Course detail:**

Reading: Basic reading, Identifying main ideas, Reading for details and understand a text from contextual clues and grammatical clues; writing: Basic grammar – revision, writing letters and memos etc, writing application and form filling and report writing skills; Listening: Listening for specific information for overall comprehension, for making inferences and note taking; Speech (Oral skills): Interviewing skills, facing interviews, Model group discussions, Inter – personal conversational patterns and presentation skill.

##### **AHSBCL 1120 Basic Computer Literacy (20:20)**

###### ***General objective:***

The Basic Computer Literacy Co Module is expected to provide sufficient knowledge, skill and attitude to make use of the information technology for effective learning and practice of Para Medical degree.

### ***Course details:***

Introduction; Data processing; Purpose and basic components of a computer Software, hardware and operating system and its concepts and definitions, Computer operations, File management, Internet: searching, browsing, e-mail and information retrieval using the www and internet; Computer maintenance and practical statistical software, Data security.

### **AHSBA 1135 Basic Anatomy (45+15:30)**

#### ***General objective:***

At the end of the course, the students should be able to gain the basic knowledge in gross and microscopic structure and the development of the human body to correlate with the clinical manifestations.

### ***Course details:***

Cell Biology: Cell structure and function, Organelles, cell division and cell cycle; Biological membranes: structure and function, transport mechanisms, signal transduction and cell-cell interactions; Classic and molecular genetics; Histology: Structure and function of different cells and tissue types; Organ: Name of the organ and structure, location and feature: large organ systems with emphasis on the relation between form and function, skin (integument), skeleton, joints (articulations), muscular system, nervous system and special senses, digestive system, endocrine system, respiratory system, circulatory system, urinary system, reproductive system and early embryology.

## **AHSBB 1146 Basic Biochemistry (60+15:30)**

### ***General objective:***

At the end of the course, the students should be able to develop knowledge in the chemistry, properties and metabolism of biomolecules in order to understand the biochemical concepts, understand the principles of nutrition and its relation to growth, energy needs, health and diseases.

### ***Course details:***

pH and buffer system; H<sup>+</sup> ion concentration - acids, bases buffer and Zwitterions-Henderson-Hasselbach equations, derivation and application; Chemistry of Carbohydrates; Chemistry of amino acids and proteins; Physical and chemical properties and structure of Proteins; Chemistry of lipids; Chemistry of nucleic acids; Enzymes: Enzyme kinetics, classification, properties of enzymes, mechanism of action, coenzymes, Hemoglobin; Transport across bio membranes; Digestion and absorption of nutrients; Oxidation- reduction potential with reference to biological system, free energy and entropy; Carbohydrate metabolism; Lipid metabolism; Nucleic acid metabolism; Replication and transcription; Protein synthesis; Plasma proteins; Immunoglobulin;

**AHSBPH 1154                      Basic Physiology I (39+13:30)**

**AHSBPH 1253                      Basic Physiology II    (36+13)**

### ***General objective:***

To acquire knowledge about the functions of each system of the body, explain the principles behind each function and explain how homeostasis is maintained by the normal body activities.

### ***Course details:***

Introduction; The Body fluids and Blood: Functions of Blood, Properties of Blood, Blood volume, RBC, WBC and platelets and Blood grouping; Excitable tissue and Autonomic nervous system: Nerve - Conduction of nerve impulse, Muscle - Physiology of muscle contractions, Types of muscles, Autonomic nervous system; Cardiovascular system: Heart & blood vessels, cardiac cycle, cardiac sound, Blood pressure and ECG, Lymphatic system: Function of lymph, lymph nodes & spleen; Respiratory system: Functions, Mechanisms of pulmonary ventilation, Exchange of gases in the lungs, Transport of gases & exchange of gases in tissues, Regulation of respiration; Digestive system and Energy metabolism: Function of organs of digestion, Digestion, Absorption, Energy metabolism: Metabolic rate, Body temperature regulation; Urinary system: Functions of urinary system, Formation of urine, Fluid, electrolytes balance & acid base dynamic; Endocrinology: The functions of hormones & their effects, Pituitary, Pineal, Thyroid, & Parathyroid, Thymus, Adrenal, Pancreas, Ovaries & Testis, Reproduction: Functions of male reproductive system, Functions of female reproductive system, Female sexual cycle, pregnancy and lactation, Fertility, infertility and contraceptives; Neurophysiology: Introduction: Brain, spinal cord, cerebro spinal fluid, cranial & spinal nerves, Reflexes and muscle tone, The special sense organs & sensations: Pain & touch, vision, hearing & equilibrium, smell & taste, Higher function of the nervous system: learning and memory.

FIRST YEAR SECOND SEMESTER:

Common for three degree courses

## **AHSBS 1211 Basic Statistics (15:00)**

### ***General objective:***

To gain basic knowledge in mathematics and statistics

### ***Course details:***

**Statistics:** Population and sample parameters estimates; Descriptive and inferential statistics; objective and quantitative data, discrete and continuous variables, nominal and ordinal data, Interval and ratio data; Frequency distributions: Class intervals and class limits, Class boundaries the size or width of a class interval, class mark; general rules for forming frequency distributions; Histograms and frequency polygons; Relative frequency distribution; cumulative frequency distribution; Stem and leafplot, Bar chart, Pie chart, Line chart; Arithmetic mean: Weighted arithmetic mean, Properties of the arithmetic mean, Arithmetic mean from grouped data; Median: Median from grouped data; Mode: Mode from grouped data; Quintiles and percentiles; Dispersion or variation; Range; Variance and standard deviation: Variance and standard deviation from grouped data; Mean deviation; Inter quartile range and Inter quartile deviation; Coefficient of variation; Moments: Moments for grouped data, Skewness, Kurtosis.

## **AHSBP 1222 Basic Pathology (30:00)**

### ***General objective:***

To gain knowledge describing the sequence of pathological changes this occurs in various organs or tissues in common diseases.

***Course detail:***

Introduction: Cellular adaptations, necrosis, apoptosis & intracellular accumulation; Acute inflammation: Inflammation mediators, chronic inflammation; Wound healing: Factors influencing in wound healing, bone fracture and healing; Oedema: haemorrhage, thrombosis, embolism; Infarction: shock; Neoplasm: Characteristic of features of malignant and benign; Epidemiology; Carcinogens; Carcinogenesis, clinical aspects of neoplasia, paraneoplastic syndrome, laboratory diagnosis of cancer, tumour immunity, diseases of the immune system, auto immune disease: rejection and transplant, AIDS, amyloidosis;

**AHSBCH1231      Basic Community Health (15:00)*****General objective:***

To gain knowledge about epidemiology and prevalence of communicable diseases and focus on the prevention and control

***Course details:***

Epidemiology: Natural history of disease – primary, secondary, tertiary prevention; Descriptive epidemiology, Analytical epidemiology, Epidemiology and control of communicable disease, Epidemiology and control of non - communicable disease, Notification , Epidemiology and control of air bone infection, Epidemiology of water & food bone infection, Epidemiology and control of vector bone infection; Food poisoning; Aging: old age care; Drug abuse; Occupational health; Health education principles of learning: Method of Health Education, Person to person

communication; **Demography:** Source and collection of vital statistical data; Child care: general aspects; Maternal care: general aspects; Family planning; Sanitation.

## **AHSSFA 1240      Safety and First aid (00:08)**

### ***General objective:***

To enable the students to develop the basic skills in safety and first aid

### ***Course details:***

Introduction, Basic principles, Dressing & bandaging, Breathing & aspxia, Chest pain, Choking, Shock, Unconsciousness, Bleeding, Fracture & Dislocation, Injures of skin, Muscles & ligaments; Burns: Chemical & Electrical; Chemical splash in the eye, Poisoning; Miscellaneous conditions: Foreign bodies in the skin, eye, ear, nose, throat and stomach; Frostbite, Effects of heat, Cramps bites and stings; Transporting of injured persons; First aid box, Cardiac Pulmonary Resuscitation (CPR)

# **SUBJECTS FOR MEDICAL LABORATORY SCIENCES**

## **FIRST YEAR SECOND SEMESTER**

### **MLSIA 1264 Instrumental Analysis (30:60)**

#### ***Objectives***

Students will gain introductive knowledge of electronics and understand the uses of different instruments used in various medical laboratories and their applications along with their routine maintenance and also understand the importance of quality control in medical laboratory work.

#### ***Course details:***

Principle, applications and systematic maintenance and control of the following instruments Analytical Balance, Centrifuge, Ultracentrifuges, Incubator, pH meter, Oven, Vortex mixer, Magnetic stirrer, Autoclave, Water bath, Water distillation apparatus, Top loading balance, Bio Safety cabinets, Microtome; Tissue processor, Cryostat etc. HPLC, Microscopy: Light microscope, Fluorescence microscope; Phase contrast micro-scope, Dark field microscope; Electron Microscope, Spectro-scopy: Introduction to Visible and Ultraviolet spectrophotometer, Introduction to Fluorescence spectroscopy, Atomic spectroscopy, Infrared spectroscopy, Mass spectroscopy, Flame-photometry.



***Objectives***

Students will obtain knowledge about the use of specific biochemical principles and they should understand the biological variation and the clinical relevance of analytic results. They will be able to evaluate the medical probability of analytic results and to give priority to analyses in emergency situations.

***Course Details:***

Principles and applications of chromatography: Paper, Thinlayer, Adsorption, Ion exchange, Gel filtration and Gas chromatographies; Principles and applications of electrophoresis: Paper, Starch, Agar gel, Column and Immuno Electrophoresis; Analysis of fluids and electrolytes, Blood gases; Plasma proteins; Measurement of pH, Urinalysis, Stool analysis, Seminal fluid, CSF, Glucose estimation, Flame Photometry, Liver function tests, Quality assurance and internal control, Identity assurance and tests reception and treatment, Internal and external quality control.

**SECOND YEAR FIRST SEMESTER*****Objectives:***

The students should develop a balanced and unified vision on humans, with respect for their integrity and rights. They should gain knowledge and skills in communication, emphasizing

meeting people at different stages and ability levels in life and focus on specific problems in the profession.

***Course Details:***

Ethics: Basic theories on ethics, models, perspectives and dilemmas; Visions on values, humans and life; Focus on empathy, Medical ethics and ethical problems related to autonomy, integrity, informed consent and duty of secrecy, Ethical guidelines and basic values in professional work, Practical training in ethical reflection, Ethical dilemmas in the health- and social sector in general and in the work of laboratories in special, Training in ethical reflection. Communication: Professional use of communication, Inter professional cooperation, Socialization and social systems, Knowledge about differences in cultural background and communication, Conflicts: handle conflicts and conflict solutions, Focus on the user of health services, Description of necessary skills needed in interaction/cooperation, Communication in groups, The concept of illness and health, Communication process, Methods of Communication, Person to person communication.

**MLSHE 2125                      Haematology 1                      (45:60)**

***Objectives:***

Students will learn the basic haematology procedures followed in a laboratory and also learn to understand biological variation and the clinical relevance of analysis results. They will be able to evaluate the medical probability of analysis results.

### ***Course details:***

Composition of blood and normal haemopoiesis, Standard procedures for collection and handling of blood specimen in haematological analysis: Anticoagulants used in the specimen collection, Effects of storage, Reference ranges of haematological values for healthy individuals and the physiological variations, Principle behind the basic haematological techniques (Manual methods); Hb estimation, Packed Cell Volume (PCV), RBC (Red Blood Cell) count, Calculation of red cell indices, WBC (White Blood Cell) count, platelet count, manual differential count, reticulocyte count and ESR (Erythrocyte Sedimentation Rate), Automated blood count techniques Calibration of automated blood cell counters, Light Microscopy (Components of light microscope and its routine maintenance), Preparation and staining methods for blood and bone marrow films; Separation and concentration of blood cells, Examination of blood films for parasites, Blood cell morphology in health and disease (RBC, WBC and platelets), Morphological classification of anaemia: Iron metabolism and iron deficiency anaemia, Vitamin B 12 and Folate metabolism and Megaloblastic anaemia, Introduction to haemolytic anaemia, Quality assurance in Haematology laboratory.

## **MLSMM 2136      Medical Microbiology (60:60)**

### ***Objectives:***

The students should obtain basic theoretical knowledge of medical microbiology. Emphasis will be on structure, metabolism and replication of microorganisms, and their role as

causes of disease. They will also gain handful experience in the identification of common bacterial pathogens.

***Course details:***

General Bacteriology: Basic history of Microbiology, General Bacteriology: morphology, growth and multiplication, pathogenicity, genetics, nutrition and metabolism, culture methods Discovery and development of antibiotics, Sources and routes of microbial infection, Mode of spread & transmission of diseases, Sterilization and disinfection, Organization of a clinical Microbiology laboratory, Microscopic examination of bacteria, Growth and nutrition of bacteria, Common bacteriological culture media, Biochemical tests in the identification of bacteria, Bacterial genetics, Antimicrobial susceptibility testing, Systematic bacteriology.

**MLSMT 2144 Medical Laboratory Technology1 (45:30)**

***Objectives:***

The Students will gain introductive knowledge of electronics and understand the uses of different instruments used in various medical laboratories and their applications along with their routine maintenance.

***Course Details:***

X- ray diffraction patterns, powder technique, etc., Lasers, Fibre optics and polarization; Basic electronics: Electronic components, Analog and digital circuits, Use of instrument manuals and charts of circuitry, Maintenance, error seeking and

simple repair of instruments. Unit operations such as vacuum filtration, vacuum concentration, centrifugation, dehydration, freeze drying and spray drying; Biosensors and luminescence quenching, Sensors and automatic instrumentation in the control of temperature and pH; Electrochemistry and ion selective electrodes, Radioactive and stable isotopes: Definition, Different types of counters used for radioactivity measurements, Radio immunoassay, Biological effects of ionizing radiation, Radioactivity, Radiations, Interaction of radiations with matter, Concepts and units;Radioprotection and radiation safety: Dose equivalent and related concepts, Comparison of risks, Radiation risk considerations, Emergency treatment of radiation exposure, Radiochemistry: Principles and saturation analysis, Labeling techniques, Specific binding reagents, Radiochemistry and radio pharmacology: Cellular tracer handling, Preparation of radio nuclides, Analysis of basic radio chemicals.

## **SECOND YEAR SECOND SEMESTER**

**MLSMP2215                      Medical Parasitology                      (45:60)**

### ***Objectives:***

Students will acquire knowledge in medically important parasites elaborately and understand the various techniques that are used for the isolation and identification in a clinical laboratory and also they will carry out the basic procedures and get exposure to advanced techniques used in the identification of parasites.

### ***Course Details:***

Introduction; Microscopy and micrometry; Collection, transport and preservation of parasitological specimen, Protozoology: Malaria, Amoebiasis, Balantidiosis, Giardiasis, Cryptosporidiosis, Leishmaniasis, Trypanosomiasis, Toxoplasmosis, Trichomoniasis, Pathogenic free-living amoebae, Helminthes: Roundworm infection, Whipworm infection, Hookworm infection, Enterobiasis, Intestinal cestode (adult cestode) infections, Larval cestode infections, Larva migrans, Lymphatic filariasis, Other human filarial infections, Animal filariasis, Schistosomiasis, Trematode infections, AIDS related protozoa; Parasitic infections in immunocompromised people, Immuno diagnosis in Parasitology, Laboratory techniques in Parasitology, Storage of parasites, Entomology: Mosquitoes, Houseflies, Myiasis, Fleas, Lice, Bed bugs, Ticks, Scabies, Other mites (Transmit scrub typhus); Snakes & Snake bite Management: Identification of Snakes, Snake bite management.

**MLSIM 2225**

**Immunology (45:60)**

### ***Objectives:***

The students should gain basic theoretical knowledge on the composition and function of the immune system and understand the regulation of immune response. And also they should mainly acquire basic knowledge and skills of immunological techniques used in the laboratories.

***Course Details:***

Introduction of immunology: Cells & Tissues of the immune system, Immunity: definition and types, Vaccines: immunization schedules, Innate and acquired immunity, Mechanism of specific immune response, Mechanism of non specific immune response, Major Histocompatibility Complex, Hypersensitivity; Immunologic Techniques: Immunoglobulin structure & Function, Nature of antigen, Antigen Antibody interaction and detection, Precipitation, Agglutination, Immunofluorescence, Neutralization tests, Complement fixation test, Coombs test, Labelled immunoassays, Blotting Techniques; Immunity to infections; Serology of Infectious Diseases; Autoimmune Diseases.

**THIRD YEAR SECOND SEMESTER****MLSLR 3213 Laboratory Management and Record keeping (30:30)*****Objectives:***

Students will be able to understand the organization of a clinical laboratory and methods for proper documentation of laboratory procedures. They will also be trained to develop skills required for laboratory management.

***Course Details:***

Laboratory organization, Hospital administration, Health care organizational behaviour, Collection and receipt of specimen, Filing and indexing system, Skills required for management

roles, Need for documentation, Budget planning & How to use budget for productivity, Computer information system, non information system; Financing, Laboratory audit, Inventory and quality control, Quality assurance, Laboratory accreditation, Decision tree, Usage of quantitative techniques in management.

## **MLSTM 3226      Transfusion Medicine      (60:60)**

### ***Objectives;***

Students should gain knowledge in performing and interpreting routine immunological and blood bank procedures and also able to receive hands-on training in routine blood bank procedures.

### ***Course Details:***

Screening of donors; Antibody Screening Test; Perform pre-transfusion testing; Investigating adverse effects of transfusion; Compatibility and blood transfusion, Prepare and issue blood products and components storage, Perform daily blood product inventory; Inspection and disposition; Perform preventive maintenance on blood bank equipments; Transfusion Transmitted Diseases; Neonatal and obstetric Transfusion; Autologous Transfusion, Transfusion Reactions; Cryopreservation of blood; Haemotherapy and transfusion complications; Stem cell transplantation; Quality securing and internal control; Laboratory working condition and internal control systems and good manufacturing practice (GMP).



## **MLSCH 3235 Clinical Histotechnology (45:60)**

### ***Objectives:***

To enable the students to gain sufficient basic knowledge to understand and execute common and routine procedures in histology laboratories Students should also be able to prepare material for routine cytology and to do diagnostic work under the auspices of responsible cytologist.

### ***Course Details:***

Principles of practices of preparing clinical specimens for histological examination: Processing, Fixation, Decalcification, Embedding, Microtomy and Plastic embedding;

Processing Stage: Labelling of specimens, Preparing Fixatives, Identifying artefacts, Identifying end points of decalcification, Microwave fixation, Processing: Dealing with Manual Methods and Different kinds of Automatic Machines, Embedding; Microtomy Stage: Maintenance, care and Dealing with different kind of Microtomes and Microtome knives; Section Cutting: Dealing with necessary instruments, Preparing adhesives such as egg albumin, Preservation and cleaning slides, Setting Microtome, Trimming and cutting, Dealing with Floating sections, Drying slides, Cryostat Method: Introducing instrument and practice; Staining Stage: Preparing Stains; H-E staining & and special methods for different kind of tissues; Introducing Microwave staining Techniques, Mounting, Labelling and Maintaining Slides, Fine needle aspiration cytology, Immunohistochemistry

## **FOURTH YEAR SECOND SEMESTER**

### **MLSRM 4113 Research Methodology and Medical Statistics (45:00)**

#### ***Objectives:***

Students will identify the main sequence in research process, gain knowledge in research methodology and be able to apply this in health care research.

#### ***Course Details:***

Introduction; Defining the research problem: Selection of the research problem, selection of researchable topic, necessity of defining the problem, techniques involved in defining the problem; Literature survey: review of literature, concepts, principles and other aspects of problem review of researches previously conducted; Formulation of objectives: General and specific objectives & hypothesis; Research Design: features of good design, different research designs, methods of investigation sampling techniques; Collection of data: Methods of Data collection: Preparation of questionnaire, statistical techniques applicable in research: Processing & Analysis of Data; Interpretation of results; Preparation & presentation of report: report writing style, context, bibliography.

## **MLSCM 4125      Clinical Microbiology      (30:90)**

### ***Objectives:***

Students will gain hands-on experience in practical skills in diagnostic microbiology and able to focus the advanced methods used in clinical microbiology.

### ***Course Details:***

Preparation of culture media, Biochemical tests used to identify bacteria, Staining techniques, Basic and specific skills for the detection and identification of Common microorganisms from all body sites, Bacterial cultivation, Antimicrobial testing and Identification and determination of drug resistance, Special techniques used in clinical microbiology; Perform necessary techniques for the isolation and identification of the more unusual clinically significant microorganisms, Advanced techniques in clinical Microbiology: Elisa-based methods for detection of antigens and antibody.

## **MLSCB 4135      Clinical Biochemistry II (30:90)**

### ***Objectives:***

Students should gain technical knowledge in the procedures that are followed in clinical chemistry and able to get handful experience in chemical analysis. Students should understand the analytical principles and assess the results.

### ***Course Details:***

Urine analysis, Serology, Stool analysis; CSF & Fluid Analysis; Semen analysis; Renal function & its evaluation; Liver Function

Tests, Laboratory diagnosis of Diabetes mellitus; Endocrine Function Tests, Examination of Gastro intestinal Contents; Pregnancy Tests.

Gastric Functions and occult blood; Tests on Liver and biliary tract diseases; Tests in pancreatic diseases; Tests in renal diseases; Tests in diseases of the small intestine; Urinary and faecal pigments; Tests on gonadal function; Thyroid function test; Endocrine Function Test; Adrenaline, Noradrenaline and related compounds; Preparation and evaluation of urine sediments; Quantitative analysis: Laboratory analysis of therapeutic and toxic substances; Chemical and enzymological measuring methods; Enzyme catalyzed concentration measurements; Osmometry and ion selective electrodes; Automation, analytical principles, Quality of the analytical process and assessment of analytical results; Assessment of method evaluation/adaptation.

## **FOURTH YEAR SECOND SEMESTER**

### **MLSRP4217Research Project**

During the fourth year second semester, all the students will be involved in Research Project under supervision.

### **MLSIH 4225Immuno haematology (45:60)**

#### ***Objectives:***

Students will identify the blood grouping systems and should gain skills in basic procedures in blood grouping systems and also be able to interpret immunological procedures in routine work.

***Course Details:***

Blood cell antigens and antibodies; Clinical significance of red cell allo antibodies; Mechanisms of immune destruction of blood cells; Basic techniques to detect antigen and antibody reactions; Blood grouping system; Rh typing and antiglobulin test; Special tests (Elution, Adsorption etc.); Blood type systems and their clinical importance; Immunological blood diseases; Haemagglutination in different reaction condition; Pregnancy testing, Autoimmune haemolytic anaemia; Diagnosis treatment and prevention of haemolytic diseases in newborns; Laboratory control of anticoagulant; Thrombolytic and anti platelet therapy.

**MLSBM 4233 Biotechnology &Molecular Biology II (30:60)*****Objectives:***

Students will acquire knowledge in Biotechnology and Molecular biology and also develop the skills to perform the techniques used in biotechnology. They will be able to use this knowledge to enhance the diagnostic methods.

***Course Details:***

Introduction to Molecular Biology in Medicine, Application of genetics in medical science Introduction to genetic services, Overview of a genetic laboratory & its function, Outline of genetic disorders, Outline of cytogenetic investigations, Outline of Molecular genetic tests Computational genomics, sequence alignment and data analysis- Introduction to cell culture Applications of cell culture, Molecular biology: Advance

techniques, Molecular biology: DNA sequencing, Gene Therapy and stem cell research.

## **MLSBM 4241      Epidemiology (15:00)**

### ***Objectives:***

At the end of the course the students should be able to understand the epidemiology of communicable and non communicable disease and the role of Medical Laboratory Sciences in epidemiological studies.

### ***Course Details:***

Epidemiological measures, Applications of Epidemiological measures in laboratory sciences, Understanding surveillance, Disease surveillance methods, Surveillance in Sri Lanka for communicable diseases, Surveillance in Sri Lanka for out breaks, Surveillance in Sri Lanka for non communicable diseases, Role of Medical Laboratory Sciences in prevention of diseases, Role of Medical Laboratory Sciences in screening of disease, Role of Medical Laboratory Sciences in screening programmes.

# **SUBJECTS FOR NURSING**

## **FIRST YEAR SECOND SEMESTER**

### **NURNP 1265 Nursing Principles and Procedures -I (45:30:45)**

#### ***General objective:***

Student should be able to demonstrate and describe the basic principles of nursing to meet the health needs of the individual, family and community and able to develop skills to protect patients from hazards and infections.

#### ***Course details:***

Patient's Environment and Comfort rest and sleep: bed making, different types of beds, different positions used for client comfort, comfort devices, Common problems of sleep; apply Principles of body alignment to lifting moving turning and positioning; Personal hygiene & Health: Care of skin, care of mouth, eyes, nose, ears, hair, nails, menstrual hygiene; performing Vital signs: Temperature, Pulse, Respiration, Blood pressure & Oxygen saturation; Nursing Process/ critical thinking in nursing practice: history taking, and General Physical Examination, Formulating care plans.

## **NURNE 1272 Ethics & Professional Adjustment (30:00)**

### ***General objective:***

Students should be able to describe the historical growth and development of nursing, legal and ethical basis of nursing practice, international code of nursing ethics, characteristics and responsibilities of a professional nurse.

### ***Course details***

Definition of terms: Nursing, Profession, Nurse, Patient, Hospital, Physician/ Surgeon, Health team & ethics; ICN code of ethics ; Nursing as a Profession: Professional nurse, Responsibilities of a professional nurse, Professional Etiquette; History of Nursing: History of ancient period; Changing pattern of nursing; image of nurse; current status of nursing; Florence Nightingale; Legal Responsibilities: Crime, Defendant, Malpractice, Narcotic law, Negligence, Plaintiff, Toil, Wrong; Early adjustments: homesickness, social adjustments; Problem solving; Critical thinking; Identify the opportunities available for Nurses for Nursing Education & Nursing Services in Sri Lanka & other Countries; Registration and organizations: Sri Lanka Medical Council (SLMC), Sri Lanka Nursing Council (SLNC), CMCC, Graduate Nurses foundation; Explain the Organizations: Government Nursing Officers Union (GNOU), Sri Lanka Nursing Association (SLNA); International Organizations: International Council of Nurses (ICN), International Red Cross, WHO; Trends in Nursing:



## **NURMP1284 Microbiology and Parasitology (45:30)**

### ***General objective:***

To gain basic theoretical knowledge in Medical microbiology, Immunology and Parasitology and to develop practical skills in medical microbiology

### ***Course details:***

Microbiology: Morphology, growth and multiplication, pathogenicity, genetics, nutrition and metabolism of bacteria and culture methods, Discovery and development of antibiotics, Sources and routes of microbial infection, Mode of spread & transmission of diseases , Immunity, hypersensitivity reaction, Vaccines: immunization schedules, Systematic bacteriology, Virology, Mycology, Sterilization and Disinfection, Collection and transport of clinical specimens,

Parasitology: Protozoology, Malaria, Amoebiasis, Balantidiosis, Giardiasis, Cryptosporidiosis, Leishmaniasis, Trypanosomiasis, Toxoplasmosis, Trichomoniasis, Helminths: Roundworm infection, Whipworm infection, Hookworm infection, Enterobiasis, Intestinal cestode (adult cestode) infection, Larval cestode infections, Lymphatic filariasis, Other human filarial infections, Animal filariasis, Trematode infections.

Entomology: Mosquitoes, Houseflies, Fleas, Lice, Bed bugs, Ticks, Scabies, Other mites (Transmit scrub typhus) Snakes & Snake bite Management.

## SECOND YEAR FIRST SEMESTER

### **NURNP 2116Nursing Principles and Procedures II (45:30:90)**

#### ***General objective:***

Student should be able to describe the principles and carryout procedures of basic needs throughout life cycle, respiration needs, nutritional needs, temperature regulation, and administration of medication to meet the needs of the individual in health and illness.

#### ***Course details:***

Admission & discharge of a patient: Admission & discharge procedures according to the hospital Policy; Therapeutic and diagnosis measures: Collecting specimens, radiological examinations; Temperature regulations: body's mechanism for temperature regulation, fever & types of fever, applying heat & cold, therapeutic bath: sitz bath, Hot water bath, warm water bath, tepid sponging, soaks bath; Respiration needs: Physiology of respiration, factors affecting respiratory function, identify the signs & symptoms of abnormal breathing, nursing action and evaluation, oxygen administration; Nutritional needs: Nutritional needs of the person, factors affecting the needs, common problems of nutrition, and Nutritional assessment: Anthropometric measurement, nursing action and evaluation; Admission of medication: Types of medication, dosage, storage, principles and routes of administration of medication, nurses' responsibilities in the administration.

## **NURCA2123      Clinical Anatomy -      (30:30)**

### ***General objective:***

Student should be able to describe the normal structure of cells, tissues, organs and systems and their inter-relationships and able to identify the structures of human body in models and specimens and relate to clinical situations.

### ***Course details:***

Detail study of all systems; Organization of the Human Body; skin (integument); skeletal system: joints (articulations); muscular system; nervous system; endocrine system; cardiovascular system; lymphatic system; respiratory system; digestive system; Urinary system; Reproductive system; Embryology; Anatomical regions.

## **NURPA2133 Pathology      (30:30)**

### ***General objective:***

Student should be able to describe the causes and pathophysiologic changes in various disease conditions with their clinical manifestations, progress and outcome and apply that knowledge in the care of patients.

### ***Course details:***

Systemic: Special pathology of major organ systems; Respiratory tract: bronchial asthma, obstructive and restrictive airway disease, pneumonia and tuberculosis, lung tumours; Cardiovascular system: hypertension, ischemic heart disease, heart failure,

infective endocarditis, rheumatic vascular disease, varicose vein; Gastrointestinal Tract: diseases in oral cavity, oesophagus, stomach & intestine; Inflammatory bowel disease: diarrhoea; Liver: hepatitis, gall bladder stone; Endocrine system: thyroid gland, thyroid carcinoma, diabetes mellitus; Renal system: glomerular; Breast; Cervical cancer; Prostate cancer; Bones; CNS;

## **NURPH 2143      Pharmacology – I    (45:00)**

### ***General objective:***

The student should be able to acquire knowledge on principles of clinical pharmacology, pharmacology of different groups of drugs used in clinical practice, their unwanted effects and clinical applications and to learn skills and responsibilities related to medicine use that are expected from a nurse in clinical setting.

### ***Course details:***

Introduction; Terminology; Pharmacokinetics: Principles of administration of drugs, Routes of administration of drugs, Nurses responsibilities in the administration & safe custody of drugs; Antimicrobial: Introduction to chemotherapy, beta lactum antibiotics, antibiotics act on bacterial protein synthesis, antibiotics act on bacterial DNA synthesis, miscellaneous antibiotics, anti TB and anti leprosy drugs, anti malarial , anti amoebic drug and other anti protozoal agents, anti fungal agents, antiviral agents; Drugs acting on ANS: sympathomimetics and sympatholytics, cholinomimetic & anti cholinergics; Drugs acting on CVS: diuretics, drugs acting on RAS, drugs used in

coagulation disorders, drugs used in dyslipidaemias, anti angal agents, anti hypertensives, drugs used in HF , antiarrhythmic agents;

## **NURIP2152 Introduction to Psychology (30: 00)**

### ***General objective:***

The student should be able to assist the students to acquire knowledge of fundamentals of psychology and develop an insight into behaviour of self and others; this will enable them to develop positive attitude and good interpersonal relationships in the practice of nursing in all health care settings.

### ***Course details:***

Introduction to Psychology; Normal Development; Sensation; Attention; and Perception, Memory and forgetting, Thinking & Intelligence; Describe the different factors that influence in the development of personality during the various periods of life cycle; Explain the principles of motivation, learning and factors influencing learning; Apply the principles of mental health for self and while taking care of others, stress management; Identify social and emotional problems of individuals and make necessary adjustments; Psychological Testing; Thinking; Counselling: Types and technique.

## SECOND YEAR SECOND SEMESTER

### **NURNP 2215 Nursing Principles & Procedures – III (30:30:90)**

#### ***General Objective:***

General objectives: Student should be able to explain the principles and carryout procedures of pain, fluid and electrolyte, elimination, Asepsis and wound management to meet the needs of the individual in health and illness.

#### ***Course details:***

Pain avoidance: Physiology of pain, common causes of pain, types of pain perception, pain reaction, assessment, planning and intervention and evaluation in relieving pain; Fluid and electrolytes: Physiology of fluid and electrolyte balance, common problems, assessment, nursing actions and evaluation of the nursing care; Elimination needs: Anatomy and Physiology of the urinary tract, normal process of elimination, Problems of urinary system, assessment, nursing action and evaluation of the nursing intervention; Anatomy and Physiology of digestive system: Normal bowel elimination, common health problems, assessment, nursing action and evaluation of the nursing intervention; wound Management: wound classification, healing, types of suture, sitz bath and surgical dressing; Asepsis: Definition of terms, principles, methods used in asepsis and nursing procedures.

## **NURAH 2225 Adult Health Nursing 1 (40:20:90)**

### ***General Objective:***

Student should be able to describe the etiology, clinical manifestations & management of infectious disease, gastro intestinal disorders and cardiovascular disorders, apply nursing process/ problem solving approach in the care of patient with specific medical- surgical condition and assist with therapeutic and diagnostic procedures.

### ***Course details:***

Pre intra & postoperative nursing care of patients with various surgical conditions; Nursing process pertaining to patients with infectious diseases: Bacterial, Viral and Protozoal; Nursing process pertaining to patients with disturbance of : Gastrointestinal functions, Hepatic functions, Biliary functions, Pancreatic functions, Splenic functions, Mouth & Esophagus, Stomach & duodenum, Small & large bowel, Liver, Pancreas & gall bladder, Spleen; Nursing process pertaining to patients with dental disorders; Therapeutic & diagnostic procedures related to gastrointestinal procedure: Abdominal Paracentesis, Gastro Oesophagescopy, ERCP, Proctoscopy, Sigmoidoscopy/ colonoscopy, Digital Rectal examination, Liver biopsy/liver abscess aspiration; Nursing process pertaining to patients with disturbance in cardiovascular functions: Heart, Acquired-disorders, Disorder of peripheral vessels and Blood, Central Venous Cannulation.

## **NURCH 2234 Community Health Nursing 1 (30:15:70)**

### ***General Objective:***

Students should be able to promote family health & community health and describe the concepts of epidemiology and influence of environmental factors on health, prevention and control the communicable & non communicable diseases.

### ***Course details:***

Concept of Community: Community diagnosis, home visit, Family care; Concept of health; Dimensions of health, disease continuum; Definition of terms; Epidemiology: Natural history of disease: Epidemiological triad; Environmental health: Air, Ventilation, Lightening, Noises, Radiation, Meteorological environment, Disposal of solid wastes, Disposal of human excreta, Housing, Water; Water borne diseases; Occupational Health; Growth and development, Health Education; Role of community health nurse.

## **NURPH 2243                      Pharmacology II                      (45:00)**

### ***General Objective:***

Student should be able to describe the responsibility of a nurse in administration of drugs and to list the chemical names, doses, preparations & side effects of the various common drugs & therapeutic agents and also able to explain the principles of storage & make appropriate reports & records of drugs.



***Course details:***

Rheumatology; NSAIDs, immune modulators, drugs used in RA and Gout; Drugs act on RS: antihistamines & antitussives, drugs used in BA; Drugs acting on GIT: drugs used in PUD, anti emetics & laxatives, anti diarrhoeals; Endocrinology: DM, thyroid and anti thyroid drugs, corticosteroids, posterior pituitary hormone; Anaemia; IV fluids; Drugs act on CNS: CA, LA, skeletal muscle relaxants, opioids; Psychotropic drugs: anticonvulsants, drugs used in PD & migrane, hypnotics & anxiolytics, anti psychotics, anti depressants & mood stabilizers, substance abuse; Reproductive: sex hormones & related drugs, hormonal contraception, other drugs used in obstetrics; Malignant disease: drugs used in cancer chemotherapy; Topical preparations: Ophthalmic, dermatological etc; Bone disorders: Calcium & vitamin D, drugs used osteoporosis.

**NURSO 2252 Introduction to Sociology (30: 00)*****General Objective:***

This course is designed to provide nursing students with a through multidisciplinary, systematic, and comparative knowledge on sociology. The prime objective of the course is to train students to analyze and apply sociological knowledge in nursing practice.

***Course details:***

Introduction: Definition of sociology, Scope and subject matter of sociology, Sociology as a science, Importance of sociology; Fundamental concepts: Society, Community, Institution and

association, Social structures; Man, society and environment: Origin of society, Inter dependence between man and society; Social Processes: Co-operation and competition, Conflict and accommodation, Assimilation and isolation; Social groups; Marriage and family; Culture; System of social stratification; Social change: Factors influencing social change; Social planning and social reconstruction: Social legislation, Social security measures, selected social problems& social work.

### **THIRD YEAR FIRST SEMESTER**

#### **NURNP 3114 Nursing Principles & Procedures IV (30:30:45)**

##### ***General Objective:***

Student should be able to explain the principles and carryout procedures of security and self-esteem needs, sexual needs and safety needs to meet the needs of the individual in health and illness.

##### ***Course details:***

Security and self esteem needs: factors affecting security and self esteem, common health problems: assessment, planning, intervention and evaluation of nursing actions; Sexual needs: factors affecting sexual functioning, common health problems: assessment, planning nursing interventions, and evaluation of nursing action; Safety needs: Factors affecting the person's activity to protect himself, common safety problems, assessment,

planning, nursing interventions and evaluating safety measures; Care of patients with special conditions: Unconscious , chronically ill, convulsive, death, sensory alteration and immobile patient.

## **NURAH 3125            Adult Health Nursing II (45:30:45)**

### ***General Objective:***

Student should be able describe and apply nursing process/ problem solving approach in the care of patients with specific medical surgical conditions namely cardiovascular, respiratory, musculo- skeletal and breast disorders.

### ***Course details:***

Nursing process pertaining to patients with disturbance of endocrine & metabolic functions: Pancreas, Thyroid, Pituitary; Nursing process pertaining to patients with disturbance in respiratory functions: Nose & larynx, Bronchi, Lungs; Nursing process pertaining to patients with disturbance of musculo-skeletal functions: Bones, Joints & Muscles; Nursing process pertaining to patients with disturbance of Genito-urinary function, male reproductive organs, nephritis, renal failure, congenital anomalies, menstrual abnormalities, infection and inflammation; Nursing process pertaining to patients with disturbance of surgical infections and wound; Therapeutic & diagnostic procedures related to Cystoscopy, Supra pubic puncture, Peritoneal dialysis catheter, Fine needle aspiration biopsy , Kidney biopsy.

## **NURCH 3134 Community Health Nursing II (30:00:90)**

### ***General Objective:***

The students should be able develop knowledge, skills and attitude to improve individual, family and community on promotion of health and prevention of disease. Also able to know the national health programmes and organizational pattern of health care services and its activities available at MOH level for improve the maternal, child, reproductive health and to maintain relevant records, reports and registers at MOH

### ***Course details:***

Records, Reports & Registers in PHC; National Health Programme: Malaria Control Programme, Tuberculosis Control Programme, Leprosy Control Programme, Filarial Control Programme, Diarrhoeal Disease Control Programme, STD/ AIDS Control Programme, Family Health Programme, Immunization Programme, Role of nurse in all these programme; Demography and family welfare (family planning); Maternal and child health services: Antenatal care, Postnatal care, New born care, Infant and Child care; School health services; Primary Health Care.

## **NURCN 3144 Child Health Nursing 1 (30:15:70)**

### ***General Objective:***

Student should be able to assist the growth and development of healthy children and assist their nutrition and immunization.

***Course details:***

Introduction: Right of Child, Baby friendly Hospital, Biostatistics related to child health, Child care through the ages; New Born: Healthy new born, Assessment, Reflexes, Care of new born, Health problems of new born, High risk new born; Growth & Development: Developmental milestones, ECCD; Nutrition: Nutritional requirements, Balanced diet for children, breast feeding, weaning, feeding problem; Immunization: Immunization Schedule EPI, Vaccination, cold chain maintenance; Assessment of children: Use of specific charts & records; Illness & the child;

**NURDT 3153      Diet Therapy      (30:30:00)*****General Objective:***

The student is able to gain knowledge regarding diet & apply the principles of diet therapy in the care of people with various diseases conditions and provides advice to select proper nutritional diets for patients and families with alterations in different body systems.

***Course details:***

Introduction: Nutritional policies in Sri Lanka, Factors affecting food & Nutrition, Food classification, BMR; Nutritional requirement & menu plan: Balanced diet, Daily allowance for different age group, planning a menu; Family meal management: Nutrition in pregnancy, lactation, infancy, toddler/Preschool, school children, adolescence, adulthood & Geriatric; Feeding Methods: Hospital Diet, Types of feeding methods, Enteral

feeding & Parenteral feeding, Calculate the nutritional value of a given diet; Food Science: Cereal, Pulses, Nuts & Oil seeds, Milk & Milk Products, Fruits & Vegetables, Sugar & Sugar Products, Beverages & Spices; Introduction to Diet Therapy: Diet as a therapeutic agent, Modification of normal diet; Diet for patients with Gastro- Intestinal disorders; Diet for patients with liver disorders; Diet for patients with disorders of cardio-vascular system; Diet for patients with renal disorders; Diet for patients with metabolic disorders; Diet for patients with obesity and allergy.

## **THIRD YEAR SECOND SEMESTER**

### **NURPM 3216 Psychiatric & Mental Health Nursing (45:30:90)**

#### ***General Objective:***

The student should be able to describe and demonstrate the basic principles and concepts of mental health and psychiatric nursing in preventive, curative and rehabilitative aspects of care to patient of different age group under guidance in all settings.

#### ***Course details:***

Introduction to mental health: Principles and concepts of mental health, factors promoting mental health, characteristic of mental health person; Orientation to Psychiatry and psychiatric Nursing; Causes of mental illness; Principles and concepts of psychiatric Nursing: Therapeutic role of the nurse; Differentiate normal from mal adjusted behaviours: Describe etiology, clinical

manifestation, diagnosis and treatment of specific psychiatric disorders of all age group; Nursing process in the care of various psychiatric disorders; Provide promotive, preventive, curative and rehabilitative aspects of care to the patient; Community Psychiatry.

### **NURAH 3224 Adult Health Nursing III (30:00:90)**

#### ***General Objective:***

Student should be able explain and apply nursing process/ problem solving approach in the care of patients with specific medical surgical conditions namely eye, ear, nose, throat, dental, skin, breast, neurological disorders and trauma.

#### ***Course details:***

Nursing process pertaining to patients with disturbance in eye functions: congenital deformities, inflammatory, keratomalacia, glaucoma, cataract; Ear, Nose, Throat functions: otitis media, mastoiditis, hearing loss, congenital anomalies, epistaxis, sinusitis, upper respiratory infection; dental functions: gingivitis, periodontitis, abnormalities of teeth, dental plaque, caries, malocclusion, dental injuries, care of dentures; Skin diseases: allergic reaction, scabies, herpes, pediculosis, eczema, psoriasis, neoplasm; Breast disorders: Infections- mastitis, cysts, abscess, neoplasms; Neurological conditions: Meningitis, Encephalitis, Epilepsy; Nursing process pertaining to patients with trauma: head injuries, spinal cord Injuries, limb injury, chest injury& abdominal injury;

## **NURED 3235 Emergency & Disaster Nursing(45:00:90)**

### ***General Objective:***

The students should be able to get the skills and knowledge in regards to the emergency management in hospital as well as in the community settings and fulfil the role of nurse in

### ***Course details:***

Basic approach to emergency care: Emergency Nursing, Emergency Assessment, Pain Management, Emergency Triage, Management of Airway Obstruction; Management of Shock, Trauma; System Based Emergency Management: head injury, spinal cord injury, ocular emergencies, ear, nose& throat emergencies, respiratory system emergencies, circulatory system emergencies, endocrine emergencies, musculoskeletal system emergencies, integumentary system emergencies; Poisonings: CPR: Paediatric, Geriatric and Psychiatric Emergencies; Disaster nursing: Types, Mitigation, Disaster Management, Planning & Nurses role in disaster Management;

## **NURCN 3245 Child Health Nursing II (45:00:90)**

### ***General Objective:***

Student should be able to explain the etiology, pathophysiology and treatment for childhood disease and disorders and apply nursing process/ problem solving approach in caring for the children in all settings.



### ***Course details:***

Health Deviations: The Child with respiratory dysfunction: upper respiratory infection, pneumonia, bronchitis, bronchial asthma, viral induced wheezing; Gastro intestinal disorders: congenital abnormalities, infectious diseases, peptic ulcer, & cirrhosis; Blood disorders: anaemia, thalassemia, hamophilia, leukaemias, lymphomas; Cardiac disorders: congenital heart deformities, rheumatic fever, congestive heart failure, infective endocarditis; Genito urinary disorders: renal failure, urinary tract infection, acute glomerulonephritis; Neurological disorders: convulsive disorders, cerebral palsy, spinal defect, Meningitis, Hydrocephalus, encephalitis & mental retardation; Endocrine dysfunction: dwarfism, diabetes incipidus, gigantism, acromagaly; Integumentary dysfunction: scabies, impetigo, burns; Skeletal dysfunction: fractures, congenital deformities, osteomyelitis, fractures; Communicable diseases: neonatal infection, typhoid, mumps, measles, chickenpox & pertussis.

## **FOURTH YEAR FIRST SEMESTER**

### **NURRM 4113 Research Methodology & Medical Statistics (45:00)**

#### ***General Objective:***

The student should be able to state the definition and basic principles of research, explain the purpose and objectives of nursing research, identify problems for research study, plan and conduct simple research related to nursing, present research

findings, appreciate the importance of research in raising the standard of patient care

***Course details:***

Introduction; Defining the research problem: Selection of the research problem, selection of researchable topic, necessity of defining the problem, techniques involved in defining the problem; Literature survey: review of literature, concepts, principles and other aspects of problem review of researches previously conducted; Formulation of objectives: General and specific objectives & hypothesis; Research Design: features of good design, different research designs, methods of investigation sampling techniques; Collection of data: Methods of Data collection: Preparation of questionnaire, statistical techniques applicable in research: Processing & Analysis of Data; Interpretation of results; Preparation & presentation of report: report writing style, context, bibliography.

**NURMN 4123      Maternity Nursing - I      (45:00)**

***General Objective:***

Student should be able to assess the physical and mental needs of the child bearing women and understand normal pregnancy, labour, new born & assist in conducting delivery.

***Course details:***

Review of anatomy and physiology of female reproductive system; Menstrual cycle; Fertilization & development of foetus: Conception an embryonic development: Gametogenesis,

Fertilization, Placenta & Amniotic fluid, Foetal circulation; Pregnancy: physiological changes in pregnancy and minor disorders in pregnancy; Normal Labour and Physiology of puerperium: Foetal skull, Female pelvis, stages of Labour, partogram, Placental delivery, Induction of Labour, Involution of uterus & Post natal care; Influence of maternal nutrition, exercise and relaxation; health and environment on the developing foetus; postnatal check-up, post natal exercises; Normal new born: physiology of newborn, Care of new born, bath, immunization; Breast-feeding; Family Planning Methods.

### **NURMN 4134 Maternity Nursing Practice - I (00: 30: 135)**

#### ***General Objective:***

Students should maintain a maternity record book during their maternity posting. Completion of their ward postings of maternity, they have to fulfil the following requirements and submit the record book in nursing department.

#### ***Detail work***

During the posting they have to perform breast examination & teach self-breast examination, describe female pelvis with regards to diameters and land marks, take obstetrical history, perform general physical examinations on antenatal mothers, perform abdominal examinations on pregnant mothers, perform urinalysis for antenatal mothers, measure blood pressure, health educate on preparation of delivery, health educate on ante-natal exercise, demonstrate mechanism of normal labour, prepare the

mother for labour, perform vaginal examination, conduct uncomplicated labour under supervision, assist repair of episiotomy, manage an immediate post-partum mother in the labour room, perform postnatal examinations, perform post natal care, provide care of episiotomy, assist in breastfeeding, perform new born examination, document the delivery details & perform immediate care of new-born.

### **NUREN 4134 Emergency Nursing Practice (00:30:135)**

#### ***General Objective:***

Students should be able to apply knowledge to provide efficient nursing care during emergency and disaster situations either in hospital setting or in disasters.

#### ***Detail work***

During their posting they have to provide nursing care for patients in critical care units in critical care Units & Intensive Care, perform emergency nursing management for patient with the different medical emergencies, use the equipment & supplies in critical care unit, perform CPR, recognize the protocols in emergency situations, use the Drugs used in Critical Care Units , Intensive Care, perform proper documentation, recognise the disaster preparedness in various situation.

## **NURLM 4142 Leadership & Management in Nursing (30:00)**

### ***General Objective:***

Student should be able to describe the concepts, principles and methods of management and apply these principles in hospitals and community settings.

### ***Course details:***

Introduction: Concept , principles , characteristics & levels of management, management process; Ward management; Describe the management process; planning, organization, staffing, leading & directing, controlling; Communication; Human resource management: Job description, process pf HRM, recruitment & selection process; Job description of various personnel; Budget planning; Material management: Inventory and quality control; patient assignment and rotation; Principles of supervision & Guidance; Documentation: Maintenance of records or reports; Performance Appraisal, Group dynamics.

## **NURTL4153                      Teaching & Learning                      (30:30)**

### ***General Objective:***

Student should be able to outline the principle and concepts of theories of education, methods of teaching and curriculum development and use this knowledge while preparing implementing and evaluating teaching programmes at various settings.

***Course details:***

Philosophy of education; Aim & trends in education & nursing education; Nursing curriculum: curriculum planning, course planning & unit planning; Educational objectives & domains; teaching & role of nursing educators; Principles & methods of teaching; Concept of Good teacher and good learning; Review of principles of educative process; learning process and communication; Teaching- learning methods; class room & clinical teaching; Teaching plan & Aids; Evaluation.

## **FOURTH YEAR SECOND SEMESTER**

### **NURRP 4217          Research Project**

During the fourth year, all the students should submit an individual Research Project (7 credits) under the supervision.

### **NURMN 4223          Maternity Nursing II          (45:00)**

***General Objective:***

Student should be able to describe the high risk pregnancy, abnormal labour, high risk new born & assist in conducting abnormal delivery, guide the health personnel in the care of mother and baby and provide appropriate intervention in emergency situations in obstetrics.

***Course details:***

Abnormalities of pregnancy: Multiple pregnancies and its management, Hyperemesis gravidarum, ectopic pregnancy,

trophoblastic neoplasia , Hydatidiform mole, placenta praevia, abruption placenta & ante partum haemorrhage; diagnosis and management of high risk pregnancies and nursing care; Diseases complicating pregnancy: Hypertension, anaemia, heart disease, diabetic mellitus, Rh iso immunization, bronchial asthma; Abnormal labour; Forceps delivery, caesarean section, preterm pre labour rupture of membrane, prolonged labour, mal position, pre term labour; Abnormalities of placenta & amniotic fluid: polyhydramnios, oligohydramnios; Obstetrical emergencies: ante partum & post partum haemorrhage, shoulder dystocia& uterine rupture; Abnormal puerperium: postpartum hemorrhage, retained placenta, placenta accrete, uterine inversion, puerperal sepsis, breast complications, psychological disorders during puerperium.

## **NURMN 4234 Maternity Nursing Practice II (00:30:135)**

### ***General Objective:***

Students should maintain a maternity record book during their maternity posting. Completion of their ward postings of maternity, they have to fulfil the following requirements and submit the record book in nursing department.

### ***Detail work:***

During the ward posting they have to perform general physical examinations on antenatal mothers, perform abdominal examinations on pregnant mothers, prepare the mother for labour, perform vaginal examination, conduct uncomplicated labour under supervision, assist repair of episiotomy, manage an

immediate post-partum mother in the labour room, provide care to a post natal mother with abnormal delivery, perform postnatal examinations & post natal care, provide care of episiotomy, assist IUD insertion, assist in breastfeeding, perform new born examination, document the delivery details & perform immediate care of new-born.

## **NURGN 4234 Geriatric Nursing Practice (00:30:135)**

### ***General Objective:***

Students should be posted in a geriatric ward or an old aged home for their practice. During their posting they are requested to perform the following requirements.

### ***Detail work:***

Assisting the client with walking, changing position, lifting, transporting, daily care- brushing, bathing, dressing and grooming, help in active and passive physical exercises, providing medications, organize spiritual events, documentation ---maintain daily care note, plan and prepare meals according to the nutrients requirement and condition of the client; Assess and care the client with common problems: bedsores, urinary tract infection, incontinent of urine & stool, prostatitis, hearing problems, alzheimer's disease, dementia, depression, arthritis/ osteoporosis, parkinson's disease, diabetics; perform therapeutic communications with older adults.



## **NURGN 4242      Geriatric Nursing (30:00:00)**

### ***General Objective:***

At the end of the course, the students should be able to describe the problems of older adults and provide appropriate care for them

### ***Course details:***

Overview of ageing: terms, theories, rights of elders, attitudes about ageing; Physical changes and common problems: physiological changes in all systems; Effects of impairment on communication; Problems affecting mental health: dementia, delirium, depression; Cognition and perceptual needs; Nutrition and fluid balance: changes in body composition, nutritional assessment, identify the risk client; Safety needs of older adults: falls, burns, poisoning & accidents; Love & Sexual needs: Changes in reproductive organs and sexual behaviour, barriers to sexual health and measures to solve the problem; Spiritual needs; coping and Stress: methods to reduce the stress; Rest and Sleep; Medications for elders; Promoting quality of life: Recommended healthy practices; End of life care.

# **SUBJECTS FOR PHARMACY**

## **FIRST YEAR SECOND SEMESTER**

### **PHABMP 1264 Basic Microbiology and Parasitology (45:30)**

#### ***General Objectives:***

To gain basic theoretical knowledge in Medical microbiology, Immunology and Parasitology and to develop practical skills in medical microbiology.

#### ***Course Details:***

Microbiology: Basic history of microbiology; Bacteria: Morphology, growth and multiplication, pathogenicity, genetics, nutrition and metabolism, culture methods, rickettsiae; Virus: Classification, structure, reproduction, general characteristics; Fungi: Classification and morphology, disease caused by them; Discovery and development of antibiotics; Sources and routes of microbial infection; Mode of spread and transmission of diseases; Bacteriology of water and milk: Pasteurization; Sterilization and disinfection; Immunity: Definition and types; Antigen-antibody reactions: Hypersensitivity reaction; Vaccines: Immunization schedules, principles of passive immunization and its significance in clinical medicine.

Parasitology: Protozoology: Malaria, amoebiasis, balantidiosis, giardiasis, cryptosporidiosis, leishmaniasis, trypanosomiasis, toxoplasmosis, trichomoniasis, pathogenic free-living amoebae; Helminths: Roundworm infection, whipworm infection, hookworm infection, enterobiasis, intestinal cestode (adult

cestode) infection, larval cestode infections, larva migrans, lymphatic filariasis, other human filarial infections, animal filariases, schistosomiasis, trematode infections other than schistosomiasis; Entomology: Mosquitoes, houseflies, myiasis, fleas, lice, bed bugs, ticks, scabies, other mites (transmit scrub typhus); Snakes and snake bite management: Identification of snakes, snake bite management.

## **PHACH1273 Pharmaceutical Chemistry I (30:30)**

### ***General objectives***

To enable the students to gain

- i) Basic knowledge in atomic and molecular structure and bonding and
- ii) Better understanding about impurities in pharmaceutical substances and pharmaceutical inorganic official compounds and basic concepts of coordination chemistry and its application in Pharmacy.

### ***Course Details:***

Atomic structure: Sub atomic particles, Cathode rays, Positive rays, Nuclear scattering experiments, Rutherford and Bohr models for atom, Heisenberg uncertainty principle, Black body radiation, Photoelectric effect, Compton effect, de Broglie's equation, Introduction to Quantum theory, Atomic orbitals and their shapes, Principles relating electronic configuration of elements; Bonding and properties of molecules: Ionic, Covalent and Coordinate bonding, Molecular structure, Introduction to molecular orbitals, vander Waal's forces, Hydrogen bonding, Metallic bonding, Bonding in molecules and their shapes,

Hybridisation, Valence shell electron pair repulsion theory, Delocalisation, Magnetic properties, Polarisation, Electro negativity, Dipolemoment, Fajan's rules; Systematic chemistry of group I to group VII elements and noble gases; Sources of impurities in Pharmaceutical substances; Official limit test: Limit test for chloride, sulphate, iron, heavy metals, arsenic and lead; A systematic study of the following inorganic compounds for their preparation, properties, assay and uses: Oxygen, sulphur, selenium, halogens, nitrogen, phosphorus, boron, silicon, titanium, calcium, barium, lead, sodium, potassium, copper, silver, gold, magnesium, zinc, mercury, arsenic, antimony, bismuth, iron and aluminium; A study of theory of Volumetric and Gravimetric analysis and choice of indicator in assay; Coordination chemistry: Nomenclature, Isomerism and bonding in coordination compounds, Preparation, properties and stability of coordination complexes, Preparation and uses of coordination complexes as chemical reagents in Pharmaceutical analysis.

## **PHACE 1284 Pharmaceuticals (45:30)**

### ***General objectives:***

To enable the students to obtain knowledge about

- i) Historical background of Pharmacy profession and
- ii) Preparation of various dosage forms

### ***Course Details:***

Pharmacy Profession: Pharmacy as a carrier, Pharmaceutical education; History of Pharmacy: Periodical development of pharmaceutical field; Metrology: Metric weights and measures,

Basic derived S.I. weights and measures, Weighing–selection and care of weights and balance, Weatphal balance, Sensitivity reciprocal and minimum weighable quantities, Density - absolute, apparent and relative, Specific gravity, Specific volume; Introduction to dosage form; Classification of Dosage forms, Concepts of formulation, Route of administration, Introducing Pharmacopoeias and formularies, Historical background and developments of dosage forms; Dosage forms: Definition, Ideal requirements, Preparation of official and other important products and uses of liquids (Solutions, Syrups, Elixirs, Spirits, Aromatic waters, Liquids for external use); Suspensions; Emulsions; Powders and Granules; Semisolids (Ointments, Creams, Pastes and Jellies); Solid: Tablets and capsule; Suppositories and Pessaries; Medicinal gases: Official medicinal gases and their uses, containers and fittings, handling and storage; Crude extracts: Principles and methods of preparation of soft and liquid extract from fresh and dry drugs and their uses; Allergenic extracts: Types of allergens, Preparation of extracts, testing and standardization of extracts, general preparation; Radiopharmaceuticals: Preparation of radio pharmaceuticals, Facilities and work area, Therapeutic and diagnostic uses.

## SECOND YEAR FIRST SEMESTER

### Second year first semester

#### **PHACE 2134 Pharmaceutics II (45:30)**

##### ***General objectives:***

To enable the students to obtain knowledge about

- i) Pharmaceutical calculations and dispensing techniques of various dosage forms and
- ii) Patient medication counseling and safe use of medication

##### ***Course Details:***

Pharmaceutical calculation: Posology: Definition, Factors determining dose of drugs, Adult dose of important drugs and their route of administration and method of calculating children dose, Percentage calculation, Calculation based on Alligation method, Alcohol dilution, Proof spirit, Hydrometers, Isotonic solution and displacement value; Prescription: Definition, Latin terms used in prescriptions, Form, Handling, Maintenance of records and pricing of prescription, Prescription refilling, Copies of the prescription order and importance of patient compliance with prescribed medication; Dispensing Techniques: Compounding and dispensing procedures, Storage and stability of medicines, Labeling of dispensed products, Principles involved in the procedures adapted in dispensing of various dosage forms, Containers and closures for packaging of dosage forms; Incompatibility: Definition, Types of incompatibility - physical, chemical and therapeutic, Responsibility of pharmacist in overcoming incompatibilities in prescription; Surgical

supplies:Surgical dressings: Fibres, Fabrics, Bandages, Self-adhesive plasters, Compound dressings; Safe use of medications: Errors, Factors contributing such errors and corrective measures, Dispensing of Radiopharmaceuticals.

## **PHACG 2154 Pharmacognosy (45:30)**

### ***General objectives:***

To enable the students to gain knowledge in

- i) Basic concepts of plants studies related to pharmaceutical field and
- ii) Pharmacognostic studies of a naturally occurring medicinal crude drugs and their evaluation techniques.

### ***Course Details:***

Introduction: Historical background, Present status and future scope of Pharmacognosy; Different systems of medicine practice in Sri Lanka: Allopathy, Ayurvedic, Unani, Siddha and Homoeopathy; Various systems of classification of drugs from biological origin: Chemotaxonomy, Serotaxonomy; Introduction to medicinal plants: Parts of medicinal plants, Plant physiology, Plant biochemistry with special reference to basic metabolic pathways, General methods of cultivation, collection and processing of drugs, Source, cultivation, collection and preparation of drugs for market, Diagnostic characters (both macroscopic and microscopic), Constituents, Chemical tests, Substitutes and adulterants, Uses of organized drugs which are obtained from Barks, Woods, Leafs, Flowers, Seeds, Fruits, Whole Plants, Root & Rhizomes and unorganized drugs with

special examples; Study of Source, Characters (macroscopic and microscopic), Constituents and preparation for pharmaceutical uses of important materials: Materials of mineral origin, Powder of natural occurrence, Important commercial fibres used in pharmacy, Essential oils, Marine natural products, Surgical dressings and Pharmaceutical enzymes; Analytical Pharmacognosy: Drug adulteration, Drug Evaluation and Quality control of herbal drugs; Nutraceuticals; Principles involved in the preparation & standardization of Ayurvedic, Siddha formulations; Natural pesticides; Immunopharmacognosy.

## **PHACH 2124 Pharmaceutical Chemistry II 45:30)**

### ***General objectives:***

To enable the students to gain better understanding in

- i) Basic concepts in Organic chemistry
- ii) Synthesis, reactivity and pharmacopoeial standards of Organic compounds and their applications in Pharmacy.

### ***Course Details:***

Basic concepts in Organic chemistry: Hybridisation in carbon compounds, Conjugation, Aromaticity, Inductive effect, Mesomeric effect, Steric effect, Organic acids and bases, Stability and reactivity of reaction intermediates (Carbanion, Carboniumion, Carbene and carbon free radical), Mechanisms of reactions (Substitution, Elimination and Addition) and factors affecting these reactions; Geometrical isomerism: Nomenclature and configurational assignment of olefins and oximes; Optical isomerism: Molecular dissymmetry and optical activity, Chirality



and configuration, Notations of configuration (Fischer and Newman Projection formulae, Sawhorse representation), Configurational nomenclature (D – L, erythro – threo and R – S systems), Racemic modifications (Formation, Properties and Resolution); Atropisomerism in biphenyls, Enantiomerism in allenes and spiranes; Conformation and chemical reactivity of 6-membered saturated rings; Asymmetric synthesis: Stereoselective and stereospecific reactions, Application of chiral auxiliaries, chiral reagents and chiral catalysts; Synthesis, Reactivity, Test for purity, Assay and Medicinal uses of important pharmacopoeial compounds of hydrocarbons: Alkyl and aryl halides, Alcohols and phenol, Ethers, Carbonyl compounds, Amines, Diazonium salts; Classification, nature, nomenclature, synthesis and important reaction of heterocyclic compounds and study the heterocyclic derivatives used in pharmacy (5 – and 6-membered and bicyclic heteroaromatic compounds); Properties, Synthesis and Reactivity of alicyclic compounds and polynuclear aromatic hydrocarbons.

## **PHACL2143 Pharmacology and Pharmacotherapy I (45:00)**

### ***General objectives:***

- i) Description of movement of drugs (pharmacokinetics) and effect of drugs (pharmacodynamics) within the body and the factors influencing them.
- ii) Understanding the basis of drug interactions and drugs dosage.

- iii) Description different types of adverse drug reaction (ADR), ADR monitoring and reporting.
- iv) Description of the pharmacology of chelating agents and their use in heavy metal poisoning and general management of poisoning.
- v) Description of principles of antimicrobial therapies and chemoprophylaxis, pharmacology, adverse effects and therapeutic applications of antibiotics, antiviral antifungal, anthelmintic and antiprotozoal agents.
- vi) Brief description of pathophysiology and clinical features of infections and the drug their drug therapy.

### ***Course details:***

Introduction to pharmacology; Pharmacokinetics; Pharmacodynamics; Factors influencing drug response; Drug interactions; Drug dosage & Therapeutic Drug Monitoring. Introduction to Toxicology; Adverse Drug Reactions; Heavy Metal Poisoning and Chelating Agents; Management of Poisoning. Introduction to Chemotherapy; Sulphonamides; Quinolones & Urinary Antiseptics; Beta Lactum antibiotics; Aminoglycosides; Macrolides & related drugs; Tetracyclines; Chloramphenicol & other Antibiotics; Antituberculosis Agents; Antimalarial Agents; Antiamoebic agents; Anthelmintic agents; Antifungal drugs; Antiviral agents. Respiratory tract infections; GIT infections; Urinary tract infection; Rheumatic Fever and Endocarditis; Meningitis, Cerebral abscess, Encephalitis; Tuberculosis; Treatment of Malaria; Treatment of Amoebiasis and other protozoal infections.

## **PHAMB 2163 Pharmaceutical Microbiology (30:30)**

### ***General objectives:***

To enable the students to acquire knowledge about

- i) Microbiological control methods, sterilisation and
- ii) Preservation techniques used in Pharmaceutical manufacturing.

### ***Course Details:***

Role of microorganisms in causing hazards and contamination of pharmaceuticals; Microbial control methods used in pharmaceuticals: Sterilisation different techniques, Control of microbes by sterilisation, Chemical agents and physical agents used to control microorganisms in pharmaceuticals, Aseptic preparation of ophthalmic solutions and injections, Sterility techniques in pharmaceutical products; Resistance of microorganisms to chemical, physical, antimicrobial agents; Microbial quality assurance: Limit and standard; Disinfection: Factors influencing disinfection, Dynamic of disinfection, Disinfectants and antiseptics and their evaluation; Microbiologically generated pharmaceuticals: Vitamins, Enzymes, Antibiotics, Alcohols, Insulin; General principles of pharmacopoeial methods of microbiological assays with reference to vitamins and antibiotics; Sutures and ligatures: Types, Preparation, Standards and Evaluation.

## **PHAMM 2111 Pharmaceutical Mathematics (15:00)**

### ***General objectives:***

To gain basic knowledge in mathematics which are applied in Pharmaceutical field.

### ***Course detail:***

Mathematics: Equations-simultaneous and quadratic, Exponentiation, Logarithms and basic trigonometry, Limits, Differentiation, Maximum, Minimum and Integration; Algebra, Matrices (up to 4th order) set theory, Trigonometry, Calculus and Differential equation

## **SECOND YEAR SECOND SEMESTER**

## **PHACE 2234          Pharmaceutics III (45:30)**

### ***General objectives:***

To enable the students to obtain knowledge about the physiochemical properties of pharmaceuticals used in formulations.

### ***Course Details:***

Physiochemical properties of gases, liquids and solids: Density, Molecular volume, refractivity; Solution: Solubility, Factors affecting solubility, Steady state diffusion, Dissolution, Drug release, Diffusion principles in biological system and Isotonic solution; Colloids: Introduction, Types of colloidal systems, Properties of colloids - Optical, Kinetic and Electric, Solubilisation; Rheology: Viscosity, Newtonian and Non

Newtonian fluids, Thixotropy and its applications, Rheology of disperse system, Viscometers; Coarse dispersion: Suspension: Interfacial properties of suspended particles, Flocculation and Defflocculation in suspension, Formulation of suspension; Emulsion: Theories of emulsification, Physical stability of emulsion, Preservation of emulsion, Rheologic properties of emulsion, Phase equilibria and emulsion formulation, Special emulsion system and gels; Surface and interfacial Phenomena: Liquid interfaces, Adsorption at liquid interfaces, Electrical properties of interfaces, Surface tension and it determination, Classification of Surfactants; Micrometrics: Particle size, Size distribution, Methods of determining particle size, Particle shape and surface area, Pore size, Derived properties of powders; Kinetics: Decomposition and stabilisation of medicinal agents, Accelerated stability analysis, Kinetic of drug transport; Complexation& Protein binding:Complexation: Definition, Classification, Methods of analysis; Protein binding: Experimental methods of protein binding, hydrophobic interaction, competitive binding, significance of protein binding; Photochemistry: Significance of photochemistry in pharmacy, Application of photochemistry; Catalysis:Theory of catalysis and its application in Pharmacy.

### **PHACH 2224 Pharmaceutical Chemistry III (45:30)**

#### ***General objectives:***

To enable the students to gain better understanding in fundamentals of Physical chemistry and its applications

### ***Course Details:***

Fundamentals of Physical Chemistry: Salts of weak acids and bases, Influence of pH on dissociation of weak acids and bases, Dissociation constant, Degree of dissociation, Common ion effect, Solubility product, Partition coefficient, Extraction; Phase equilibria: Gibbs Phase rule, One component systems, Two component systems (Miscible, Partially miscible and Immiscible liquids), Henry's law, Solubility of solids (ideal and real solutions), Raoult's law, Osmosis, Three component systems, Construction of phase diagrams, Phase interface (Liquid/ gas and Solid/gas interfaces), Adsorption and its utilisation; Electrochemistry: Characteristics of electrolytes, Ostwald's law, Activity coefficient, Ionic strength, Debye – Hückel equation, Faraday's law, Electrical conductivity of solutions and its measurement, Ampholytes, Mobility of ions, Electrode potential, Oxidation-Reduction potential, Types of electrodes, Electrochemical cells, Electromagnetic force and pH measurements, Electrometric analysis (Potentiometry, Polarography, Amperometry, Coulometry, Conductometry and Colorimetry); Chemical thermodynamics: Basic concepts, work, reversible and irreversible expansions, Isothermal and Adiabatic processes, First law of thermodynamics, Internal energy, Enthalpy, Heat capacities, Joule – Thomson effect, Thermochemistry, Second law of thermodynamics, Entropy, Free energy and work functions, Gibbs – Helmholtz equations, Clapeyron equation, Clausius – Clapeyron equation, van't Hoff's isotherm and isochore, Chemical potential and its variation with temperature and pressure, Gibbs-Duhem equation; Chemical kinetics: Rate,

order and molecularity of chemical reactions, Zero-order, First-order and Second-order reactions, Determination of order and rate constant (differential method, Half-life method and flooding), factors affecting the rate of chemical reactions, kinetics of catalysis; Photochemistry: Basic concepts, Laws of photochemistry (Grothas – Draper law, Stark – Einstein law), Quantum yield, Photosensitized reactions, Fluorescence and Phosphorescence; Crystal systems: Habit, Elements of symmetry, Miller indices, Unit cells, Bragg's equation and measurement of diffraction angle, Classification of crystals, Crystal defects.

## **PHACL 2242 Pharmacology and Pharmacotherapy II (30:00)**

### ***General objectives:***

- i) Description of pharmacology, adverse effects and therapeutic applications of drugs acting on autonomic system, renal system, cardiovascular system and blood and blood forming organ.
- ii) Brief description of pathophysiology, clinical features and drug therapy of disorders of autonomic and cardiovascular systems.
- iii) Description of pharmacology, adverse effect and therapeutic applications of drugs acting on immune system.
- iv) Description of role of autacoids in homeostasis and pharmacology, adverse effects and therapeutic applications of drugs act by interfering autocoids actions and drugs used in bronchial asthma.

- v) Brief description of pathophysiology, clinical features and drug therapy of bronchial asthma and rheumatoid and related disorders.

***Course details:***

Cholinomimetics; Anticholinergics; Sympathomimetics; Sympatholytics; Myasthenia Gravis, OP poisoning ; Drugs acting on kidney: Renin-Angiotensin system & related drugs, Diuretics & Antidiuretics; Drugs acting on cardiovascular system: Antianginal agents, Antihypertensive agents, Drugs used in heart failure, Antiarrhythmic agents, Antihyperlipidaemic agents; Drugs acting on blood and blood forming organs: Haemopoietic agents, Drugs used in coagulation disorders; Disorders of cardiovascular system: Cardiac failure & Arrhythmias, Hypertension & Coronary artery diseases, Anaemias, Immune modulators & Vaccines. Histamine, Bradykinin & their Antagonist; Serotonin & related drugs; Eicosanoids; Non-Steroidal Anti-Inflammatory Agents & Drugs used in Rheumatoid Arthritis & Gout; Drugs used in bronchial asthma; Respiratory disorders: Bronchial asthma & Chronic obstructive pulmonary diseases; Rheumatoid Arthritis; Collagen disorders Arthropathies, etc.

**PHACP2212 Community Pharmacy (30:00)**

***General objectives:***

To enable the students to acquire knowledge about

- i) The community pharmacy facilities, services, management and its legislation



ii) Psychological application in the pharmacy profession

***Course details:***

Role and contribution of pharmacist in community health care and education; Community pharmacy facilities: Pharmacy premises, Dispensing area, Storage of Medicines, Equipments, Reference books, Rest rooms; Personnel: Pharmacist/Chief pharmacist, Apprentice pharmacist, Supportive personnel; Professional conduct of pharmacists; Staff training and development; Continuous professional development (CPD); Pharmaceutical services: Reception and assessment of prescription, assembly of the required medicine or product, Good Compounding Practice (GCP), Good Labelling of Medicine (GLM), Packing of medicine, Dispensing, Patient medication counseling, Forged prescriptions, Medication errors, and Disposal of expired medicines; Documentation: Prescription book and Patient's Medication records (PMR), Non-prescription medicine; Pharmacy Management: Quality management, Inventory management, Responsibilities of the management, Client/customer services; Legislation: legal requirements to operate community pharmacy and documents; Illustration of psychology: Introduction of the main trends in psychology application, Verbal communication and non – verbal communication, Stress, frustration and conflicts, Health, illness and norms, Mental hygiene, Psychology of a patient and psychology of a health service worker.

## **PHAJE 2253 Pharmaceutical Jurisprudence and Ethics (45:00)**

### ***General objectives:***

To enable the students to obtain knowledge about

- i) General principles of the law relating to the practice of pharmacy with special reference and
- ii) Principles of Ethics and Concepts in the profession of Pharmacy

### ***Course Details:***

Definition and scope of Forensic Pharmacy; Pharmacist's role in the drug treatment and drug usage; Pharmacist as a member of Health care team; Pharmaceutical legislation in Sri Lanka: National Law: Medical Ordinance: Registration of Pharmacist; Poison, Opium and Dangerous Drugs Ordinance, Cosmetics Devices and Drug Act 1980, Regulation and their Amendments, Food Act, Excise Ordinance, Fair Trading Commission and pricing of pharmaceuticals; International Law: Convention on Narcotic drugs, Convention on Psychotropic drugs and their legislation affecting the practice of Pharmacy; Miscellaneous legislation: Health and Safety Legislation, Consumer Protection Law Act on Trade, An awareness of the regional legislation and their relationship to National Legislation; Ethics: Principles of Ethics, Oath of Pharmacist, World Health Organisation (WHO) criteria of ethical drug promotion, Sri Lanka Medical Association (SLMA) ethical criteria for the promotion of Medicinal Drugs and Devices in Sri Lanka, International Federation of Pharmaceutical Manufacturers Association (IFPMA), Professional

responsibilities (towards patients, public pharmacy and other professions), “Code of Ethics” of the profession.

## **THIRD YEAR FIRST SEMESTER**

### **PHAMC 3114 Medicinal Chemistry I (45:30)**

#### *General objectives:*

To enable the students to acquire knowledge about

- i) Physico–chemical properties of drug molecules and
- ii) Chemistry of drugs including structure activity relationship with special reference in pharmaceutical field.

#### *Course Details:*

Basic principles of Medicinal Chemistry: Physico – chemical aspects of drug molecules in relation to biological activity, Drug receptor interaction including transduction; Synthetic procedures of selected drugs, Mode of action, Structure activity relationship including Physico–chemical properties, Formulation, Storage condition, Assays and Therapeutic uses of following classes of drugs: Antimicrobials: Sulphonamides, Antihelminthic drugs, Antiamoebic drugs, Antimalarials, Antitubercular drugs, Antileprotic drugs, Antifungal drugs, Anticancer drugs; Drugs acting on Autonomic nervous system: Cholinergic drugs, Anticholinergic drugs, Adrenergic drugs, Anti adrenergic drugs; Drug acting on Cardiovascular system: Antiarrhythmic drugs, Anti hypertensivedrugs, Antianginal drugs, Vasodilators, Hypo lipidaemic drugs; Diuretics; Drugs acting on Blood: Coagulants and Anticoagulants, Antithrombotic drugs.

## **PHACE 3134    Pharmaceuticals IV    (45:30)**

### ***General objectives:***

To enable the students to acquire knowledge in formulation principles of various dosage forms and importance of optimisation of drug formulation system.

### ***Course Details:***

Tablets: Types, Ideal requirements, Granulation methods, General formulation, Preparation and Evaluation, Types of coating, British Pharmacopoeial formulation; Capsules: Advantages of capsules, Hard gelatin and Soft gelatin capsules, Shell formation, Manufacturing, Size, Storage, Painting, Filling, Cleaning, Binding, General formulation of contents, Evaluation; Microencapsulation: Advantages, Coating materials, Method of application of coating materials, BP formulations; Parenterals (Products requiring sterile packing): Types, Advantages and Limitations, General formulations, Vehicles, Production procedure and facilities, Controls, Tests, Selected BP injections, Sterile powders, Implants, Emulsions and Suspensions; Pharmaceutical aerosols: Propellants, General formulations, Manufacturing and Packaging methods, Pharmaceutical applications; Ophthalmic preparation: Requirements, Formulations, Method of preparation, Containers, Evaluation, BP formulations; Novel drug delivery system: Transdermal delivery system, Osmotic drug delivery system; Controlled drug delivery system: Principle, Advantages & disadvantages, selection of drug candidates, various approaches to design controlled release formulations; Targeted drug delivery

system, liposome; Introduction to cosmetic formulations; Muco adhesive drug delivery system: Buccal, nasal, rectal and vaginal drug delivery systems; Introduction to biopharmaceutics and pharmacokinetics.

### **PHACL 3143 Pharmacology and Pharmacotherapy III (45:00)**

#### ***General objectives:***

- i) Description of pharmacology, adverse effects and therapeutic applications of drugs acting on gastrointestinal system.
- ii) Brief description of pathophysiology, clinical features and drug therapy of gastrointestinal disorders.
- iii) Brief description of pathogenesis of neoplasm and basis of anticancer therapy.
- iv) Description of pharmacology, adverse effects and indications of anticancer drugs.
- v) Description of pharmacology, adverse effects and therapeutic applications of hormones and related drugs.
- vi) Brief description of pathophysiology, clinical features and drug therapy of endocrine disorders.

#### ***Course details:***

Drugs used in peptic ulcer disease; Pharmacology of vomiting & Antiemetics; Laxatives; Antidiarrhoeal & Drugs used in inflammatory bowel disease; Intravenous fluids; Disease affecting gastrointestinal tract: Peptic ulcer; Liver disease & Portal hypertension. Introduction; Anticancer Drugs. Hypothalamic & Pituitary hormones; Thyroid and & Antithyroid drugs;

Corticosteroids & related drugs; Gonadal hormones & related Drugs; Insulin & oral hypoglycaemics; Drugs affecting calcium & bone metabolism; Endocrinology; Diabetes Mellitus; Disorders of Thyroid.

## **PHACN 3124 Chemistry of Natural Products (45:30)**

### ***General objectives:***

To enable the students to acquire knowledge in

- i) Natural medicinal products with emphasis on their source, isolation, chemical properties and
- ii) Official preparation and utilisation of natural medicinal products in Pharmacy and Medicine.

### ***Course Details:***

Structural elucidation of natural products – general methods; Source, Isolation, Structure, Chemistry, Synthesis, Uses, Official preparations, Methods of estimation, Test for identity and Pharmacopoeial standards of the following: Carbohydrates: Review of general chemistry of Carbohydrate, Structure of Glucose, Determination of configuration and ring structure of Glucose, Study of chemical nature of Fructose, Sucrose, Lactose, Maltose and Starch, Cellulose and their derivatives; Proteins: Classification, General characteristics of protein, amino acids and essential amino acids, Synthesis of individual amino acids, Degradation of protein, Study the official compounds in Pharmacopoeia; Glycosides: Introduction, Classification of glycosides, General study of Cardiac glycosides of Digitalis, Strophanthus and Squill, Anthracene glycosides and Saponin glycosides,

Chemistry of Cyanophoric glycosides (Amygdaline);Lipids: General chemical composition of Fixed oils, Fats and Waxes, Methods of analysis of Fats, Oils and Waxes in Pharmacopoeia of Britain, Test of adulteration; Vitamins:Classification of Vitamins, Skeleton structure of Vitamins, Constitutions and synthesis of official compounds in BP; Carotenoids: Sources, Structure and conversation to Vitamin A; Alkaloids: Ephedrine, Nicotine, Atropa, Cinchona, Coca, Opium, Ipeca, Nuxvomica, Curare and Rauwolfia alkaloids;Terpenes:Classification and Pharmacopoeial examples, Geraniol and itsconstitution, Synthesis of Linalol, Inter relationship of Limonene, Dipentene, Alphaterpeniol, Terpin hydrate, Cineole and Carvone, Constitution of Menthol and Thymol, Synthesis of Camphor.

### **PHAPT 3153 Pharmaceutical Technology (45:00)**

#### ***General objectives:***

To enable the students to obtain knowledge about

- i) Basic techniques used in the dosage form and
- ii) Industrial hazards and safety precautions in pharmaceutical industry.

#### ***Course Details:***

Heat transfer and mass transfer; Materials of plant construction: physical, chemical and economic factors affecting the pharmaceutical industry; Fluid flow: Types of flow, Reynold's number, Concepts of boundary layers, Basic equation of fluid flow; Flow control: Valves, Flow meters, Manometer and Measurements of flow and pressure; Humidity: humidity chart,

Measurement of humidity, Humidifier and Dehumidifier; Air conditioning: Principles and application in pharmaceutical field; Refrigeration: Compression and absorption types of refrigeration cycle, Refrigerators and their choices and application in pharmacy; Corrosion and its prevention; Basic concepts, Theory/ Mechanism and Equipments used in Pharmaceutical industries of Evaporation, Distillation, Extraction, Drying, Mixing, Size reduction, Size separation, Filtration, Centrifugation, and Crystallisation; Various mechanisms involved in filling; Powder flow and compaction; Basic concepts: Compression process used in tablet machine, Safety methods used in pharmaceutical laboratories, Industrial hazards and safety precautions, Materials handling system; Containers, closures and packaging materials; Design of fermenter and automation involved in it.

## **THIRD YEAR SECOND SEMESTER**

### **PHACL 3242 Pharmacology and Pharmacotherapy IV (30:00)**

#### ***General objectives:***

- i) Description of pharmacology, adverse effects and therapeutic applications drugs acting on central nervous system.
- ii) Brief description of pathophysiology, clinical features and drug therapy of disorders of central nervous system.
- iii) Understanding the differences in physiological functions during pregnancy, in children and elderly and the basis of treatment in them.



- iv) Brief description of different stages of drug development and the phases of clinical trials.
- v) Description of pharmacology of therapeutic gases and their therapeutic uses and recent advances in medicine and use of drugs in sports and to modify the body functions according to the life-style.

***Course details:***

Pharmacology of Central nervous system; General Anaesthesia; Local Anaesthesia; Skeletal muscle relaxants; Hypnotics, Sedative & Anxiolytics; Antipsychotics & Mood Stabilisers; Antidepressants; Opioids & Antagonists; Drug Abuse; Anticonvulsants; Drugs used in Parkinsonism; Miscellaneous CNS drugs; Disorders of Central nervous system: Chronic head ache & Migraine; Epilepsy; Neurodegenerative disease; Parkinsonism, Alzheimer's disease etc.; Psychiatric disorders. Prenatal & Paediatric pharmacology; Drugs Geriatric Pharmacology; Drug development & Clinical trials; Therapeutic Gases; Life-Style drugs, Drugs in Sports, Gene Therapy, Stem Cell therapy.

**PHAMC 3214 Medicinal Chemistry II (45:30)**

***General objectives:***

To enable the students to acquire knowledge in

- i) Chemistry of drugs including structure activity relationship with special reference in pharmaceutical field and
- ii) Concepts of Quantitative Structure-Activity Relationship for drug design.

### ***Course Details:***

Synthetic procedures of selected drugs, Mode of action, Structure activity relationship including physico – chemical properties, Formulation, Storage condition, Assay and Therapeutic uses of following classes of drugs: Drugs acting on Gastrointestinal tract: Antidiarrhoeal, Emetics and Antiemetics, Laxatives and Purgatives, Antispasmodics, Carminatives and Digestants; Hormones and related drugs: Anti thyroid drugs and Oral hypoglycaemic drugs, Corticosteroids; Drugs acting on Respiratory system: Antitussives, Bronchodilators; Drugs acting on Central nervous system: General anaesthetics, Sedatives and Hypnotics, Antiepileptics, Antiparkinsonism drugs, Antipsychotics, Anxiolytics, Antidepressants, Narcotic analgesics & their antagonist, CNS stimulants and Muscle relaxants and Local anaesthetics; Antihistamine: H1 Antagonists and H 2 Antagonists; Analgesics: Opioid analgesics, General non narcotic analgesics, Antipyretic and Anti inflammatory drugs; Miscellaneous: Antiseptics & Disinfectants, Medicinal dyes, Diagnostic agents and Immunosuppressants; Drug metabolism and concepts of prodrug; Principles of drug design, Quantitative Structure - Activity Relationship (QSAR).

## **PHAAM 3223 Pharmaceutical Administration and Marketing (45:00)**

### ***General objectives:***

To enable the students to gain knowledge in

- i) Basic concept of Management and Organisation.

- ii) Pharmaceutical marketing and advertising with special references to the pharmaceutical trade and
- iii) Basic Accountancy and Economic studies related to Government and private sectors in pharmaceutical trade.

***Course Details:***

Management: Management and Organization of commercial offices: principle and important concepts include filing and indexing system, Basic principles of Industrial Management, Factory organization and management, Commercial correspondence; Pharmaceutical marketing and advertising with special references to the pharmaceutical trade: Definition and scope of marketing, Functions: Buying, Selling, Transportation, Storage, Finance, Feedback, Information; Channel of distribution of drugs: The wholesaler: role of wholesaler in distribution of pharmaceutical services offered to the manufacturer and the retailer, retail institutions; Analyzing the market-market research; Sales promotions and salesmanship; Pharmaceutical Product Development; Information system: Computer information system, Non – information system; Accountancy: Basic accountancy: principles of accounting, ledger posting and preparation of trial balance, capital and revenue, columnar cash book, treatment of bank account, preparation of profit and loss account and balance sheet, elements of income tax treatmentary bills as related to pharmaceutical trade; Principles of Economics: Law of demand & supply, demand schedule, demand curve, consumption, organization production, Labour distribution, problem, condition, affecting demand & supply, legislation, welfare, trade, union, inland and foreign trade; Principles of importing and

exporting goods; Governing international trade; Theory of comparative cost; Foreign exchange; Principles of insurance: general, fire and marine; Sales organization, factors governing sales.

## **PHAHP3236 Hospital Pharmacy (45:90)**

### ***General objectives:***

To enable the students to obtain knowledge in

- i) Hospital and hospital pharmacy and its organisation, layout and function and distribution of drugs in hospital and
- ii) Production and applications of nuclear pharmacy in hospital.

### ***Course Details:***

Hospital: Hospitals and their organization, typical organization and the structure of hospital pharmacy, Drug distribution system in hospital, Ambulatory and inpatient and charging of prescribed drugs, Dispensing of narcotic and other hazardous substances in hospital pharmacy; Hospital formulary system: Guiding principles, Preparation of the formulary, Purchase, Inventory control and storage of drugs in hospital, Nomenclature and uses of surgical instruments and hospital equipments, Budget preparation and implementation; Pharmacy therapeutic committee: Objective, Organization and important functions; Communication in the hospital pharmacy: Patient communication, Inter departmental communication; Drug information service: Advice and consultation regarding drug therapy, Role of hospital pharmacist in educational and training programme, Applications of computer in hospital pharmacy; Nuclear pharmacy:

Production of radiopharmaceuticals, isotopetagging, preparation of radioisotopes in laboratory using radiation dosimetry and radioisotope generators, quality control, permissible radiation dose level, radiation hazards, their prevention and specifications for radioactive laboratory.

## **FOURTH YEAR FIRST SEMESTER**

### **PHAPA4114 Pharmaceutical Analysis (45:30)**

#### ***General objectives:***

To enable the students to understand

- i) Basic concepts of separation and analytical techniques and
- ii) About quality control of pharmaceuticals.

#### ***Course Details:***

Separation and Purification techniques: Basic principles and Pharmaceutical applications of Crystallisation, Sublimation, Distillation, Solvent extraction, Gel filtration and Chromatographic techniques (Column, Thin layer, Paper, Gas, Ion-exchange and High Performance Liquid Chromatography); Spectroscopic and Analytical techniques: Instrumentation, Interpretation of spectra and Pharmaceutical applications of Ultra violet – Visible, Infrared, Nuclear Magnetic Resonance and Electron Spin Resonance spectroscopies and Mass spectrometry; Basic concepts, Instrumentation and Pharmaceutical applications of Flame photometry, Nephelometry, Turbidimetry and Fluorimetry; Quality control of Pharmaceuticals: Methods for Quality control, Raw material analysis (Packaging material tests, Permeability of packaging material, Tests for foil, bottles, Carton and Shipment).

## **PHACP4132 Clinical Pharmacy (30:00)**

### ***General objectives:***

To enable the students to acquire knowledge in

- i) Therapeutic Drug Monitoring and Pharmacovigilance and their applications
- ii) Toxicological studies in poison and treatment and management for that
- iii) Drug and poison information for studying the case report

### ***Course details:***

Introduction to clinical pharmacy: Definition, Scope and functions; Role of Clinical Pharmacist; Therapeutic Drug Monitoring (TDM): Introduction, Criteria for TDM, Methodologies, Clinical application of TDM, Benefits of TDM education and Training; The clinical pharmacokinetic basis of drug therapy: Indication, Interpretation and Dose adjustment; Pharmacovigilance: Scope, definition and aims of Pharmacovigilance, Reporting, Evaluation, Monitoring, Preventing and Management of Adverse drug reactions, Role of pharmacist in management of Adverse drug reactions; Substance abuse: Sign and symptoms of substance abuse and treatment of dependence; Brief study about patient medication history; Principles of toxicology: Definition of poison, General principles of treatment of poisoning, General principles involved in the management of poisoning, Antidote and Clinical application, Supportive care in clinical toxicology, Gut decontamination, Elimination enhancement; Drug and poison information: Introduction to drug information resources available, Systematic approach in

answering drug information inquiries, Critical evaluation of drug information and literature, Preparation of verbal reports, Establishing drug information centre; Poison information-organization and information resources.

## **PHABT 4144 Pharmaceutical Biotechnology (60:00)**

### ***General objectives:***

To enable the students to obtain knowledge in

- i) Broad studies in enzyme, immune, plant and fermentation biotechnology and their pharmaceutical applications and
- ii) Brief studies about recombinant DNA technology and Blood products & Plasma substitutes.

### ***Course Details:***

Enzyme Biotechnology: Introduction, General methods of isolation, Purification and Application of immobilized enzyme in drug analysis; Biological sources, Methods of separation, Chemical nature and Uses of the following: Papain, Pepsin, Trypsin, Pancreatin, Asparaginase and Pectinase; Immuno-biotechnology: Vaccinology: Production of vaccines, sera and immunoglobulin of bacterial origin and viral origin, Blending and containerization of vaccines, Principles criteria and standardization methods of quality control of vaccines, sera and immunoglobulin; Injections of biological Origin: Injection of Heparin, Injection of insulin & its products, Injection of penicillin and Injection of procaine; Hybridoma technology: Introduction, Techniques of production and purification of monoclonal antibodies, Application of monoclonal antibodies;

Collection, processing and storage of blood products & plasma substitutes; Fermentation Technology: Principles, Types of process, Surface culture, Protected culture, Solid state fermentation, Microbial transformation, Limitation and advantages; Preparation of Alcohol, Citric acid, Lactic acid, Penicillin, Streptomycin, Riboflavin, diastase and 1 - Cystine-mono-hydrochloride; Recombinant DNA technology: Introduction, mutagenesis, cutting and rejoining; Polymerase chain reaction: isolation and amplification of gene; Gene expression and their applications; Production of Insulin and Hepatitis - B vaccine; Medicinal plant biotechnology: Introduction, Historical background, Preparation of culture media, Types of culture, Modification through transformative cell culture, Regeneration of plant, micropropagation, Protoplast microinjection methods of gene transfer in plants, Pharmaceutical application of plant tissue culture.

## **PHANP4124 Natural Product Chemistry (45:30)**

### ***General objectives:***

To enable the students to acquire knowledge in

- i) Natural medicinal products with emphasis on their source, isolation and chemical properties,
- ii) Official preparation and utilisation of natural medicinal products in Pharmacy and Medicine and
- iii) Evaluation of safety and efficacy of herbal medicine.

### ***Course Details:***

Source, Isolation, Structure, Chemistry, Synthesis, Uses, Official preparations, Methods of estimation, Test for identity and



Pharmacopoeial standards of the following: Purines: Constituents, Synthesis of Uric acid and Caffeine, Inter relationship of Caffeine, Theobromine and Theophylline and their medicinal importance; Steroids: Nomenclature, Test for steroids, Skeleton structure of Cholesterol, Ergosterol, Stigmasterol, Bile acids and Androgens; Estrogens: Inter – relationship of Estrone, Esterole, and Estradiol, Constitution of Esterone and preparation and medicinal uses of synthetic non-steroid estrogenic compounds: Benzesterol, Hexesterol, Dienosterol, Stillbosterol; Progesterone: Skeletons structure, Synthesis of Progesterone from naturally occurring Sapogenins, Structure and activity relationship, Skeleton structure of important Progesterone derivatives used as oral contraceptives; Adrenal cortex hormone: Classification, Skeleton structure of Cortisone, Corticosterone, Hydrocortisone, Synthesis of cortisone from naturally occurring sapogenins, Skeleton structure of important synthetic corticosteroid analogues such as alpha fluoro compounds; Antibiotics: Skeletal structure of Penicillin, Degradation of Penicillin, Skeleton structure of depot and newer synthetic Penicillins, Streptomycin, Chloramphenicol and Tetracycline, Synthetics of Chloramphenicol, Anti cancer and Anti fungal antibiotics and WHO guidelines for evaluation of safety and efficacy of herbal medicine, quality specifications of plant materials and toxicity studies of herbal medicines.

## **PHARM 4153 Research Methodology and Medical Statistics (45:00)**

### ***General objectives:***

To enable the students to identify the main sequence in research process, gain knowledge in research methodology and able to apply this in health care set ups.

### ***Course Details:***

Introduction; Defining the research problem: Selection of the research problem, selection of researchable topic, necessity of defining the problem, techniques involved in defining the problem; Literature survey: review of literature, concepts, principles and other aspects of problem review of researches previously conducted; Formulation of objectives: General and specific objectives & hypothesis; Research Design: features of good design, different research designs, methods of investigation sampling techniques; Collection of data: Methods of Data collection, Preparation of questionnaire; Statistical techniques applicable in research: Processing & Analysis of Data, Interpretation of results; Preparation & presentation of report: report writing style, context, bibliography.

## FOURTH YEAR SECOND SEMESTER

### PHAAP4214 Advanced Pharmaceutics (45:30)

#### *General objectives:*

To enable the students to acquire knowledge about

- i) Stability testing for dosage formulations and packaging and various concepts used in production management
- ii) Various cosmetic formulations
- iii) Physiological and pharmaceutical factors influencing drug release and absorption of dosage forms.

#### *Course Details:*

Stability testing: Stability of formulated products: Requirements, Drug relating aspects, Shelf life, Overage, Containers and Closures; Kinetic principles of stability testing: Reaction rate and order, Acid-base catalysis, Decomposition reactions, Stabilisation and stability testing (Chemical, Physical and Thermal); Preformulation studies: Consideration of importance, Physical properties: Physical forms, Particle size, Crystal form, Bulk control, Solubility, Wetting, Flow cohesiveness, Compressibility, Organoleptic characters and effect on final product; Consideration of Chemical properties: Hydrolysis, Oxidation, Recemisation, Polymerisation, Isomerisation, Decarboxylation, Formulation additives, Stabilisers, Suspending and Dispensing agents, Dyes, Solid excipients, and its effect on finished products; Packaging of pharmaceuticals: desirable features and detailed study of different types of pharmaceutical containers and closures; Product processing:

Production management and GMP consideration, quality control and assurance; Cosmetic formulation: Formulation and preparation of Dentifrices, Hair creams, Lipsticks, Face powders, Shaving preparations, Baby powder, Bath preparations, Skin creams, Shampoo, Conditioners, Hair dyes, Depilatories, Manicure preparations, Deodorants, Perfumes; Biopharmaceuticals: Rate of drug absorption after administration, Drug concentration in blood, Biological factor in drug absorption, Physico-chemical factors, Dosage form consideration for gastrointestinal absorption, Drug distribution, Site seeking, Drug elimination; Pharmacokinetics: Compartment models, A brief study of Pharmacokinetic data and parameters, Significance of the data; Bioavailability: Concepts of bioavailability, Factors affecting bioavailability, dissolution rate and bioequivalence testing.

## **PHADD 4223 Drug Discovery and Development (45:00)**

### ***General objectives:***

To enable the students to acquire knowledge about

- i) The discovering pathways of drugs
- ii) Designing the drug by optimizing the target interaction and their access to the target
- iii) The process of development of drug

### ***Course Details:***

Drug discovery: Choosing a disease, Choosing drug target: Target specificity and selectivity between species, Target specificity and selectivity within the body and Targeting drugs to

specific organs and tissues; Identifying the bioassay: In-vivo and in-vitro test, High-throughput screening, Surface plasmon resonance and Scintillation proximity assay; Finding a lead compound: Combinatorial synthesis and Basic concepts of computer aided design; Isolation and purification, Structure determination; Drug design: Optimizing the targetinteraction: Structure – Activity Relationship: Role of functional groups of drugs binds with the binding site, Identification of pharmacophore; Strategies in drug design with examples; Optimizing access to the target:Improving absorption, Making drugs more resistance to chemical and enzymatic degradation, Making drugs less resistance to drug metabolism, Targeting drug, Reducing toxicity, Prodrugs, Drug alliance, Endogeneous compounds as drug; Drug development: Preclinical trails: Toxicity testing, Drug metabolism studies and Pharmacology, formulation and stability tests; Clinical trials; Patenting and regulatory affairs; Chemical and process development.

## **CHAPTER 6**

### **BY – LAWS RELATING TO CONDITIONS OF RESIDENCE AND DISCIPLINE OF STUDENTS**

**[BY- LAWS MADE UNDER SECTION 135(1) (D) OF THE UNIVERSITIES ACT NO 16 OF 1978, AS AMENDED BY THE UNIVERSITIES (AMENDMENT) ACT NO.07 of 1985]**

These by – Laws may be cited as By- Laws No. 1 relating to condition of Residence and Discipline of students and shall come into force on 1st May 1986.

#### **6.1. Conditions of Residence**

- 6.1.1. Student means –any one of all postgraduate, undergraduate and diploma students of the University of Jaffna.
- 6.1.2. Residence means – the stay during any day of a student within the Campus premises whether it be for purpose of study in a prescribed course, or for the use of the Library and/or any other facility, and/or the stay as a legitimate resident of the University hostel.
- 6.1.3. All students shall follow the prescribed course of study to the satisfaction of the Senate. Any student who keeps away from the course continuously for a period of one academic term without authorized leave of absence will be deemed to have left the course.

- 6.1.4. Leave may be granted up to one week by the Dean of Faculty to which the student belongs, and beyond that period, by the Vice-Chancellor.
- 6.1.5. Any student who contacts a contagious disease shall immediately contact the University Medical Officer, and strictly follow his/her advice. If this is not possible, the student may obtain the advice of a qualified Medical Officer and report to the University Medical Officer as soon as possible.
- 6.1.6. Students who are residents of the University Hostel are required to fully comply with the rules of Residence issued by the Warden from time to time.
- 6.1.7. All students except the hostel residents are required to vacate the premises of the University by 22.00 hours (or at any other time notified by the Vice-Chancellor) on each day, unless otherwise engaged in legitimate business. Students who are residents of the University Hostel and who wish to gain entry to the Campus premises after 22.00 hours should either produce their University Identity Cards/Record Books or identify themselves by placing their signature/ index number, when requested by the security staff.
- 6.1.8. Students receiving visitors who are not persons of the University are required to report of same to the Chief Security Officer or the Officer In-Charge of the Security Staff on duty.
- 6.1.9. All students are required to be suitably attired during their period of residence in the Campus.

## **6.2. Registration and Conditions of Discipline**

- 6.2.1. Students of the University at all times shall Endeavour to safeguard the dignity, good name and reputation of the University.
- 6.2.2. Students are admitted and registered as under-graduate or graduate students of the University subject to their good behaviour and the observance of strict discipline.
- 6.2.3. On admission to the University no student shall be dully registered as a student unless such student makes a declaration duly signed by him/her as provided for in Schedule 1 to these By-Laws to the effect that he/she had read and understood the provisions of these By-Laws and that he/she will at all times abide by the provisions of these By-Laws.
- 6.2.4. Upon the receipt of an application on the prescribed form for registration as a student of the University together with such documents as may be necessary for this purpose, along with the declaration referred to in the foregoing paragraph, the Registrar or such other officer as may be nominated by him for this purpose shall register such student and shall issue to the student so registered an Identity Card and a Student's Record Book bearing the photograph of the student concerned duly embossed with the seal of the University which shall be final and conclusive evidence pertaining to the identity of the student and also to the accuracy of the particulars stated therein.



- 6.2.5. Every registered student of the University shall have in this possession either such Identity Card or Student's Record Book which he shall produce when called upon to do so by a member of the Academic Staff or by any officer authorized by the Vice-Chancellor or Registrar for this purpose.
- 6.2.6. If any registered student fails to produce or wilfully refuses to produce or neglects to produce such Identity Card or Student's Record Book when called upon to do so by an authorized officer of the University such student shall be deemed to be guilty of an offence punishable under these By-Laws.
- 6.2.7. In the event of the failure or the refusal to produce such Identity Card or Student's Record Book the authorized officer shall have the power to take such student to custody and to produce him before the Warden of the respective Hall of Residence if such student claims to be residing in a Hall of Resident if such student claims to be residing in a Hall of Residence for identification. In the event of such student not being a resident of a Hall of Residence such student may be produced before the Chief Security Officer or Marshal who shall report him to the Vice-Chancellor for appropriate action.
- 6.2.8. The particular stated in the Identity Card or Student's Record Book shall be deemed to contain prima facie evidence of the status of the student and shall be in the manner prescribed in Schedule II of these By-Laws.
- 6.2.9. No club, society, Union or other association of students shall be recognized except as provided for in the relevant

sections of the Universities Act No. 16 of 1978 as amended by the Universities (Amendment) Act No. 07 of 1985.

- 6.2.10. A recognized body of students so formed shall be hereinafter called a University Society.
- 6.2.11. A University Society shall be governed by the provisions of the relevant sections of the Universities Act No. 16 of 1978 as amended by the Universities (Amendment) Act No. 07 of 1985, and By-Laws framed under same for the specified purpose.
- 6.2.12. No public meeting may be held by any student(s), University Society, or other Association of students on the University premises except with the permission of the Vice-Chancellor. The latter shall be obtained in a manner prescribed by notice from time to time.
- 6.2.13. The Vice – Chancellor shall designate the place and time of meeting when granting approval and the meeting shall not be held elsewhere or at any other time without the prior concurrence of the vice-chancellor.
- 6.2.14. For the purpose of this section a public meeting may be a gathering of five or more students with or without fees being charged.
- 6.2.15. Exceptions to the provisions of this section may be permitted by the Vice-Chancellor through delegation to the Dean of a Faculty or Head of Department the authority to allow at his/her discretion the holding of a meeting which is of an academic nature.
- 6.2.16. The holding of an unauthorized meeting shall be considered an act of indiscipline and those responsible shall be liable for punishment.

- 6.2.17. For the purpose of this section, acts of indiscipline under unauthorized meetings include the public announcement of such meetings, the putting up of posters or banners connected with such meetings, conducting the meetings, and addressing meetings.
- 6.2.18. Unless the prior consent of the Vice Chancellor has been obtained, no subscriptions may be collected from among students of the University by any student(s), University Society or other association; provided that this regulation shall not apply to a subscription collected by a University Society in accordance with, and for purpose of, its rules.
- 6.2.19. Harassment (including any form of ragging) and intimidation of any person whether physical or mental shall be considered an act of indiscipline.
- 6.2.20. For the purpose is Section, intimidation shall include the display of posters in the Campus premises by any student or students which are not properties of a University society, calling for the boycott of lectures or strike action.
- 6.2.21. Even in the case of posters belonging to a University Society, they can be recognized as valid notices only if that Society has met legitimately and taken a majority decision at such meeting.
- 6.2.22. The causing of actual physical injury or physical harm or of threat to cause same constitutes a grave act of indiscipline and shall be regarded as a punishable offence.
- 6.2.23. Kidnap, attempted kidnap, or threat to kidnap any person or persons constitutes a grave act of indiscipline and shall be regarded as a punishable offence.