



# **Bharath**

**INSTITUTE OF HIGHER EDUCATION AND RESEARCH**

(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)

**B.Sc. ALLIED HEALTH SCIENCE**  
**REGULATIONS AND SYLLABUS 2021**

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**NEUROSCIENCE TECHNOLOGY**

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## **Regulations for B.Sc. (Allied Health Science) Course: 2021**

### **Introduction**

B.Sc. (Allied Health Science), a (3-year course work + 1-year internship) program under the Faculty of Allied Health Sciences, is aimed at training students to prepare them as qualified physician assistants who will be able to meticulously assist the concerned specialist in handling the various illnesses. This program is a taught course that covers relevant topics and specialized areas of knowledge as opted. The aim of this B.Sc. Program is to provide a thorough training to the candidates through formal lectures and/or seminars and practical programs which culminate in a one year internship that finally prepares the student for the rigors of the medical world.

### **1. Short Title and Commencement**

These Regulations shall be called the “Regulations for B.Sc. (Allied Health Science) Course” of BIHER. These regulations shall be deemed to have come into force from the academic year 2017-18. These regulations are subject to modifications as may be approved by the Academic council from time to time.

### **2. Eligibility for Admission**

- a) A candidate desiring to join the (3-year course work + 1-year internship) programme, leading to the degree B.Sc. (Allied Health Science) should have passed the HSC/CBSE/ISC or equivalent examination with one of the following subject combinations:
  - i) Physics, Chemistry, Biology
  - ii) Physics, Chemistry, Botany and Zoology
- b) A candidate shall, at the time of admission submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

### **3. Age limit for admission**

A candidate should have completed the age of 17 years as on 31<sup>st</sup> December of the year of admission.

### **4. Eligibility Certificate**

Candidates, who have passed any qualifying examination other than the Higher Secondary Course examination conducted by the Government of Tamil Nadu, shall obtain an Eligibility Certificate, from BIHER and produce the same at the time of admission.

**5. Registration**

A candidate admitted to the course shall register his/her name with the University by submitting the application form for registration, duly filled in along with the prescribed fee, through the Head of the Institution within the stipulated date.

**6. Duration of the course**

The duration of the B.Sc. (Allied Health Science) Degree Course shall be (3-year course work + 1-year internship) comprising of 8 (eight) semesters and one year (semesters 7 & 8) of compulsory internship. The candidate is required to pursue the course on a full time basis, and must complete the course within seven years from the date of provisional registration.

**7. Commencement of the Course**

The course shall ordinarily commence on 1<sup>st</sup> August of the academic year. Admission for the said course shall be completed by 31<sup>st</sup> August.

**8. Curriculum**

The first three years of the course will be utilized as follows:

The first two semesters will be spent on Pre and Para clinical subjects including Anatomy, Physiology, Biochemistry, Basics in Medical Physics, English, Computers, Microbiology, Pathology, Pharmacology, Environmental Science and Community Medicine and Nursing. At the beginning of the third semester students will be assigned to branch of Specialization, to which allotted and they will proceed with the specialty during the third, fourth, fifth and sixth semesters,

The fourth year of the course shall be compulsory internship in the respective specialty. The Syllabus for the course shall be as specified in the regulation.

**9. Medium of Instruction**

English shall be the medium of instruction for all the subjects of study and for the examination.

**10. Working Days**

In the case of I to VI semesters, each semester shall consist of not less than 100 working days and each academic year shall have a total of 200 working days or above. In the case of VII & VIII semesters, each semester shall have 140 working days.

**11. Attendance**

The candidate shall have not less than **80%** attendance in Theory and Practical separately. Each semester shall be taken as a unit for the purpose of calculating the attendance. The candidate lacking attendance in a subject shall be denied permission to appear for the University Examination in that subject.

## 12. Condonation of Lack of Attendance

The discretionary power of condonation of shortage of attendance to appear for University Examination rests with the University.

Lack of attendance can be condoned up to a maximum of 5% of the minimum attendance required in the following exceptional circumstances:

- (i) Any illness / accident (for which Medical certificate from a registered medical practitioner must be produced)
- (ii) Any unforeseen tragedy in the family (should produce the letter from the parent/guardian)
- (iii) Participation in NCC/NSS and other co-curricular activities representing the Institution / University. (Certificate from competent authority is required)

For any of the above reasons, request shall be made by the candidate with prescribed fees to the Controller of Examination through proper channel, ten days prior to the commencement of the theory examination.

## 13. Commencement of the examinations

There shall be two sessions of University examinations in an academic year, viz., December and June.

## 14. Cut-off dates for admission to the examinations

The candidates admitted from 1<sup>st</sup> August to 31<sup>st</sup> August of the academic year shall be registered to take their first semester examination in the month of December of the academic year after fulfillment of the stipulated regulations.

## 15. Grading system

All assessments of a course shall be done on absolute marks basis. However, for the purpose of reporting the performance of a candidate, letter grades, each carrying certain points, will be awarded as per the range of total marks (out of 100) obtained by the candidate, as detailed below:

<b>GRADE PATTERN (CBCS)</b>		
<b>Letter Grade</b>	<b>Grade Points</b>	<b>Range of Marks</b>
O (Outstanding)	10	86-100
A+ (Excellent)	9	70-85
A (Very Good )	8	60-69
B+ (Good)	7	55-59
B (Above Average)	6	50-54
C (Average )	5	45-49
D- (Pass)	4	40-44
F (Fail / RA (Reappear )	0	Below 40
AB (Absent )	0	-
NC – Not completed	0	-

After results are declared, Grade Statement will be issued to each student which will contain the following details:

- The college in which the candidate has studied
- The list of subjects enrolled during the semester and the grades scored.
- The Credits awarded and accumulated.
- The Grade Point Average (GPA) for the semester and
- The Cumulative Grade Point Average (CGPA) of all subjects enrolled from first semester onwards.

GPA is the ratio of, the sum of the products of the number of credits of subjects ( C ) and the grade points scored in those subjects (GP), to the sum of the credits of all the subjects in that semester.

$$\text{GPA} = \frac{\text{Sum of [C} \times \text{GP]}}{\text{Sum of C}}$$

CGPA will be calculated using the above formula, considering all the subjects enrolled from first semester onwards. “RA”, “I” and “NA” grade will be excluded for calculating GPA and CGPA.

**16. Classification of successful candidates**

The CGPA arrived at the completion of the course shall be the criteria for the classification of successful candidates as below:

<b>CGPA (Percentage)</b>	<b>Classification</b>
10.0 (90-100%)	First class with honours
8.0-9.9 (75-89%)	First class with Distinction
6.5 to 7.9 (60-74%)	First class
4.5 to 6.4 (40-59%)	Second class

- a) Successful candidates who secure 75% marks and above as a course aggregate in the first appearance taking University theory, practical, project / dissertation evaluation and viva shall alone be awarded Distinction. This will also apply for award of University rank.
- b) Successful candidates who secure 60% marks and above as a course aggregate in the University theory, practical, project / dissertation evaluation and viva shall be awarded First Class.
- c) All others who secure 40-59% in gross percentage will be classified to have passed in Second Class.

**17. Continuous (Internal) Assessment**

- a. Continuous (Internal) Assessment for Theory shall be the average of the best two out of three.

- b. Continuous (Internal) Assessment for Practical's shall be the average of the best two out of three.
- c. The minimum Internal Assessment will be 40% separately for Theory & Practical

**18. Semester – End Examination (University/Department)**

- a) The examination in B.Sc. (Allied Health Science) shall consist of Written Theory examinations and Practical Examinations. The semester – End Examination (University/Department) shall be conducted at the end of each semester.
- b) Papers for which Internal Examination is recommended by the Board of Studies and approved by the Academic Council, the following criteria shall be followed.
  - i) The weight age for Continuous (Internal) Assessment and Internal Examination (to be conducted by the respective department) shall be in the ratio of 25% and 75% respectively.
  - ii) The Continuous (Internal) Assessment marks shall be the average of the best two out of three. The date of Semester – End Examinations (Internal examinations) shall be as per the University guidelines

**19. EXAMINATION PATTERN (for all specialties) (with practical) – UNIVERSITY**

**EXAM.**

<b>A. Theory</b>	<b>Max. Marks – 60</b>	<b>Duration: 2 1/2 hrs</b>
<b>I. Essay Questions (1×10)</b>	<b>10 Marks</b>	
<b>II. Short Notes (8×5)</b>	<b>40 Marks</b>	<b>I &amp; II SEMESTER alone</b>
<b>III. Short Answers (5x2)</b>	<b>10 Marks</b>	
<b>B. Theory</b>	<b>Max. Marks – 60</b>	
<b>I. Essay Questions (2×10)</b>	<b>20 Marks</b>	<b>III, IV, V &amp; VI SEMESTER</b>
<b>II. Short Notes (8×5)</b>	<b>40 Marks</b>	
<b>C. Practical</b>		
<b>I. Practical (Including Oral)</b>	<b>20 Marks</b>	
<b>D. Continuous (Internal) Assessment</b>		
<b>I. Theory</b>	<b>10 Marks</b>	
<b>II. Practical</b>	<b>10 Marks</b>	
<b>Internal Examination</b>		
<b>Short Notes or Short Answers</b>	<b>8×5 = 40</b>	
<b>IA</b>	<b>= 10</b>	
<b>Total</b>	<b>-----</b>	
	<b>50</b>	
	<b>-----</b>	

## 20. Marks Qualifying for a Pass

For passing the University / End-semester Examination from Semester I to Semester VI, the candidate shall secure the marks as stated below,

- a) **40% minimum in the End-Semester examination as well as 40% aggregate marks (continuous assessment and End – Semester examination). The minimum marks for internal assessment shall be 40%.**
- b) For papers which are internally evaluated the same distribution of 25% for Continuous (Internal Assessment and 75% for Semester – end Examination (which shall be conducted by the respective department) shall be followed.

### **Criteria to pass:**

#### **I and II SEMESTER**

**1.Theory – Minimum Pass - 40% .**

**2.Theory&Practical–40%of the aggregate(i.e)theory(60)+practical(20)=80,**

**40% of this (i.e) 32 is the minimum marks to pass.**

#### **III and VIII SEMESTER**

**1.Theory –Minimum Pass - 40%,**

**2.Practical – Minimum Pass - 40%**

## 21. Carry-over of failed subjects

A candidate, who fails in any one or more of the first year subjects, shall be permitted to carry over the subjects to the second year. However a candidate should clear all the

Subjects of the second year along with the carried over subjects of the first year before getting promoted to the third year. The student shall start the Internship training (VII & VIII semester) only after he/she clears all the papers from Semester I to Semester VI.

## 22. Revaluation of answer papers

There shall be no revaluation of answer papers of failed candidates. Failed candidates are however, permitted to apply to the University for retotaling within fifteen days of publication of the results.

## 23. Temporary break of study

- a) A Candidate is not normally permitted to temporarily break the study.
- b) If a candidate is continuously absent from the institute for one year without any information / permission.
  - i) Having notified the Dean/Director/Principal within this period, this absence shall be treated as “Temporary Break of Study”.
  - ii) Without notifying the Dean/Director/Principal, his/her name will be removed from the institute rolls.



- c) If a candidate is compelled to temporarily break the study for valid reasons (such as accident or hospitalization due to prolonged ill health), he/she shall apply for condonation of the break to the Dean/Director/Principal through the Head of the Department.
- d) For condonable break of study:
  - i) If the lack of attendance is within condonable limits as per Clause No. 12 the candidate shall be permitted to write the examination for the current semester.
  - ii) If there is non-condonable lack of attendance, the candidate shall rejoin the program at the respective semester as and when it is offered after the break and shall be governed by the rules and regulations in force at the time of rejoining.
- e) The total period for completion of the programme reckoned from the commencement of the semester to which the candidate was first admitted shall not exceed the maximum period specified in Clause No. 6 irrespective of the period of break of study in order that he/she may be qualified for the award of the degree.
- f) In any case, a candidate shall be permitted to temporarily break the study only once during the entire duration of the program. The candidate shall forfeit the registration in case of a second break or in case of a non-condonable break of study.
- g) Without prejudice to the above rules, the candidate who has completed the attendance requirement for a semester, but has proceeded on a condonable break of study without appearing for the University Examination, shall be permitted to appear for the examinations without repeating the semester and thereafter continue the subsequent semester.

**SCHEME OF EXAMINATION 2021**

**B.Sc .ALLIED HEALTH SCIENCES**

**SEMESTER I (Common to all Courses)**

S.No	Paper	Teaching Hrs		Evaluation-University Examination {marks}					
		L	P	I.A.		University Exam		Total	Credits
				T	P	T	P		
1.	Anatomy[UE]	60	20	10	10	60	20	100	5
2.	Physiology[UE]	60	20	10	10	60	20	100	5
3.	Biochemistry [UE]	60	20	10	10	60	20	100	5
4.	Medical Physics[I.E.]	60	20	10	-	40	-	50	5
5.	English[I.E.]	60	-	10	-	40	-	50	4
6.	Basics of Computers[I.E.]	30	30	10	-	40	-	50	4
Total									28

**SEMESTER II (Common to all Courses)**

S.No	Paper	Teaching Hrs		Evaluation-University Examination {marks}					
		L	P	I.A.		University Exam		Total	Credits
				T	P	T	P		
1.	Microbiology[U.E.]	60	20	10	10	60	20	100	5
2.	Pathology [U.E.]	60	20	10	10	60	20	100	5
3.	Pharmacology [U.E.]	60	20	10	10	60	20	100	5
4.	Environmental Science &Community Med.[I.E.]	60	20	10	-	40	-	50	5
5.	Basics of Nursing[I.E.]	60	-	10	-	40	-	50	4
<b>TOTAL</b>									<b>24</b>

U.E.-University Examination

I.E - Internal Examination. \*These examinations shall be conducted by the respective department.

## NEUROSCIENCE TECHNOLOGY

### SCHEME OF EXAMINATION 2021

#### SEMESTER – III

S.No	Paper	Hrs/Sem		Evaluation (Marks)					
		L	P	Internal Assessment		University Exams/Department* Exams		Total	Credits
				T	P	T	P		
1.	Basic Neurosciences I- Applied Anatomy & Physiology related to Neuroscience technology (UE).	60	-	20	-	60	-	80	4
2.	Charts & Card test– Practical I (UE).	-	120	-	20	-	60	80	4
3.	Basic Neurosciences I- Pharmacology related to Neuroscience technology (UE)	60	-	20	-	60	-	80	4
4.	Charts & Card test – Practical II (UE)	-	120	-	20	-	60	80	4
5.	Basic Principles of Hospital Management(IE)	60	-	20	-	60*	-	80	4
6.	Applied Anatomy & Physiology related to Neuroscience technology: Comprehensive Viva (IE)	-	180	-	25	-	75*	100	5
<b>TOTAL</b>									<b>25</b>

Total No. of Hours – 600 Hours

U.E.-University Examination

I.E.-Internal Examination.

\*These examinations shall be conducted by the respective department.

## NEUROSCIENCE TECHNOLOGY

### SCHEME OF EXAMINATION 2021

#### SEMESTER – IV

S.No	Paper	Hrs/Sem		Evaluation (Marks)					
		L	P	Internal Assessment		University Exams/Department* Exams		Total	Credits
				T	P	T	P		
1.	Basic Neurosciences II – Applied Basic Electroencephalography (UE)	60	-	20	-	60	-	80	4
2.	Electroencephalography- Charts, Recording, Spotters- Practical I (UE)	-	120	-	20	-	60	80	4
3.	Basic Neurosciences II – Disorders of the brain tumor. Theory(UE)	60	-	20	-	60	-	80	4
4.	Electroencephalography- Charts, Recording, Spotters- Practical II (UE)	-	120	-	20	-	60	80	4
5.	Health Care Management(IE)	60	-	20	-	60*	-	80	4
6.	Clinicals in Basics of Neuroscience technology: comprehensive viva(IE)	-	180	-	25	-	75*	100	5
<b>TOTAL</b>									<b>25</b>

Total No. of Hours – 600 Hours

U.E.-University Examination

I.E.-Internal Examination.

\*These examinations shall be conducted by the respective department.

**NEUROSCIENCE TECHNOLOGY**  
**SCHEME OF EXAMINATION 2021**  
**SEMESTER – V**

S.No	Paper	Hrs/Sem		Evaluation (Marks)					
		L	P	Internal Assessment		University Exams/Department *Exams		Total	Credits
				T	P	T	P		
1.	Basic Neurosciences III- Peripheral neuropathies Theory(UE)	60	-	20	-	60	-	80	4
2.	Applied Nerve conductions, Electromyography and Evoked Potentials Practical I (UE)	-	120	-	20	-	60	80	4
3.	Basic Neurosciences III- Inflammatory myopathies – Polymyositis and dermatomyositis Theory(UE)	60	-	20	-	60	-	80	4
4.	Applied Technology - Practical II (UE)	-	120	-	20	-	60	80	4
5.	Hospital Products, Promotion, Sales & Public relation (or) Physician's Office Management(IE)	60	-	20	-	60*	-	80	4
6.	Clinicals in Principles of Neuroscience Technology : comprehensive viva(IE)	-	180	-	25	-	75*	100	5
<b>TOTAL</b>									<b>25</b>

Total No. of Hours – 600 Hours

U.E.-University Examination

I.E.-Internal Examination.

\*These examinations shall be conducted by the respective department.

**NEUROSCIENCE TECHNOLOGY**  
**SCHEME OF EXAMINATION 2021**  
**SEMESTER – VI**

S.No	Paper	Hrs/Sem		Evaluation (Marks)					
		L	P	Internal Assessment		University Exams/Department* Exams		Total	Credits
				T	P	T	P		
1.	Sleep Medicine & Polysomnography Theory(UE)	60	-	20	-	60	-	80	4
2.	Clinical Assessment I- Charts & Card test Practical I (UE)	-	120	-	20	-	60	80	4
3.	Application of Clinical Neurophysiology & Assessment Theory(UE)	60	-	20	-	60	-	80	4
4.	Clinical Assessment I- Charts & Card test Practical II (UE)	-	120	-	20	-	60	80	4
5.	Trauma & Cardiac Life Support(IE)	60	-	20	-	60*	-	80	4
6.	Clinicals in Neuroscience technology: comprehensive viva(IE)	-	180	-	25	-	75*	100	5
<b>TOTAL</b>									<b>25</b>

Total No. of Hours – 600 Hours

U.E.-University Examination

I.E.-Internal Examination.

\*These examinations shall be conducted by the respective department.

**COMMON TO ALL BRANCHES**  
**INTERNSHIP [VII & VIII SEMESTER]**

Sl. No.	Programme	Hours Prescribed	University Examination			
			Project Evaluation	Viva	Total	Credits
<b>1</b>	<b>Internship</b>	<b>675</b>	-	-	-	<b>15</b>
<b>2</b>	<b>Project</b>	<b>180</b>	<b>80</b>	<b>20</b>	<b>100</b>	<b>6</b>
<b>No Minimum for Passing</b>					<b>Total Credits</b>	<b>21</b>

## **B.SC. ALLIED HEALTH SCIENCE 2021 NEUROSCIENCE TECHNOLOGY**

An **ALLIED HEALTH SCIENCE** professional is an important part of a multidisciplinary Health care team who provide support service and rehabilitation measures for the patients in the hospital.

**Duration of the course:** Three years followed by one year internship which is **compulsory?**

**Medium of instruction:** ENGLISH

**The first & second Semester syllabi for Allied Health sciences are common for all the courses.**

**FIRST YEAR: (Semester I & II)**

**MAIN SUBJECTS:**

Anatomy	Physiology	Biochemistry
Pathology	Microbiology	Pharmacology

**SUBSIDIARY SUBJECTS:**

English, Computer, Medical physics, Environmental Science & Community, Medicine & Basics of Nursing.

Exams in subsidiary subjects shall be conducted at the college level and marks forwarded to the university.

**INTERNAL ASSESSMENT:**

1. Written tests-average of 2 tests, viva, assignments, aptitude, punctuality and Attitude.
2. Log book-It will have the recordings, of all activities department and date wise including practical demonstrations. There will not be a practical record

**INTERNAL ASSESSMENT MARKS:**

1. Written test etc.....	10
2. Log book & Practical.....	10
Total	20

80% ATTENDANCE & 40%of INTERNAL ASSESSMENT marks are essential to appear for the University Examination

**University Exams shall be conducted at the end of each semester. (JUNE & DEC)**



**B.SC. ALLIED HEALTH SCIENCE  
NEUROSCIENCE TECHNOLOGY 2021  
SCHEME OF EXAMINATION**

**SEMESTER I**

**(Common To All Courses For Anaesthesia Technology, Cardiac Technology, Medical Laboratory Technology, Renal Dialysis Technology, Radiology And Imaging Science Technology, Perfusion Technology, Respiratory Care Technology)**

S.No	Paper	Teaching Hrs		Evaluation University Examination [marks]					
		L	P	I.A.		University Exam		Total	Credits
				T	P	T	P		
1.	Anatomy[UE]	60	20	10	10	60	20	100	5
2.	Physiology[UE]	60	20	10	10	60	20	100	5
3.	Biochemistry [UE]	60	20	10	10	60	20	100	5
4.	Medical Physics[I.E.]	60	20	10	-	40	-	50	3
5.	English[I.E.]	60	-	10	-	40	-	50	3
6.	Basics of Computers[I.E.]	30	30	10	-	40	-	50	3
<b>Total</b>									<b>24</b>

U.E - University examination.

I.E - Internal examination.

[These examinations shall be conducted by respective departments].

**B.SC. ALLIED HEALTH SCIENCE**  
**NEUROSCIENCE TECHNOLOGY 2021**

**SYLLABUS**

**SEMESTER – I**

**(Common to All Courses for Anaesthesia Technology, Cardiac Technology, Medical Laboratory Technology, Renal Dialysis Technology, Radiology And Imaging Science Technology, Perfusion Technology, Respiratory Care Technology)**

**1. ANATOMY (UE)**

**UNIT I: Organization of the human body**

**1. Introduction**

- Introduction to human body
- Definition and subdivision of anatomy

Anatomical position and terminology

- Region and systems of the body
- Cavities of the body and their contents
- Levels of organization of the body

**2. Cell and genetics**

- Parts of cell – cell membrane, cytoplasm, organelles, inclusion bodies, nucleus
- Structure of chromosome, DNA, RNA.
- Basics & fundamentals of Genetics, Karyotyping, Chromosomal disorders, prenatal diagnosis, genetic counseling and gene therapy.
- Cell division – Definition and main events that occur in different stages of mitosis and meiosis.
- Tissues – Definition, characteristic features and types with example.
- Types of glands with example

**UNIT II: Systems of support and movement**

**1. Skeletal system**

- Cartilage: Type and basic histological feature.

- Bones: definition, classification based on location, name and number of bones with general feature of important bones, function of bone, histological feature of a compact bone.
- Joints – Definition and types with example, Axis and movements. Shoulder, elbow, hip, knee joints – type, bones and ligaments involved, possible movements.

## 2. Muscular system

- Types of muscle with basic histological features
- Parts of skeletal muscle.
- Definition of origin and insertion
- Origin, insertion, nerve supply, action of sternocleidomastoid, pectoralis major, deltoid, gluteus maximums and diaphragm.

## UNIT III: Controls systems of the body

### 1. Nervous system

- Subdivisions of the nervous system
- Spinal cord-location, extent, external features and blood supply
- Brain-subdivision, location, external features of Medulla oblongata, Pons, Midbrain, Cerebellum, and Cerebrum, Thalamus and Hypothalamus, Location and subdivision of ventricles of brain. Circle of Willis.
- Cranial nerves-name, number, attachment, area of distribution
- Spinal nerves-typical spinal nerve. Name and location of plexuses. Location and distribution of brachial and lumbosacral plexus.
- Autonomic nervous system-sympathetic and parasympathetic nervous system. Location of pre-ganglionic and post-ganglionic neurons.

### 2. Sense organs

- Location and features of nose, tongue, eye, ear and skin.

### 3. Endocrine system

- Names of the endocrine glands. Location and features of pituitary, thyroid, parathyroid, suprarenal, pancreas, ovaries and testis. Names of hormones produced by each gland.
- Microscopic features of thyroid and pancreas.

## **UNIT IV: Maintenance of the human body.**

### **1. Cardio vascular system**

- Types and general features of blood vessels. Structure and types of arteries and veins. Shape, size, location, covering, external and internal features of Heart. Conducting system of heart. Blood supply of the heart. Name, location, branches and main distribution of principal arteries and veins

### **2. Lymphatic system**

- General features of Lymph node and lymphatic vessels. Name, location, external features, microscopic feature of tonsil and spleen.

### **3. Respiratory system**

- Name the organs of respiration. Location and features of Nasal cavity, pharynx, larynx, trachea, lung & pleura. Mention the microscopic feature of lung.

### **4. Digestive system**

- Name the parts of the alimentary canal and accessory organs. Location & features of oesophagus, stomach, small and large intestine. Location and feature of tongue, salivary glands, pancreas, liver and gall bladder. Microscopic feature of liver.

### **5. Urinary system**

- Names of urinary organs. Location and features of kidney, ureter, urinary bladder & urethra. Microscopic feature of kidney.

### **6. Reproductive system**

- Names of male and female organs of reproduction. Location and features of testis, epididymis, vas deferens, prostate gland and spermatic cord. Location & features of uterus, uterine tube, ovary and breast.

### **7. Embryology**

- Structure of gametes & gametogenesis. Fertilization to development of embryo till 3<sup>rd</sup> week. Derivatives of germ layers. Teratogens, Structure and Functions of placenta.

## **UNIT V: Anatomical regions**

- Simple ideas about scalp, triangles of neck, axilla, cubital fossa, carpal tunnel, mediastinum, umbilicus, inguinal canal, femoral triangle
- sub sartorial canal popliteal fossa

## **PRACTICALS/DEMONSTRATIONS**

1. Demonstrations of dissected specimens.
2. Viewing of projection of microscopic slides of muscle, bone, cartilage, spleen, tonsil, lung, liver, kidney, thyroid and pancreas

## **REFERENCE BOOKS**

1. Manipal manual for AHS by Dr. Sampath Madhyastha, (Second Edition)  
Published by CBS Publishers.
2. Handbook of anatomy for nurses by Dr. P. Saraswathi
3. Ross and Wilson, Anatomy and physiology in health & illness.

## **2. PHYSIOLOGY (UE)**

### **Unit-I**

#### **1. General Physiology:**

- Concept of Homeostasis
- Cell structure and functions
- Transport across membranes

#### **2. Body and body fluids:**

- Body fluid volumes, compartments and composition
- Blood composition and functions
- Plasma proteins – Types and functions
- Erythrocytes – functions, Erythropoiesis, anemia's
- Leucocytes – classification and functions
- Platelets – morphology and functions
- Blood coagulation – Mechanism and name of anticoagulants
- Blood groups – Basis of ABO & Rh grouping, Erythroblastosis Foetalis

#### **3. Muscle physiology:**

- Muscles – Classification & structure of striated, nonstriated & cardiac muscle
- Neuromuscular junction
- Mechanism of skeletal muscle contraction

#### **4. Digestive system:**

- Salivary glands, functions of saliva
- Parts of stomach, composition & functions of gastric juice
- Pancreatic Juice – composition & functions
- Bile – composition & functions of bile & bile salts
- Functions of Small intestine & large intestine

### **Unit-II**

#### **1. Skin**

- Structure & Functions

## **2. Excretory system:**

- Kidney: Basic physiological anatomy (Including JGA)
- Formation of urine – GFR
- Formation of urine – Reabsorption & secretion
- Micturition Reflex
- Dialysis – Principle, types
- Renal function tests

## **Unit-III**

### **1. Endocrine system:**

- Hypothalamo hypophyseal inter relationship
- Posterior pituitary hormones and its actions
- Anterior pituitary hormones, Growth hormone – Actions
- Dwarfism, gigantism, acromegaly
- Thyroid hormones – Actions
- Cretinism, Myxoedema, Grave's disease (clinical features)
- Parathyroid hormones – Functions, Tetany
- Insulin, Glucagon's – Actions, Diabetes mellitus
- Adrenal medullary hormones & their actions
- Adrenal cortex hormones & their actions

### **2. Reproductive system:**

- Male reproductive organs – Spermatogenesis, Testosterone actions
- Female reproductive organs – menstrual cycle (endometrial and ovarian cycles) and its hormonal control
- Contraceptive methods in male and female

## **Unit-IV**

### **1. Respiratory system:**

- Basic physiological anatomy
- Surfactant
- Mechanics of respiration
- Lung volumes and capacities
- Oxygen transport, Carbon-di-oxide transport

- Nervous and chemical regulation
- Pulmonary function tests.

## 2. Cardiovascular system:

- Basic physiological anatomy, innervations of heart
- ECG – normal waves, intervals and their significance
- Cardiac cycle – mechanical events, Heart sounds
- Blood pressure – Definition, measurement, normal values, factors maintaining BP Regulation

## Unit-V

### 1. Nervous system:

- Structure of neuron, neuroglia cells, synapse and transmission across it
- Reflex – Components of reflex arc, examples.
- Functions of ascending tracts – anterior, lateral spinothalamic tracts, Dorsal column
- Functions of Corticospinal (Pyramidal) tract-Descending tract
- Functional areas of cerebral cortex
- Functions of basal ganglia, thalamus, hypothalamus, limbic system and cerebellum

### 2. Special senses:

- Receptors for various special senses

## Practical Demonstration

### Haematology:

1. Enumeration of RBC count.
2. Enumeration of WBC count.
3. Differential Count.
4. Estimation of Hemoglobin.
5. Determination of blood group.
6. Determination of bleeding time and clotting time.

### Clinical physiology:

1. Measurement of blood pressure.
2. Determination of Radial pulse

### Reference Book

1. Human Physiology for BDS by A.K.Jain, 4<sup>th</sup> Edition, Avichal publishing co



### **3. BIOCHEMISTRY (UE)**

#### **Unit I – Cell and its molecules**

- **Cell** – Cell organelles, Fluid Mosaic Model, functions of cell membrane, Brief description of transport across the cell membrane.
- **Carbohydrates** – Definition, Classification with examples, Sources, physiological significance and HbA1c.
- **Lipids** – Definition, Classification with examples, Sources, Types of lipids present in the body, storage form, storage site, free cholesterol structure, functions of lipids, lipoprotein structure and its functions.
- **Nucleic acids** – Nucleotide, Nucleoside, types of nucleic acids, secondary structure of DNA & Its functions; Types of RNA & its functions.

#### **UNIT II – Proteins and Enzymes**

- **Proteins** – Definition, Classification, functions of proteins, Plasma proteins; Classification of Amino acids with examples
- Haemoglobin structure, Functions of haemoglobin, haemoglobin derivatives, Abnormal haemoglobin
- **Enzymes:** Definition, Classification, coenzymes, Metalloenzymes, Factors affecting enzyme activity, Regulation of enzymes, over view of Mechanism of enzyme action, Isoenzymes and Clinical importance of enzymes.

#### **UNIT III-Vitamins, Minerals, Nutrition**

**Vitamins:** Definition, Classification of Vitamins

Sources, RDA, Function & Deficiency symptoms of

- Fat Soluble Vitamins (A, D, E & K);
- Water Soluble Vitamins (Thiamine, Riboflavin, Niacin, Biotin, Pantothenic acid, Pyridoxine, Folic acid, Cobalamine) and Vitamin C

**Minerals:** Definition, Classification of Minerals

Sources, RDA, Function, Reference levels & Deficiency Symptoms of

- Calcium, Phosphorus, Iron Copper, Zinc, Sodium, Chloride, Iodine, Potassium, Fluorine and Selenium.

**Nutrition:** BMR, SDA, Dietary fibres, protein Energy Malnutrition and Obesity

#### **UNIT IV – Bioenergetics and Metabolism**

**Bioenergetics:** Electron Transport chain and Oxidative Phosphorylation

#### **Metabolism**

- **Carbohydrates:** Digestion and absorption, Glycolysis, TCA cycle, Metabolism of Fructose and Galactose.
- **Lipids:** Digestion and absorption, Beta oxidation of fatty acids, Regulation of Cholesterol level in the cell and outline of lipid transport.
- **Proteins:** Digestion and Absorption, Formation and Disposal of Ammonia, Urea Cycle, Special Products of Glycine, Tyrosine and Tryptophan.

#### **UNIT V – Miscellaneous**

Outlines of DNA organization, Replication, Transcription, Genetic code and Translation

Organ function Tests: Liver, Renal and Bone.

#### **PRACTICAL**

- Spotters

#### **Reference Book**

1. Essentials of Biochemistry by Satyanarayana, Current edition and Allical publishers.

## **4. BASICS IN MEDICAL PHYSICS AND ELECTRONICS (IE)**

### **Unit I: Laser**

Nature of light-Reflection-Refraction-Total internal reflection-Optical fibers-Applications in Medicine – Laser-Principles-Action-Types of laser, Basic principles of laser in Medical Application – Argon-Iron laser photo coagulator-Photo thermal-Photochemical application-Applications of laser in Medicine-Laser hazards and safety measures

### **Unit II: Radiation Physics**

Introduction to nuclear physics and radioactivity, Radioactive radiations – X-ray, production of x-ray, Properties of x-ray radiations – Biological effects of radiation, Radiation damage in matter, Radiation protection principles, radiation detection and measurement – Ultrasound and generation of ultrasound.

### **Unit III: Introduction to Imaging Technique**

Principles of Microscope: Simple microscope and compound microscope-  
Radiography: Making and X-ray image-Fluoroscopy. CT Scans, MRI –  
Ultrasonography: Ultrasound picture of Body-A-Scan-M-Scan-Ultrasound diathermy-  
Phonocardiography – Radio isotopes: Uses of Radio isotopes – <sup>99m</sup>Tc Generator –  
Scintillation detectors – Application of scintillation detectors – Gamma Camera –  
Positron Camera

### **Unit IV: Semiconductor devices**

Principles of diodes and Transistors – Integrated circuits – Amplifiers – Basic configuration and types – differential and operational amplifiers – Waveform generators – Timer – A/D and D/A converters – Active filters – Transducers – Basic configuration and types.

### **Unit V: Bio potential Recording Systems**

Introduction to bioelectric potential – Electrodes and surfaces – Bio potential amplifier – Frequency ranges of various bio potential signals – Working principles of bio potential recording systems – Electrocardiography – Electroencephalograph – Electromyography.

**Reference Books:**

1. New Understanding physics for advanced level – Jim Breithaupt.
2. Advanced Physics for you by Keith Johnson, Simmons Hewett, Sue holt, John miller
3. Christensen's Physics of diagnostic Radiology by Thomas S. Curry III, M.D., Robert C Murray, Jr. Ph.D., Dow Dey, PhD.
4. Applied Electronics, A. Subramanyam, The National Publishing co., Madras (1996).
5. Design and Development of Medical Electronic Instrumentation, David Prutchi and Michael Norris, John Wiley & Sons (2005).

## **5. ENGLISH (IE)**

### **Unit I: Spoken Communication**

- Learning to read the phonetic symbols
- Stress
- Intonation
- Rhythm
- Commonly mispronounced words
- Correct pronunciation of important commonly used words in hospital practice

### **Unit II: Vocabulary and Reading**

- Special features of English vocabulary
- Common errors in choice of word
- Semi technical vocabulary
- Collecting material from library on scientific topics
- Comprehensive exercises

### **Unit III: Writing**

- Writing letters regarding permission, leave, opening bank account etc.
- Taking notes from lecture / reading materials
- Writing reports on patient care
- Summarizing scientific passages

### **Unit IV: Grammatical and Idiomatic Usage**

- Correction of errors
- Types of interrogative sentences
- Active-Passive voice
- Tense
- Principles of precision, clarity and specificity

## **6. BASIC OF COMPUTERS (IE)**

### **UNIT I: INTRODUCTION**

Computer basics – Types of computers – hardware components – input devices – output devices – storage devices – memory – units and sizes – factors affecting performance – operating systems – applications software – networking – LAN and WAN – Accessories – backup – computer virus – software copyright.

### **UNIT II: WORD PROCESSING**

Windows – Office automation – WORD processor – open a new document – toolbars – menus – font dialog box – enter text – scroll – spelling checker – Autocorrect – undo and redo – bullets and numbered lists – indenting – moving and copying – find and replace – auto shapes – saving document – preview and print.

### **UNIT III: ELECTRONIC SPREADSHEET AND DATA PRESENTATION**

**EXCEL** spreadsheet – grid of rows and columns – active cell – selecting range – entering data – editing data – row and column labels – adjusting width – creating and copying formulae – relative – logical functions – lookup function – creating chart – bar chart – pit chart – print and save.

**POWERPOINT** presentation – creating slide shows- building outline – switching levels in outline – adding pictures – slide designs – design templates – formatting – color scheme – customized backgrounds – inserting content – hyperlink – revolution in education.

### **UNIT IV: DATABASE MANAGEMENT SYSTEM**

**ACCESS** database – concept – template –primary key – records and fields – Student roster database – input mask – adding records – viewing data – updating entries – searching and querying – sorting – Table, forms and reports.

### **UNIT V: APPLICATIONS IN HEALTH CARE AND MEDICINE**

**INTERNET** – e-governance – access to information – communication facility – mechanics of E-mail – social transformation – electronic billing – drug information – information flow in lab and radiology – storage of medical records – networking the organization – patient care – intelligent monitoring – scholarly information – health

informatics – robotic assisted surgery – Clinical decision support systems –  
Telemedicine.

## **REFERENCES BOOKS**

1. Peter Norton., Introduction to Computers. 7<sup>th</sup> Edition, Tata McGraw hill Education Private Limited 2010.
2. Gary B. Shelly, Thomas J. Cashman, Misty E. Vermaat., Microsoft Office 2007. 1<sup>st</sup> Edition, Delmar Cengage Learning 2010.

**B.SC. ALLIED HEALTH SCIENCE  
NEUROSCIENCE TECHNOLOGY 2021**

**SCHEME OF EXAMINATION**

**SEMESTER - II**

**(Common To All Courses For Anaesthesia Technology, Cardiac Technology, Medical Laboratory Technology, Renal Dialysis Technology, Radiology And Imaging Science Technology, Perfusion Technology, Respiratory Care Technology)**

S.No	Paper	Teaching Hrs		Evaluation-University Examination [marks]					
		L	P	I.A.		University Exam		Total	Credits
				T	P	T	P		
1.	Microbiology [U.E.]	60	20	10	10	60	20	100	5
2.	Pathology [U.E.]	60	20	10	10	60	20	100	5
3.	Pharmacology [U.E.]	60	20	10	10	60	20	100	5
4.	Environmental Science & Community Med.[I.E.]	60	20	10	-	40	-	50	5
5.	Basics of Nursing[I.E.]	60	-	10	-	40	-	50	4
Total no. of credits									24



**B.SC. ALLIED HEALTH SCIENCE**  
**NEUROSCIENCE TECHNOLOGY 2021**

**SYLLABUS**

**SEMESTER – II**

**(Common To All Courses For Anaesthesia Technology, Cardiac Technology, Medical Laboratory Technology, Renal Dialysis Technology, Radiology And Imaging Science Technology, Perfusion Technology, Respiratory Care Technology)**

**1. MICROBIOLOGY (UE)**

**UNIT – I: General Bacteriology**

Introduction & History of Microbiology, Classification & Morphology of Bacteria, Growth & nutrition, Culture Media & Methods, Sterilization & Disinfection, Fundamental aspects of antibacterial agents and antimicrobial susceptibility testing.

**UNIT – II: Immunology**

Infection, Immunity, Immunization schedule, applications of antigen antibody reactions, Hypersensitivity, Tumor & Transplantation Immunology.

**UNIT – III: Virology**

Introduction to virology, viral hepatitis, poliomyelitis, Rabies, Human immunodeficiency virus.

**UNIT – IV: Mycology & Parasitology**

Introduction to mycology, pathogenic yeasts & fungi, Introduction to parasitology, Amoebiasis, Malaria, Helminthic infections.

**UNIT – V: Applied Microbiology**

Outline of common bacterial diseases, treatment & prevention-Respiratory tract infections (upper & lower), Meningitis (septic & aseptic), Enteric infections (food poisoning & gastro enteritis), Anaerobic infections, Skin & soft tissue infections, Urinary tract infections, Sexually transmitted diseases, Tuberculosis & Leprosy, Hospital acquired infections, Biomedical waste management.

**PRACTICAL EXERCISES:** Spotters, Gram staining.

**Reference Books**

1. Textbook of Microbiology by Ananthanarayan & Panicker's, 8<sup>th</sup> edition- Universities Press (India) PVT LTD.
2. Textbook of Microbiology by C. P. Baveja, 4<sup>th</sup> edition, Arya Publications.
3. Textbook of Medical Parasitology, CK Jayaram Paniker, 5<sup>th</sup> edition, Jaypee Publications.
4. Medical Parasitology by C. P. Baveja & V. Baveja, 2<sup>nd</sup> edition, Arya Publications.
5. Publications.

## **2. PATHOLOGY (UE)**

### **UNIT-I: General Pathology I: Cellular Pathology, Acute and Chronic Inflammation, Tissue Renewal Regeneration and Repair, Hemodynamic Disorders Thromboembolic Disease and Shock**

Introduction to Pathology, Adaptations Of Cellular Growth And Differentiation, Causes Of Cell Injury, Mechanisms Of Cell Injury, Necrosis, Apoptosis, Pathologic Calcification, Cellular Aging, Acute Inflammation – Mediators Of Inflammation Outcomes Of Acute Inflammation, Morphologic Patterns Of Acute Inflammation, Chronic Inflammation – Causes Of Chronic Inflammation, Granulomatous Inflammation, Healing By Repair, Scar formation And Fibrosis, Cutaneous Wound Healing, Healing By First Intention, Healing By Second Intention, Edema, Hemostasis and Thrombosis, Infarction, Shock

### **UNIT-II: General Pathology II: Diseases of the Immune System, Neoplasia, Environmental And Nutritional Disease, Diseases Of Infancy And Childhood**

Innate Immunity, Adaptive Immunity, Components Of The Immune System, Mechanisms Of Hypersensitivity Reactions, Acquired Immunodeficiency Syndrome (AIDS), Neoplasia – Definition and Nomenclature, Characteristics Of Benign And Malignant Neoplasms, Molecular Basis Of Cancer, Essential Alterations For Malignant Transformation, Clinical Aspects Of Neoplasia, Laboratory Diagnosis Of Cancer, Common Environmental And Nutritional Pathology, Nutritional Diseases, Tumors And Tumor-Like Lesions Of Infancy And Childhood

### **UNIT-III: Systemic Pathology I: Blood Vessels, the Heart, Red Blood Cell and Bleeding Disorders, Diseases Of White Blood Cells**

Arteriosclerosis, Atherosclerosis, Hypertensive Vascular Disease, Ischemic Heart Disease, Hypertensive Heart Disease, Valvular Heart Disease, Infective Endocarditis, Rheumatic Fever and Rheumatic Heart Disease, Cardiomyopathies, Leukopenia, Anemias, Polycythemia, Bleeding Disorders, Reactive Proliferations Of White Cells, Definitions And Classifications of Lymphoid Neoplasms and Myeloid Neoplasms, Splenomegaly.

#### **UNIT-IV: Systemic Pathology II: The Lung, The Gastrointestinal Tract, Liver And Biliary Tract**

Acute Respiratory Distress Syndrome, Obstructive Pulmonary Diseases, Pulmonary Infections, Gastritis, Peptic Ulcer Disease, Inflammatory Bowel Diseases, Liver Function Tests, Hepatic Failure, Cirrhosis, Portal Hypertension, Jaundice, Cholelithiasis

#### **UNIT-V: Systemic Pathology III: The Urogenital System, The Breast, The Endocrine System, Bones Joints And Soft-Tissue, Peripheral Nerve And Skeletal Muscle, The Central Nervous System**

Renal Function Tests, Nephrotic Syndrome, Nephritic Syndrome, Urolithiasis, Pap Smear, Carcinoma Of The Breast-Types And Classification, Thyroid Gland – Hyperthyroidism, Hypothyroidism, Thyroiditis, Graves' Disease, Diffuse And Multinodular Goiters, Parathyroid Glands – Hyperparathyroidism, Hypoparathyroidism, Diabetes Mellitus, Fractures, Osteomyelitis, Arthritis, Osteoarthritis, Rheumatoid Arthritis, Infectious Arthritis, Diseases of Peripheral Nerve, Diseases of Skeletal Muscle, Infections of CNS – CSF Findings

#### **REFERENCE BOOKS**

1. Pocket companion to Pathologic Basis of Disease by Robbins and Cotran, 7<sup>th</sup> edition, Saunders.
2. Pathology Quick Review and MCQs by Harsh Mohan, 2<sup>nd</sup> edition, Jaypee Publications.

## **PATHOLOGY – UNIVERSITY PRACTICAL EXAMINATION**

**(Common to all courses)**

**Duration – 2 Hrs**

**Maximum Marks – 20**

### **EXPERIMENTS:-**

#### **I. URINE EXAMINATION: (8 Marks)**

- **Physical - 2 Marks**
- **Chemical (Any one) - 2 Marks**
  - a) **Test for Sugar**
  - b) **Test for Protein**
  - c) **Test Ketone bodies**
- **Microscopic Examination - 4 Marks**

#### **II. BLOOD EXAMINATION: (Any one of the following) (8 Marks)**

- **Blood grouping**  
**Bleeding time, clotting time**
- **Hb Estimation & PCV**
- **Differential Count**
- **WBC Count**

#### **III. SPOTTERS: (4 Marks)**

**Any two instruments & 2 Charts**

### **3. PHARMACOLOGY (UE)**

#### **UNIT-I: General Pharmacology**

Introduction to pharmacology-various terminologies-sources & routes of drug administration – Absorption & Factors modifying drug absorption – Distribution of drugs – Metabolism: Phase II, - Excretion: routes, modes & kinetics of elimination – Excretion – Mechanism of drug action in brief, synergism & antagonism and Factors modifying drug action – Adverse drug reactions – ADR reporting & monitoring – Drug interactions.

#### **UNIT-II: Central Nervous System & Respiratory System**

Introduction to CNS and Neurotransmitters, drugs used in insomnia, Sedatives and hypnotics – diazepam – alprazolam, anti-anxiety drugs, Antiepileptic's – phenytoin, carbamazepine, sodium valproate, General Anesthetics – halothane, isoflurane, sevoflurane – Local Anesthetics – lignocaine – list of other drugs, Alcohols – ethyl alcohol – disulfuram, Anti parkinsonians – levodopa – carbidopa, Opioids – morphine – naloxone – tramadol – pentazocine, NSAIDs – aspirin – diclofenac – ibuprofen – paracetamol – cox 2 inhibitors. Drugs used in bronchial asthma and cough

#### **UNIT-III: Cardio vascular system & blood**

Drugs used in Ischemic Heart Disease-nitrates-Calcium channel blockers-nifedipine, verapamil-list of other drugs – Beta blockers – propranolol, atenolol – metoprolol and antiplatelets – aspirin, clopidogrel, and names of other drugs-fibrinolytic drugs-streptokinase and other drugs, Drugs used in CCF-digoxin and list of other drugs useful in CCF, Shock. Diuretics: 4 groups – Thiazides, Loop diuretics, Potassium sparing and osmotic diuretics. Hypertension – outline of drugs used in hypertension, Renin angiotensin system – ACE inhibitors – captopril, ramipril and names of other drugs – Receptor antagonist – losartan and list of other drugs, Antiarrhythmic drugs-classification – Quinidine, Lignocaine and amiodaron – Drugs for Hypercholesterolemia – statins. Drugs for anemia – oral & parenteral iron preparations, folic acid, vitamin B12 and erythropoietin. Coagulants and anti-coagulants

#### **UNIT-IV: Hormones and GIT**

Contraceptives – oral and injectable, Corticosteroids – glucocorticoids – hydrocortisone-prednisolone-dexamethasone and names of topical steroids – Insulin – Oral hypoglycemic – sulphonyl ureas, biguanides and others, Thyroid and Antithyroid drugs, Sex Hormones-Estrogen and anti estrogens, Progestin and Anti progestins, Androgen And anti-androgens.

Emetics and anti-emetics-metoclopramide and domperidone, Drugs used in peptic ulcer, constipation-lactulose & Diarrhea-ORS-Loperamide.

#### **UNIT-V: Chemotherapy and Miscellaneous**

Introduction – Beta lactum antibiotics: Penicillin's – natural, semi synthetic penicillin's – amoxicillin – cloxacillin-clauvulinic acid – sulbactam – Cephalosporin's – cephalexin – cefuroxime – cefixime – ceftriaxone-cefepime, Broad spectrum antibiotics – Doxycycline – chloramphenicol-imipenem-Macrolides – erythromycin, azithromycin and others – Quinolones- ciprofloxacin and list of other drugs and sulfonamides- cotrimoxazole- Amino glycosides-gentamycin, amikacin and names of other drugs Anti TB-first line drugs, Anti leprosy-dapsone and clofazimine Anti-malarial- chloroquine- mefloquine and artemisinins, Anti-fungal- amphotericin B- fluconazole and topical drugs & Anti-viral drugs- acyclovir and anti HIV, Anti protozoals- metronidazole – Anthelmintics- albendazole- praziquantel.

Anti-cancer drugs-Introduction – Anti metabolites- methotrexate- 6 mercapto purine- Alkylating agents- cyclophosphamide- busulphan and cisplatin – Plant products- vinblastin- vincristine- taxanes, antibiotics-actinomycin D- monoclonal antibodies.

Immuno modulators- cyclosporine, tacrolimus, azathioprine and steroids.

Toxicology-Drugs used in common poisoning, organophosphates, methyl alcohol, Benzodiazepam.

#### **PRACTICALS: - SPOTTERS / CHARTS**

#### **REFERENCE BOOKS:**

1. Lippincott's Illustrated Reviews: Pharmacology, 5<sup>th</sup> edition, by Richard A. Harvey and Pamela C. Champe, Lippincott Williams & Wilkins Publisher
2. Essentials of Medical Pharmacology: K.D. Tripathi, 6<sup>th</sup> edition, Jaypee Publishers.

#### **4. ENVIRONMENTAL SCIENCE AND COMMUNITY MEDICINE (IE)**

##### **UNIT – I:**

- **Natural Resources:** Introduction, Multi-disciplinary nature of environmental studies, Earth Resources and Man, Renewable And Non-Renewable Resources, Water Resources, Mineral Resources: Food Resources: Effect of modern agriculture, Fertilizer/pesticide problems, Water logging, ND salinity, Energy Resources.
- **Ecosystems:** Concept of an Ecosystem, Structure And Functions of an Ecosystem, Producers, Consumers and Decomposers, Cycles in the Ecosystem
- **Biodiversity:** Introduction, Definition: Genetic, Species, Ecosystem diversity, India as a Mega Diversity Nation, Hotspots of Biodiversity Threats to Biodiversity. Poaching of Wildlife, Man-Wildlife Conflicts, Endangered and Endemic Species Of India, Conservation of Biodiversity

##### **UNIT – II:**

- **Pollution:** Definition, Causes, Effects and Control Measures of Air Pollution, Water Pollution, Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards, Solid Waste Management role of Individuals in Pollution Prevention.
- **Social Issues Human, Population and Environment:** From Unsustainable To Sustainable Development, Urban Problems Related To Energy, Water Conservation, rain Water Harvesting, global warming, acid rain, ozone layer depletion, nuclear accidents and nuclear holocaust. Environment Protection Act.

##### **UNIT – III:**

- **Concept of health & disease:** Concept of health, Definition of health, Philosophy of health- Dimension of health – Concept of wellbeing, Spectrum of health, Responsibility of health – Determinates of health & Indicators of health – Concepts of disease & Concepts of cessation – Natural history of disease – Iceberg phenomenon, Concepts of control – Concepts of prevention – Modes of Intervention, Changing pattern of disease.

##### **UNIT – IV:**

- **Epidemiology:** Definition & explanation, Aims, Epidemiologic approach, Basic measurements in epidemiology & tools of measurements – Measurements of



Mortality & Morbidity, Epidemiologic methods- Descriptive epidemiology- Analytical epidemiology – case control study – analytical epidemiology – Cohort study – Experimental epidemiology – RCT – Association & Causation Uses of epidemiology (Criteria for judging causality) – Infection disease epidemiology Definitions Dynamic of disease transmission & Modes of transmission – Disinfection – Definition Types Agents used Recommended disinfection procedures-Investigation of an epidemic.

#### **Unit – V:**

- **Environment & health:** Definition & components (environment sanitation environmental sanitation)
- **Water:** Safe & Whole some water Requirements Uses source of water supply (sanitary well)-Purification of water (1). Large scale purification, (2). Small scale purification – Water Quality – Special treatment of water
- **Air:** Composition The air of occupied room discomfort. Air pollution & its effects. Prevention & Control of air pollution
- **Ventilation:** Definition Standards\_of ventilation Types of ventilation. Light, Noise & Radiation, Metrological environment, Housing, Disposal of waste Excreta disposal

#### **PRACTICALS:**

1. Epidemiology Problems
2. Environmental spotters

#### **REFERENCE BOOK**

1. Textbook of Preventive and Social medicine by k. Park, 21<sup>st</sup> edition, published by Banarsidas Bhanot

## **5. Basics of nursing (IE)**

### **CONTENTS**

#### **Unit I: Introduction of Health**

Health care system, major health problems of the country, nature of disease pattern, technological advances and national health programmes, health for all by 2000 AD. Role of health care workers in the health care delivery system, impact of illness of the individual family and community.

#### **History of Nursing**

**Communication Skills:** Relationship with patients, process of communication

#### **UNIT II: Concept of Nursing**

**Nursing Processes:** Problems solving approach, assessment, diagnosis, planning, implementation and evaluation.

#### **Unit III: First Aid and Nursing in Emergencies**

- Definition, basic principles, scope and rules
- Wounds, haemorrhages, shock, fracture, dislocation and muscle injuries, respiratory emergencies, resuscitation, unconsciousness, Miscellaneous conditions, burns, scalds, foreign bodies in the skin, eyes, ear, nose, throat and stomach.
- Frost bite, effects of heart cramps, bites and stings.
- Poisoning
- Transporting injured persons.

#### **Unit IV: Personal Hygiene and Health**

- Care of skin, mouth, eyes, nails, hair
- Menstrual hygiene, clothing, mental health, common health problems of poor personal hygiene.
- Comfort, Rest and Sleep
- **Hospital Housekeeping**

#### **Unit V: Health Education**

Introduction to principles and methods of health education. Use of audio visual aids, mass education, role of nurse in health education.

## **LIST OF BOOKS**

### **Anatomy**

1. Manual of Anatomy and Physiology – Prof. P.Saraswathi (Vengadam Publishers, Phone no: 044-26263469)
2. B D Chaurasia: Genera; human anatomy

### **Physiology**

1. Basics of Medical Physiology (Third edition) by D. Venkatesh/H.H. Sudhakar

### **Psychology**

1. Textbook of Biochemistry for Paramedical Students By Dr. P. Ramamoorthy
2. Essentials of Biochemistry by U. Sathyanarayana

### **Psychology**

1. Psychology – The Sciences of Behaviour – Fifth edition 1982 – Neil Carlson – William Bulkist – Allyn and Bacon.
2. Psychology made simple – Abraham Sperling, Ph. D -Advisory editor – M.S. Gill. MA, Ph. D- ‘Made simple books’ –W.H. Allen, London.

### **Elements of health and nursing principles**

1. Clint & Geraldine, 2011, Potter and Perry’s fundamentals of Nursing, Elsevier publications.

### **English**

1. Effective English Communication by Krishna Mohan and Meenakshi Raman, Tata McGraw – Hill Publishing Company Limited, New Delhi. (Approx. Cost Rs. 200)
2. English for colleges and Competitive Exams by Dr. R. dyvadatham, Emerald Publishers (Approx. cost Rs. 150)

### **Microbiology**

1. Prof C P Baveja – Text book of Microbiology.
2. Satish Gupte – Text Book of Microbiology

### **Pathology**

1. Textbook of Pathology, Harsh Mohan, 3<sup>rd</sup> edition

### **Pharmacology**

1. Prep Manual for Undergraduates in Pharmacology by Tara V Shanbag, 2<sup>nd</sup> edition
2. Pharmacology for Dental and Allied Health Sciences by Padmaja Udaykumar, 3<sup>rd</sup> edition

### **Medical Physics**

1. Basic Radiological physics – K. Thayalan, Jaypee Brothers, Medical Publishers (P) Ltd, New Delhi.
2. Lasers and optical fibre communications-P. Sarah, I.K. Internation publishing House Pvt, Ltd. New Delhi.

### **Community Medicine**

1. Park's Textbook of Preventive and Social Medicine-23<sup>rd</sup> Edition

# NEUROSCIENCE TECHNOLOGY

## SCHEME OF EXAMINATION 2021

### SEMESTER – III

S.No	Paper	Hrs/Sem		Evaluation (Marks)					
		L	P	Internal Assessment		University Exams/Department* Exams		Total	Credits
				T	P	T	P		
1.	Basic Neurosciences I- Applied Anatomy & Physiology related to Neuroscience technology Theory(UE)	60	-	20	-	60	-	80	4
2.	Charts & Card test – Practical I (UE)	-	120	-	20	-	60	80	4
3.	Basic Neurosciences I- Pharmacology related to Neuroscience technology Theory(UE)	60	-	20	-	60	-	80	4
4.	Charts & Card test – Practical II (UE)	-	120	-	20	-	60	80	4
5.	Basic Principles of Hospital Management(IE)	60	-	20	-	60*	-	80	4
6.	Applied Anatomy & Physiology related to Neuroscience technology: Comprehensive viva(IE)	-	180	-	25	-	75*	100	5
TOTAL									25

Total No. of Hours – 600 Hour

U.E.-University Examination

I.E.-Internal Examination.

\*These examinations shall be conducted by the respective department.

# **1. Applied Anatomy & Physiology related to Neuroscience technology**

## **– Theory(UE) Paper - I**

### **Unit I: Spinal Cord**

- Structure.
- Blood supply – Functions.
- Tracts.

### **Unit II:**

- Spinal roots and peripheral nerves.
- Branchial plexus.
- Lumbosacral Plexus.

### **Unit III:**

- Basics of Nerve Conduction study.
- Neuromuscular Junction.

### **Unit IV:**

- Motor unit.
- Muscle stretch reflex.
- Muscle contraction.

### **Unit V:**

- Membrane potential.
- Ion channels.
- Neurotransmitters.

## **2. Charts & Card test (Practical I)**

### **3. Pharmacology related to Neuroscience technology – Theory (UE)**

#### **Paper II**

- General pharmacology: definitions, routes of drug administration, pharmacokinetics, pharmacodynamics.
- Drugs acting on the autonomic nervous system.
- General and local anesthetics, skeletal muscle relaxants.
- Sedative hypnotics, ethyl alcohol.
- Antiepileptic drugs.
- Antiparkinsonian drugs.
- Drugs used in mental illness.
- CNS stimulants and cerebroactive drugs.
- Drugs affecting coagulation, bleeding and thrombosis.
- Antiseptics, disinfectants.



## **4. Charts & Card test (Practical II)**

## **5. Basic Principles of Hospital Management [IE]**

**(Common to all specialties – Anaesthesia Technology, Cardiac Technology, Clinical Laboratory Technology, Renal Dialysis Technology, Radiology & Imaging Science Technology and Perfusion Technology)**

### **Unit I: Introduction to management & Organization**

The evolution of Management, Definition and importance of Management. Planning – Organizing – staffing – Motivating – Leading – Controlling. Management of health care units (in brief). Individual behaviour in organization; organizational functioning (Group / Individual); Perception; Motivation MBO; Organizational Development.

### **Unit II: Planning and Management of Hospitals & Clinical Services:**

Building and physical layout – space required for separate function – Planning of infrastructure facilities, clinical services, equipment & Human resources – Types of Hospitals. Organization and administration of various clinical services; outpatient services. In-patient services, emergency services, operation theatres, ICU's and super specialty services.

### **Unit III: Organizing of support clinical services & Hospital management:**

Imaging – CSSD – Laboratory – Blood Bank – diet – Medical Records – Mortuary. Housekeeping – Maintenance (Water, Electricity, Civil, Air Conditioning, Lift) – Pest Control – transport – Security. Forecasting – Purchasing & procurement (Sourcing, methods and procedures). – Storing & Issuing, Concept of inventory control, Maintenance of equipment's and contracts (with special reference to major biomedical equipment's). Trends in financing of Health and Hospital Services – Classification of Hospitals depending on source of financing – roles of financial institutions.

### **Unit IV: Personnel and quality Management in Hospital & Marketing:**

Concepts – Manpower planning – Training & Developments – Team Building – Conflict Management – Performance appraisal – Office rules and regulations Outline of Strategic Planning and Marketing. Concepts of quality – Professional Audit System – QA program – Medical Audit – Quality Circle – TQM – Patient Satisfaction – ISO 9000. A brief outline – computerization in hospital departments. Concept, Techniques, Indicators, Evaluation of Efficiency & Effectiveness evaluation of hospital and medical care services.

### **Unit V: Ethical, current issues and Legal Aspects of Hospitals management services:**

Laws related to Hospital – Medico Legal Cases law of Torts – Autopsy – Dying declaration – CPA. – Waste Management – Telemedicine – Organ Transplantation – Rehabilitation Service – Health Insurance. Operations Research and Quantitative Methods in Hospital Administration & Nursing Services in a Hospital.

**6.Applied Anatomy & Physiology related to Neuroscience  
technology: Comprehensive Viva (IE)**

# NEUROSCIENCE TECHNOLOGY

## SCHEME OF EXAMINATION 2021

### SEMESTER – IV

S.No	Paper	Hrs/Sem		Evaluation (Marks)					
		L	P	Internal Assessment		University Exams/Department* Exams		Total	Credits
				T	P	T	P		
1.	Basic Neurosciences II- Applied Basic Electroencephalography Theory(UE)	60	-	20	-	60	-	80	4
2.	Electroencephalography- Charts, Recording, Spotters - Practical I (UE)	-	120	-	20	-	60	80	4
3.	Basic Neurosciences II – Disorders of the brain tumor. Theory(UE)	60	-	20	-	60	-	80	4
4.	Electroencephalography- Charts, Recording, Spotters - Practical II (UE)	-	120	-	20	-	60	80	4
5.	Health Care Management(IE)	60	-	20	-	60*	-	80	4
6.	Clinicals in Basics of Neuroscience technology: comprehensive viva(IE)	-	180	-	25	-	75*	100	5
TOTAL									25

Total No. of Hours – 600 Hours

U.E.-University Examination

I.E.-Internal Examination.

\*These examinations shall be conducted by the respective department.

# **B.SC. ALLIED HEALTH SCIENCES**

## **NEUROSCIENCE TECHNOLOGY**

### **SYLLABUS**

#### **SEMESTER-IV**

#### **1.Basic Neuroscience II – Applied Basic Electroencephalography** **Theory (UE) Paper - I**

##### **Unit I: Basic of Instrumentation**

- Electrical concepts conduction, insulation voltage current, resistance, power capacitance, inductance.
- DC/AC, Impedance Transistors, Differential power amplifier.
- **The Electroencephalography & Instrumentation:**
- Filter-High frequency, Low frequency, Time constant biological filters, 50Hz filters.

##### **Unit II: Electroencephalography recording technique**

- Electrodes-Types, Materials, Maintenance of electrode.
- Modes of application, the 10-20 system, the 10-10 system.
- Special electrodes in EEG, Reporting, Montages- Bipolar/Referential/Monopolar/laplacian, Video of EEG, Ambulatory EEG

##### **Unit III: Normal rhythms & Abnormal**

- Seizure, Epilepsy and the classification of the epilepsy
- Normal rhythms: alpha, beta, gamma, delta, theta, Mu, Lambda, Cone waves.
- Abnormal waveforms: Spike, Sharp, Polyspike, spike and slow waves, PLEDS, slow waves, FIRDA, phantom spike wave, photo paroxysmal response, triphasic sharp waves.
- **Epilepsy:** Abnormal epileptic patterns- Benign rolandic epileptic forms, 3/sec cycle, CJD, PLED's, Sub acute sclerotic lateralized epileptic discharges, Hypsarthymia/west syndrome, Artifacts – Non-physiological Artifact & Physiological Artifact.

##### **Unit IV: Patients grounding & safety**

- Analog and digital EEG.
- Factors affecting EEG.
- Drugs affecting EEG.
- EEG changes in sleep.
- EEG in comatose patient

- Electrical silence.

### **Unit V: Disease Condition Related**

- Alzheimer.
- Dementia.
- Parkinson's disease.
- Parkinson's plus.
- Parkinsonism.
- Stroke – Thrombotic, Embolic, Aneurysm, TIA.
- Epilepsy.
- Management of Seizure.
- Glasscow coma scale.
- Hydrocephalus.
- EEG findings in brain death.

### **Recommended Books**

- 1) EEG in Clinical in Practice – John R. Hughes.
- 2) Electroencephalography – Ernst Niedermeyer, Fernando Lopes da Silva.

### **Reference Books**

- 1) Primer of EEG: With A Mini-Atlas, le – A. James Rowan MD and Eugene Tolunsky MD

**2.Electroencephalography- Charts, Recording, Spotters –**  
**(Practical I)**

### **3.Basic Neurosciences II – Disorders of the brain tumor - Theory(UE)**

#### **Unit 1:**

- Disturbances of consciousness.
- Cerebrovascular disorders.

#### **Unit 2:**

- Pyogenic meningitis.
- Tubercular meningitis.

#### **Unit 3:**

- Encephalitis.

#### **Unit 4:**

- Brain tumors.
- Brain death.

#### **Unit 5:**

- Sleep disorders.



## **4. Electroencephalography- Charts, Recording, Spotters –**

### **(Practical II)**

## **5. HEALTH CARE MANAGEMENT**

### **UNIT I: Concept of Health Care and Health Policy**

Health in Medical Care, Indigenous systems of Health Care & their relevance, Framework for Health Policy Development.

### **UNIT II: Health Organisation**

Historical development of Health Care System in the third world & India, Organization & Structure of Health administration in India, Type of Health Organization including International Organizations, Private & Voluntary Health care provider, Distribution of Health Care Services, Health Care System in Public sector Organization, Health systems of Various Countries.

### **UNIT III: Health Policy and National Health Programme**

National Health Policy, Drug Policy, National Health Programs (Malaria, T.B., Blindness, AIDS etc.,) Evaluation of Health Programs (Developing indicators for evaluation), Medical Education & Health Manpower Development.

### **UNIT IV: Health Economics – Fundamentals of Economics**

Scope & Coverage, Demand for Health Services, Health as an Investment, Population, health of Economic Development. **Economics of Health-**

Population based health services, Economics of Communicable and Non Communicable diseases

### **UNIT V: Methods & Techniques of Economic Evaluation of Health Program**

Cost Benefit & Cost Effective Methods

- **Household & Health**

Health Expenditure & Outcome, Rationale for Government action, Household capacity, income and schooling

- **Health Insurance.**

**6.Clinicals in Basics of Neuroscience technology:**  
**COMPREHENSIVE VIVA (IE)**

## NEUROSCIENCE TECHNOLOGY

### SCHEME OF EXAMINATION 2021

#### SEMESTER – V

S.No	Paper	Hrs/Sem		Evaluation (Marks)					
		L	P	Internal Assessment		University Exams/Department* Exams		Total	Credits
				T	P	T	P		
1.	Basic Neurosciences III – Peripheral neuropathies Theory(UE)	60	-	20	-	60	-	80	4
2.	Applied Nerve conductions, Electromyography and Evoked Potentials Practical I (UE)	-	120	-	20	-	60	80	4
3.	Basic Neurosciences III – Inflammatory myopathies- Polymyositis and dermatomyositis Theory(UE)	60	-	20	-	60	-	80	4
4.	Applied Technology - Practical II(UE)	-	120	-	20	-	60	80	4
5.	Hospital Products, Promotion, Sales & Public relation (or) Physician’s Office Management(IE)	60	-	20	-	60*	-	80	4
6.	Clinicals in Principles of Neuroscience Technology : comprehensive viva(IE)	-	180	-	25	-	75*	100	5
TOTAL									25

Total No. of Hours – 600 Hours

U.E.-University Examination

I.E.-Internal Examination.

\*These examinations shall be conducted by the respective department.

**B.SC. ALLIED HEALTH SCIENCES**

**NEUROSCIENCE TECHNOLOGY**

**SYLLABUS**

**SEMESTER-V**

**1. Peripheral Neuropathies - Theory (UE)**

**Unit 1: Peripheral neuropathies**

- Axonal neuropathies.
- Demyelinating neuropathies – Guillain Barre Syndrome and Chronic inflammatory demyelinating polyneuropathy.

**Unit 2:**

- Mononeuritis multiplex.

**Unit 3:**

- Traumatic neuropathies.

**Unit 4:**

- Entrapment neuropathies.

**Unit 5:**

- Compressive myelopathies.

## **2.Applied Nerve conductions, Electromyography and Evoked Potentials - (Practical I)**

- Nerve conduction studies techniques.
- Physiological variables affecting nerve conductions.
- Nerve conductions in pathological states
  - a) Demyelinating neuropathies.
  - b) Axonopathy.
  - c) Entrapment neuropathies.
  - d) Plexopathy.
  - e) Radiculopathy.
- Repetitive nerve stimulation.
- H- reflex and F- response.
- Electromyography in myopathy and neuropathy.
- Evoked potentials in
  - a) Disorders of the central nervous system.
  - b) Disorders of the peripheral nervous system.
- Event related potentials.
- Surface recording of EMG in movement disorders.

### **3.Inflammatory myopathies – Theory (UE)**

#### **Unit 1:**

- CNS Demyelination and multiple sclerosis.

#### **Unit 2:**

- Inflammatory myopathies – Polymyositis and Dermatomyositis.

#### **Unit 3:**

- Muscular Dystrophies.

#### **Unit 4:**

- Myotonia.

#### **Unit 5:**

- Myopathies.
- Movement disorders – tremors, dystonia, Parkinson's disease.

#### **4.Applied Technology (Practical II)**

- Nerve conduction studies
  - a) Motor nerve conduction
  - b) Sensory nerve conduction
  - c) F- response
  - d) H- reflex
- Recording R-R variation & sympathetic skin response.
- Interpretation of Nerve conduction graphs and data.
- Factual reporting of Nerve conduction studies.
- Recording evoked potentials
  - a) Auditory evoked potentials
  - b) Visual evoked potentials
  - c) Somatosensory evoked potentials
- Factual reporting evoked potentials.



## **5. HOSPITAL PRODUCTS, PROMOTION, SALES AND PUBLIC RELATIONS [IE]**

### **Unit I:**

- **An introduction to Marketing**

Role of marketing in Business management – Evolution and definition of marketing – Concepts of Marketing – Service vs. Products – Management of Service Management process

- **Services Marketing**

Classification of services – Characteristics of services and their marketing implication – Selecting appropriate tools for marketing.

### **Unit II:**

- **Component of Service Marketing**

Product Planning, Market research system – Market segmentation – Targeting – Positioning – Launching new service – Concept of product life cycle, Pricing, setting the price – Economic Theory – Responding to price change, Physical Distribution, Major Aspects – Channels of distribution – Selection of channel, Promotion, Role of communication – Promotion mix – Advertising (Media – budget – Cost effectiveness – (attributing to hospitals a human face – Good will – image building among major public), Sales promotion (techniques – Evaluation), Direct selling (Sales force – Evaluation), Physical Environment, Process, People.

### **Unit III:**

- **Analysing Markets and Buyer Behaviour**

Model of consumer behavior – Factors influencing buyer behavior – Buying decision process.

- **Branding of a Hospital Facility**

Brand name and concept - Positioning hospitals – Developing and USP – Brand image – Image building – long term and short term activities.

### **Unit IV:**

- **Other Marketing routes for Health Care Units**

Interpersonal communication – Print materials institutional marketing – seminars – conference.

- **One case study related to Hospital Marketing**

**OR**

**PHYSICIAN'S OFFICE MANAGEMENT**

**UNIT I. Outpatient Section**

Registration of new cases, Registration of repeat cases, Patient record guide, Laboratory X-Ray reports & reports & reports filing, Alpha index typing & Filing, O.P. Records coding (disease & indexing), O.P. records retrieval, O.P. Statistics

**UNIT II. Inpatient Section**

Admitting office procedure, Inpatient record removal & forwarding, Ward Census,

**UNIT III.** Assembling & deficiency checks, I.P. record coding & indexing,

**UNIT IV. Discharge Analysis**

Incomplete record control, Completed record control, Medico legal procedures & issue of Medical certification, Record retention & destruction of O.P. & I.P. records,

**UNIT V. Miscellaneous**

Hospital reception, Secretarial practice, Library (Medical)

**6. CLINICALS IN PRINCIPLES OF NEUROSCIENCE TECHNOLOGY**  
**COMPREHENSIVE VIVA (IE)**

**Exam pattern (IE) Total marks-100**

- 1. VIVA-marks distribution (25 + 75 marks)**

**NEUROSCIENCE TECHNOLOGY**  
**SCHEME OF EXAMINATION 2021**  
**SEMESTER – VI**

S.No	Paper	Hrs/Sem		Evaluation (Marks)					
		L	P	Internal Assessment		University Exams/Department* Exams		Total	Credits
				T	P	T	P		
1.	Sleep Medicine & Polysomnography – Theory(UE)	60	-	20	-	60	-	80	4
2.	Clinical Assessment – Charts & Card test Practical I (UE)	-	120	-	20	-	60	80	4
3.	Application of Clinical Neurophysiology & Assessment Theory(UE)	60	-	20	-	60	-	80	4
4.	Clinical Assessment – Charts & Card test Practical II (UE)	-	120	-	20	-	60	80	4
5.	Medical Psychology (IE)	60	-	20	-	60*	-	80	4
6.	Clinicals in Neuroscience technology Chemistry: comprehensive viva(IE)	-	180	-	25	-	75*	100	5
<b>TOTAL</b>									<b>25</b>

Total No. of Hours – 600 Hours

U.E.-University Examination

I.E.-Internal Examination.

\*These examinations shall be conducted by the respective department.

**B.SC. ALLIED HEALTH SCIENCES**  
**NEUROSCIENCE TECHNOLOGY**  
**SYLLABUS**  
**SEMESTER-VI**

**1. Sleep Medicine & Polysomnography Theory (UE)**

**Unit I:**

- Anatomy of sleep.

**Unit II: Medical Disorders of sleep**

- Insomnia.
- Obstructive Sleep Apnea.
- Central Sleep Apnea.
- Sleep disorders in elderly.
- Narcolepsy and related disorders.

**Unit III:**

- Polysomnography.

**Unit IV**

- Median Sleep Latency (MSLT).

**Unit V**

- Actigraphy.

## **2.Clinical Assessment I – Charts & Card test (PRACTICAL I)**

### **3.Application of Clinical Neurophysiology & Assessment THEORY (UE)**

#### **Unit I:**

- Neurological complications of systemic disease.
- Trauma and the nervous system.
- Vascular disease of the nervous system.

#### **Unit II:**

- Cancer and the nervous system.
- Hypoxic, toxic and metabolic encephalopathies.
- Nutritional diseases of the nervous system.

#### **Unit III:**

- Disorders of cerebrospinal fluid circulation and brain edema.
- The Dementias.
- Parkinsonism and related movement disorders.

#### **Unit IV:**

- Disorders of cerebellum and tracts.
- Disorders of upper lower motor neurons.
- Disorders of peripheral nerves.

#### **Unit V:**

- Disorders of autonomic nervous system.
- Disorders of neuromuscular transmission.
- Disorders of skeletal muscle.

## **4.Clinical Assessment II – Charts & Card test (PRACTICAL II)**



## **5. Medical Psychology [IE]**

### **UNIT I: BIOLOGY OF BEHAVIOUR**

- Body mind relationship – modulation process in health and illness.
- Genetics and behavior: Heredity and Environment
- Brain and behaviour: Nervous system, Neurons and synapse.
- Association cortex, RT and Lt Hemispheres.
- Psychology of sensations.
- Muscular and glandular controls of behavior.
- Nature of behavior of an organism/integrated responses.

### **UNIT II: COGNITIVE PROCESS**

- Attention: Types, determinants, duration and degree, alterations.
- Perception: Meaning, Principles, factors affecting, errors.
- Learning: Nature, Types, Learner and learning, Factors influencing, laws and theories, process, transfer, study habits.
- Memory: Meaning, types, nature factors. Influencing, development theories and methods of memorizing and forgetting.
- Thinking: Types and levels, stages of development, relationship with language and communication.
- Intelligence: Meaning, classification, uses, theories.
- Aptitude: Concepts, types, individual differences and variability.
- Psychometric assessments of cognitive process.
- Alterations in cognitive process.
- Applications.

### **UNIT III: MOTIVATION AND EMOTIONAL PROCESS**

- Motivation: Meaning, concepts, types, theories, motives and behaviour, conflicts and frustration, conflict resolution.
- Emotions and stress
  - 1) Emotions: Definition, components, changes in emotions, theories, emotional adjustments, emotions in health and illness.
  - 2) Stress: stressors, cycle, effect, adaptation and coping.
- Attitude: Meaning, nature, development, factors affecting,
  - 1) Behaviour and attitudes.
  - 2) Attitudinal change.
- Psychometric assessments of emotions and attitudes.
- Alterations in emotions.
- Applications.

### **UNIT IV: PERSONALITY**

- Definitions, topography, types, theories.
- Psychometric assessments of personality.

- Alterations in personality.
- Applications.

## **UNIT V: DEVELOPMENTAL PSYCHOLOGY**

- Psychology of people at different ages from infancy to old age.
- Psychology of vulnerable individuals-challenged, women, sick, etc.,
- Psychology of groups.

**6. CLINICALS IN NEUROSCIENCE TECHNOLOGY:**  
**COMPREHENSIVE VIVA (IE)**

# **ALLIED HEALTH SCIENCE**

## **INTERNSHIP PROGRAMME**

# ALLIED HEALTH SCIENCE

## INTERNSHIP

### Regulation for Internship

Internship is an important part of training wherein an Allied Health Science Graduate acquires skills, and applies his knowledge gained during his course of study.

### Objectives:

1. To Facilitate Reinforcement of Training.
2. To Develop Professionalism, Communication and Team Building skills.
3. To help in understating of ethical Practices like
  - Rights and dignity of patients
  - Ethical Conduct and professional obligations to colleagues, patients, families and community

The Internship is compulsory for all the candidates. It shall commence after the students have completed and passed all academic and clinical requirements.

The internship shall be for duration of one year.

The degree shall be awarded after satisfactory completion of internship.

### EVALUATION OF INTERNEES

Formative and Summative evaluation are carried out. A **Log Book** is maintained by all interneers. No Marks are allotted. Satisfactory completion of Log Book is essential for completion of internship.

Day to day assessment of the interneers during the internship posting should be done (Log Book). Summative evaluation is based on observation of the supervisors of different department and their records in the log books. Based on the formative and summative evaluation the head of department shall issue certificate of satisfactory completion of training, following which the university shall award the degree.

During internship a project is allocated to each intern by the respective Heads of departments. The project work is marked for 100 (including viva).

Six credits are given for the project

30 hours per credit

Total 180 hours

The Project is done for a Maximum duration of 6 months.

## **Internship credits**

The internship is given 15 Credits. (i.e.) 45 hrs/Credit. A Total of 675 hours.

After Undergoing internship for a period of Six months, each Department shall conduct an **internal evaluation** of the student to assess the skills developed and progress of the student before issuing the certificate of completeness.

The duration of the posting and skill acquisition in various technology courses are attached.

### **Number of Working days for interns:-**

All Sundays are holidays.

On Government holidays duties are allotted on turns to the interns. In cases of leave or absence extension of posting shall be given which is done at the discretion of Head of Department.

## **COMMON TO ALL BRANCHES**

### **INTERNSHIP [VII & VIII SEMESTER]**

Sl. No.	Programme	Hours Prescribed	University Examination			CREDITS
			Project Evaluation Max: 80	Viva Max: 20	Total Max: 100	
1	Internship	675	-	-	-	15
2	Project	-				6
<b>No Minimum for Passing</b>			<b>Total Credits</b>			<b>21</b>

## NEUROSCIENCE TECHNOLOGY

### Neuro Electro Physiology:- (Internship postings for one year)

- 1) Neurology Department – **6 months**
- 2) Routine electroencephalography, video electroencephalography – **2 months.**
- 3) Sleep Lab Posting – **2 months.**
- 4) Nerve conduction & electromyography, autonomic lab, trans cranial magnetic stimulation lab – **1 month.**
- 5) Evoked potentials and intraoperative monitoring – **1 month.**

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