BHARATI VIDYAPEETH
(DEEMED TO BE UNIVERSITY), PUNE

Faculty of Medical Sciences
B. Sc (Electrophysiology Technology)
New Syllabus

BHARATI VIDYAPEETH
(Deemed to be University) Pune, India
MEDICAL COLLEGE, PUNE
PUNE –SATARA ROAD, PUNE – 411 043.

SYLLABUS

SEM I TO SEM VI

B. Sc

(ELECTROPHYSIOLOGY TECHNOLOGY)

and

ABILITY ENHANCEMENT

ELECTIVE COURSES

BHARATI VIDYAPEETH

(Deemed to be University) Pune, India

MEDICAL COLLEGE, PUNE

PUNE –SATARA ROAD, PUNE – 411 043.

BACHELOR OF SCIENCE (B.Sc) COURSES

BHARATI VIDYAPEETH

MEDICAL COLLEGE PUNE, 411043

(Choice Based Credit System (CBCS)

Under Faculty of Medical Science

(To be implemented from Academic Year 2020-21)

B.Sc

NEURO

ELECTROPHYSIOLOGY TECHNOLOGY

DOCUMENT ON

CONDUCT OF COURSE

BACHELOR OF SCIENCE (B.Sc) COURSES

BHARATI VIDYAPEETH

MEDICAL COLLEGE PUNE, 411043

(Choice Based Credit System (CBCS))

Under Faculty of Medical Science

(To be implemented from Academic Year 2019-20)

(All BSc Skilled SYLLABUS)

General Rules & Regulations

These Rules & Regulations may be called as, "The Rules & Regulations For B.Sc. Paramedical Courses of Bharati Vidyapeeth Medical College", Pune.

Introduction

Bharati Vidyapeeth Deemed University, Pune has developed the training Programme for capacity building since we have 'State of Art' infrastructure, the necessary renowned, experienced and dedicated faculty. We are attached to a spacious well equipped tertiary care hospital and excellent clinical exposure.

These courses will increase the employability in various hospitals, private clinics, medical centers, doctors office etc. It will help in overall development of technical and interpersonal skills required to work under the respective health care areas.

Notification

The notification for the conduct of courses have been issued by Registrar Bharati Vidyapeeth based on the decision taken during various academic committee meetings. These are attached as **Notification No 1124.**

B.Sc. Health Skilled Courses

Learning Objectives

a) To learn Basic Sciences including Anatomy, functions & surface landmarks of various organs & systems.
b) To learn Physics & technology related to Radiography & Imaging Technologies.
c) Introduction to basic imaging including CT & Ultrasound
d) Knowledge of working of MRI machine including care of the patients undergoing MRI
e) Administration & Radiation safety in Interventional procedures.

Learning Outcomes

a. To be able to effective handle the various diagnostics technologies such as X-Ray, USG, CT, MRI, 2D Echo & other scans.
b. To be able to effectively interpret abnormalities observed in the imaging and bring to the knowledge of radiologist & concerned specialist.
c. To be able to manage all the equipment effectively used in diagnostic radiology & interventional radiology.
d. To be able to understand & ensure implementation of Radiation Safety measures.

Eligibility for Admission

1) The minimum age for admission shall be 17 years on 31st December of the year in which admission is sought

Minimum education

10+2 class passed with Science subjects (Physics, Chemistry, Biology) & English Core/English Elective with aggregate of 50% marks from any recognized board.

Method Of Selection

Admission are made based on the merit list prepared following on interview by a board of faculty members.

. **Course Structure**

a) B.Sc. Courses

The duration of courses is 3 years divided in to 6 semesters including followed by one year of internship. I & II semester shall be common for all the specialization. III, IV, V & VI semesters involve theory, practical and handling of equipment in the respective specialty. I & II semester

will have minimum of 90 days, teaching spread over 15 weeks excluding holidays Sundays, vacations, and three weeks of exams followed by CAP.

1) The Syllabus is common during I and II semesters for all B.Sc. Paramedical courses. The subjects include Anatomy, Physiology, Microbiology, Pathology, Biochemistry, Pharmacology, Community medicine, English and Communication skills, Principles of Nursing, Computer related to Medical Care.

2) The Syllabus and the related topics and numbers of hours of teaching in each semester (both theory and practical's) has been based on 'Credit Based Scoring System. As per UGC guidelines, component wise weightage will be as follows :-

i) General Education Components – 40%

ii) Skill Development Components – 60%

3) CHOICE BASED CREDIT SYSTEM (CBCS) :- The CBCS provides choice for students to select from prescribed courses (Core, elective or minor or soft Skill Courses). Under the CBSC, the requirement for awarding a degree of diploma or certificate is prescribed in terms of number of credit to be completed by the student. The teaching curriculum has been designed and comprises of 140 credit points in three years.

a) Credit

- A unit by which the course work measured.
- It determines the number of hours of instruction required per week.
- While assigning credit values to courses, one credit is considered to be equal to 15 hours of lectures and 30 hours of lab / fieldwork / in-plant training/ internship/ or any other .
- In each of the courses, credits will be assigned on the basis of the number of lectures/ tutorials/ laboratory work other forms of learning required for completing the course the instructional days for one academic year are 180 working days i.e. 90 days per semester.
- Credit Point it is the product of grade point and number of credit for a course.
- The courses in a programme shall be majorly of three kinds, namely, core courses, Open courses, or general courses. Core courses are those which are in the discipline of study and are either foundational or specializations. Core courses may either hard core (Courses which are compulsory to all students in the programme) or soft core (courses which are elective). The hard core courses also include laboratory courses, capstone courses such as internships, in – plant training or full – term projects.
- The core courses should be about 70-75% of the minimum credits that constitute the programme. Remaining 25-30% of the credits may be open courses or general courses. The open courses may be ancillary courses from other disciplines or other

specializations or inter – disciplinary. About 5 – 10 % of the credits may be for general courses. .

- The evaluation for all courses shall have two components – Internal assessment (IA) and end of the term University Examination (UE).

b) Grade Point:- Grading System For Various B.Sc. Courses : -

The university shall adopt a 10 – point absolute grading system for grading in each head of passing. The system will have seven grade points, the highest being 10. The grading system shall be as shown in table – 1 below. The performance indicators O, A+, A, B+, B, C and D shall respectively mean Outstanding, Excellent, Very Good, Good, Average, satisfactory and poor. It may be noted that entries in table are meant for converting marks in individual courses to grade points. The respective grade points can also be computed from the following formulas in given table 2.

Table – 1 : The Grading System Under CBCS

% Marks in a paper / practical	Grade Point	Grade Point (GP)
80 ≤ Marks ≤ 100	10	O
70 ≤ Marks < 80	9	A+
60 ≤ Marks < 70	8	A
55 ≤ Marks < 60	7	B+
50 ≤ Marks < 55	6	B
40 ≤ Marks < 50	5	C
Marks < 40	0	D

The Formulas to calculate the Grade Points (GP) :

Suppose that 'Max' is the maximum marks assigned for an examination or evaluation based on which GP will be computed. In order to determine the GP, set x = Max/10 (since we have adapted 10 – point system).Then GP is calculated by the formulas shown in table 2. After computing the grade point the grade can be found from able11.

Table – 2: Formula to Calculate Grade Point

In Individual Evaluations

Range of Marks at the evaluation	Formula for the Grade Point
$8x \leq M \leq 10x$	10
$5.5x \leq M < 8x$	Truncate(M/x)+2
$4x \leq M < 5.5x$	Truncate(M/x)+1

c) Nature Of Examination: For all courses there shall be Internal Assessment (IA) conducted by the university. The UE will be based on the entire syllabus.

d) Computation of grade point Averages: Cumulative performance indicators such as GPA, SGPA, or CGPA shall be calculated as described and illustrated below.

e) **(i)** The performance at UE and IA will be combined to obtained the Grade Point Average (GPA) for the course. The weights for performance at UE and IA shall respectively be 60% and 40%.

(ii) The grade point average (GPA) for a course shall be calculated by first finding the total marks out of 100 for the course. The corresponding GP (as per the table in (2) above) shall be the GPA for the course.

(iii) Two kinds of performance indicators, namely the Semester Grade Point Average (SGPA) and the Cumulative Grade Point Average (CGPA) shall be computed at the end of each term. The SGPA measures the cumulative performance of a learner in all the courses in a particular semester, while the CGPA measures the cumulative performance in all courses since his/her enrolment. The CGPA of a learner when he/she completes the programme is the final result of the learner.

(iv) The SGPA is calculated by the formula $SGPA = \frac{\Sigma Ck*GPk}{\Sigma Ck}$, where Ck is the credit – Value assigned to a course and GPk is the GPA obtained by the learner in the course. In the above, the sum is taken over all the courses that the learner has undertaken for the study from the time of his/her enrolment and als the during the semester for which

CGPA is calculated, including those in which he/she might have failed or those for which he/she remained absent. The CGPA shall be calculated up to two decimal place accuracy.

(v) The CGPA is calculated by the formula CGPA = $\frac{\Sigma Ck*GPk}{\Sigma Ck}$, where Ck is the credit – Value assigned to a course and GPk is the GPA obtained by the learner in the course. In the above, the sum is taken over all the courses that the learner has undertaken for the study from the time of his/her enrolment and also the during the semester for which CGPA is calculated, including those I which he/she might have failed or those for which he/she remained absent. The CGPA shall be calculated up to two decimal place accuracy.

(vi) The CGPA, calculated after the minimum credits Specified for the programme are 'earned' will be the final result.

f) Standards of Passing and ATKT Rules:-

1. For all courses, both UE and IE constitute separate heads – of – passing (HoP). In order to pass in such courses and to 'earn' the assigned credits.

   (a) The learner must obtained a minimum grade point of 5.0 (40% marks) at UE and also a minimum grade point of 5.0 (40% marks) at IA;

2. If he/she fails in IA, the learner passes in the course provided he/she obtains a minimum of 25% in IA and GPA for the course is atleast 6.0 (50% in aggregate). The GPA for a course will be calculated only if the learner passes at the UE. The following examples illustrate this rule for passing in a course under.

Table – 3 : Illustration of passing Rule specified in E. 1

Case No.	UE marks Out Of 60	IA marks out of 40	Total marks out of 100	GP of UE	GP of IA	GPA	Remarks
1	24	16	40	5.0	5.0	5.0	Pass
2	40	10	50	7.0	0	6.0	Pass
3	40	06	46	7.0	0	5.0	Fails at IA
4	20	40	--	0	10.0	0	Fails at UE
5	34	12	46	7.0	0	5.0	Fails at IA
6	20	15	--	0	0	0	Fails at both UE &IA

1. A student who fails at UE in a course has to reappear only at UE as a backlog candidate and clear the HoP. Similarly, A student who fails in a course at IA has to reappear only at IA as a backlog candidate and clear the HoP.

ATKT RULES :-

- A student is allowed to carry backlog of courses prescribed for Semester I, III & V to Sem – II, IV & VI respectively.
- A student is allowed to keep term for Semester III if he/she is failing in any number of subjects of Sem – I & II.
- Student is allowed to keep term of Sem – V, if he/she is failing in any number of subjects of Sem – III & IV but passed in all subjects of Sem – I & II.
- Students should have cleared all subjects of Semester I, II, III, IV and V to be eligible for appearing in Semester VI examination.

4) Semester wise and teaching subject wise credits number of hours of teaching required in a semester and per week and scoring pattern of examination is as follows

CHOICE BASED CREDIT SYSTEM

(SEM I AND SEM II)

SEMESTER I (COMMON)												
CORE COURSES												
Course Code & Course		Theory Credits (Total Hours)	Practical Credits (Total Hours)	Teaching Hours Per Week		Examination Scheme						
						Theory Marks			Practical Marks			
				Theory/ Tutorial	Practical	U/E	I/A	Total	U/E	I/A	Total	
AH 101	ANATOMY	2 (30)	2.5(75)	3	4	40	20	60	60	40	100	
AH 102	PHYSIOLOGY	2 (30)	2.5(75)	3	4	40	20	60	60	40	100	
AH 103	BIOCHEMISTRY	2 (30)	2.5(75)	3	4	40	20	60	60	40	100	

AH 104	ENGLISH	3 (45)	-	3	-	60	40	100	-	-	-
ABILITY ENHANCEMENT ELECTIVE COURSE											
AEEC 105	PRINCIPLES OF NURSING	2 (30)	2.5(75)	3	4	40	20	60	60	40	100
CORE ELECTIVE COURSES											
CEC 106	COMMUNICATION SKILLS*	2 (30)	-	2	-	60	40	100	-	-	-
CEC 107	COMPUTER RELATED TO MEDICAL CARE **	1(15)	1 (30)	1	2	40	20	60	60	40	100
1 theory credit = 15 classroom &/or experiential learning hours 1 practical credit = 30 practical training hours **Note : Students have chosen all subjects for studying in Semester I**									**Total Credit Points**		**25**

SEMESTER II COMMON)												
CORE COURSES												
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**					
						Theory Marks			**Practical Marks**		
				Theory/ Tut/ Sem	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**
AH 201	MICROBIOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 202	PATHOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 203	PHARMACOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 204	COMMUNITY MEDICINE	2 (30)	2 (60)	2	4	40	20	60	60	40	100
ABILITY ENHANCEMENT ELECTIVE COURSE											
AEEC 205	ENVIRONMENT STUDIES	3 (45)	-	3	-	60	40	100	-	-	-
CORE ELECTIVE COURSE											
CEC 206	HOSPITAL OPERATIONAL MANAGEMENT	2 (30)	2 (60)	2	4	40	20	60	60	40	100
OR											
CEC 207	INTRODUCTION TO QUALITY AND PATIENT SAFETY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
1 theory credit = 15 classroom &/or experiential learning hours				1 practical credit = 30 practical training hours					**Total Credit Points**		**23**

SEMESTER PATTERN

TEACHING DAYS

AND

EXAMINATION PATTERN (Including)

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INTERNAL ASSESSMENT

SEMESTER DURATION AND TEACHING DAYS

Distribution of semester will be as follows

Semester III (Jul 2023 – Dec 2023)
Semester IV (Jan 2024 – Jun 2024)
Semester V (Jul 2024 – Dec 2024)
Semester VI (Jan 2025 – Jun 2025).

Each semester will have minimum 90 teaching days spreaded over a period of 16 weeks.

Weekly Training Programme
Weekly Training Programme will be made based on 'Credit Points' and allotted 'Teacher hours per week' and its record will be kept in respective departments and a copy of the same will also be forwarded to 'School of Allied Health Sciences' (Skill Development Courses)

Examination Pattern
Has been given separately in subsequent pages.

Remuneration
Following remuneration / honorarium will be paid to faculties:-

Existing Faculty	Rs. 600/- per lecture
Visiting / Guest Faculty	Rs. 1000/ - per lecture

Remuneration/Honorarium will be paid online after consolidated summary made at the end of each month

Remuneration will only be generated by School Of Allied Health Sciences after receiving the training Programme of previous month.

B.Sc. (All B.Sc. Courses)

University Exam Pattern (Semester-I)
THEORY- Core Course (Except English)
(Anatomy, Physiology, Biochemistry)

Theory			Practical			Grand Total
University Exam (U/E)	Internal Assessment (I/A)	Total	U/E	I/A	Total	160
40	20	60	60	40	100	

A) Theory: Question paper pattern (40 marks)

Type of Questions	No of questions	Marks allotted for each question	Total marks
Long Answer Question (LAQ)	2 out of 4	07	14
Short answers Question (SAQ)	4 out of 6	04	16
Multiple Choice Question (MCQ)	10 out of 10	01	10
Total	16	--	40

Theory: Question paper pattern (60 marks)

(ENGLISH)

Type of Questions	No of questions	Marks allotted for each question	Total marks
Long Answer Question (LAQ)	2 out of 4	10	20

Short answers Question (SAQ)	4 out of 6	05	20
Multiple Choice Question (MCQ)	10 out of 10	02	20
Total	16	--	60

THEORY – CORE ELECTIVE COURSES

Following examination pattern will be follows.

Computers related to Medical Care

Type of Questions	No of questions	Marks allotted for each question	Total marks
Long Answer Question (LAQ)	2 out of 4	07	14
Short answers Question (SAQ)	4 out of 6	04	16
Multiple Choice Question (MCQ)	10 out of 10	01	10

Total	16	--	40

Communication Skill

Theory: Question paper pattern (60 marks)

Type of Questions	No of questions	Marks allotted for each question	Total marks
Long Answer Question (LAQ)	2 out of 4	10	20
Short answers Question (SAQ)	4 out of 6	05	20
Multiple Choice Question (MCQ)	10 out of 10	02	20
Total	16	--	60

ABILITY ENHANCEMENT ELECTIVE COURSES

Theory: Question paper pattern (40 marks)

(PRINCIPLES OF NURSING)

Type of Questions	No of questions	Marks allotted for each question	Total marks
Long Answer Question (LAQ)	2 out of 4	07	14
Short answers Question (SAQ)	4 out of 6	04	16
Multiple Choice Question (MCQ)	10 out of 10	01	10
Total	16	--	40

UNIVERSITY EXAM

PRACTICAL

PRACTICALS Total Marks – 60

Distribution of marks will be as follows

(a) Spots – 20
(b) Viva – 20
(c) Practical / Procedure – 20
(In case there is no procedure during a semester, these marks will be added in viva).

INTERNAL ASSESSMENT
(MID SEMESTER EXAM)

Will be based on their performance in Mid Semester exam which will be conducted at the end of 8/9 weeks of teaching in both theory & practical dates of which will be given by School of Allied Health Sciences

Theory (Total Marks 20)

(ALL EXCEPT ENGLISH & COMMUNICATION SKILL)

Following examination pattern will be follows.

Type of Questions	No of questions	Marks allotted for each question	Total marks
Short answers Question (SAQ)	2 out of 3	05	10
Multiple Choice Question (MCQ)	10 out of 10	01	10
Total		--	20

THEORY (ENGLISH & COMPUTER SKILL)

Type of Questions	No of questions	Marks allotted for each question	Total marks
Long Answer Question (LAQ)	2 out of 3	2×10	20
Short answers Question (SAQ)	2 out of 3	2×5	10
Multiple Choice Question (MCQ)	10 out of 10	10×1	10
Total		-	40

PRACTICAL

Total Marks – 40

Distribution of marks will be as follows

(a) Spots / Practical's -20

(b) Viva-20

Each student will be given an assignment / tutorial and will be made to do a presentation for which marks as above will be allotted.

B.Sc. (All B.Sc. Courses)

University Exam Pattern (Semester-II)

THEORY- Core Courses

(Microbiology, Pathology, Pharmacology, Community Medicine)

Theory			Practical			Grand Total
University Exam	Internal Assessment	Total	U/E	I/A	Total	160

(U/E)	**(I/A)**					
40	**20**	**60**	**60**	**40**	**100**	

Theory: Question paper pattern (40 marks)

(Microbiology, Pathology, Pharmacology, Community Medicine)

Type of Questions	No of questions	Marks allotted for each question	Total marks
Long Answer Question (LAQ)	2 out of 4	07	14
Short answers Question (SAQ)	4 out of 6	04	16
Multiple Choice Question (MCQ)	10 out of 10	01	10
Total	16	--	40

ABILITY ENHANCEMENT ELECTIVE COURSES

Theory: Question paper pattern (60 marks)

Type of Questions	No of questions	Marks allotted for each question	Total marks
Long Answer Question (LAQ)	2 out of 4	10	20
Short answers Question (SAQ)	4 out of 6	05	20
Multiple Choice Question (MCQ)	10 out of 10	02	20
Total	16	--	60

Theory – Core Elective Courses

Following examination pattern will be follows.

Type of Questions	No of questions	Marks allotted for each question	Total marks
Long Answer Question (LAQ)	2 out of 4	07	14
Short answers Question (SAQ)	4 out of 6	04	16

Multiple Choice Question (MCQ)	10 out of 10	01	10
Total	16	--	40

UNIVERSITY EXAM

PRACTICAL

PRACTICALS Total Marks – 60

Distribution of marks will be as follows

(d) Spots – 20
(e) Viva – 20
(f) Practical / Procedure – 20
(In case there is no procedure during a semester, these marks will be added in viva).

INTERNAL ASSESSMENT
(MID SEMESTER EXAM)

Will be based on their performance in Mid Semester exam which will be conducted at the end of 8/9 weeks of teaching in both theory & practical dates of which will be given by School of Allied Health Sciences

Theory (Total Marks 20)

Following examination pattern will be follows.

Type of Questions	No of questions	Marks allotted for each question	Total marks
Short answers Question (SAQ)	2 out of 3	05	10
Multiple Choice Question (MCQ)	10 out of 10	01	10
Total		--	20

PRACTICAL

Total Marks – 40

Distribution of marks will be as follows

(c) Spots -20

(d) Viva-20

Each student will be given an assignment / tutorial and will be made to do a presentation for which marks as above will be allotted.

SEMESTER - I

SUBJECT-ANATOMY (AH101)

Learning Objectives:-

1) To give theoretical knowledge and its application, to undertake training in Anatomy.

2) To broaden the horizon of students by teaching them regarding various bones, joints, musculoskeletal system and loco motor system.

Syllabus is as follows :-

Unit I - Human Body as a whole

1. Define anatomy.
2. List the sub-divisions of anatomy.
3. Describe the Anatomical terms of location and position of various parts and organs in the human body
4. Fundamental planes of the body.
5. Enumerate the levels of organization of human body.
6. Structure of cell
7. Basic Tissues of the body - classification and preparation of tissue for observation under microscope – describe properties of various basic tissues of the body with examples – Epithelial tissue, connective tissue, muscular tissue, nervous tissue.
8. Microscope- Parts of microscope and functions
9.

Unit II - Loco motor System

Skeletal system:

1. Classify different types of bones.
2. Describe different parts of bone.
3. Understand blood supply of a long bone.
4. Identify major bones of the body and their parts
5. Classify different joints with examples.
6. Describe general features of a synovial joint.
7. Classification of different types of synovial joints with type of movements and examples.
8. Classify different types of muscles.
9. List the names of muscles as functional groups.
10. Describe important muscles in the body.- Trapezius, Deltoid, Pectoralis major, Gluteus maximus, Hamstring muscles, Soleus, sternocleidomastoid, oblique muscles of abdomen, muscles of tongue, scapular muscles
11. **Describe the following :**
    Axilla, cubital fossa, popliteal fossa, Triangles of neck, Flexor and Extensor Retinaculum, Palmar and Plantar Apo neurosis
12. Describe Type, Sub type, Articular surface,Ligaments, Relations, Blood supply, Nerve supply, Movements and Clinical Anatomy of Shoulder joint, Elbow Joint, Wrist joint, 1st carpo-metacarpal joint, Hip Joint, Knee Joint, Ankle Joint

Unit III - Nervous System

1. Parts of nervous system.
2. Structure of nervous tissue.
3. Spinal cord - coverings, extent, general features, sub-divisions, structural organization of grey matter and

white matter. Blood supply. Formation of tracts –Posterior column pathway, pyramidal tract and their clinical importance. Injuries to spinal cord.

4. Brain stem – components, Blood supply, important functional components and effect of their injury
5. Cerebellum – location, parts, functional subdivisions, connexions, blood supply and functional importance
6. Cerebrum – surfaces, poles, lobes, blood supply, sulci, gyri and important functional areas and their clinical importance. Thalamus, hypothalamus, basal ganglia, corpus striatum, hippocampus and amygdala – their location and function.
7. Cranial nerves – names, location of nucleus and the functional components
8. Spinal nerves – Course of a typical spinal nerve. Formation of plexuses – brachial, lumbar – important nerves of upper limb, lower limb.

Unit IV - Circulatory System

1. General plan of circulatory system.
2. Pulmonary, portal and systemic circulations.
3. Structure of cardiac muscle, blood vessels.
4. Thoracic cavity – Bony cage, muscles – intercostal muscles, diaphragm
5. Mediastinum – sub-divisions, contents
6. Heart - coverings, external features, chambers, blood supply, nerve supply.
7. Major arteries of upper limb, lower limb, head and neck, abdomen and pelvis.
8. Important veins – superior and inferior vena cava, portal vein, veins of upper limb and lower limb - varicose veins and their importance
9. Lymphatic system – components, Describe in brief anatomy and microscopic structure of lymphoid organs – lymphnode, tonsil, thymus, spleen, thoracic duct.

Unit V - Respiratory System

1. Parts of respiratory system.
2. Nasal cavity, paranasal air sinuses, nasal septum, lateral wall of nose.

3. Pharynx – extent, sub-divisions, muscles
4. Larynx – cartilages, muscles, parts, nerve supply
5. Trachea and bronchial tree – extent, measurements, histological structure of trachea – subdivisions of bronchial tree – broncho-pulmonary segments and their clinical importance
6. Pleura – types, reflections, recesses
7. Lung – location, relations, lobes, fissures, surfaces.

Unit VI - Digestive System

1. Abdomen – quadrants, musculature of wall, Formation inguinal canal, rectus sheath and their importance
2. Components of digestive system.
3. Mouth - Tongue, palate – Structure of tongue
4. Salivary glands – parotid, sub-mandibular – Brief anatomy and structure
5. Stomach – position, parts, blood supply, nerve supply, lymphatic drainage, relations, structure
6. Small intestine – sub-divisions, microscopic structure
7. Large intestine in general - sub-divisions, microscopic structure. Specific -caecum and appendix
8. Accessory organs of digestive system –Liver, pancreas, extra hepatic biliary apparatus - Gross features, relations, blood supply, microscopic structure.

Unit VII - Excretory and Reproductive Systems Learning objectives:

1. Excretory system – parts
2. Kidney – Gross anatomy and microscopic structure.
3. Ureter, urinary bladder and urethra – gross anatomy in brief.
4. Male reproductive system – parts – external genitalia – Testis and duct system in detail. Microscopic structure of testis.
5. Female reproductive system - parts – external genitalia – Ovaries and duct system in detail. Microscopic structure of Ovary and uterus.

6. Accessory organs of reproduction – prostate gland, mammary gland- gross anatomy and their structure

Unit VIII - Endocrine System

1. List the endocrine glands and their location
2. Thyroid and parathyroid glands – location, relations, blood supply, functions, clinical importance – Microscopic structure
3. Pituitary gland – location, parts, relations, blood supply, functions, clinical importance- Microscopic structure
4. Supra renal gland - location, parts, relations, blood supply, functions, clinical importance - Microscopic structure.

Syllabus (Practical)

- General Anatomy of cartilage, bone, joints, muscles and vessels
- Bones, muscles and joints of Upper limb
- Bones, muscles and joints of Lower limb
- Thorax - Bones of thorax, Mediastinum, Lungs and pleura, Heart and pericardium
- Abdomen – pelvis, organs of Alimentary system, excretory system, male and female reproductive System
- Vertebral column
- CNS – parts of brain with functions, cerebrum, cerebellum
- Histology – of basic tissues – epithelium, bone, cartilage, muscles, vessels
- Living anatomy and Bony landmarks
- Embryology – spermatogenesis, oogenesis, Fertilization, early development
- Introduction to Genetics

SUBJECT- PHYSIOLOGY (AH102)

Learning Objectives:-

1. To have an enhanced knowledge and appreciation of mammalian physiology;
2. To understand the basic functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems;
3. To understand how these separate systems interact to yield integrated physiological responses to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail;
5. To be able to recognize and identify principal tissue structures.

S. No	Chapter	Topics
1	General Physiology	Concept of Homeostasis, Cell structure and function, Transport across cell membrane
2	Nerve Muscle Physiology	Action Potential, Structure and classification of nerves, N-M Junction, Muscle contraction and E-C coupling
3	Blood	Blood Composition and functions, Leucocyte structure and function, RBC- Structure, Function and Erythropoiesis, Platelet- Structure and

		Functions, Plasma Proteins and Immunity
4	Cardiovascular System	Functional anatomy and Nerve supply of heart, Origin and spread of cardiac impulse, Cardiac cycle, cardiac output, Heart rate, ECG
5	Respiratory System	Structure of Respiratory tract, Mechanism of Respiration, Regulation of respiration, Transport of Oxygen and Transport of CO2, Hypoxia and Cyanosis
6	Excretory System	Structure of nephron and blood supply, Formation of urine- Filtration, Formation of Urine- Reabsorption and secretion, Micturition reflex, Daily output of urine, Bladder abnormalities, Diuretics,
7	Skin	Sweat gland, Temperature regulation
8	Digestive system	Functions of saliva, Stomach- Structure, gastric glands, Functions of gastric juice, Pancreatic juice- Composition and function, Functions of bile, Deglutition and Motility
9	Nervous system	Synapse and synaptic transmission, Reflex and properties of reflex, Sensory ending and sensory mechanisms, Spinal cord pathways, Thalamus, Basal Ganglia and Parkinsonism, Cerebellum – Functions, Cerebrospinal fluid and Autonomic Nervous system
10	Special senses	Physiology of vision, Audition and Vestibular apparatus

11	Endocrine system	Anterior and posterior Pituitary gland hormone, Diabetes insipidus, Dwarfism, Gigantism, Acromegaly Thyroid hormone- Functions, Cretinism, Myxedema, Goiter and Grave's disease Parathyroid hormone- Functions, Tetany Insulin- Actions, Diabetes mellitus Adrenal cortical hormones
12	Reproductive system	Male reproductive organs, Spermatogenesis, Testosterone Female Reproductive organs- Menstrual cycle, Male and female contraceptive methods

SUBJECT- BIOCHEMISTRY (AH103)

Learning Objectives:-

By the end of the course, the students should be able to demonstrate knowledge and understanding in the following core areas.

Aspects of protein structure
Enzyme kinetic behavior and mechanisms
Bioinformatics
Chromatin structure in relation to gene expression
Mechanism and control of DNA transcription in animals
DNA damage repair, and integrity, immortalization
Protein synthesis & translational control.
Molecular microbiology of infectious disease

Syllabus is as follows:-

1. **H+, Acids, Bases, Buffers :**

Equilibrium constant, dissociation of water, H+ concentration, pH, acids-strong and weak, bases, titration behavior, Henderson-Hesselbach equation, buffers, pH measurement, physiological buffers.

2. **Membrane and Cell:**

Organelles, functions, membrane structure, transport across membranes, ionophores, membrane proteins, transporters.

3. Chemistry of Carbohydrates:

Classification, important monosaccharides, stereoisomerism, anomerism. Reaction with acids, amines, oxidizing agents, reducing agents. Osazones, Disaccharides, polysaccharides.

4. Chemistry of lipids:

Definition, classification, nature of fatty acids, triacyl glycerol, saponification and iodine number, rancidity, antioxidants, complex lipids, steroids. energitics, Lipolysis.

5. Chemistry of amino acids, peptides, proteins:

Structure of 20 amino acids, grouping isomerism, charge properties, ninhydrin reaction, peptide bond, examples of peptides, Proteins –classification, Structure-primary, secondary, tertiary and quaternary forms, denaturation.

6. Chemistry of Nucleic Acids including protein synthesis :

History, bases, nucleosides, nucleotides. DNA and gene. Types of RNAs, Nucleotides coenzymes.

7. Haemoglobin :

Structure and functions of haemoglobin, Hb derivatives, degradation of Hb, Jaundice, Haemoglobinopathies

8. Enzymes:

History, catalyst, classification, efficiency, specificity, basic account of mechanism of action. Factors affecting enzyme activity. Units of measurement, Inhibitors – competitive, non- competitive, examples. Coenzymes, proenzymes, isoenzymes, Clinical enzymology, normal values.

9. Vitamins:

History, Vitamins A, D, E and K. B-complex vitamins – thiamine, riboflavin, niacin, pyridoxine, folic acid, pantothenic acid, biotin, B-12, Vitamin C. Brief account of chemistry, source, requirements, deficiency diseases, biochemical functions, Hypervitaminosis.

10.Mineral metabolism:

Bulk and trace elements. Sodium, potassium, Calcium, Phosphorous, Iron. Brief account of iodine, magnesium, copper, zinc, fluoride, manganese, selenium and molybdenum.

11.Energy Metabolism:

Calorimetry, basal metabolism, specific dynamic action, energy requirements under different conditions. Hormonal influence.

12.Nutrition:

Distribution of energy in dietary factors, Nitrogen balance, Protein quality, Kwashiorkar and Marasmus. Protein supplimentation, Recommended dietary allowance and diet planning.

13.Immunology :

BASICS : Innate & acquired immunity, humoral & cell mediated immunity, antigen & antibodies

Practical Examination Scheme for BSc Skill Development Course I year-I Semester

Question	Heading	Marks

Q.A	**Spots** **There will be total 5 spots of 2 marks each on following** a) Identification and use of common laboratory equipments and glassware: Ovens, incubators, refrigerators, deep fridge, centrifuges, water baths, water distillation apparatus, analytical balance, flasks, pipettes, cylinders funnels, tubes, thermometers, colorimeter, spectrophotometer, ELISA, Chemiluminesence. b) Identification and use of appropriate specimen collection containers.	**10 Marks**
Q.B	**Qualitative Experiment on** **Candidate has to Perform one of the following:** 1) Tests on Monosaccharides(Glucose and Fructose) 2) Tests on Disaccharides(Lactose and Sucrose) 3) Precipitation Reactions of Proteins 4) Normal Constituents of Urine 5) Abnormal Constituents of Urine	**20 Marks**
Q.C	**Quantitative Estimation:** **Candidate has to Perform one of the following:** 1) Estimation of Blood Glucose 2) Estimation of Blood Urea 3) Estimation of Serum Total Proteins and Albumin, Calculations of Albumin: Globulin Ratio 4) Estimation of Serum Creatinine, Urine Creatinine, and calculation of Creatinine Clearance 5) Estimation of Serum Bilirubin	**30 Marks**

	Total	**60 Marks**

SUBJECT ENGLISH (AH 104)

Learning Objectives:-

At the end of the course student will be able:-

a. to enable the learner to communicate effectively and appropriately in real life situation
b. to use English effectively for study purpose across the curriculum
c. to develop interest in and appreciation of Literature;
d. to develop and integrate the use of the four language skills i.e.

UNIT-1 PROSE

1. SECRET OF WORK ---- SWAMI VIVEKANANDA
2. PLAYING THE ENGLISH GENTLEMAN ----- M. K. GANDHI

UNIT-2 POETRY

1. ECOLOGY ----- A.K. RAMANUJAN
2. LA BELLE DAME SANS MERCI -------JOHN KEATS

UNIT – 3 SHORT STORY

1. THE BOY WHO BROKE THE BANK ------ RUSKIN BOND
2. LOTTERY TICKETS ------ ANTONCHEKOV
3. THE DEATH TRAP ----- SAKI (H.M. MUNRO)

UNIT -4 GRAMMAR

1. CORRECTION OF SENTENCES
2. MATCH THE ONE WORD SUBSTITUTE
3. LETTER WRITING
4. EXPANSION OF PROVERBS
5. PRECIS WRITING
6. COMPREHENSION OF PASSAGE

SUBJECT-PRINCIPLES OF NURSING (AEEC105)

Learning Objectives:-

1. To help individuals to attain independence in self-care. It necessitates development of compassion and understanding of human behavior among its practitioners to provide care with respect and dignity and protect the rights of individuals and groups.
2. A central goal of care is to promote, maintain, and restore the well-being and health of women, families, and communities. Accountability:
3. To learn principles of nursing keeping SMART in mind :- 'Specific' refers to who, what, when, where, and why. 'Measurable' means that you can actually measure and evaluate the progress of that goal in a concrete way. 'Action-oriented' means there are actions that can be taken to reach the goal.
   Reasonable means that they are helpful in patient care & welfare
   Timely means that care is provided in a timely manner to avoid complication & morbidities.

Unit I : Nursing & Nursing process:

Definition, concept of Nursing, History of Nursing, Nursing process, Problems solving approach, Assessment, Diagnosis, planning, Implementation and Evaluation.

Unit II : First aid and Nursing Emergencies:

Definition, basic principles, scope and rules.
Wounds, hemorrhages, shock, fracture, dislocation and muscle injuries, respiratory emergencies, resuscitation,unconsciousness,Miscellaneousconditions,burns,scalds,foreignbodiesintheskin, eyes, ear, nose, throat and stomach.Frost bite, effects of heat cramps, bites and stings. Poisoning.
Transporting injured persons.

Unit III : Personal Hygiene and Health

Menstrual hygiene, clothing, mental health, common health problems of poor personal hygiene.

Unit IV : Comfort, Rest and Sleep

Unit V : Hospital Housekeeping

Unit VI : Health Education

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

Clinical Practicals :

1. First Aid, CPR,(for pediatric and adult) Bandaging types.
2. Practiceofvariouscomfortdevices,variouspositionsinnursingfoundationlab.
3. Health talk, preparation of 3-5 types of A.V.Aids,
4. Ward visit to monitor BMWmanagement.
5. Assessment of Pulse, Respiration and Temperature (can be add)

COMMUNICATION SKILLS (CEC 106)

Learning Objectives:

1. Students will be able to understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication, etc. from multiple perspectives.

2. Students will be able to find, use, and evaluate primary academic writing associated with the communication discipline.

3. Students will develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others. Such skills could include communication competencies such as managing conflict, understanding small group processes, active listening, appropriate self-disclosure, etc. Students will be able to communicate effectively orally and in writing.

Syllabus is as follows:-

CS-1: ASPECTS OF COMMUNICATION

Unit-1: Communication: An Introduction

- Definition, Nature and Scope of Communication
- Importance and Purpose of Communication
- Process of Communication
- Types of Communication

Unit-2: Non-Verbal Communication

- Personal Appearance
- Gestures
- Postures
- Facial
- Expression
- Eye Contacts
- Body
- Language(Kinesics)
- Time language
- Silence
- Tips for Improving Non-Verbal Communication

Unit-3: Effective Communication

- Essentials of Effective Communication
- Communication Techniques
- Barriers to Communication

CS-2: VERBAL COMMUNICATION (ORAL-AURAL)

Unit-4: Listening Skills-I

- Purpose of Listening
- Listening to Conversation (Formal and Informal)
- Active Listening- an Effective Listening Skill
- Benefits of Effective Listening
- Barriers to Listening

Unit-5: **Listening Skills-II**

- Academic Listening (Listening to Lectures)
- Listening to Talks and Presentations

Unit-6: Oral Communication Skills (Speaking Skills)-I

- Importance of Spoken English

Unit-7: Oral Communication Skills-II (Communication in Context-I)

- Asking for and giving information
- Offering and responding to offers
- Requesting and responding to requests
- Congratulating people on their success
- Expressing condolences

- Asking questions and responding politely
- Apologizing and forgiving

Unit-8: Oral Communication Skills-III (Communication in Context-II)

- Giving instructions
- Seeking and giving permission
- Expressing opinions(likes and dislikes)
- Agreeing and disagreeing
- Demanding explanations
- Asking for and giving advice and suggestions
- Expressing sympathy

CS-3: VERBAL COMMUNICATION (WRITTEN)

Unit-9: Effective Writing Skills-I

- Elements of Effective Writing (What is writing?)
- The Sentence, Phrases and Clauses
- Types of Sentences

Unit-10: Effective Writing Skills-II

- Main Forms of Written Communication

- Paragraph Writing (Linkage and Cohesion)
- Letter Writing(formal and informal)
- Essay writing
- Notices

Unit-11: Effective Writing Skills-III

- Summarising
- Précis Writing
- Note-making

CS-4: COMMUNICATION AS A SKILL FOR CAREER BUILDING

Unit-12: Preparing for a Career

- Identifying job openings
- Applying for a job
- Preparing Cover letters
- Preparing a CV/Resume and Effective Profiling

Unit-13: Presentation Skills

- Preparing a PowerPoint Presentation
- Greeting and introducing

- Group Discussions
- Preparing for and Facing a Job Interview

Unit-14: Telephone Skills

- Basics of Telephone communication
- How to handle calls- telephone manners
- Leaving a message
- Greeting and Leave Taking over phone(etiquette)

Unit-15: Time & Stress Management

- Identifying Time Wasters
- Time Management Tips
- Identifying Factors Responsible for Stress
- Stress Management Tips
- Test Preparation Tips

Unit-16: Soft Skills for Leadership and Team Management

- Qualities of a Good Leader
- Leadership Styles
- Decision Making
- Intrapersonal skills

- Interpersonal skills
- Problem solving
- Critical thinking
- Negotiation skills

Unit-17: Practical Assignments:

- ORAL Communication
- Written Communication

COMPUTERS RELATED TO MEDICAL CARE (CEC 107)

Learning Objectives:-

After studying this course, one should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products

I Introduction to Computers

Introduction, Computers in the field of health care, advantages and disadvantages of computers, applications of computers in various fields, types of computers, basic computer organization, input output devices

II Number Systems

Introduction to number systems, positional and non-positional number system, decimal, binary, octal and hexadecimal systems and number conversion from one system to another.

III Computer codes and computer arithmetic

Computer codes-BCD, EBCDIC, ASCII, Unicode,
binary arithmetic- addition, subtraction, multiplication and division, additive methods for subtraction, multiplication and division

IV Processor and memory

CPU –internal structure and functions of different parts,
Main memory- basics, types, uses
Secondary memory-basics, types, examples with advantages, disadvantages and uses

V Computer software, programming, languages

Software/hardware concept, software types-system and application software, functions
Programming- program planning, algorithm, flowchart and pseudo code concept with example
Languages- Types-machine, assembly, high level, advantages and limitations, translator program and commonly used high level languages Examples

VI Database management, data and computer communication,

internet and multimedia

Data and information concept, two methods to organize data, DBMS,
Database models
Basic elements of communication system, techniques, channels and devices, types of computer networks
Concept of internet, basic services, World Wide Web www, uses of internet
Multimedia concept, multimedia computer system, multimedia applications

Computer Practical

Microsoft word

Introduction
Introduction to MS-word
Menus
Shortcuts
Document types
Working with documents
Saving, opening new and existing document
Margins, Header & Footer
Using table properties
Editing – Deleting, Cut, Paste, Copy, Replace search, etc
Creating graphs, borders & shading, tables
Printing, page set up etc
Assignments covering above points

Microsoft Excel

Introduction
Introduction to MS-Excel
Opening spread sheet
Shortcuts
Working with Spreadsheets
Opening a file, saving, using Menus
Setting margins, entering data
Rows, columns & cells
Formatting cells
Mathematical operations
Using / creating graphs, labeling & formatting graphs
Assignments covering above points

Microsoft PowerPoint
Introduction
Introduction to PPT
Creating, saving & opening a presentation
Working with templates
Setting backgrounds, presentation layouts
Insert pictures, graphs
Assignments covering above points

SUBJECT: MICROBIOLOGY (AH 201)

Learning Objectives:-

Students will be able to acquire, articulate, retain and apply specialized language and knowledge relevant to microbiology.

Students will acquire and demonstrate competency in laboratory safety

Students will communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing

Week No	Contents of Theory	Contents of Practical	Venue	Remark
Week No 01	1. Introduction & History of Microbiology.	1.Visit to Laboratory 2.Gram Staining	Department of	

	2. Morphology of bacteria -I		Microbiology, Bharti Vidyapeeth Medical College	
Week No 02	1. Morphology of bacteria –II 2. Growth requirement of bacteria	1.Special Staining & ZN Staining 2.Motility		
Week No 03	1. Sterilization- I 2. Sterilization- II	1.Sterilization-I 2. Sterilization-II		
Week No 04	1. Antibiotic Classes & Their Action. 2. Various methods of sensitivity testing	1.ABST all methods		
Week No 05	1. Infection 2. Infection control	1.Systematic study –I 2.Systematic Study-II		
Week No 06	1. Immunity & Immunization schedule 2. Hypersensitivity-I	1.Serological reactions		
Week No 07	1. Hypersensitivity-II 2. Culture Media	1.Culture media 2.Infection Control		
Week No 08	1. Identification of bacteria 2. Respiratory Infection & meningitis	1.Respiratory infection & Meningitis 2.Enteric fever		
Week No 09	1.Enteric fever & UTI 2.Leprosy & TB	1.UTI 2.Leprosy TB		
Week No 10	1.SDT & Miscellaneous infections 2. Wound Infections & HAI	1.STD 2.Wound infection &HAI		
Week No 11	1.Mycology –I (Yeast) 2. Mycology-II (Moulds)	1.Mycology-I (yeast) 2.Mycology -		
Week No 12	1.Hepatitis, HIV 2.Dengue, Chikungunya, Influenza	1.Virology-I 2.Virology-II		

Week No 13	1.Polio, Rabies 2. introduction to parasitology	1.Protozoa 2.Helminths		
Week No 14	1.Entamoeba Histolytica, Malaria 2.T.solium, T.saginata, E.granulosus	1.Anaerobic Infections 2.Laboratory Animals		
Week No 15	1.Ascaris, Hookworm 2. Filaria	1.Quality Control In Microbiology		

SUBJECT: PATHOLOGY (AH 202)

Learning Objectives:-

Students should learn how to evaluate laboratory and pathologic testing, including pitfalls related to specimen collection, handling mythologies, and the skills of individuals performing those tests.

Greater knowledge about laboratory tests will not only enable testing to be used more effectively but will also allow more and better understanding of the nuances and interpretation of laboratory evaluations.

Understand the pathologic basis of disease for which a particular test is performed.

Understand the principles considered in test selection for screening, diagnosis treatment and monitoring of disease.

Syllabus is as follows :-

- Cell injury and adaptation

- Degeneration, Necrosis and Gangrene
- Hemodynamic disturbances
- Inflammation and healing
- Chronic inflammation
- Nutrional and Environment and mental diseases
- Neoplasia
- Hematology
- Heart & blood vessels
- Respiratory diseases
- GIT, Liver diseases
- Kidney disease
- Endocrine diseases
- Bone and joint diseases
- CNS diseases
- Revision

Syllabus Practical

- Collections of samples
- Necrosis and Gangrene
- Ischemia , Infarction
- Acute inflammation
- Chronic inflammation
- Inflammation and healing
- Neoplasia
- Anemia ,Leukemia
- CVS,Blood vessels
- Respiratory diseases
- GIT diseases
- Kidney diseases and urine
- Thyroid ,DM
- Bone and joints
- CNS diseases
- Revision

The pattern of practical's/demonstration in Pathology will be decided as per the topic given in the syllabus.

SUBJECT: PHARMACOLOGY (AH 203)

Learning Objectives:-

The student will be able to identify a range of drugs used in medicine and discuss their mechanisms of action.

The student will be able to report the clinical applications, side effects and toxicities of drugs used in medicine.

Knowledge of the pathogenesis of diseases, interventions for effective treatment, and mechanisms of health maintenance to prevent disease

Subject : Pharmacology

Syllabus

Theory - Contents

S.No	Topic	No. of Hours
1	General Pharmacology	10
2	Autonomic Nervous System	4
3	Biogenic. amines & Autocoids	4

4	Kidney - Diuretics	2
5	Chemotherapy	6
6	Endocrinology	2
7	Miscellaneous drugs	2
Total Hours		**30**

Practicals

S.No	Topic	No. of Hours
1	Practicals	9
2	Drug display	27
3	Student - discussion	27
4	Record work & Model exams	5
Total Hours		**68**

Bharti Vidyapeeth
School of allied health Sciences
BSc Courses (Pharmacology – Syllabus)

Week No.	*Contents of theory*	*Contents of Practical*
	Routes/Dosage forms	Dosage forms ,Routes display
2	Pharmacokinetics	Bioavailability , Instruments
3	Pharmacodynamics	Student discussion
4	Adverse Drug Reactions	Spotters
5	ANS – Adrenergic (Emphasis on Anaphylaxis)	Drug Display Student Discussion
6	Cholinergic	Drug Display
7	Biogenic Amines – Histaminic &	Student Discussion

	Antihistaminic	
8	Prostaglandins / NSAIDs	Drug Display
9	Contrast Media – Uses & ADRs	Drug Display
10	Chemotherapy – General Concepts	Student Discussion
11	Chemotherapy – Individual agents	Drug Display
12	Chemotherapy – Individual agents	Drug Display
13	Endo - Steroids	Student Discussion
14	Kidney - diuretics	Student Discussion
15	Chelating agents	Student Discussion

The pattern of practical's/demonstration in Pharmacology will be decided as per the topic given in the syllabus.

SUBJECT: COMMUNITY MEDICINE (AH 204)

LEARNING OBJECTIVES:

At the end of the course, the learner shall be :

1. Aware of the physical, social, psychological, economic, and environmental health determinants of health and disease.
2. Able to think epidemiologically, diagnose totally, treat comprehensively and be able to function as community and first contact physician.
3. Able to apply the clinical skills to recognize and manage common health problems including their physical, emotional and social aspects at the individual, family and community levels and deal with public health emergencies.
4. Able to identify, prioritize and manage the health problems of the community after making community diagnosis.
5. Able to perform as an effective leader of health team at primary care level.

BSc courses (Semester I/II)

Week No.	Mode of teaching- Lecture	No. Of hours	Mode of teaching- Small group (Practical)	No. Of hours
Week 01	Concept in Community Medicine	2	Introduction, Disinfection-I	4
Week 02	Mode of transmission of disease and methods of control	2	Disinfection-II	4
Week 03	Health services and Primary health center	2	Nutrition- I	4
Week 04	Nutritional Health	2	Nutrition- II	4
Week 05	Epidemiology of Communicable Diseases	2	Immunization	4
Week 06	Epidemiology of Communicable Diseases	2	Field visit-I	4
Week 07	Epidemiology of Non Communicable Diseases	2	Field visit-II	4
Week 08	Epidemiology of Non Communicable Diseases	2	Field visit-III	4
Week 09	National Health Programme	2	Family planning	4

Week 10	Disease Control Programme	2	Hospital waste management	4
Week 11	Demography and Population Control-I	2	Seminar-I	4
Week 12	Demography and Population Control-II	2	Seminar-II	4
Week 13	Environmental Sanitation	2	Water-I	4
Week 14	Revision and Feedback	2	Water-II	4
Week 15		2	Assignment Evaluation-I	4
Week 16			Assignment Evaluation-II	4
Week 17			Project Evaluation	4
Week 18			Vital statistics- Sources of Health Information	4
Week 19			Revision -I	4
Week 20			Revision -II	4
Total hours		28 hours		80 hours

SUBJECT: ENVIRONMENTAL STUDIES (AEEC 205)

Learning Objectives:-

Master core concepts and methods from ecological and physical sciences and their application in environmental problem solving.
Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.

Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.
Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.
Ability Enhancement Compulsory Courses (AECC – Environmental Studies)

Unit 1: Introduction to Environmental Studies
Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere.
Scope and importance; Concept of sustainability and sustainable development.
(2 Lectures)

Unit 2: Ecosystems
What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession. Case studies of the following ecosystems:
a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) (6 Lectures)

Unit 3: Natural Resources: Renewable and Non-renewable Resources
Land Resources and land use change; Land degradation, soil erosion and desertification.
Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
Heating of earth and circulation of air; air mass formation and precipitation.
Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.
(8 Lectures)

Unit 4: Biodiversity and Conservation

Levels of biological diversity :genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots

India as a mega-biodiversity nation; Endangered and endemic species of India

Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

(8 Lectures)

Unit 5: Environmental Pollution

Environmental pollution : types, causes, effects and controls; Air, water, soil, chemical and noise pollution

Nuclear hazards and human health risks

Solid waste management: Control measures of urban and industrial waste..

Pollution case studies. (8 Lectures)

Unit 6: Environmental Policies & Practices

Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.

Environment Laws : Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act; International agreements; Montreal and Kyoto protocols and conservation on Biological Diversity (CBD). The Chemical Weapons Convention (CWC). Nature reserves, tribal population and rights, and human, wildlife conflicts in Indian context (7 Lectures)

Unit 7: Human Communities and the Environment

Human population and growth: Impacts on environment, human health and

welfares. Carbon foot-print.
Resettlement and rehabilitation of project affected persons; case studies.
Disaster management: floods, earthquakes, cyclones and landslides.
Environmental movements: Chipko, Silent valley, Bishnios of Rajasthan.
Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).
(6 Lectures)

Unit 8: Field work
Visit to an area to document environmental assets; river/forest/flora/fauna, etc.
Visit to a local polluted site – Urban/Rural/Industrial/Agricultural.
Study of common plants, insects, birds and basic principles of identification.
Study of simple ecosystems-pond, river, Delhi Ridge, etc.

SUBJECT: HOSPITAL OPERATIONAL MANAGEMENT (CEC)

S.N.	Theory Content	Hours

Learning Objectives:-

- To promote awareness of health care among all sections of the Indian people.
- To promote awareness among functionaries involved in Health and Hospital Management.
- To promote the development of high quality hospital services and community health care.
- To promote a forum for the exchange of ideas and information among health and hospital planners, academicians, administrators, various statutory bodies and the general public for the improvement of Hospital and Health Care delivery Systems.
- To provide opportunities for training in all aspects of Hospital Services Health

Care Delivery System and Health Care Administration

To update the knowledge and skill of the Health & Hospital Administrators and other personnel involved in the management of health care organization through continuous education.

1.	**Principles and Practices of Management:** Definition of management, Difference between management and administration, Functions and Responsibilities of Managers &Organizational Behavior: Meaning, Definition, Significance, Models of Organization Behaviour.	**4**
2.	**Managerial Accounting & Financial Management:** Accounting: Concept and Characteristics, Financial Accounting Information, Comparison of Financial and Management Accounting, Principles of Accounting, Concept of Business Finance, role, functions and objectives. of finance management in healthcare sector.	**4**
3.	**Laws Related to Hospital & Medical Services :** PCPNDT Act, Medical Termination of Pregnancy Act, Drugs and Cosmetics Act, Payment and Wages Act, Child Labour Act	**4**
4.	Introduction to hospital material management& Inventory control	**3**
5.	**Introduction to Administration of Clinical & Non-clinical Services :** Functions of Clinical & Non-clinical departments	**6**
6.	Introduction to commonly used softwares & hospital management modules related to hospital management	**5**
Total Theory Hours		**26**
Practical teaching contents		
1.	Based on contents related to the theory module practical exposure during hospital postings/ practicals.	**52**

Mode of conduction of Practical Exam:

SUBJECT : INTRODUCTION TO QUALITY AND PATIENT SAFETY (CEC207)

Learning Objectives:--

• The objective of the course is to help students understand the basic concepts of quality in health Care and develop skills to implement sustainable quality assurance program in the health system.

• To understand the basics of emergency care and life support skills.

• To Manage an emergency including moving a patient

• To help prevent harm to workers, property, the environment and the general public.

• To provide a broad understanding of the core subject areas of infection prevention and control.

•To provide knowledge on the principles of on-site disaster management

Topic 1: Quality assurance and management – Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norms, Introduction to NABH guidelines

Topic 2: Basics of emergency care and life support skills - Basic life support (BLS), Vital signs and primary assessment, Basic emergency care – first aid and triage, Ventilations including use of bag-valve-masks (BVMs), Choking, rescue breathing methods, One- and Two-rescuer CPR, Code Blue.

Topic 3: Bio medical waste management and environment safety -Definition of Biomedical Waste, Waste minimization, BMW – Segregation, collection, transportation, treatment and disposal (including color coding), Liquid BMW, Radioactive waste, Metals/ Chemicals / Drug waste, BMW Management & methods of disinfection, Modern technology for handling BMW, Use of Personal protective equipment (PPE), Monitoring & controlling of cross infection (Protective devices)

Topic 4: Infection prevention and control - Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)],Prevention & control of common healthcare associated infections, Components of an effective infection control program, Guidelines (NABH and JCI) for Hospital Infection Control

Topic 5: Patient Care and Safety Standards –Access , assessment and continuity of care, Care of Patients in specific care areas, Management of Medication, patients' Rights and Education and Medical documentation

Topic 6: Disaster preparedness and management and Safety Codes in Hospital - Fundamentals of emergency management, Psychological impact management, Resource management, Preparedness and risk reduction, information management, incident command and institutional mechanisms. Code Red, Code Pink, Code Black, Code Violet and Spill Management.

BACHELOR OF SCIENCE (B.Sc) COURSES

BHARATI VIDYAPEETH

MEDICAL COLLEGE PUNE, 411043

(Choice Based Credit System (CBCS))

under Faculty of Medical Science

(To be implemented from Academic Year 2020-21)

General Rules & Regulations

These Rules & Regulations may be called as, "The Rules & Regulations For B.Sc. Paramedical Courses of Bharati Vidyapeeth Medical College", Pune.

Introduction

Bharati Vidyapeeth Deemed University, Pune has developed the training Programme for capacity building since we have 'State of Art' infrastructure, the necessary renowned, experienced and dedicated faculty. We are attached to a spacious well equipped tertiary care hospital and excellent clinical exposure.

These courses will increase the employability in various hospitals, private clinics, medical centers, doctors office etc. It will help in overall development of technical and interpersonal skills required to work under the respective health care areas.

Courses Offered

Details of courses offered along with their eligibility criteria and member of seats are as follows:

Sr. No	Name Of The Course	Eligibility	No Of Seats	Duration
1	B.Sc. (Cardiovascular Technology)	10+2(Science) & English with 50% minimum Marks	10	3 years
2	B.Sc. (Neuro Electrophysiology)	10+2(Science) & English with 50% minimum Marks	10	
3	B.Sc. (Anesthesia & OT Technology)	10+2(Science) & English with 50% minimum Marks	10	

Eligibility for Admission

1) The minimum age for admission shall be 17 years on 31st December of the year in which admission is sought

Minimum education

10+2 class passed with Science subjects (Physics, Chemistry, Biology) & English Core/English Elective with aggregate of 50% marks from any recognized board.

Method of Selection

Admission are made based on the merit list prepared following on interview by a board of faculty members.

. **Course Structure**

a) **B.Sc Courses**

The duration of courses is 3 years divided in to 6 semesters followed by One Year internship. I & II semester shall be common for all the specialization. III, IV, V & VI semesters involve theory, practical and handling of equipment in the respective specialty. I & II semester will have minimum of 90 days, teaching spread over 16 weeks excluding holidays Sundays, vacations, and three weeks of exams followed by CAP.

Semester I (Jul 2020 – Dec 2020)
Semester II (Jan 2021 – Jun 2021)
Semester III (Jul 2021 – Dec 2021)
Semester IV (Jan 2022 – Jun 2022).
Semester V (Jul 2022 – Dec 2022)
Semester VI (Jan 2023 – Jun 2023)

Each Semester will have more than 90 teaching days followed by an university exam. The details of these will be submitted to Bharati Vidyapeeth University prior to end of each semester and permission will be sought for conduct of examination.

Commencement of the Programme

The course will ordinarily commence from 01 July 2020.

Medium Of Instruction: English.

Change Of Course :- As all the heads of the courses are compulsory, change of course is not allowed.

Remuneration / Honorarium:- Following remuneration / honorarium will be paid to faculties:-

Existing Faculty	Rs. 600/- per lecture
Visiting / Guest Faculty	Rs. 1000/ - per lecture

Remuneration/Honorarium will be paid online after consolidated seminary made at the end of each month.

Attendance:- A candidate must have minimum of 80% attendance (irrespective of the kind of absence) in theory and practical in each subjects for appearing for examination. A candidate must have 80% attendance in each of the practical areas before award of degree.

Holidays & Vacation :- As per medical college norms.

Syllabus & Examination Pattern

1) The Syllabus is common during I and II semesters for all B.Sc. Paramedical courses. The subjects include Anatomy, Physiology, Microbiology, Pathology, Biochemistry, Pharmacology, Community medicine, English and Communication skills, Principles of Nursing, Computer related to Medical Care.
2) The Syllabus and the related topics and numbers of hours of teaching in each semester (both theory and practical's) has been based on 'Credit Based Scoring System. As per UGC guidelines, component wise weightage will be as follows :-
   i) General Education Components – 40%
   ii) Skill Development Components – 60%
3) **CHOICE BASED CREDIT SYSTEM (CBCS) :-** The CBCS provides choice for students to select from prescribed courses (Core, elective or minor or soft Skill Courses). Under the CBSC, the requirement for awarding a degree of diploma or certificate is prescribed in terms of number of credit to be completed by the student. The teaching curriculum has been designed and comprises of 140 credit points in three years.

   a) Credit

   - A unit by which the course work measured.
   - It determines the number of hours of instruction required per week.

- While assigning credit values to courses, one credit is considered to be equal to 15 hours of lectures and 30 hours of lab / fieldwork / in-plant training/ internship/ or any other .
- In each of the courses, credits will be assigned on the basis of the number of lectures/ tutorials/ laboratory work other forms of learning required for completing the course the instructional days for one academic year are 180 working days i.e. 90 days per semester.
- Credit Point it is the product of grade point and number of credit for a course.
- The courses in a programme shall be majorly of three kinds, namely, core courses, Open courses, or general courses. Core courses are those which are in the discipline of study and are either foundational or specializations. Core courses may either hard core (Courses which are compulsory to all students in the programme) or soft core (courses which are elective). The hard core courses also include laboratory courses, capstone courses such as internships, in – plant training or full – term projects.
- The core courses should be about 70-75% of the minimum credits that constitute the programme. Remaining 25-30% of the credits may be open courses or general courses. The open courses may be ancillary courses from other disciplines or other specializations or inter – disciplinary. About 5 – 10 % of the credits may be for general courses. .
- The evaluation for all courses shall have two components – Internal assessment (IA) and end of the term University Examination (UE).

b) <u>Grade Point:- Grading System For Various B.Sc. Courses : -</u>

- The university shall adopt a 10 – point absolute grading system for grading in each head of passing. The system will have seven grade points, the highest being 10. The grding system shall be as shown in table – 1 below. The performance indicators O, A+, A, B+, B, C and D shall respectively mean Outstanding, Excellent, Very Good, Good, Average, satisfactory and poor. It may be noted that entries in table are meant for converting marks in individual courses to grade points. The respective grade points can also be computed from the following formulas in given table 2.

Table – 1 : The Grading System Under CBCS

% Marks in a paper / practical	Grade Point	Grade Point (GP)
80 ≤ Marks ≤ 100	10	O
70 ≤ Marks < 80	9	A+
60 ≤ Marks < 70	8	A
55 ≤ Marks < 60	7	B+
50 ≤ Marks < 55	6	B
40 ≤ Marks < 50	5	C
Marks < 40	0	D

The Formulas to calculate the Grade Points (GP) :

Suppose that 'Max' is the maximum marks assigned for an examination or evaluation based on which GP will be computed. In order to determine the GP, set x = Max/10 (since we have adapted 10 – point system). Then GP is calculated by the formulas shown in table – 2. After computing the grade point the grade can be found from able – 1.

Table – 2 : Formula to Calculate Grade Point

In Individual Evaluations

Range of Marks at the evaluation	Formula for the Grade Point
8x ≤ M ≤ 10x	10
5.5x ≤ M < 8x	Truncate(M/x)+2
4x ≤ M < 5.5x	Truncate(M/x)+1

c) **Nature Of Examination:** For all courses there shall be Internal Assessment (IA) conducted by the university. The UE will be based on the entire syllabus.

d) Computation of grade point Averages: Cumulative performance indicators such as GPA, SGPA, or CGPA shall be calculated as described and illustrated below.

e) **(i)** The performance at UE and IA will be combined to obtained the Grade Point Average (GPA) for the course. The weights for performance at UE and IA shall respectively be 60% and 40%.

(ii) The grade point average (GPA) for a course shall be calculated by first finding the total marks out of 100 for the course. The corresponding GP (as per the table in (2) above) shall be the GPA for the course.

(iii) Two kinds of performance indicators, namely the Semester Grade Point Average (SGPA) and the Cumulative Grade Point Average (CGPA) shall be computed at the end of each term. The SGPA measures the cumulative performance of a learner in all the courses in a particular semester, while the CGPA measures the cumulative performance in all courses since his/her enrolment. The CGPA of a learner when he/she completes the programme is the final result of the learner.

(iv) The SGPA is calculated by the formula SGPA = $\frac{\Sigma Ck*GPk}{\Sigma Ck}$, where Ck is the credit – Value assigned to a course and GPk is the GPA obtained by the learner in the course. In the above, the sum is taken over all the courses that the learner has undertaken for the study from the time of his/her enrolment and als the during the semester for which CGPA is calculated, including those in which he/she might have failed or those for which he/she remained absent. The CGPA shall be calculated up to two decimal place accuracy.

(v) The CGPA is calculated by the formula CGPA = $\frac{\Sigma Ck*GPk}{\Sigma Ck}$, where Ck is the credit – Value assigned to a course and GPk is the GPA obtained by the learner in the course. In the above, the sum is taken over all the courses that the learner has undertaken for the study from the time of his/her enrolment and also the during the semester for which CGPA is calculated, including those I which he/she might have failed or those for which he/she remained absent. The CGPA shall be calculated up to two decimal place accuracy.

(vi) The CGPA, calculated after the minimum credits Specified for the programme are 'earned' will be the final result.

f) <u>Standards of Passing and ATKT Rules:-</u>

1. For all courses, both UE and IE constitute separate heads – of – passing (HoP). In order to pass in such courses and to 'earn' the assigned credits.

(a) The learner must obtained a minimum grade point of 5.0 (40% marks) at UE and also a minimum grade point of 5.0 (40% marks) at IA;

2. If he/she fails in IA, the learner passes in the course provided he/she obtains a minimum of 25% in IA and GPA for the course is at least 6.0 (50% in aggregate). The GPA for a course will be calculated only if the learner passes at the UE. The following examples illustrate this rule for passing in a course under.

Table – 3 : Illustration of passing Rule specified in E. 1

Case No.	UE marks Out Of 60	IA marks out of 40	Total marks out of 100	GP of UE	GP of IA	GPA	Remarks
1	24	16	40	5.0	5.0	5.0	Pass
2	40	10	50	7.0	0	6.0	Pass
3	40	06	46	7.0	0	5.0	Fails at IA
4	20	40	--	0	10.0	0	Fails at UE
5	34	12	46	7.0	0	5.0	Fails at IA
6	20	15	--	0	0	0	Fails at both UE &IA

3. A student who fails at UE in a course has to reappear only at UE as a backlog candidate and clear the HoP. Similarly, A student who fails in a course at IA has to reappear only at IA as a backlog candidate and clear the HoP.

ATKT RULES:-

- A student is allowed to carry backlog of courses prescribed for Semester I, III & V to Sem – II, IV & VI respectively.
- A student is allowed to keep term for Semester III if he/she is failing in any number of subjects of Sem – I & II.
- Student is allowed to keep term of Sem – V, if he/she is failing in any number of subjects of Sem – III & IV but passed in all subjects of Sem – I & II.
- Students should have cleared all subjects of Semester I, II, III, IV and V to be eligible for appearing in Semester VI examination.

4) Semester wise and teaching subject wise credits number of hours of teaching required in a semester and per week and scoring pattern of examination is as follows:

SEMESTER I (COMMON)												
CORE COURSES												
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**						
						Theory Marks			**Practical Marks**			
				Theory/ Tutorial	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**	
AH 101	ANATOMY	2 (30)	2.5(75)	3	4	40	20	60	60	40	100	
AH 102	PHYSIOLOGY	2 (30)	2.5(75)	3	4	40	20	60	60	40	100	
AH 103	BIOCHEMISTRY	2 (30)	2.5(75)	3	4	40	20	60	60	40	100	
AH 104	ENGLISH	3 (45)	-	3	-	60	40	100	-	-	-	
ABILITY ENHANCEMENT ELECTIVE COURSE												
AEEC 105	PRINCIPLES OF NURSING	2 (30)	2.5(75)	3	4	40	20	60	60	40	100	
CORE ELECTIVE COURSES												
CEC 106	COMMUNICATION SKILLS*	2 (30)	-	2	-	60	40	100	-	-	-	
CEC 107	COMPUTER RELATED TO MEDICAL CARE **	1(15)	1 (30)	1	2	40	20	60	60	40	100	
1 theory credit = 15 classroom &/or experiential learning hours 1 practical credit = 30 practical training hours **Note : Students have chosen all subjects for studying in Semester I**									**Total Credit Points**		**25**	

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MEDICAL COLLEGE, PUNE

PUNE –SATARA ROAD, PUNE – 411 043.

SEMESTER II COMMON)											
CORE COURSES											
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**					
						Theory Marks			**Practical Marks**		
				Theory/ Tut/ Sem	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**
AH 201	MICROBIOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 202	PATHOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 203	PHARMACOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 204	COMMUNITY MEDICINE	2 (30)	2 (60)	2	4	40	20	60	60	40	100
ABILITY ENHANCEMENT ELECTIVE COURSE											
AEEC 205	ENVIRONMENT STUDIES	3 (45)	-	3	-	60	40	100	-	-	-
CORE ELECTIVE COURSE											
CEC 206	HOSPITAL OPERATIONAL MANAGEMENT	2 (30)	2 (60)	2	4	40	20	60	60	40	100
OR											
CEC 207	INTRODUCTION TO QUALITY AND PATIENT SAFETY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
1 theory credit = 15 classroom &/or experiential learning hours				1 practical credit = 30 practical training hours					**Total Credit Points**		**23**

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SEMESTER II COMMON)											
CORE COURSES											
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**					
						Theory Marks			**Practical Marks**		
				Theory/ Tut/ Sem	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**
AH 201	MICROBIOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 202	PATHOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 203	PHARMACOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 204	COMMUNITY MEDICINE	2 (30)	2 (60)	2	4	40	20	60	60	40	100
ABILITY ENHANCEMENT ELECTIVE COURSE											
AEEC 205	ENVIRONMENT STUDIES	3 (45)	-	3	-	60	40	100	-	-	-
CORE ELECTIVE COURSE											
CEC 206	HOSPITAL OPERATIONAL MANAGEMENT	2 (30)	2 (60)	2	4	40	20	60	60	40	100
OR											
CEC 207	INTRODUCTION TO QUALITY AND PATIENT SAFETY	2 (30)	2 (60)	2	4	40	20	60	60	40	100

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1 theory credit = 15 classroom &/or experiential learning hours	1 practical credit = 30 practical training hours	**Total Credit Points**	**23**

SEMESTER II COMMON)												
CORE COURSES												
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**					
						Theory Marks			**Practical Marks**		
				Theory/ Tut/ Sem	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**
AH 201	MICROBIOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 202	PATHOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 203	PHARMACOLOGY	2 (30)	2 (60)	2	4	40	20	60	60	40	100
AH 204	COMMUNITY MEDICINE	2 (30)	2 (60)	2	4	40	20	60	60	40	100
ABILITY ENHANCEMENT ELECTIVE COURSE											
AEEC 205	ENVIRONMENT STUDIES	3 (45)	-	3	-	60	40	100	-	-	-
CORE ELECTIVE COURSE											
CEC 206	HOSPITAL OPERATIONAL MANAGEMENT	2 (30)	2 (60)	2	4	40	20	60	60	40	100
OR											
CEC 207	INTRODUCTION TO QUALITY AND PATIENT SAFETY	2 (30)	2 (60)	2	4	40	20	60	60	40	100

1 theory credit = 15 classroom &/or experiential learning hours	1 practical credit = 30 practical training hours	**Total Credit Points**	**23**

B.Sc. (NEURO ELECTROPHYSIOLOGY TECHNOLOGY) SEMESTER III											
CORE COURSE											
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**					
						Theory Marks			**Practical Marks**		
				Theory/ Tutorial	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**
ELPH 301	Basics of electronics concepts related to Neurophysiology	2 (30)	3(90)	2	6	60	20	80	80	40	120
ELPH 302	Neuro Pathology	2 (30)	3(90)	2	6	60	20	80	80	40	120
ELPH 303	Neuro Anatomy	3 (45)	3(90)	2	6	60	20	80	80	40	120
ELPH 304	Neuro Physiology	2 (30)	3(90)	2	6	60	20	80	80	40	120
ABILITY ENHANCEMENT ELECTIVE COURSE											
ELPH/ AEEC 305	Biostatistics and research methodology	2 (30)		2		60	40	100			
OR											
ELPH/ AEEC 306	Medical Records Managements	2 (30)		2		60	40	100			
1 theory credit = 15 classroom &/or experiential learning hours				1 practical credit = 30 practical					Total Credit Points		23

B.Sc. (NEURO ELECTROPHYSIOLOGY TECHNOLOGY) SEMESTER IV											
CORE COURSE											
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**					
						Theory Marks			**Practical Marks**		
				Theory /Tutorial	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**
ELPH 401	Neuro biochemistry	3(45)	3(90)	2	6	60	20	80	80	40	120
ELPH 402	Basic of EEG	2(30)	3(90)	2	6	60	20	80	80	40	120
ELPH 403	Basics of EMG & NCV	2(30)	3(90)	2	6	60	20	80	80	40	120
ELPH 404	Patient care management and clinical care	2(30)	3(90)	2	6	60	20	80	80	40	120
ABILITY ENHANCEMENT ELECTIVE COURSE											
ELPH/ AEEC 405	Organization Behavior	2 (30)		2		60	40	100			
OR											
ELPH/ AEEC 406	Pursuit of Inner Self Excellence	2 (30)		2		60	40	100			
1 theory credit = 15 classroom & /or experiential learning hours 1 practical credit = 30 practical training hours									Total Credit Points		23

B.Sc. (NEURO ELECTROPHYSIOLOGY TECHNOLOGY) SEMESTER V											
CORE COURSE											
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**					
						Theory Marks			**Practical Marks**		
				Theory/ Tutorial	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**
ELPH 501	Evoked potentials,	2(30)	3(90)	2	6	60	20	80	80	40	120
ELPH 502	Instrumentation of EEG	2(30)	3(90)	2	6	60	20	80	80	40	120
ELPH 503	Instrumentation of EMG & NCV	2(30)	3(90)	2	6	60	20	80	80	40	120
ELPH 504	Application of clinical neurophysiology	2(30)	3(90)	2	6	60	20	80	80	40	120
ABILITY ENHANCEMENT ELECTIVE COURSE											
ELPH/ AEEC 505	Medical Bioethics	2 (30)		2		60	40	100			
OR											
ELPH/ AEEC 506	Human rights Professional values	2 (30)		2		60	40	100			
1 theory credit = 15 classroom & /or experiential learning hours 1 practical credit = 30 practical training hours									**Total Credit Points**		**23**

B.Sc. (NEURO ELECTROPHYSIOLOGY TECHNOLOGY) SEMESTER VI											
CORE COURSE											
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**					
						Theory Marks			**Practical Marks**		
				Theory/ Tutorial	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**
ELPH 601	Intra-operative neuro monitoring	3(45)	3(90)	2	6	60	20	80	80	40	120
ELPH 602	Neuro–Imaging Modalities	2(30)	3(90)	2	6	60	20	80	80	40	120
ELPH 603	Clinical neurology	2(30)	3(90)	2	6	60	20	80	80	40	120
ELPH 604	EEG and EMG Machines and clinical practice	2(30)	3(90)	2	6	60	20	80	80	40	120
ABILITY ENHANCEMENT ELECTIVE COURSE											
ELPH/ AEEC 605	Project related to electrophysiology technology	2 (30)		2		60	40	100			
1 theory credit = 15 classroom & /or experiential learning hours 1 practical credit = 30 practical training hours									**Total Credit Points**		**23**

Syllabus (Neuro-electrophysiology Technology)

SEMESTER III

COURSE CODE WISE SYLLABUS

CODE – ELPH 301

BASICS OF ELECTRONICS CONCEPTS RELATED TO NEUROPHYSIOLOGY

THEORY

Unit-1
Electric Current
Ohm's Law
Resistivity/Resistance
Capacitance Inductance & transformers Decibel,
Db. Transformer basics
Basics of electrical power

Unit-2
Voltage RLC circuit
Basics of voltage
Semiconductors Q, quality factor Bandwidth, wavelength, frequency, amplitude

Unit-3
Characteristics
Calibration Damping, Low frequency Filter, Sensitivity, Amplitude Linearity,

Unit-4
Noise
Introduction,
Types
Technique for noise removal
Grounding

PRACTICAL

Unit-1
Electric Current
Ohm's Law
Resistivity/Resistance
Capacitance Inductance & transformers Decibel,
Db. Transformer basics
Basics of electrical power

Unit-2
Voltage RLC circuit
Basics of voltage
Semiconductors Q, quality factor Bandwidth, wavelength, frequency, amplitude

Unit-3
Characteristics
Calibration Damping, Low frequency Filter, Sensitivity, Amplitude Linearity,

Unit-4
Noise
Introduction,
Types
Technique for noise removal
Grounding

CODE – ELPH 302

Neuro Anatomy

THEORY

Unit-1
•Basic anatomy
•Basics of nervous system
•Sub divisions of nervous system
•Central
•Peripheral
•Autonomic

•Living anatomy of head and neck

Unit-2
Thalamus
•Introduction
•Division of diencephalon
•External features parts of thalamus
•Nuclei of thalamus
•Connections of thalamic nuclei
•Uses/ functions

Unit-3 Hypothalamus
•Introduction
•Division and boundaries of hypothalamus
•Hypothalamic nuclei
•Connections of hypothalamic
•Functions/uses

Unit-4 Ventricular system
•Introduction
•Review of skull
•Classification •Functions

Unit-5 Cerebrospinal fluid
•Introduction
•Production Circulation and absorption
•Function

Unit-6 Skull
•Introduction
•Bones of the skull
•Joints of the skull
•Anatomical position of skull Features of the skull-exterior and interior

Unit-7 Cerebellum Introduction
•Arterial supply of the cerebellum
•External features
•Divisions of cerebellum
•Internal structure (In brief)Boundaries and functions

Unit-8 Motor and sensory tracts
Sensory receptors
Sensory and motor pathways
Pyramidal system
Upper and lower motor neuron

Practical

Anatomy museum visit & Identify parts of brain skull

Unit-1
•Basic anatomy
•Basics of nervous system
•Sub divisions of nervous system
•Central
•Peripheral
• Autonomic
•Living anatomy of head and neck

Unit-2
Thalamus
•Introduction
•Division of diencephalon
•External features parts of thalamus
•Nuclei of thalamus
•Connections of thalamic nuclei
•Uses/ functions

Unit-3 Hypothalamus
•Introduction
•Division and boundaries of hypothalamus
•Hypothalamic nuclei
•Connections of hypothalamic
•Functions/uses

Unit-4 Ventricular system
•Introduction
•Review of skull
•Classification •Functions

Unit-5 Cerebrospinal fluid
•Introduction
•Production Circulation and absorption
•Function

Unit-6 Skull
•Introduction
•Bones of the skull
•Joints of the skull
•Anatomical position of skull Features of the skull-exterior and interior

Unit-7 Cerebellum Introduction
•Arterial supply of the cerebellum
•External features
•Divisions of cerebellum
•Internal structure (In brief)Boundaries and functions

Unit-8 Motor and sensory tracts
Sensory receptors
Sensory and motor pathways
Pyramidal system
Upper and lower motor neuron

CODE – ELPH 303

Neuro Physiology & Biochemistry

THEORY

Unit-1
Nerve muscle physiology
•Functional anatomy, biological activities, electrical and physiological properties of nerve fibre, types of nerve fibre, degeneration and regeneration of neurons

Structure and function of neuromuscular junction, neuromuscular transmission,

- Introduction of skeletal muscle, functional anatomy and organization, process and characteristics of muscle excitability and contractility, characteristics of skeletal muscles in intact body, EMG, and common muscle disorders, source of energy and metabolic phenomenon during muscle contraction
- drugs affecting and disorders of neuromuscular junction- factors promoting neuronal growth,

Unit-2 Cranial nerves

- Introduction, function of cranial nerve,
- clinical significance

Unit-3 Membrane potential

- Introduction, genesis of membrane potential, recording of membrane potential
- Evolution of patients receiving oxygen therapy
- Hazards of oxygen therapy. Unit-4Synapses
- Definition and its types,
- Chemical synapse,
- Neurotransmitters

Unit 5 Pathways

- Introduction, Salutatory propagation, plexus and roots, afferent and efferent pathways, peripheral nerves of limbs

Unit-6 Cerebellum

Introduction, stimulus, sensors and receptors and its types, sensory cortex and its types, neural circuits and neuronal activity, functions.

Unit 7 Brain stem

Introduction, physiological structure, development, blood supply, clinical significance, functions.

Neuro Biochemistry

Unit-1

Introduction to Cell

- Definition of the cell

•Difference between prokaryotic & eukaryotic cell
•Structure of cell
•Structure of cell membrane
•Structure of various cell organelles i.e. nucleus, mitochondria, golgi body, lysosomes, ribosomes, endoplasmic reticulum, centrioles etcDetailed function of above mentioned cell

Unit-2 Chemistry of Proteins
•Definition of the proteins & amino acids
•Structure & function of proteins and amino acids
•Classification of proteins & amino acids
•Biologically important peptides & amino acids
•Amino acids & peptides which act as neurotransmitters
• Organization of protein structure
Denaturation

Unit-3 Protein Metabolism
•Transamination
•Deamination
•Oxidative deamination
•Decarboxylation
•Synthesis, transport ,disposal and toxicity of ammonia
•Urea cycle and its disorders
•Metabolism of individual amino acids specifically related to nervous tissue
•Specialized products formed from amino acids Inborn errors of amino acid metabolism

Unit-4 NervousTissue
•Introduction, Types and functions of neurotransmitters
•Morphogenesis•Neurulation

Practical

Visit to Electrophysiology Lab & Patient based Discussion
Unit-1
Nerve muscle physiology

•Functional anatomy, biological activities, electrical and physiological properties of nerve fibre, types of nerve fibre, degeneration and regeneration of neurons
Structure and function of neuromuscular junction, neuromuscular transmission,
•Introduction of skeletal muscle, functional anatomy and organization, process and characteristics of muscle excitability and contractility, characteristics of skeletal muscles in intact body, EMG, and common muscle disorders, source of energy and metabolic phenomenon during muscle contraction
•drugs affecting and disorders of neuromuscular junction•factors promoting neuronal growth,
Unit-2 Cranial nerves
•Introduction, function of cranial nerve,
•clinical significance

Unit-3 Membrane potential
•Introduction, genesis of membrane potential, recording of membrane potential
•Evolution of patients receiving oxygen therapy
• Hazards of oxygen therapy. Unit-4Synapses
• Definition and its types,
• Chemical synapse,
• Neurotransmitters

Unit 5 Pathways
•Introduction, Salutatory propagation, plexus and roots, afferent and efferent pathways, peripheral nerves of limbs

Unit-6 Cerebellum
Introduction, stimulus, sensors and receptors and its types, sensory cortex and its types, neural circuits and neuronal activity, functions.

Unit 7 Brain stem
Introduction, physiological structure, development, blood supply, clinical significance, functions.

CODE – ELPH 304

Neuro Radiology (Basics)

THEORY

Unit 1 Introduction to neuro-imaging techniques
Principles
Advantages & Disadvantages
Recent advances

Unit 2 – Introduction to Xray system
Principles of Xray
Basics
Applied
Advantages & Disadvantages

Unit- 3 Introduction to MRI system
Principles of MRI and Fmri
Basic MR components
Biological Effect on MR Imaging
Advantage of MR Imaging system.

Unit- 4 Introduction to CT system
Principles of CT
Basics
Applied
Advantages & Disadvantages

PRACTICAL

Unit 1 Introduction to neuro-imaging techniques
Principles
Advantages & Disadvantages
Recent advances

Unit 2 – Introduction to Xray system
Principles of Xray
Basics
Applied

Advantages & Disadvantages

Unit- 3 Introduction to MRI system
Principles of MRI and Fmri
Basic MR components
Biological Effect on MR Imaging
Advantage of MR Imaging system.

Unit- 4 Introduction to CT system
Principles of CT
Basics
Applied
Advantages & Disadvantages

CODE – ELPH/AECC 305

BIOSTATISTICS & RESEARCH METHODOLOGY

• Introduction: Concepts, Types, Significance, And Scope Of Statistics, Meaning Data, Sample, Parameter, Type And Level Of Data And Their Measurement Organization And Presentation Of Data – Tabulation Of Data, Frequency Distribution Graphical And Tabular Presentation.

• Measures Of Central Tendency: Mean, Median, Mode

• Measures Of Variability: Range, Percentiles, Average Deviation, Quartile Deviation, Standard Deviation.

• Normal Distribution: Probability, Characteristics And Application Of Normal Probability Curve, Sampling Error.

• Measures Of Relationship: Correlation- Need And Meaning Rank Order Correlation, Scatter Diagram Method, Product Moment Correlation, Simple Linear Regression Analysis And Prediction.

• Significance Of Statistic And Significance Between Two Statics (Testing Hypothesis)

• Non-Parametric Test- Chi-Square Test , Sign, Median Test, Mann Whitney Test. •Parametric Test -'T' Test, Anova, Manova, Ancova And Reliability Tests

Research Methodology

1. Stages Of Research Process
2. Developing Ideas And Defining A Research Question
3. Literature Review
4. Errors In Measurement And Their Control,
5. Reliability And Validity
6. Epidemiological Measures Of Disease Frequency
7. Research Design:

I. Quantitative (Epidemiological)

1 A. Experiment (Clinical, Field, Community)

2 B. Observational

3 I. Cohort

4 Ii. Case Control

5 Iii. Cross Sectional Study

6 Iv. Ecological Study

Ii. Qualitative Research Method (Sociological)

i. Developing Instruments (Delphi Technique)
ii. Focus Groups
iii. In Depth Interview
iv. Key Informant Interview

8. Ethical Issues

9. Critical Appraisal Of A Research Report

SEM IV

CODE – ELPH 401

Applied Neuro Pathology

THEORY

Unit-1 Bone-gross and micro

- Normal structure of bone and cartilages
- Osteomyelitis –pyogenic, acute, chronic and tuberculosis
- Osteoporosis, osteomalacia , rickets, scurvy
- One Tumor-classification, benign
- Malignant
- Giant cell (tumor of bone)
- Rheumatoid arthritis
- Gout & Gouty arthritis
- Osteomyelitis osteosarcoma (briefly)

Unit-2 Muscle-gross and micro

- Normal structure of muscle
- Myasthenia gravis
  Myopathies –muscular dystrophies

Unit-3 Nerve-gross and micro

- Normal structure of nerve
- Hydrocephalus
- Infections –meningitis, acute, chronic, pyogenic, tuberculosis meningitis
- HIV encephalopathy (AIDS -dementia complex)
- Brain hemorrhage
- Trauma to the CNS (head injury)
- Peripheral nervous system (Normal structure)
- Peripheral neuropathy
- Wallisian degeneration

PRACTICAL

Unit-1 Bone-gross and micro

- Normal structure of bone and cartilages
- Osteomyelitis –pyogenic, acute, chronic and tuberculosis
- Osteoporosis, osteomalacia , rickets, scurvy
- One Tumor-classification, benign
- Malignant
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- Gout & Gouty arthritis
- Osteomyelitis osteosarcoma (briefly)

Unit-2 Muscle-gross and micro

- Normal structure of muscle
- Myasthenia gravis
  Myopathies –muscular dystrophies

Unit-3 Nerve-gross and micro

- Normal structure of nerve
- Hydrocephalus
- Infections –meningitis, acute, chronic, pyogenic, tuberculosis meningitis
- HIV encephalopathy (AIDS -dementia complex)
- Brain hemorrhage
- Trauma to the CNS (head injury)
- Peripheral nervous system (Normal structure)
- Peripheral neuropathy
- Wallisian degeneration

CODE – ELPH 402

Basics of EEG

THEORY

Unit-1

- Anatomical and physiological structure of Human brain.
- Division
- Clinical significance

Unit-2

- Electroencephalography:
- Brain waves
- Frequency
- 10-20 electrode placement system,
- Montage
- Amplitude
- Source of EEG

Unit-3

- Review of EEG machine:
- Basic components (designing and working),
- Block diagram of EEG machine
- Functioning of each component

Unit-4

- Amplifiers,
- Pre-amplifiers,
- Noise and its types,
- Basic of filters.

Unit 5

- Neonatal EEG:
- Introduction,
- Frequency,
- Amplitude EEG in different age groups
- Normal and abnormal EEG

PRACTICAL

Unit-1

- Anatomical and physiological structure of Human brain.
- Division
- Clinical significance

Unit-2

- Electroencephalography:
- Brain waves
- Frequency
- 10-20 electrode placement system,
- Montage
- Amplitude
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- Basic components (designing and working),
- Block diagram of EEG machine
- Functioning of each component

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- Amplifiers,
- Pre-amplifiers,
- Noise and its types,
- Basic of filters.

Unit 5

- Neonatal EEG:
- Introduction,
- Frequency,
- Amplitude EEG in different age groups
- Normal and abnormal EEG

CODE – ELPH 403

Basics of EMG & NCV

THEORY

Unit-1 Anatomical and physiological structure of human nervous system

Lymphatic system

Upper and lower limbs

Sensory and motor nerves.

Unit-2 Electromyography (working principle)

Nerve conduction velocity

Nerve muscle stimulator

Electrode placement

Stimulator applications

Unit-3 Review of EMG machine: basic components (designing and working), block diagram of EMG machine

Advancement in EMG machine design

Unit-4

Amplifiers

Preamplifiers,

noise and its types,

Basics of filters.

PRACTICAL

Unit-1 Anatomical and physiological structure of human nervous system

Lymphatic system

Upper and lower limbs

Sensory and motor nerves.

Unit-2 Electromyography (working principle)

Nerve conduction velocity

Nerve muscle stimulator

Electrode placement

Stimulator applications

Unit-3 Review of EMG machine: basic components (designing and working), block diagram of EMG machine

Advancement in EMG machine design

Unit-4

Amplifiers

Preamplifiers,

noise and its types,

Basics of filters.

CODE – ELPH 404

Patient care management and clinical care

THEORY

Cerebral vascular diseases
Space occupied lesion
Toxic, metabolic and endocrine conditions
Infections disease
Psychiatric disorder.
Pediatric condition.
Drug effects on E.E.G.
Disorders of sleep
Electro cerebral silence.

PRACTICAL

Unit I
Maintain patient, ward record.
Proper labeling of patient investigation.
History taking, Investigations.
Unit-2
Patient preparation for procedure.
Pre procedure
Neurology procedure.
Post procedure care.
Unit-3
Observation , Examination
Physical examination
Nursing care, Ward management
Patient care during seizures
Differential diagnosis
provisional diagnosis
Medication

Unit-4
Factual report writing
Receiving patient in procedure room (EEG and EMG room),
Decision for treatment/ admission

CODE – ELPH/AECC 405

ORGANISATIONAL BEHAVIOUR

INTRODUCTION:

All organizations, be the business, educational or government, are social systems. They are run by people. The functioning of an organization depends upon how people work or behave in the organization. Human behavior in organizations is highly unpredictable. It is unpredictable because it arises from people's deep-seated needs and value systems. However, it can be partially understood in terms of the framework of behavioral science, management and other disciplines. There is no idealistic solution to organizational problems. All that can be done is to increase our understanding and skills so that human relations at work can be enhanced.

KEY ELEMENTS OF ORGANISATIONAL BEHAVIOUR:

There are four key elements in organizational behavior. There are people, structure, technology and the environment. Each of the four elements of organizational behavior will be considered briefly.

- People
- Structure
- Technology
- Environment

CHALLENGES AND OPPORTUNITIES FOR ORGANISATIONAL BEHAVIOUR

INTRODUCTION : There are many challenges and opportunities for managers to use Organizational Behavior concepts to enhance the overall effectiveness of individuals, groups and organization. The following are some of the critical issues confronting managers for which the knowledge of Organizational Behavior offers worthy solutions based on behavioral science and other interdisciplinary fields.

SIGNIFICANT PROBLEMS IN MANAGEMENT : The following are some of the significant problems:

- Improving People Skills
- Improving Quality and Productivity
- Managing Workforce Diversity
- Responding to Globalization
- Empowering People
- Coping with Temporariness
- Stimulating Innovation and Change
- Improving Ethical Behavior

i) **Improving People Skills**

ii) **Improving Quality and Productivity**

iii) **Responding to Globalization:**

- An Expatriate manager have to manage a workforce that is likely to have very different needs, aspirations and attitudes from the ones that they are used to manage in their home countries.

- Understanding the culture of local people and how it has shaped them and accordingly learn to adapt ones management style

- Coping with ‘Temporariness
- Stimulating Innovation and Change
- Improving Ethical behavior
- Implications for Managers

SEMESTER V

CODE – ELPH 501

Evoked potentials

THEORY

Unit1

- Evoked Potential
- Introduction
- Types
- Visual pathways
- Late Response
- Blink Reflex
- Clinical significance

Unit-2

- BERA
- Introduction,
- auditory pathways,
- electrode (shielded electrodes)
- Repetitive Nerve Stimulation
- Clinical significance

Unit-3

- Pattern reversal
- Introduction,
- Working principle,
- Partial field stimulation,
- Check board
- Clinical significance

Unit-4

- Stroboscope
- Introduction
- Working principle

PRACTICAL

Unit1

- Evoked Potential
- Introduction,
- Types
- Visual pathways
- Late Response
- Blink Reflex
- Clinical significance

Unit-2

- BERA
- Introduction,
- auditory pathways,
- electrode (shielded electrodes)
- Repetitive Nerve Stimulation
- Clinical significance

Unit-3

- Pattern reversal
- Introduction,
- Working principle,
- Partial field stimulation,
- Check board
- Clinical significance

Unit-4

- Stroboscope
- Introduction,
- Working principle

CODE – ELPH 502

Instrumentation of EEG

THEORY

Unit-1
Nervous system:
•Anatomical and physiological structure of human brain.
•Dissections of human brain
•Brain organization, protection and blood supply
•White and grey matter

Unit-2

- EEG
- Brain waves,
- Frequency ,
- Amplitude,
- Source of EEG,
- Clinical significance of brain waves

Unit-3
EEG machine
•Components (designing and working principle),
block diagram of EEG machine,
•Difference between portable EEG machine and normal EEG machine

Unit-4
Traveller/Portable EEG machine
•Design, working,
•advantages & disadvantages

Unit-5
•Advancement in EEG machine
•Design and manufacturing

PRACTICAL

Unit-1
Nervous system:
•Anatomical and physiological structure of human brain.
•Dissections of human brain
•Brain organization, protection and blood supply
•White and grey matter

Unit-2

- EEG
- Brain waves,
- Frequency ,
- Amplitude,
- Source of EEG,
- Clinical significance of brain waves

Unit-3
EEG machine
•Components (designing and working principle),
block diagram of EEG machine,
•Difference between portable EEG machine and normal EEG machine

Unit-4
Traveller/Portable EEG machine
•Design, working,
•advantages & disadvantages

Unit-5
•Advancement in EEG machine
•Design and manufacturing

CODE – ELPH 503

Instrumentation of EMG & NCV

THEORY

Unit1
Sensory motor and integrative system:
Sensory nerves,
Process of sensation,
Sensory receptors,
Somatic sensory pathways,
Somatic motor pathways

Unit-2
EMG/NCV:
Introduction,
Abnormalities
Spontaneous activity
Motor unit potential waveform analysis

Unit-3
Instrumentation of EMG/NCV:
Block diagram, working principle, stimulator
Advantage and disadvantage.

Unit-4
Advancement in EMG/NCV machine
Design and manufacturing

Unit-5
Analysis of spontaneous activity in EMG
Analysis of MUP Routine upper extremity,
Facial and Phrenic Nerve Conduction Techniques.

PRACTICAL

Unit1

Sensory motor and integrative system:
Sensory nerves,
Process of sensation,
Sensory receptors,
Somatic sensory pathways,
Somatic motor pathways

Unit-2
EMG/NCV:
Introduction,
Abnormalities
Spontaneous activity
Motor unit potential waveform analysis

Unit-3
Instrumentation of EMG/NCV:
Block diagram, working principle, stimulator
Advantage and disadvantage.

Unit-4
Advancement in EMG/NCV machine
Design and manufacturing

Unit-5
Analysis of spontaneous activity in EMG
Analysis of MUP Routine upper extremity,
Facial and Phrenic Nerve Conduction Techniques.

CODE – ELPH 504

APPLICATION OF CLINICAL NEUROPHYSIOLOGY AND ASSESSMENT OF CLINICAL NEUROLOGY

THEORY

- Instrumentation for Intraoperative monitoring (IOM)
- Precautions to be taken during IOM
- Electrode placement, stimulation parameters for tethered cords, brachial plexus, dorsal column, cranial nerves, peripheral nerves and brainstem nuclei
- Brainstem auditory evoked potentials for cerebello-pontine angle tumors, microvascular decompression cases
- Somatosensory evoked potentials for aneurysm surgery, spinal cord surgery
- Motor evoked potentials using transcranial electrical stimulation for spinal cordmonitoring, monitoring of cases with intramedullary tumors, intradural extramedullary tumors and scoliosis correction
- Electrocorticography
- Neurological complications of systemic disease
- Trauma and the nervous system
- Vascular diseases of the nervous system
- Cancer and the nervous system
- Infections of the nervous system
- Multiple sclerosis and other white matter diseases
- Hypoxic, toxic and metabolic encephalopathy's
- Nutritional diseases of the nervous system
- Disorders of cerebrospinal fluid circulation and brain edema
- 10.Inborn errors of metabolism, mitochondrial disorders, channelopathies
- 11.The Dementias
- 12.Sleep and its disorders
- 13.Headache and other cranio-facial pain
- 14.Cranial neuropathies
- 15.Parkinsonism and related movement disorders
- 16.Disorders of cerebellum and tracts
- 17.Disorders of bones, joints, ligaments, and meninges

- 18.Disorders of upper and lower motor neurons
- 19.Disorders of nerve roots and plexuses
- 20.Disorders of peripheral nerves
- 21.Disorders of autonomic nervous system
- 22.Disorders of neuromuscular transmission
- 23.Disorders of skeletal muscle
- 24.Neurological problems of the newborn

PRACTICAL

- Instrumentation for Intraoperative monitoring (IOM)
- Precautions to be taken during IOM
- Electrode placement, stimulation parameters for tethered cords, brachial plexus, dorsal column, cranial nerves, peripheral nerves and brainstem nuclei
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- 10.Inborn errors of metabolism, mitochondrial disorders, channelopathies
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- 14.Cranial neuropathies
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- 16.Disorders of cerebellum and tracts
- 17.Disorders of bones, joints, ligaments, and meninges
- 18.Disorders of upper and lower motor neurons
- 19.Disorders of nerve roots and plexuses
- 20.Disorders of peripheral nerves
- 21.Disorders of autonomic nervous system
- 22.Disorders of neuromuscular transmission
- 23.Disorders of skeletal muscle
- 24.Neurological problems of the newborn

CODE – ELPH /AECC 505

MEDICAL BIOETHICS,HUMAN RIGHTS AND PROFESSIONAL VALUES

The aim of this course is to provide, through a series of workshops, an understanding of medical ethics and how
it is applied in clinical practice.
At the end of the course the student should be able to:
1) Describe and discuss the principal strands of ethical thought
2) Systematically apply them to ethical dilemmas in clinical practice and how they might best be dealt with
The student should gain an understanding of and be able to demonstrate in practice
1) Utilitarianism
2) Deontology
3) The Principles approach to medical ethics and how they are applied
4) Autonomy
5) Informed consent
6) Confidentiality
7) Human Rights as applied to medicine

Introduction to Medical Ethics

What is Ethics? What does it do and how does it work?
Ethics is an understanding of the nature of conflicts arising from moral imperatives
and how best we may deal with them. Specifically it deals with conflicts in potential outcome (consequences of actions) or with duties and obligations. Ethics does NOT decide what is morally right or wrong; rather it considers how we should act best in the light of our duties and obligations as moral agents. Clinicians have specific duties of care to their patients
and to society. It is generally held that clinicians should always act in the best interest of their patients; but
sometimes there is a conflict between obligations to a patient and those perceived to be owed to the community or to other patients. It may not always be the case that what the clinician believes is in the best interest of the
patient is what the patient wishes or will consent to. Central to modern medical ethics is a respect for patient autonomy and the fundamental principle of informed consent.

Medical Ethics is a practical subject as well as a branch of moral philosophy.
Ethics is an integral part of good medical practice. It is an essential branch of medicine.

Ethics deals with the choices we make and our actions in relation to those choices. It deals with choices made by both clinicians and patients and the duties and obligations of clinicians to their patients. Medical ethics also deals with the choices made by society, the distribution of resources and access to health care and the dilemmas arising from them.

Ethics deals with choices. Where there are no choices there is no need for ethics. There are almost always choices to consider and there is almost always a need for ethics. Any choice we make involves ethics, although sometimes we may not realise or consider it. How we live involves choices affecting ourselves and others with both the potential for benefit and for harm (consequences)

How we feed ourselves, clothe ourselves, keep ourselves warm, travel to work etc. All these choices have consequences for others.

Ethics is also about duties and obligations: to whom we have duties, how extensive they are, how best they may be discharged and how we deal with conflicting duties and obligations.
Patients have duties and obligations too, which is why we should respect them as moral agents. Parents have duties of care to their children; and sometimes a clinician's duty to a child patient may conflict with those of the parents, and this needs an ethical approach to resolve.

Ethical practice involves a systematic approach to decision making and actions, considering the interests of all affected by the decision. patient, they should consider not only whether they should do so but also how they should do so in the best interest of their patient.

HUMAN VALUES AND PROFESSIONAL ETHICS

Unit-I: Introduction to Value Education

1. Value Education, Definition, Concept and Need for Value Education

2. The Content and Process of Value Education

3. Self-Exploration as a means of Value Education

4. Happiness and Prosperity as parts of Value Education

Unit-II: Harmony in the Human Being

1. Human Being is more than just the Body

2. Harmony of the Self (Ì) with the Body

3. Understanding Myself as Co-existence of the Self and the Body

4. Understanding Needs of the Self and the Needs of the Body

Unit-III: Harmony in the Family and Society and Harmony in the Nature

1. Family as a basic unit of Human Interaction and Values in Relationships

2. The Basics for respect and today's Crisis : Affection, Care, Guidance, Reverence, Glory, Gratitude and Love

3. Comprehensive Human Goal : The Five dimensions of Human Endeavour

Unit-IV: Social Ethics

1. The Basics for Ethical Human conduct

2. Defects in Ethical Human Conduct

3. Holistic Alternative and Universal order

4. Universal Human Order and Ethical Conduct

Unit-V: Professional Ethics

1. Value Based Life and Profession

2. Professional Ethics and Right Understanding

3. Competence in Professional Ethics

4. Issues in Professional Ethics – The Current scenario

5. Vision for Holistic Technologies, Production System and Management Models

SEMESTER VI

CODE – ELPH 601

INTRA-OPERATIVE NEURO MONITORING

THEORY

Unit1

- IONM Basics and Common Modalities
- Introduction to IONM
- Basics of Recording
- Somatosensory Evoked Potentials (SSEPs)
- Electromyograms (EMGs) and
- Transcranial Electrical Motor Evoked Potentials (TceMEPs)
- Brainstem Auditory Evoked Responses (BAERs)
- Electroencephalograms (EEGs) and Other IONM
- Modalities
- Factors Affecting Daily Job Performance of IONM

Unit-2

- Fundamentals and principles of IONM
- Requirements for IONMina Hospital Organization:
- Challenges &Integration in Medical Care Programs,
- Financing,
- Education programs
- Credentialing
- Features and Limitations

Unit-3

- MEP
- Introduction,

- Clinical significance
- Long term monitoring of EEG

PRACTICAL

Unit1

- IONM Basics and Common Modalities
- Introduction to IONM
- Basics of Recording
- Somatosensory Evoked Potentials (SSEPs)
- Electromyograms (EMGs) and
- Transcranial Electrical Motor Evoked Potentials (TceMEPs)
- Brainstem Auditory Evoked Responses (BAERs)
- Electroencephalograms (EEGs) and Other IONM
- Modalities
- Factors Affecting Daily Job Performance of IONM

Unit-2

- Fundamentals and principles of IONM
- Requirements for IONMina Hospital Organization:
- Challenges &Integration in Medical Care Programs,
- Financing,
- Education programs
- Credentialing
- Features and Limitations

Unit-3

- MEP
- Introduction,
- Clinical significance

Long term monitoring of EEG

CODE – ELPH 602

Neuro–Radiology Applied

THEORY

Unit-1
Introduction to Neuro imaging techniques
Principles
Advantages and Disadvantages
Recent advances

Unit 2
Introduction to Emission Computed Tomography (ECT) systems.
Principles and applications of SPECT
Principles and applications of PET
Principles and applications of CT
System components of CT
Contrast Scale for different neuro-imaging techniques.

Unit-3
Introduction to MRI system
Principles of MRI and Fmri
Basic MR components
Biological Effect on MR Imaging
Advantage of MR Imaging system.

Unit-4
Introduction to BCI
Applications of BCI
Introduction to MEG
Applications of MEG
Advantage and disadvantage of MEG

PRACTICAL

Unit-1
Introduction to Neuro imaging techniques
Principles
Advantages and Disadvantages
Recent advances

Unit 2
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Principles and applications of CT
System components of CT
Contrast Scale for different neuro-imaging techniques.

Unit-3
Introduction to MRI system
Principles of MRI and Fmri
Basic MR components
Biological Effect on MR Imaging
Advantage of MR Imaging system.

Unit-4
Introduction to BCI
Applications of BCI
Introduction to MEG
Applications of MEG
Advantage and disadvantage of MEG

CODE – ELPH 603

CLINICAL NEUROLOGY

THEORY

Introduction to Neurology

- Neurological diseases – a basic approach
- Clinical examination basics
- Episodic impairment of consciousness
- Delirium and altered sensorium
- v) Stupor and Coma
- vi) Memory Impairment
- vii) Child with developmental delay
- Behavioral disorders
- Apraxia, agnosia and aphasia
- Disorders of vision
- Hearing impairment and vertigo
- Cranial and facial pain
- Brainstem syndromes
- Ataxic disorders
- Movement disorders
- Gait disorders
- Hemiplegia and monoplegia
- Paraplegia
- Proximal and distal weakness
- Floppy infant
- Sensory abnormalities of face, trunk and limbs
- Neurological causes of bladder, bowel and sexual dysfunction
- The Epilepsies

2. Neuropharmacology

- 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
- Anti parkinsonian drugs
- Drugs used in mental illness
- CNS stimulants and cerebroactive drugs
- Drugs affecting coagulation, bleeding and thrombosis
- Antiseptics, disinfectants

3. Microbiology (including sterilization)

- Morphology and physiology of bacteria
- Sterilization and disinfection
- Infection and immunity
- Important bacteria, viruses, and parasites

- Normal microbial flora of body, bacteriology of water and air, hospital infection

PRACTICAL

Introduction to Neurology

- Neurological diseases – a basic approach
- Clinical examination basics
- Episodic impairment of consciousness
- Delirium and altered sensorium
- v) Stupor and Coma
- vi) Memory Impairment
- vii) Child with developmental delay
- Behavioral disorders
- Apraxia, agnosia and aphasia
- Disorders of vision
- Hearing impairment and vertigo

- Cranial and facial pain
- Brainstem syndromes
- Ataxic disorders
- Movement disorders
- Gait disorders
- Hemiplegia and monoplegia
- Paraplegia
- Proximal and distal weakness
- Floppy infant
- Sensory abnormalities of face, trunk and limbs
- Neurological causes of bladder, bowel and sexual dysfunction
- The Epilepsies

3. Neuropharmacology
    - 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
    - Anti parkinsonian drugs
    - Drugs used in mental illness
    - CNS stimulants and cerebroactive drugs
    - Drugs affecting coagulation, bleeding and thrombosis
    - Antiseptics, disinfectants

4. Microbiology (including sterilization)
    - Morphology and physiology of bacteria
    - Sterilization and disinfection
    - Infection and immunity
    - Important bacteria, viruses, and parasites

    - Normal microbial flora of body, bacteriology of water and air, hospital infection

CODE – ELPH 604

EEG and EMG Machines and clinical practice

THEORY

Unit1

- Instrumentation of EEG:
- Block diagram,
- Waveform analysis,
- Sleep studies,
- Difference between neonatal and adult EEG waveforms

Unit-2

- Instrumentation of EMG/NCV:
- Block diagram,
- Working,
- Waveform analysis,
- Differentiate between sensory and motor nerves

Unit-3

- Filters:
- Classification,
- Circuit diagrams
- Implementation

Unit-4

- Differential Amplifiers:
- block diagram,
- circuit diagram,
- working,
- Implementation

Unit 5

- Recording technique and parameter,
- Source of artifacts & methods of elimination
- Activation procedure; Hyperventilation, Photic stimulation
- Electrode , Types,
- Electrode Impedance,

PRACTICAL

Unit1

- Instrumentation of EEG:
- Block diagram,
- Waveform analysis,
- Sleep studies,
- Difference between neonatal and adult EEG waveforms

Unit-2

- Instrumentation of EMG/NCV:
- Block diagram,
- Working,
- Waveform analysis,
- Differentiate between sensory and motor nerves

Unit-3

- Filters:
- Classification,
- Circuit diagrams
- Implementation

Unit-4

- Differential Amplifiers:
- block diagram,
- circuit diagram,
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Unit 5

- Recording technique and parameter,
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MEDICAL COLLEGE, PUNE

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SYLLABUS

ABILITY ENHANCEMENT ELECTIVE COURSES

COURSE: BSc (NEURO ELECTROPHYSIOLOGY TECHNOLOGY)
SEMESTER III

SUBJECT & CODE: BIOSTATISTICS AND RESEARCH METHODOLOGY (ELPH/AEEC 305)

Teaching Objectives

- To enable students to present, analyze and interpret data.
- To enable students to use concepts of probability in business situations.
- To enable students to make inferences from samples drawn from large datasets.
- To enable students to apply univariate and multivariate statistical techniques

Learning Outcomes

- To understand the importance & Methodology for research
- To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

SYLLABUS	
• Introduction of Biostatistics • Data and its type • Descriptive statistics • Measure of Central tendency • Sampling technique • Inferential statistics • Parametric and non-parameters test • Introduction to research methods • Identifying research problem • Ethical issues in research • Research design	• Introduction to research methods • Identifying research problem • Ethical issues in research • Research design • Basic Concepts of Biostatistics • Types of Data • Research tools and Data collection methods • Sampling methods • Developing a research proposal

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SYLLABUS

ABILITY ENHANCEMENT ELECTIVE COURSES

COURSE: BSc (NEURO ELECTROPHYSIOLOGY TECHNOLOGY)
SEMESTER III

SUBJECT & CODE: MEDICAL RECORDS MANAGEMENTS

(ELPH/AEEC 306)

- Introduction
- History, need, importance.
- Characteristics of a good medical record.
- Organizational aspects.
- Filing and retention methods.
- Safety measures against fire and Pest control
- Outsourcings of preservation of medical records.

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SYLLABUS
ABILITY ENHANCEMENT ELECTIVE COURSES
COURSE: BSc (NEURO ELECTROPHYSIOLOGY TECHNOLOGY)
SEMESTER IV
SUBJECT & CODE: ORGANIZATION BEHAVIOUR

(ELPH/AEEC 405)

Teaching Objective

• To understand the initial insights into underlying principles and fundamental theories of organizational behavior.
• The Student should develop a sense of what falls under the domain of organizational behavior.
• He should develop an understanding of academic views on the behavior and motivations of people in organizations and the purposes of organizations.
• This course clearly takes an academic and scientific lens with the aim of understanding human behavior in organizations.

Learning Outcomes

• Describe and apply motivation theories to team and organizational scenarios in order achieve a team's or an organization's goals and objectives.

• Explain the effect of personality, attitudes, perceptions and attributions on their own and other's behavior's in team and organizational settings.

• Explain types of teams and apply team development, team effectiveness, and group decision making models and techniques. Analyses and apply leadership theories and better understand their own leadership style.

Syllabus

- Organizational Behavior - Definition - Importance - Historical Background - Fundamental concepts of OB - 21st Century corporate - Different models of OB i.e. autocratic, custodial, supportive
- Perception Process - Nature & Importance - Perceptual Selectivity - Perceptual Organization - Social Perception - Impression Management
- Learning - Process of Learning - Principles of Learning - Organizational Reward Systems – Behavioral Management
- Motivation - Motives - Characteristics - Classification of motives - Primary Motives - Secondary motives - Morale - Definition and relationship with productivity – Morale Indicators
- Leadership - Definition - Importance - Leadership Styles - Models and Theories of Leadership Styles
- Conflict Management - Traditional vis-a-vis Modern view of conflict - Constructive and Destructive conflict - Conflict Process - Strategies for encouraging constructive conflict - Strategies for resolving destructive conflict.

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SYLLABUS

ABILITY ENHANCEMENT ELECTIVE COURSES

COURSE: BSc (NEURO ELECTROPHYSIOLOGY TECHNOLOGY) SEMESTER IV

SUBJECT & CODE: PURSUIT OF INNER SELF EXCELLENCE (ELPH/AEEC 406)

- **Spiritual Values for human excellence :** The value of human integration; Compassion, universal love and brotherhood (Universal Prayer) ; Heart based living ; Silence and its values, Peace and non-violence in thought, word and deed ; Ancient treasure of values - Shatsampatti , Patanjali's Ashtanga Yoga ,Vedic education - The role of the Acharya , values drawn from various cultures and religious practices - Ubuntu, Buddism, etc.; Why spirituality? Concept – significance ; Thought culture.

- **Ways and Means :** Correlation between the values and the subjects ;Different teaching techniques to impart value education; Introduction to Brighter Minds initiative; Principles of Communication; Inspiration from the lives of Masters for spiritual values - Role of the living Master.

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SYLLABUS

ABILITY ENHANCEMENT ELECTIVE COURSES

COURSE: BSc (NEURO ELECTROPHYSIOLOGY TECHNOLOGY)
SEMESTER V

SUBJECT & CODE: MEDICAL BIOETHICS

(ELPH/AEEC 504)

Teaching Objective

- To introduce the wide range of ethical issues in health care.
- To provide basic skills in: A) Approaching ethical issues. B) Analysis and statement of issues. C) Understanding the relevant ethical principles invoked.
- Imparting knowledge and skills that will enable students to develop ethical answers to these issues
- To acquire acquire specialized knowledge of law and IPR.
- The main objective of the IPR is to make the students aware of their rights for the protection of their invention done in their project work.

Learning Outcomes

- Upon successful completion of the course, students will be able to: Recognize what constitutes an ethical concern in health care
- Understanding ethical issues in Health care.
- Understand better the complexity and multi-dimensionality of medical ethical concerns and uniqueness of each problem.
- Capacity to rationally justify your decision
- Develop the ability to reason through difficult medical/clinical ethical issues both orally, in the context of a group of their peers, and through written

- The students get awareness of acquiring the patent and copyright for their innovative works. They also get the knowledge of plagiarism in their innovations which can be questioned legally.

- **Introduction to Bioethics**: Bioethical issues related to Healthcare & medicine.
- **Anatomy :**Cadaver ethics, Human dignity, PNDT, Disposal of cadaver, Genetic Counselling
- **Physiology -** Animal ethics, Health policy privacy
- **Biochemistry & Pathology -** Prudence of investigation confidentiality, Patients bill of rights, Disposal of investigative material, Integrity, Blood transfusion
- **Pharmacology -** Rational drug prescribing, Clinical trials, Risk minimization, Animal ethics
- **Microbiology -** Hand wash, Drug resistance minimization, Prudence of investigation confidentiality, Sterilization procedure, Biosafety and bio hazard
- **Medicolegal aspects of medical records**
- **Introduction to Intellectual Property**:
- Concept of Intellectual Property Kinds of Intellectual Property Patents, CopyrightsDesigns, Trademarks,Geographical Indication, Infringement of IPR, Its protection and Remedies Licensing and its types

Reference Books:

1. Contemporary issues in bioethics – Beauchamp & walters (B&W) 4th edition.
2. Classic philosophical questions by Gloud (8th Edition)
3. Case book series and booklets by UNESCO Bioethics Core curriculum 2008
4. Encyclopedia of Bioethics 5 vol set, (2003) ISBN-10: 0028657748
5. Intellectual property rights- Ganguli-Tat McGrawhill. (2001) ISBN-10: 0074638602,
6. Intellectual Property Right- Wattal- Oxford Publicatiopn House.(1997) ISBN:0195905024.

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SYLLABUS

ABILITY ENHANCEMENT ELECTIVE COURSES

COURSE: BSc (NEURO ELECTROPHYSIOLOGY TECHNOLOGY)
SEMESTER V

SUBJECT & CODE: HUMAN RIGHTS & PROFESSIONAL VALUES

(ELPH/AEEC 505)

Teaching Objective

- To understand interaction between society and educational institutions.
- To sensitize the citizens so that the norms and values of human rights and duties of education programme are realized.
- To encourage research activities.
- To encourage research studies concerning the relationship between Human Rights and Duties Education.

Learning Outcomes

- This course will aim at making the learners acquire conceptual clarity and develop respect for norms and values of freedom, equality, fraternity and justice.
- It will include awareness of civil society organizations and movements promoting human rights.
- This will make the students realize the difference between the values of human rights and their duties.

Syllabus

- **Background -** Introduction, Meaning, Nature and Scope, Development of Human Rights, Theories of Rights, Types of Rights

- **Human rights at various level-** Human Rights at Global Level UNO, **Instruments**: U.N. Commission for Human Rights,European Convention on Human Rights.
- **Human rights in India -** Development of Human Rights in India, Human Rights and the Constitution of India, Protection of Human Rights Act 1993- National Human Rights Commission, State Human Rights Commission, Composition Powers and Functions, National Commission for Minorities, SC/ST and Woman
- **Professional values**- Integrity, Objectivity, Professional competence and due care, Confidentiality
- **Personal values**- ethical or moral values, Attitude and behavior- professional behavior, treating people equally
- **Code of conduct-** professional accountability and responsibility, misconduct, Cultural issues in the healthcare environment

Reference Books:

1. Jagannath Mohanty Teaching of Human sRights New Trends and Innovations Deep & Deep Publications Pvt. Ltd. New Delhi2009
2. Ram Ahuja: Violence Against Women Rawat Publications Jewahar Nager Jaipur.1998.
3. Sivagami Parmasivam Human Rights Salem 2008
4. Hingorani R.C.: Human Rights in India: Oxford and IBA New Delhi.
