T.S.MISHRA UNIVERSITY
LUCKNOW

ORDINANCE : H-009

Bachelor of Physiotherapy (BPT)

Notified on 12/09/2023

Established under Uttar Pradesh Private Universities(Amendment)Act,

2023

(UP ACT No. 10 of 2023)

PREFACE

To ensure seamless education and to achieve academic excellence in the University rules and regulations for “BACHELOR OF PHYSIOTHERAPY (BPT)” course is published vide Ordinance 09. These regulations will be in addition to the norms set by the regulatory body from time to time.

FACULTY OF PARAMEDICAL SCIENCES

Ordinance for Bachelor of Physiotherapy (BPT)

Duration: 4 & 1/2 years

Bachelor of Physiotherapy (BPT)

Program Objectives

1. Course work entitles independent physiotherapy assessment and treatment in any health care delivery centers in India by the graduates.
2. The coursework is designed to train students to work as independent physiotherapists or in conjunction with a multidisciplinary team to diagnose and treat movement disorders as per red and yellow flags.
3. Course work will enlighten the skill of the graduate's physical/functional diagnosis, treatment planning, management, administration of physiotherapy treatment, and patient support.
4. Graduates can find employment opportunities in hospitals/nursing homes/sports teams/fitness centers/Community Rehabilitation/Health planning boards/health promotions services in both private and public sectors as well as in independent physiotherapy clinics.
5. Physiotherapy graduates are encouraged to pursue further qualification to attain a senior position in the professional field and also to keep abreast with the recent advances, new technology and research. The professional should opt for continuous professional education credits offered by national and international institutes.

PO1: The students will be able to possess knowledge and comprehension of diagnosis and treatment utilizing physiotherapy Techniques.

PO2: The students will be able to develop the skills for diagnosis and differential diagnosis in physiotherapy conditions.

PO3: The students will be able to design and formulate the treatment plan to address theneeds of patients.

PO4: The students will be able to identify themselves as physiotherapists delivering effective health care.

PO5: The students will be able to understand the health care needs of the society and the best practices to provide them.

PO6: The student will be able to learn and apply the basic medical knowledge for diagnosis and effective management of physiotherapy conditions.

PO7: The students will learn, practice, and implement appropriate ethical guidelines for effective and optimal treatment.

PO8: The students will understand their roles and responsibilities either individually or as a rehabilitation team member in delivering effective health care.

PO9: The students will have good leadership qualities and entrepreneurship skills by working and communicating effectively in an interdisciplinary environment either independently or witha team.

PO10: The students will be able to demonstrate and apply the technical skills to integrate the core areas of physiotherapy practice.

PO11: To provide students with sufficient breadth and depth of knowledge in physiotherapy and related areas and enable them for higher studies and life -long learning programs.

Learning Objectives:

At the completion of this course, the student should be-

1. Able to examine, evaluate, diagnose, plan, execute and document physiotherapy treatment independently or along with the multidisciplinary team.
2. Able to evaluate patients for impairments and functional limitations and be able to execute all routine physiotherapeutic procedures.
3. Able to operate and maintain physiotherapy equipment used in treatment of patients, physiotherapy treatment planning (both electrotherapy and exercise therapy) & procedures independently.
4. Able to provide patient education about various physiotherapeutic interventions to the patient and care givers.

1. Scope:

This ordinance shall apply to the program leading to Bachelors of Physiotherapy (BPT).

2. Admission Criteria:

2.1 Age:

A candidate seeking admission in Bachelors of Physiotherapy (BPT) course should have completed 17 years of age, as of 31st December of the year of admission.

2.2 Qualifying Examination:

A candidate seeking admission to the Bachelors of Physiotherapy (BPT) program should have passed 10+2 examination or its equivalent conducted by Boards/Councils established by State Government/Central Government with Physics, Chemistry, Biology and English as subjects. The candidate must possess a minimum of 40 % marks in the qualifying examination. 5 % relaxation will be given to reserve category candidates.

2.3 Admission to **BPT** course will be made as per the rules prescribed by the competent authority of the university, from time to time, in following manner:

2.3.1 Direct admission based on merit of the eligible candidates

2.3.2 On merit in entrance test conducted by competent authority.

2.4 Lateral entry:

Candidate(s) having two years' diploma in Physiotherapy Techniques and registered with state medical faculty shall be eligible for admission directly in Second Year (3rd Semester) of Bachelor of Physiotherapy (BPT) course.

2.4.1 The marks of the diploma holder will be exempted and will not be added in the 1st year (1st & 2nd semester) of (BPT) course. The marks of these candidates will be granted only from 2nd year onwards. For these candidates their earlier grades will be transcripted.

2.4.2 Admission through lateral entry to BPT course will depend upon availability of seats.

3. Duration of the Course:

The duration of the Course of Bachelors of Physiotherapy (BPT) shall be 4 & ½ years (4 years academic and 6 months' Compulsory rotatory internship).

3.1 The maximum period for completion of program successfully should not exceed Nine(09) Years. (Nx2)

4. Medium of Instruction: English

5. Attendance:

A candidate is required to obtain minimum 75% attendance in theory, tutorials and seminarsand 80% in practical of each subject individually to be eligible to appear in the university examination. However, a relaxation may be allowed on extreme by competent authority.

6. Organization of the Program:

6.1 Each academic year shall consist of two semesters, each of 6 months duration.

6.2 Six months (180 days) of internship will be mandatory for award of Bachelors of Physiotherapy (BPT) Degree.

7. Curriculum and Credit System*:*

7.1 The 4 & 1/2-year curriculum has been divided into 8 semesters and shall include lectures, tutorials, practical, seminars, projects and case studies as defined in the scheme of instructions and examinations and executive instructions issued by the University from time to time.

7.2 The curriculum will also include such other curricular, co-curricular and extracurricular activities as may be prescribed by the University from time to time.

7.3 Credit System:

Each BPT program will have a curriculum in which every course will be assigned certain credits reflecting its weight and contact periods per week, as given below:

1 Credit Theory(L) = 1 hour per week per semester.

1 Credit Tutorial (T)= 1 hour per week per semester.

1 Credit Practical/ Lab (P)= 2 hours per week per semester.

1 Credit Clinical Posting(CP) = 3 hours of Clinical Posting hours per week per semester.

In addition to theory and Laboratory courses there may be other courses such as seminar, clinical training, projects etc., which will be assigned credits as per their contributions in theprogramme without regards to contact periods.

7.4 Minimum Credit Requirements:

The minimum credit required for award of a **BPT degree** is **184**.

8. Curriculum Outline:

FIRST SEMESTER

Sl. No.	Course Titles	Hours			Credit hours
		Theory	Practical	Total	
BPT-101	Human Anatomy I (Including Applied Anatomy)	80	64	144	6
BPT-102	Human Physiology I (Including Applied Physiology)	80	64	144	6
BPT-103	Biochemistry	50	20	70	3
BPT-104	Bio physics	30	20	50	3
BPT-105	Health Psychology	50	-	50	3
	Non-University exam Subjects				
BPT-106	Remedial English	30	-	30	2
	Total	**320**	**168**	**488**	**23**

SECOND SEMESTER

Sl. No.	Course Titles	Hours			Credit hours
		Theory	Practical	Total	
BPT-107	Human Anatomy II (Including Applied Anatomy)	80	64	144	6
BPT-108	Human Physiology II (Including Applied Physiology)	80	64	144	6
BPT-109	Biomechanics and Kinesiology I	80	64	144	6
BPT-110	Yoga-Basic theory, science and techniques	30	20	50	3
	Non-University exam Subjects				
BPT-111	Computers & Informatics	30	-	30	2
	Total	**300**	**212**	**512**	**23**

THIRD SEMESTER

Sl. No.	Course Titles	Hours			Credit hours
		Theory	Practical	Total	
BPT-201	Exercise Therapy-I	80	64	144	6
BPT-202	Electrotherapy-I	80	64	144	6
BPT-203	Biomechanics and Kinesiology II	80	64	144	6
BPT-204	Microbiology	50	-	50	3
	Non-University exam Subjects				
BPT-205	Environmental Science	30	-	30	2
BPT-206	Clinical Observation		60	60	2
	Total	**320**	**252**	**572**	**25**

FOURTH SEMESTER

Sl. No.	Course Titles	Hours			Credit hours
		Theory	Practical	Total	
BPT-207	Exercise Therapy II	80	64	144	6
BPT-208	Electrotherapy II	80	64	144	6
BPT-209	Pharmacology	50	-	50	3
BPT-210	First Aid & Emergency Care	30	30	60	3
BPT-211	Pathology	55	20	75	3
	Non-University exam Subjects				
BPT-212	Medical/Physiotherapy Ethics & Laws	30	-	30	2
BPT-213	Clinical Observation		60	60	2
	Total	**325**	**238**	**563**	**25**

FIFTH SEMESTER

Sl. No.	Course Titles	Hours			Credit hours
		Theory	Practical	Total	
BPT-301	Cardio Pulmonary Medicine& Surgery	80	64	144	6
BPT-302	General Surgery	80	20	100	4
BPT-303	General Orthopaedics and Traumatology	80	64	144	6
BPT-304	General Medicine	80	20	100	4
	Non-University exam Subjects				
BPT-305	Introduction to Health Care Systems	30	-	30	2
BPT-306	Clinical Education		80	60	2
	Total	**350**	**248**	**578**	**24**

SIXTH SEMESTER

Sl. No.	Course Titles	Hours			Credit hours
		Theory	Practical	Total	
BPT-307	Regional Orthopaedics and Diagnostic imaging	80	64	144	6
BPT-308	Clinical Neurology and Neuro Surgery	80	64	144	6
BPT-309	Community Physiotherapy and Rehabilitation	80	64	144	6
BPT-310	Research Methodology & Biostatistics	60	-	50	2
	Non-University exam Subjects				
BPT-311	Introduction to Quality & Patient Safety	15	-	15	1
BPT-312	Professionalism & Values	10		10	1
BPT -313	Clinical Education		60	60	2
	Total	**325**	**252**	**577**	**24**

SEVENTH SEMESTER

Sl. No.	Course Titles	Hours			Credit hours
		Theory	Practical	Total	
BPT-401	Physiotherapy in Orthopaedics-I	60	40	100	4
BPT-402	Physiotherapy in Neurology-I	60	40	100	4
BPT-403	Physiotherapy in Cardiopulmonary conditions-I	60	40	100	4
BPT-404	Physiotherapy in Sports-I	60	40	100	4
BPT-405	PT in General Medical &Surgical Condition	60	40	100	4
	Non-University exam Subjects				
BPT-406	Evaluation Methods and Outcome Measures	30		30	1
BPT-407	Clinical reasoning & Evidence Based physiotherapy	30		30	1
BPT-408	Clinical Education		60	60	2
	Total	**360**	**260**	**620**	**24**

EIGHTH SEMESTER

Sl. No.	Course Titles	Hours			Credit hours
		Theory	Practical	Total	
BPT-409	Physiotherapy in Orthopaedics-II	60	40	100	4
BPT-410	Physiotherapy in Neurology-II	60	40	100	4
BPT-411	Physiotherapy in Cardiopulmonary Condition-II	60	40	100	4
BPT-412	Physiotherapy in Sports-II	60	40	100	4
BPT-413	Research Project		120	120	4
	Non-University exam Subjects				
BPT414	Critique inquiry, case presentation and discussion.	20	-	20	1
BPT-415	Clinical Education		60	60	2
	Total	**260**	**340**	**600**	**23**

Internship

Sl. No.	Course Titles	Hours			Credit hours
		Theory	Practical /Clinical	Total	
BPT-416	Internship		960	960	16
	Total			**960**	

EVALUATION SCHEME

BPT FIRST SEMESTER

S.NO	Course	Course Code	Theory		Practical		Total M.M
			Internal M.M	External M.M	Internal M.M	External M.M	
1	Human Anatomy I (Including Applied Anatomy)	BPT-101	20	80	20	80	200
2	Human Physiology I (Including Applied Physiology)	BPT-102	20	80	20	80	200
3	Biochemistry	BPT-103	20	80	20	80	200
4	Bio physics	BPT-104	20	80	-	-	100
5	Health Psychology	BPT-105	20	80	-	-	100
Non-University Exam Subjects							
6	Remedial English	BPT-106	-	-	-	-	-
Total			**100**	**400**	**60**	**240**	**800**

BPT SECOND SEMESTER

S.NO	Course	Course Code	Theory		Practical		Total M.M
			Internal M.M	External M.M	Internal M.M	External M.M	
1	Human Anatomy II (Including Applied Anatomy)	BPT-107	20	80	20	80	200
2	Human Physiology II (Including Applied Physiology)	BPT-108	20	80	20	80	200
3	Biomechanics and Kinesiology I	BPT-109	20	80	20	80	200
4	Yoga-Basic theory, science and techniques	BPT-110	20	80	20	80	200
Non-University Exam Subjects							
5	Computers & Informatics	BPT-111	-	-	-	-	-
Total			**80**	**320**	**80**	**320**	**800**

BPT THIRD SEMESTER

S.NO	Course	Course Code	Theory		Practical		Total M.M
			Internal M.M	External M.M	Internal M.M	External M.M	
1	Exercise Therapy-I	BPT-201	20	80	20	80	200
2	Electrotherapy-I	BPT-202	20	80	20	80	200
3	Biomechanics and Kinesiology II	BPT-203	20	80	20	80	200
4	Microbiology	BPT-204	20	80	-	-	100
Non-University Exam Subjects							
5	Environmental Science	BPT-205	-	-	-	-	-
6	Clinical Education	BPT-206	-	-	-	-	-
Total			**80**	**320**	**60**	**240**	**700**

BPT FOURTH SEMESTER

S.NO	Course	Course Code	Theory		Practical		Total M.M
			Internal M.M	External M.M	Internal M.M	External M.M	
1	Exercise Therapy II	BPT-207	20	80	20	80	200
2	Electrotherapy II	BPT-208	20	80	20	80	200
3	Pharmacology	BPT-209	20	80	-	-	100
4	First Aid & Emergency Care	BPT-210	20	80	-	-	100
5	Pathology	BPT-211	20	80	-	-	100
Non-University Exam Subjects							
6	Medical/Physiotherapy Ethics & Laws	BPT-212	-	-	-	-	-
7	Clinical Education	BPT-213	-	-	-	-	-
Total			**100**	**400**	**40**	**160**	**700**

BPT FIFTH SEMESTER

S.NO	Course	Course Code	Theory		Practical		Total M.M
			Internal M.M	External M.M	Internal M.M	External M.M	
1	Cardio-Pulmonary Medicine & Surgery	BPT-301	20	80	20	80	200
2	General Surgery	BPT-302	20	80	-	-	100
3	General Orthopaedics and Traumatology	BPT-303	20	80	20	80	200
4	General Medicine	BPT-304	20	80	-	-	100
Non-University Exam Subjects							
5	Introduction to Health care Systems	BPT-305	-	-	-	-	-
6	Clinical Education	BPT-306	-	-	-	-	-
Total			**80**	**320**	**40**	**160**	**600**

BPT SIXTH SEMESTER

S. No.	Course	Course Code	Theory		Practical		Total Marks
			Internal M.M	External M.M	Internal M.M	External M.M	
1	Regional Orthopaedics and Diagnostic imaging	BPT-307	20	80	20	80	200
2	Clinical Neurology and Neuro Surgery	BPT-308	20	80	20	80	200
3	Community Physiotherapy and Rehabilitation	BPT-309	20	80	20	80	200
4	Research Methodology & Biostatistics	BPT-310	20	80	-	-	100
Non-University Exam Subjects							
5	Introduction to Quality & Patient Safety	BPT-311	-	-	-	-	-
6	Professionalism & Values	BPT-312	-	-	-	-	-
7	Clinical Education	BPT -313	-	-	-	-	-
Total			**80**	**320**	**60**	**240**	**700**

BPT SEVENTH SEMESTER

S.No	Course	Course Code	Theory		Practical		Total Marks
			Internal M.M	External M.M	Internal M.M	External M.M	
1	Physiotherapy in Orthopaedics-I	BPT-401	20	80	20	80	200
2	Physiotherapy in Neurology-I	BPT-402	20	80	20	80	200
3	Physiotherapy in Cardiopulmonary conditions-I	BPT-403	20	80	20	80	200
4	Physiotherapy in Sports-I	BPT-404	20	80	20	80	200
5	PT in General Medical & Surgical Condition.	BPT-405	20	80	20	80	200
Non-University Exam Subjects							
6	Evaluation Methods and Outcome Measures	BPT-406	-	-	-	-	-
7	Clinical reasoning & Evidence based physiotherapy	BPT-407	-	-	-	-	-
8	Clinical education	BPT-408	-	-	-	-	-
Total			**100**	**400**	**100**	**400**	**1000**

BPT EIGHTH SEMESTER

S. No.	Course	Course Code	Theory		Practical		Total Marks
			Internal M.M	External M.M	Internal M.M	External M.M	
1	Physiotherapy in Orthopaedics-II	BPT-409	20	80	20	80	200
2	Physiotherapy in Neurology-II	BPT-410	20	80	20	80	200
3	Physiotherapy in Cardiopulmonary-II	BPT-411	20	80	20	80	200
4	Physiotherapy in Sports-II	BPT-412	20	80	20	80	200
5	Research Project	BPT-413	100	-	-	-	100
Non-University Exam Subjects							
6	Critique inquiry, case presentation and discussion.	BPT- 414	-	-	-	-	-
7	Clinical education	BPT-415	-	-	-	-	-
Total			**180**	**320**	**80**	**320**	**900**

INTERNSHIP

There shall be six months (180 days) of compulsory rotatory Internship after the successful completion of Eight semester, as under:

S.No.	Name of Department	Duration
1	Orthopaedics	1 month
2	ICU	1 month
3	Neurology and Neurosurgery	1month
4	Pediatrics and Medicine	1 month
5	General Surgery and Obstetrics and Gynecology	1 month
6	CTVS + Plastic Surgery	1 month

Other Details

8.2 The rotatory internship must be completed from the university hospital only. However, in exceptional cases on extreme compassionate grounds permission to complete the internship from other hospital may be granted by the competent authority.

8.3 The University shall issue a provisional degree Bachelors of Physiotherapy (BPT) on passing the final examination and after the completion of internship on demand by the candidate.

8.4 Assessment of Internship:

On successful completion of internship, the Dean/Principal shall issue a certificate following which the university shall award the degree of Bachelors of Physiotherapy(BPT).

9 EXAMINATION / ASSESSMENT AND GRADING

9.1 Components of Evaluation:

Each Subject will be evaluated out of 100 marks. The Subjects will normally have thefollowing components of evaluation:

Theory Subjects:

Internal Assessment (IA)	20 marks
End-Semester Examination (ESE)	80 marks

Practical Subjects including Seminar, Lab Posting, Project, etc.

Internal Assessment (IA)	20 marks
End-Semester Examination (ESE)	80 marks

9.2 Grading of Performance

In each Subject, based on the combined performance in all assessments in a particular semester as per the curriculum/syllabus, the student is awarded a letter grade. These letter grades not only indicate a qualitative assessment of the learner's performance but also carry a quantitative (numeric) equivalent called the Grade Point. The letter grades and their equivalent grade point applicable for undergraduate programs are given below:

Percentage of Marks Obtained	Letter Grade	Points	Performance
85.00 and above	O	10	Outstanding
80.00 – 84.99	A	9	Excellent
75.00 – 79.99	B	8	Very Good
65.00 – 74.99	C	7	Good
60.00 – 64.99	D	6	Fair
55.00 – 59.99	E	5	Average
50.00 – 54.99	P	4	Pass
Less than 50.00	F	0	Fail

COMPUTATION OF SEMESTER GRADE POINT AVERAGE (SGPA) ANDCUMULATIVE GRADEPOINT AVERAGE (CGPA)

SPGA is the weighted average of the grade points obtained in all courses by the student during the semester (All courses excluding English and electives)

Ex. SGPA Computation

Course Number	Credit/s	Letter grade	Grade point	Credit point (Credit ×grade)
1	3 (C1)	A	8 (G1)	3 × 8 = 24
2	4 (C2)	B+	7 (G2)	4 × 7= 28
3	3 (C3)	B	6 (G3)	3 × 6= 18

$$\text{SGPA} = \frac{C1G1 + C2G2 + C3G3}{C1 + C2 + C3}$$

$$= \frac{70}{10} = 7 \text{ (rounded off to two decimal points)}$$

Computation of CGPA

CGPA is calculated with SGPA of all semesters to two decimal points and is indicated in final grade in mark card/transcript showing grades of all 8 semesters and their courses/subjects.

CGPA reflects the failed status in case of fail till the course/s are passed.

Semester I	**Semester 2**	**Semester 3**	**Semester 4**
Credit – Cr: 20 SGPA: 6.5 Cr × SGPA = 20 ×6.5	Cr: 22 SGPA: 7.0	Cr: 25 SGPA: 5.5	Cr: 26 SGPA: 6.0

$$\text{CGPA} = \frac{20 \times 6.5 + 22 \times 7 + 25 \times 5.5 + 26 \times 6}{93}$$

$$= \frac{577.5}{93} = 6.2$$

9.3 Schedule of Examination:

On Completion of each semester a university examination will be conducted. Theory examinations will be of 3 hours as per the university schedule followed by practical examination.

9.4 Supplementary Examination: Supplementary Examination will be held along with forthcoming odd/even semester examination as applicable.

9.5 Internal Assessment:

It shall be based on evaluation of periodic tests assignments, clinical presentations, Viva, etc., regular periodic examinations should be conducted throughout the course. There will be a minimum of two (2) internal examinations.

The break-up of IA (20 Marks) shall be as follows:

Theory Subjects:

(i) Average of Two Internal Examination:	-	10 Marks
(ii) Teacher's Assessment		
(a) Tutorial /Assignment /Quizzes	-	05 Marks
(b) Attendance	-	05 Marks

Practical Subjects:

(i) One Midterm viva –voce /tests	-	10 Marks
(ii) Teacher Assessment		
i. Lab Record	-	05 Marks
ii. Attendance	-	05 Marks

9.5.1. Internal assessment of the subject shall be added to compute subject percentage.

9.5.2. The students may improve their internals assessment by appearing for "Improvement Sessional Examination."

10. Qualifying Standards:

10.1 Marks obtained in internal assessment of the Theory and Practical will be merged with the Theory & Practical marks of the University examination.

10.2 In an individual subject the minimum pass marks (including internal assessment) shall be 50% in theory and 50% in practical separately. The marks obtained in the University Examinationand in the internal assessment of the subject shall be added to compute subject percentage.

10.3 To clear Subsidiary subjects, a candidate shall secure 40% of the total marks prescribed for the subject. Marks of Subsidiary subject will not be included in the grand total.

11. Promotional Rules:

11.1 A student shall be declared pass in a semester when he/she is pass in all the theory and practical subjects.

11.2 A student failing to satisfy the passing standards of one or more subjects in the semester shall be permitted to pursue course of the next semester and clear the back paper in the subsequent odd/even semester examination.

11.3 Students shall be allowed to keep term for Semester III if she/he passes each of Semester I and Semester II or fails in not more than 50% subjects of Semester I and Semester II taken together.

11.4 Students shall be allowed to keep term for Semester IV irrespective of grades obtained in each course of Semester III.

11.5 Students shall be allowed to keep term for Semester V if she/he passes in all heads of Semester I, Semester II, Semester III and Semester IV.

11.6 A student shall be eligible to undertake internship only when he/ she has cleared all the subject of all the final and pre-final years.

12. Grace Mark: A student can be awarded 'Grace Marks' not exceeding a maximum of 5 marks either in theory or practical, in not more than two subjects. The grace marks shall not be added to the aggregate marks. No grace marks in subsidiary subjects.

13. Declaration of Result:

In an individual subject the minimum pass marks (including internal assessment) shall be 50% in theory and 50% in practical separately. The marks obtained in the University Examination and in the internal assessment of the subject shall be added to compute subject percentage.

14. Award of Division:

14.1 His/her division shall be awarded on the basis of all Semester result.

14.2 If a candidate passes all examinations in first attempt without grace and secures 75%or more marks, he/she shall be placed in 'First Division with Honors.'

14.3 If a candidate passes all examinations in first attempt and secures 60% or more marks, he/she shall be placed in First Division.

15. Award of Rank:

On the basis of Final year result, the top three candidates shall be awarded rank according to their merit provided they pass all examinations in first attempt.

16. Award of Degree:

The student shall be eligible for award of **BPT** degree on successful completion of prescribed course of study i.e. he/ she must have been declared pass in final result and completed Six Months Rotatory internship.

17. Scrutiny and Re-evaluation:

Scrutiny and Re-evaluation shall be as per university regulations.

18. Subsidiary Subjects:

18.1 To clear Subsidiary subjects, a candidate shall secure 40% of the total marks prescribed for the subject.

18.2 Marks of Subsidiary subjects are not included in the grand total.

18.3 Degree will be awarded only after clearing all subsidiary subjects and after satisfactory completion of internship.

18.4 No External Exam for Subsidiary Subject.

19. Unfair means: All cases regarding reported use of Unfair Means will be disposed as peruniversity regulations.

20. Cancellation of admission:

The admission of a student at any stage of study shall be cancelled if: a) He/she is not found qualified as per U.P. State Medical Faculty norms and guidelines or the eligibility criteria prescribed by the University.

ANNEXURE - 1

SYLLABUS

BPT FIRST SEMESTER

HUMAN ANATOMY-I (Including Applied Anatomy)

BPT-101

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-101	**HUMAN ANATOMY-I**	**144 (80T+ 64 P)**	**6**	**6**	**20 (T) +20(P)**	**80 (T) +80(P)**	**200**

COURSE DESCRIPTION- It is designed to provide students with the working knowledge of the structure of the human body which is an essential foundation for their clinical studies.

COURSE OBJECTIVE - The student will be able to demonstrate knowledge in human anatomy as needed for the study and practice of physiotherapy and occupational therapy.

COURSE OUTCOMES

CO1: To identify the microscopic structures of various tissues and organs in the human body and correlate the structure with the functions.

CO2: To understand the basic principles of embryology including genetic inheritance and stages involved in development of the organs and systems from the time of conceptions till birth.

CO3: To understand the bones, joints, muscles, vascular and nerve supply ofupper limb.

CO4: To know about basic anatomical knowledge of boundaries and contents ofthoracic cavity.

CO5: To understand the bones, joints, muscles, vascular and nerve supply ofhead and neck.

UNIT – I

1. General Anatomy

a. Introduction and subdivisions of Anatomy.
b. Anatomical nomenclature: Terms of Planes, Positions, Body parts and movements.
c. Basic tissues of the body: Definition, location and their function
d. Structure and appendages of skin
e. Superficial & deep fascia: Definition and functions, modifications of deepfascia

2. General Histology and Embryology

a. Epithelium, Connective Tissue
b. Muscle, bone and Cartilage

c. Nerve and Vessels

d. Development of skin fascia and blood vessels

e. Development of Endo, Exoskeleton, neural tube and spinal cord

UNIT- II

Regional Anatomy

Thorax:

a. Cardio–Vascular System Mediastinum: Divisions and contents Pericardium: Thoracic Wall: position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body region wise.
b. Respiratory system- Outline of respiratory passages: Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on bronchopulmonary segments.
c. Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.
d. Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.
e. Applied Anatomy: Diaphragmatic Hernia, Applied anatomy of respiratory system, Applied anatomy of circulatory system, Applied anatomy of tracheaand esophagus

UNIT – III

Abdomen:

a. Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum,functions of peritoneum.
b. Large blood vessels of the gut.
c. Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, gallbladder.
d. Pelvis: Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system.
e. Endocrine glands: Position, shape, size, function, blood supply and nerve supply of the following glands: Hypothalamus and pituitary gland, thyroid glands, parathyroid glands, Adrenal glands, pancreatic islets, ovaries and testes, pineal glands, thymus.
f. Applied Anatomy: Abdominal Hernia, Congenital anomalies, Clinical significance of 9 regions of abdomen, Surgical incisions, Applied anatomy of visceral organs

UNIT – IV

Musculoskeletal Anatomy- (All the topics to be taught in detail)

a. Connective tissue classification.
b. **Bones**- Composition & functions, classification and types according to Morphology and development.
c. **Joints**- definition, classification, structure of fibrous, cartilaginous joints, blood supply and nerve supply of joints.
d. **Muscles**– origin, insertion, nerve supply and actions.

UNIT – V

3. Upper Extremity

a. Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges.
b. Soft parts: Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of forearm, back of forearm, palm, dorsum of hand, muscles, nerves, blood vessels and lymphatic drainage of upper extremity.
c. Joints: Shoulder girdle, shoulder joint, elbow joints, radioulnar joint, wrist joint and joints of the hand.
d. Arches of hand, skin of the palm and dorsum of hand.
e. Applied Anatomy: Injuries related to dislocations/subluxation of joints of upper limb, Injuries related to fractures of bones of upper limb, entrapment neuropathies, Brachial plexus injury, Rotator cuff injuries, Injuries related to vascular supply of upper limb, Injuries related to nerve damage, Knowledge of ossification of bones of upper limb, Deformities, Anatomy related to surgical management of breast carcinoma. Knowledge of lymph nodes and lymph vessels and their pathology, Triangle of auscultation, soft tissue injuries of upper limb, Capsular injuries, Venipuncture in cubital fossa, Reflexes, Contractures and Syndromes of upper limb and thorax.

PRACTICAL- List of Practical/Demonstrations

1. Upper extremity including surface Anatomy.
2. Thorax including surface anatomy, abdominal muscles.
3. Embryology- models, charts & X-rays.

HUMAN PHYSIOLOGY-I (Including Applied Physiology)
BPT-102

CourseNo.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-102	**HUMAN PHYSIOLOGY-I**	**144 (80T+64 P**	**6**	**6**	**20(T) + 20 (P)**	**80 (T) + 80 (P)**	**200**

COURSE DESCRIPTION:

The course is designed to assist the students to acquire knowledge of the normal human Physiology of various body systems and understand the alternation in physiology in disease and practice of Physiotherapy as applicable for each systemic disorder.

COURSE OBJECTIVE:

The objective of this course is that after lectures, demonstrations, practical and clinics the student will be able to demonstrate an understanding of elementary human physiology.

COURSE OUTCOMES

CO1: Understand the cell physiology in detail including the transport mechanism of human body and blood and body fluid distribution and composition.

CO2: Understand interaction and integration of different organ systems in health and diseases special nerve-muscle physiology.

CO3: Understand the functional mechanisms of cardiovascular system, student should be able to tell about the conducting system of heart, cardiac muscle, cardiac output along with the calculation and handling of equipment e.g. measurement of blood pressure

CO4: Describe the physiology of respiratory system which include mechanics of breathing, spirometer, transport of gases and the common disorders of respiratory system.

CO5: Demonstrate a brief knowledge of pathway of vision, auditory, taste, smelland balance along with their disorders.

THEORY

1. **General Physiology**
   a. Cell: Morphology, Organelles: their structure and functions
   b. Transport Mechanisms across the cell membrane
   c. Body fluids: Distribution, composition.
2. **Blood**
   a. Introduction: Composition and functions of blood.
   b. Plasma: Composition, formation, functions, Plasma proteins.
   c. RBC: count and its variations.
   Erythropoiesis- stages, factors regulating.
   Reticulo- endothelial system (in brief)

Haemoglobin – structure, function and derivatives

Anemia (in detail), types of

Jaundice Blood indices, PCV, ESR

d. WBC: Classification, Morphology, functions, count, its variation of each Immunity
e. Platelets: Morphology, functions, count, its variations
f. Hemostatic mechanisms: Blood coagulation – factors, mechanisms, their disorders, Anticoagulants.
g. Blood Groups: Landsteiner's law, types, significance, determination, Erythroblastosis foetalis.
h. Blood Transfusion: Cross matching, Indications and complications.
i. Lymph: Composition, formation, circulation and functions.
j. Applied Physiology: Thalassemia Syndrome, Hemophilia, VWF, Anemia, Leukocytosis, Bone marrow transplant, Oxygen debt.

3. Nerve Muscle Physiology

a. Introduction: Resting membrane potential, Action potential – ionic basis and properties.
b. Nerve: Structure and functions of neurons, Classification, Properties and impulse transmission of nerve fibers. Nerve injury – degeneration and regeneration.
c. Neuroglia: Types and functions.
d. Physiology of the Brain: Areas & Connections
e. Sympathetic and Parasympathetic regulation, thermoregulation
f. Peripheral nervous system
g. Muscle: Classification, Skeletal muscle: Structure, Neuromuscular junction: Structure, Neuromuscular transmission,
h. Applied Physiology: Muscles and Nervous System Functions, Types of nerve fibers, Action potential, Strength-duration curve, ECG, EMG, VEP, NCV, Degeneration and regeneration of nerve, Reactions of denervation, Synaptic transmission, stretch reflex- Mechanism and factors affecting it, Posture, Balance and Equilibrium/Coordination of voluntary movement, Voluntary motor action, clonus, Rigidity, incoordination, Special senses- Vision, taste, hearing, vestibular, Olfaction, myasthenia gravis. Excitation-Contraction coupling, Rigor-mortis.

4. Cardiovascular System

a. Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organization of CVS, Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential, Properties.
b. Conducting system: Components, Impulse conduction Cardiac Cycle: Definition, Phases of cardiac cycle. Pressure and volume curves. Heart sounds –causes, character, ECG: Definition, Different types of leads, Waves and their causes, P-R interval, Heart block.

c. Cardiac Output: Definition, Normal value, Determinants, Stroke volume and its regulation, Heart rate and its regulation, their variations
d. Arterial Blood Pressure: Definition, Normal values and its variations, determinants, Peripheral resistance, Regulation of BP.
e. Arterial pulse.
f. Shock– Definition, Classification, causes and features
g. Regional Circulation: Coronary, Cerebral and Cutaneous circulation
h. Applied Physiology: Circulatory adjustment in exercise and in postural and gravitational changes, Pathophysiology of fainting and heart failure, Cardiovascular changes during exercise.

5. Respiratory System-

Introduction: Physiological anatomy– Pleura, tracheo-bronchial tree,
COURSE OUTCOMES

a. Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration, Chest expansion, Lung compliance: Normal value, pressure- volume curve, factors affecting compliance and its variations, Surfactant –
Composition, production, functions, RDS
b. Spirometry: Lung volumes and capacities, Timed vital capacity and its clinical significance, Maximum ventilation volume, Respiratory minute volume.
c. Dead Space: Types and their definition.
d. Pulmonary Circulation Ventilation- perfusion ratio and its importance.
e. Transport of respiratory gases: Diffusion across the respiratory membrane, Oxygen transport – Different forms, oxygen-haemoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr Effect, Carbon dioxide transport: Different forms, chloride shift.
f. Regulation of Respiration: Neural Regulation, Hering-breuer's reflex, Voluntary control, Chemical Regulation.
g. Applied Physiology: Hypoxia: Effects of hypoxia, Types of hypoxia, hyperbaric oxygen therapy, Acclimatization Hypercapnia, Asphyxia, Cyanosis– types and features, Dysbarism, Disorders of Respiration: Dyspnoea, Orthopnoea, Hyperpnoea, hyperventilation, apnoea, tachypnoea, periodic breathing- types Artificial respiration, Respiratory changes during exercise. Pulmonary Functions, Respiratory adjustments in exercises, Artificial respiration, Breath sounds.

PRACTICAL

More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of common clinical situations of interestin Physiotherapy.

1. Clinical Examination: Examination of Radial pulse, blood pressure, CVS, Respiratory system, Sensory system, Motor System, reflexes, cranial nerves.

2. Amphibian Experiments– Demonstration and Dry charts Explanation, Normal cardiogram of amphibian heart, Properties of Cardiac muscle, Effect of temperature on cardiogram, Simple muscle curve, Effect of increasing the strength of the stimuli
3. Effect of temperature on muscle contraction, Effect of two successive stimuli, Effect of Fatigue, Effect of load on muscle contraction, Genesis of tetanus and clonus, Velocity of impulse transmission.
4. Hematology: To be done by the students

   Study of Microscope and its uses, Determination of RBC count, WBC count, Differential leukocyte count, Estimation of hemoglobin, Calculation of blood indices, Determination of blood groups, Determination of bleeding time, Determination of clotting time, Demonstrations only: Determination of ESR, Determination of PCV.

BIOCHEMISTY

BPT-103

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-103	**BIOCHEMISTY**	**70(50T + 20 P)**	**3**	**3**	**20(T) +20 (P)**	**80(T) +80(P)**	**200**

COURSE DESRCIPTION- The course describes structures & functions of cell in brief; normal functions of different components of food, Enzymes, define Basal metabolic rate & factors affecting the same [in brief], withspecial reference to obesity; nutritional aspects of carbohydrates, lipids, proteins & vitamins &their metabolism with special reference to obesity; define enzymes, discuss in brief, factors affecting enzyme activity; describe indetails biochemical aspects of muscle contraction.

COURSE OBJECTIVE- The students will be able to understand the biochemical change of the various elements of the body at cellular level and extra cellular level.

COURSE OUTCOME-

CO1: The graduate should be able to understand the importance of nutrition.

CO2: The graduate should be able to identify the different types of biomolecules (carbohydrate,lipid and amino acid),to understand the chemistry of various types of biomolecules in maintaining the health.

CO3: The graduate should be able to understand the importance of Enzymes,nucleic acid and Digestion of biomolecules.

CO4: The graduate should be able to understand the importance of different pathways concerned with carbohydrate, lipid and protein metabolism along with their application in different physical and clinical conditions after the completion of the course.

CO5: To understand the importance of Vitamin, minerals, Cell biology, muscle contraction, Hormones, Clinical biochemistry and acid base balance.

1. Nutrition: RDA, BMR, SDA, caloric requirement and balanced diet.
2. Carbohydrates: Definition, classification and generalfunctions. CarbohydrateMetabolism - Glycolysis, T.C.A cycle.
3. Lipids: Definition, classifications and general functions. Essential fatty acids and their importance, Cholesterol, Lipoproteins. Metabolism-

   b−Oxidation **COURSE OUTCOMES**
4. Amino Acids: Definition, classification, essential and nonessential aminoacids.

   Proteins: Definition, classification, and Biomedical Importance.Metabolism:

5. Formation and fate of ammonia, Urea cycle and its significance.
6. Study of hemoglobin and myoglobin with their functions.
7. Enzymes: Definition, classification with examples, Factors affecting enzyme action, isoenzyme and coenzyme, Clinical importance of enzymes.
8. Biochemistry of connective tissue - Introduction, various connective tissueproteins collagen, elastin- structure and associated disorders.
9. Vitamins: Definition, classification and functions, dietary source, daily requirement and deficiency disorders.
10. Cell Biology: Introduction, Cell structure, Cell membrane structure and function, various types of absorption, Intracellular organelles and their functions, briefly on cytoskeleton.
11. Muscle Contraction: Contractile elements in muscle, briefly on the process of muscle contraction, Energy for muscle contraction.
12. Clinical Biochemistry: Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate, Liver function tests, Renal function tests.

PRACTICAL

Qualitative and Quantitative estimation: Routine blood investigations normal values LFT, KFT, TFT, Lipid Profile, Thyroid Profile, Plasma glucose GTT, G.t curve Plasma protein, Plasma creatinine Demo experiments enzymes assays, Na, K, Ca.

BIOPHYSICS
BPT-104

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-104	**BIOPHYSICS**	**50(30T+ 20 P)**	**3**	**3**	**20 (T)**	**80 (T)**	**100**

COURSE OBJECTIVE- Describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers etc. and the simple instruments used to test /calibrate these components [such as potentiometer, oscilloscope etc.] of the circuitry, and will be able to identify such components

COURSE OUTCOME-

CO1: Explain various terms used in relation to biophysics, thermodynamics.
CO2: Explain the physics principles & Laws of Electricity, & Electromagneticspectrum
CO3: Discuss effects of environmental &man-made electromagnetic field at the cellular level & outline risk factors on prolonged exposure.
CO4: Describe the Main electrical supply, Electric shock, examine precautions to be taken for prevention of electric shock
CO5: Identify and describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers etc. & the simple instruments used to test /calibrate these components (such as potentiometer, oscilloscope, mustimeter) of the circuit; & identify such components.

1. Overview of Electrophysiology different electrical signals in human body. Potential of nerve – resting membrane potential–ionic basis. Nernst equation. Hodgkin-Huxley model. Goldman equation.
2. Action potential- ionic basis, gating kinetics and physio-pharmacology of different ion channels. Voltage clamp studies, biphasic and compound action potential. Receptor potential- general transduction mechanism, stimulus– receptor relationship, adaptation of receptors.
3. Non-Ionizing Radiation physics: Electricity and Magnetism at the Cellular level, Different sources of non-Ionizing radiation-their physical properties, various types of optical radiations-UV, visible & IR sources, Lasers-Theory and mechanism.
4. Measurement of fluence from optical sources, Optical properties of tissues, theory and experimental techniques, interaction of laser radiation with tissues, photo thermal, photochemical, photo ablation electromechanical effect.
5. Radiofrequency & Microwave radiation, Production and properties, interaction mechanism of RF and microwaves with biological systems,

Thermaland non-thermal effects on whole body, lens and cardiovascular systems, tissue characterization.

6. Hyperthermia and other applications. Biomagnetism, Effects,applications. Electrical Impedance and Biological Impedance, Principle and theory of thermography, applications in biology & medicine. The use of electromagnetic, acoustic and mechanical energies to produce biophysical effects at the cellular, tissue, organic level.
7. Photobiological phenomenon: Photoactivation of biological systems, Photodynamic therapy and mechanism of photodynamic action on cells. Photo bio-stimulation through Lasers. Photo-medicine. Optical properties of skin, Acute and chronic effect of sunlight on skin, Photosensitivity, Phototoxicity, photo allergy and clinical implication, Beneficial effects of sun and artificial light energy, Photoprotection, Photo immunology. Medi photonics: Lasers in dermatology, oncology and cell biology.

PRACTICAL

Measurement of Pressure, Movement, Force, Frequency & Time using different instruments.

Demonstration of different therapeutic currents oscilloscope.

HEALTH PSYCHOLOGY
BPT-105

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-105	**HEALTH PSYCHOLOGY**	**50 T**	**3**	**3**	**20 (T)**	**80 (T)**	**100**

COURSE DESCRIPTION – This course will develop the basic knowledge of Psychology with respect to the normal development of a child and the psychological condition of patient in terms of Health-related psychological introspection. This develops the utilization and importance of Psychology with respect to Physiotherapy treatment.

COURSE OBJECTIVE – The student will be able to recognize and help with the psychological factors involved in disability, pain, disfigurement, unconscious patients, chronic illness, death, bereavement and medical surgical patients/conditions. They should also understand the elementary principles of behavior for applying in the therapeutic environment. In addition, the students will be able to show their proficiency based on written and internal evaluation.

COURSE OUTCOMES –

CO1: Recognize and help with the psychological factors involved in disability, pain, disfigurement, unconscious patients, chronic illness, death, bereavement and medical- surgical patients/conditions.
CO2: Understand the elementary principles of behavior for applying in the therapeutic environment.
CO3: Perform psychosocial assessment of patients in various developmental stages
CO4: Understand Ego defense mechanisms and learn counseling techniques to help those in need.
CO5: Know about importance of psychology in health delivery system.

THEORY

1. Introduction to Psychology

a. Schools: Structuralism, functionalism, behaviorism, Psychoanalysis.
b. Methods: Introspection, observation, inventory and experimental method.
c. Branches: pure psychology and applied psychology
d. Psychology and physiotherapy

2. **Growth and Development**
   a. Lifespan: Different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age).
   b. Heredity and environment: role of heredity and environment in physical and psychological development, "Nature v/s Nurture controversy".
3. **Sensation, attention and perception**
   a. Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense.
   b. Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants).
   c. Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context).
   d. Illusion and hallucination: different types.
4. **Motivation**
   a. Motivation cycle (need, drive, incentive, reward).
   b. Classification of motives.
   c. Abraham Maslow's theory of need hierarchy
5. **Frustration and conflict**
   a. Frustration: sources of frustration.
   b. Conflict: types of conflict.
   c. Management of frustration and conflict
6. **Emotions**
   a. Three levels of analysis of emotion (physiological level, subjective state, and overt behavior).
   b. Theories of emotion
   c. Stress and management of stress.
7. **Intelligence**
   a. Theories of intelligence.
   b. Distribution of intelligence.
   c. Assessment of intelligence
8. **Thinking**
   a. Reasoning: deductive and inductive reasoning
   b. Problem solving: rules in problem solving (algorithm and heuristic)
   c. Creative thinking: steps in creative thinking, traits of creative people
9. **Learning**
   a. Factors affecting learning. Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.
   b. The effective ways to learn: Massed/Spaced, Whole/Part,

Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.

10. Personality

a. Approaches to personality: type & trait, behavioristic, psycho analytic and humanistic approach.

b. Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.

c. Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.

11. Social psychology

a. Leadership: Different types of leaders, Different theoretical approaches to leadership.

b. Attitude: development of attitude, Change of attitude.

12. Clinical psychology – Models of training, abnormal behavior assessment, clinical judgement, psychotherapy, self-management methods, physiotherapist patient interaction, aggression, self-imaging, stress management, assertive training, Group therapy, Body awareness, Pediatric, child and geriatric clinical psychology.

13. Counselling: Principles and Types of counselling, PLISSIT model, Principles and techniques of counselling special children and their family members.

14. Yogic Psychology: Mann, Buddhi, Chit, Ahankar,Vrittis, True knowledge and Inaccurate knowledge, Imagination, Sleep, Memory, Kleshas, Lack of awareness, Vikshepas, disease, apathy and mental dullness, dilemma and indecision, carelessness, haste, indifference, laziness, absence of non-attachment, false perception, Failure to attain, Fear of missing out (FOMO), Digital distraction, guilt and shame. vighnas, solutions.

REMEDIAL ENGLISH
BPT-106

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-106	**REMEDIAL ENGLISH**	**30 T**	**2**	**2**	**20 (T)**	**80 (T)**	**100**

COURSE DESCRIPTION- The course is designed to enable students toenhance ability to comprehend spoken and written English, required for effective communication in their professional work.

COURSE OBJECTIVE - The objectives of this course are to write grammatically correct English, to develop writing skills, to understand and express meaningfully the prescribed tent. To comprehend and communicate in simple English; grooming the personality of the students.

COURSE OUTCOMES –

CO1: Understand about the grammatical and idiomatic usages

CO2: To gain knowledge about various methods of patient education, barriers of communication and how to overcome them.

CO3: Become fluent in speaking and enhance the ability to communicate effectively with colleagues, doctors, patients etc. and writing various official letters, writing patients reports and summarize scientific sessions.

CO4: Handling difficulty situations with grace style and professionalism.

CO5: To enable students to enhance ability to comprehend spoken and written English, required for effective communication in their professional work.

This course introduces the elements of English as used in medical terminology. Emphasis is placed on building familiarity with medical words through knowledge of roots, prefixes, and suffixes. Topics include: origin, word building, abbreviations and symbols, terminology related to the human anatomy, reading medical orders and reports, and terminology specific to the student's field of study. Spelling is critical and will becounted when grading tests. Derivation of medical terms. Define word roots, prefixes, and suffixes. Conventions for combined morphemes and the formation of plurals. Basic medical terms in health care andphysiotherapy. Form medical terms utilizing roots, suffixes, prefixes, and combining roots. Interpret basic medical abbreviations/symbols.

Communicative English

Time words and
Tenses Active and
Passive VoiceDirect-
Indirect Speeches

Prepositions and Conditionals
Practice of daily use words, numerals and tongue twisters
Vocabulary building, Construction of simple sentences
Basic sentence pattern, subject and predicate

Functional English

Introduction to Functional English
Describing Actions and Processes, Offering, Requests, Routines/Timetable, Making Comparisons, Sharing Interests and Experience

Conversational Skills

An Introduction to Conversations for various purposes importance of acquiring Conversational Skills
Models, Techniques and Types of Conversations

Introduction to Communication and Key Concepts in Communication

An Introduction to Communication
Basic Terms, Concepts, and Contexts of Communication
Factors influencing message encoding, the nature of message, and messageuses and effects
Importance, Types and Principles of Communication

Effective Listening and Reading Skills

An Introduction to Listening and Reading
Purposes, Types and Techniques of Listening and Reading
Barriers to effective Listening & Reading and overcoming the BarriersNote-taking and Note-making

Writing Skills: An Introduction to Writing

Importance of Effective Writing Paragraph Development: Coherence –Topic Sentence, Supporting Sentence & Data etc.
Business Letter Writing

BPT SECOND SEMESTER

HUMAN ANATOMY-II (Including Applied Anatomy)

BPT-106

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-106	HUMAN ANATOMY--II	144 (80T+ 64P)	6	6	20(T) + 20 (P)	80(T) + 80 (P)	200

COURSE DESCRIPTION- The study of anatomy will include identificationof all gross anatomical structures. Particularly emphasis will be placed on description of bones, joints, muscles, the brain, cardio pulmonary and nervous system, as these are related to the application of physiotherapy and occupationaltherapy in patients.

COURSE OBJECTIVE – It is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies. Studies are concerned with the topographical and functional anatomy of the limbs and thorax. Particular attention is paid to the muscles, bones and joints of the regions. The abdomen, pelvis, perineum, head and neck and central nervous system (CNS) are studied with particular reference to topics of importance to physiotherapists. The study of the CNS includes detailed consideration of the control of motor function.

COURSE OUTCOMES –

CO1: Identify the axis and planes of different movements in human body and should be able to tell common anatomical terminology.

CO2: Identify the structures and classification of various connective tissues, bones, joints and muscles in the human body and correlate the structure with thefunctions.

CO3: Discuss about the structural and functional importance of muscles, joints, long and short nerves and different spaces in upper limb and lower limb, trunk and pelvis including applied aspect.

CO4: Gain knowledge of greater vessels, muscles and structural and functional importance of different viscera

CO5: Identify and describe various parts of nervous system

1. Lower extremity

a. Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.

b. Soft parts: Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior

compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot, skin of foot.

c. Joints: Hip Joint, Knee joint, Ankle joint, joints of the foot.

d. Applied Anatomy: Injuries related to dislocations/subluxation of joints of lower limb, Injuries related to fractures of bones of lower limb, anatomy of entrapment neuropathies, Injuries related to vascular supply of lower limb, Injuries related to nerve damage, Knowledge of ossification of bones of lower limb, Deformities, Soft tissue injuries of upper limb, Capsular injuries, Reflexes, Contractures and Syndromes of lower limb, Intramuscular injection.

2. Trunk & Pelvis

i. Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs.

ii. Soft tissue: Pre and Para vertebral muscles, intercostals muscles, anterior abdominal wall muscles, Intervertebral disc.

iii. Pelvic girdle and muscles of the pelvic floor.

iv. Applied Anatomy: Injuries related to fractures, bony deformities, Spondylolisthesis, Spondylolysis, Spondylitis, Nerve entrapments, Spinal cord injuries: hemiplegia and paraplegia

3. Head and Neck

i. Osteology: Mandible and bones of the skull.

ii. Soft parts: Muscles of the face and neck and their nerve and blood supply- extraocular muscles, triangles of the neck.

iii. Gross anatomy of eyeball, nose, ears and tongue.

iv. Temporomandibular joints

4. Neuro-Anatomy - Organization of Central Nervous system- Spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system

i. Cranial nerves

ii. Peripheral nervous system

iii. Neurons, classification with examples.

iv. Simple reflex arc.

v. Parts of a typical spinal nerve/Dermatome/Myotome/Sclerotome

vi. Peripheral nerve

vii. Neuromuscular junction

viii. Sensory end organs

ix. Central Nervous System

x. Spinal cord segments in relation to vertebral column

xi. Brain Stem

xii. Cerebellum
xiii. Structure and features of meninges
xiv. Inferior colliculi
xv. Superior Colliculi
xvi. Thalamus
xvii. Hypothalamus
xviii. Corpus striatum
xix. Cerebral hemisphere
xx. Lateral ventricles
xxi. CSF circulation
xxii. Blood supply to brain
xxiii. Basal ganglia
xxiv. The pyramidal system
xxv. Pons, medulla, extra pyramidal systems
xxvi. Anatomical integration

5. **Surface Anatomy:** surface anatomy of the musculoskeletal system, group work in surface anatomy of the thorax, abdomen, neck, limbs, thorax and abdomen, the pelvic region.

6. **Radiological Anatomy**

Radiological features of various soft tissues and bones are relevant to Head,Neck, Thorax, Abdomen, limbs and Pelvis.

PRACTICAL- List of Practical/Demonstrations

1. Lower extremity including surface Anatomy.
2. Head & Spinal cord and Neck and Brain including surface Anatomy.
3. Histology- Elementary tissue including surface Anatomy.
4. Embryology- models, charts & X-rays.

HUMAN PHYSIOLOGY-II (Including Applied Physiology)
BPT-107

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-107	**HUMAN PHYSIOLOGY-II**	**144(80 T+ 64P)**	**6**	**6**	**20 T) + 20 (P)**	**80(T) + 80 (P)**	**200**

COURSE DESCRIPTION- The course is designed to assist the students to acquire knowledge of the normal human Physiology of various body systems and understand the alternation in physiology in disease and practice of Physiotherapy as applicable for each systemic disorder.

COURSE OBJECTIVE- The objective of this course is that after lectures, demonstrations, practical and clinics the student will be able to demonstrate an understanding of elementary human physiology

COURSE OUTCOME –

CO1: Demonstrate in depth the knowledge of GIT, Its structure, functions, composition & functions of different juices, movements, digestion & absorption and related applied.

CO2: Understand the function of Peripheral and central nervous system and their function. They should be able to tell different pathways present in central nervous system with their location function and lesion including Upper and Lower motor neuron lesion.

CO3: understand the physiology of excretory system and its related applied. CO4: To understand the influence of various environmental factors including personal stressors like exercise on various organ systems.

CO5: understand the endocrines, male and female reproductive system with reference to hormones, puberty, contraception, pregnancy & lactation.

1. Digestive System

a. Introduction: Physiological anatomy and nerve supply of alimentary canal, enteric nervous system.

b. Salivary Secretion: Saliva: Composition, Functions, Regulation, Mastication(in brief)

c. Swallowing: Definition, Different stages, Function.

d. Stomach: Functions, Gastric juice: Gland, composition, function, regulation, Gastrin: Production, function and regulation, Peptic ulcer, Gastric motility,Gastric emptying, vomiting.

e. Pancreatic Secretion: Composition, production, function, Regulation.

f. Liver: Functions of liver, Bile secretion: Composition, functions and regulation, Gallbladder: Functions.

g. Intestine: Succus entericus: Composition, function and regulation of secretion, Intestinal motility and its function and regulation.
h. Mechanism of Defecation.

2. Renal System

a. Physiology of kidney and urine formation.
b. Glomerular filtration rate, clearance, Tubular function.
c. Water excretion, concentration of urine regulation of Na+, Cl-, K+ excretion
d. Physiology of urinary bladder
e. Neural control of Micturition
f. Applied physiology: Types of bladders

3. Male & Female Reproductive System Male

a. Physiology of ovary and testis
b. Physiology of menstrual cycle and spermatogenesis
c. Functions of progesterone, estrogen and testosterone
d. Puberty & menopause
e. Physiological changes during pregnancy

4. Endocrine System-

a) Introduction: Major endocrine glands, Hormone: classification, mechanism of action, Functions of hormones.
b) Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone. Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus. Physiology of growth and development: hormonal and other influences.
c) Pituitary- Hypothalamic Relationship.
d) Thyroid Gland: Thyroid hormone and calcitonin: secretory cells,synthesis, storage, action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave's Disease.
e) Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism, Hyperthyroidism, Calcium metabolism and its regulation.
f) Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol, and Androgens. Disorders: Addison’s disease, Cushing’s syndrome, Conn’s syndrome, Adreno genital syndrome.
g) Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline, Disorders: Pheochromocytoma.
h) Endocrine Pancreas: Secretory cells, action, regulation of secretion of insulin and glucagon, Glucose metabolism and its regulation, Disorder: Diabetes mellitus. Diabetes Mellitus, Physiological basis of Peptic Ulcer, Jaundice, GIT disorders and Dietary fiber, Thyroid functions, Vitamins deficiency.

i) Calcitriol, Thymus and Pineal gland (very brief).
j) Local Hormones (Briefly).

PRACTICAL

More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of common clinical situations of interest in Physiotherapy.

Recommended Demonstrations

- Spirometry
- Artificial Respiration
- ECG
- Perimetry
- Ergometry

BIOMECHANICS AND KINESIOLOGY I

BPT-108

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-108	**BIOMECHANICS AND KINESIOLOGY I**	**144(80T + 64 P)**	**6**	**6**	**20(T) +20 (P)**	**80(T) + 80 (P)**	**200**

COURSE DESCRIPTION- This Course Supplements the Knowledge of anatomy and enables the student to have a better understanding of the principles of biomechanics and their application in musculoskeletal and various other dysfunctions.

COURSE OBJECTIVE- On completion of this subject, the students will be able to analyze normal human movement from a global perspective, integrating biomechanics, muscle mechanics and motor control theory. Experience quantitative methods of movement analysis using various methods. Apply the analytic methods to specific example of normal human motor performance. Use these methods for evaluation and treatment of disorders of the musculoskeletal system.

COURSE OUTCOME-

CO1: The basics of mechanics of force system, equilibrium, lever and pulley.

CO2: Describe the joint structure, classification and function of joints and biomechanics of Connective tissue

CO3: Describe the muscle structure and function of muscles, types of muscles, contractions and factors effecting muscle recruitment and functions

CO4: Develop ability to analyze the kinetics and kinematic motions of all the joints

CO5: Discuss the normal cytoskeleton structure and components of joints and muscles

Biomechanics and Kinesiology I

a. Introduction to Biomechanics and kinesiology and related terminology
b. Motion: definition, types of motion, plane and axis of motion, factor determining the kind and modification of motion
c. Force - Definition, diagrammatic representation of force, point of application, classification of forces, concurrent, coplanar and collinear forces, composition and resolution of forces, angle of pulls of muscle
d. Friction

e. Gravity - Definition, line of gravity, Centre of gravity
f. Equilibrium - Supporting base, types, and equilibrium in static and dynamic state
g. Levers - Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body
h. Pulleys - system of pulleys, types and application
i. Elasticity - Definition, stress, strain, HOOKE'S Law
j. Springs - properties of springs, springs in series and parallel, elasticmaterials in use

1. Muscle biomechanics

Definition, properties of muscle, muscular contraction, structural classification, action of muscle in moving bone, direction of pull, angle of pull, functional classification, coordination of muscular system.

2. Joint structure and Function

a. Introduction: Basic Principle of Human Joint design & Joint Function.
b. Materials Found in Human Joints: Structure of Connective Tissue.
c. Brief about Specific Connective Tissue Structures.
d. General Properties of Connective Tissue: Mechanical Behavior, Viscoelasticity
e. Time and Rate-Dependent Properties, Properties of Specific Tissues
f. General Changes with Disease, Injury, Immobilization, Exercise, and Overuse

Practical:

The course involves a description of principles of biomechanics and their application in musculoskeletal function and dysfunction. At the end of thecourse, the candidate will be able to–

1. Understand the principles of Biomechanics.
2. Describe the properties of connective tissue, & effect ofmechanical loading, & factors which influence the muscle strength, & mobility of articular & periarticular soft tissues.
3. Practical Aspects of muscle, joint ligaments, Tendon, disc, Bursa etc. 4. Practical analysis of Posture & Gait analysis.
5. Practical aspect to demonstrate different types of joints.

INTRODUCTION TO YOGA – BASIC THEORY, SCIENCE AND TECHNIQUES

BPT-109

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-109	INTRODUCTION TO YOGA	50(30 T+20 P)	3	3	20 (T) + 20 (P)	80(T) + 80 (P)	200

COURSE DESRCIPTION- The course gives idea about the basic principles of yoga and its implication with other adjunct therapies in different conditions.

COURSE OBJECTIVE- The course will provide deeper insight into the curriculum of Yogic Sciences along with the practical applications of Yoga and physiotherapy techniques.

COURSE OUTCOME-

CO1: To know about the basic principles of biophysics relative to mechanics ofmovement/ motion and understand the efficacy of various position used in therapeutic

CO2: Understand the definition, principal of yoga and their benefits and cautions for each Asanas.

CO3: Describe Asanas in various positions in their physiological changes occur in body.

CO4: Acquire skills of performing Pranayama,Yogasanas and meditation.

CO5: Enable and impart skill in them to practice and apply Yogic practices for Health to general public and teach Yoga for Total personality development and spiritual evolution

THEORY

1. **Foundations of Yoga**
    a. Introduction to Yoga and its philosophy
    b. Brief history, development of Yoga
    c. Philosophical foundations of Yoga
    d. Streams & types of Yoga
    e. Meditation-brief introduction about types.
2. **Yoga and Health**
    a. Concept of body in yoga – Pancha kosha theory
    b. Concept of Health and Disease in yoga
    c. Stress management through yoga
    d. Disease prevention and promotion of positive health through yoga
    e. Physiological effects of Yoga practices Physiological effects of

Shatkriyas

f. Physiological effects of Asanas
g. Physiological effects of Pranayamas
h. Physiological effects of Relaxation techniques
i. Physiological effects of Meditation

PRACTICAL - List of Practical/Demonstrations (30hours)

3. **Sukshma Vyayama / Sithilikarna Vyayama and Surya Namaskar**: (3 hours)
   a. Loosening exercises of each part of the body particularly of the joints
   b. 12 step Surya namaskar with prayer and specific mantras
4. **Yogic kriyas** [Observation/demonstration only] (3hours)
   a. Neti (Jala Neti, Sutra Neti)
   b. Dhauti (Vamana Dhauti, Vastra Dhauti)
   c. Trataka
   d. Shankaprakshalana (Laghu & Deergha)
5. **Yog asanas**

a. Standing postures (4hours)
   i. Tadasana (Upward stretch posture)
   ii. Ardha Chakrasana (Half wheel posture)
   iii. Ardha Kati chakrasana (Half lumber wheel posture)
   iv. Utkatasana (Chair posture)
   v. PadaHastasana (Hand to toes posture)
   vi. Trikonasana (Triangle posture)
   vii. ParshvaKonasana (Side angle posture)
   viii. Garudasana (Eagle posture)
   ix. Vrikshasana (Tree posture)

b. Prone positions
   i. Makarasana (Crocodile posture)
   ii. Bhujangasana (Cobra posture)
   iii. Salabhasana (Locust posture)
   iv. Dhanurasana (Bow posture)
   v. Naukasana (Boat posture)
   vi. Marjalasana (Cat posture)

c. Supine postures
   i. Ardhahalasana/Uttana Padasana
   ii. Sarvangasana (All limb posture)
   iii. Pawanamuktasana (Wind releasing posture)
   iv. Matsyasana (Fish posture)

v. Halasana (Plough posture)
vi. Chakrasana (Wheel posture)
vii. Setu Bandhasana (Bridge posture)
viii. Shavasana (Corpse posture)

d. Sitting postures

i. Parvatasana (Mountain posture)
ii. Bhadrasana (Gracious posture)
iii. Vajrasana (Adamantine posture)
iv. Paschimottanasana (Back stretching posture)
v. Janushirasana (Head to knee posture)
vi. Simhasana (Lion posture)
vii. Gomukhasana (Cow head posture)
viii. Ushtrasana (Camel posture)
ix. Ardha Matsyendrasana (Half matsyendra spine twist posture)
x. Vakrasana (Spinal twist posture)
xi. Kurmasana (Turtle posture)
xii. Shashankasana (Rabbit posture)
xiii. Mandukasana (Frog Posture)

e. Meditative postures

i. Siddhasana (Accomplished pose)
ii. Padmasana (Lotus posture)
iii. Samasana
iv. Swastikasana (Auspicious posture)

6. Pranayamas

a. The practice of correct breathing and Yogic deep breathing
b. Kapalabhati
c. Bhastrika
d. Sitali
e. Sitkari
f. Sadanta
g. Ujjayi
h. Surya Bhedana
i. Chandra Bhedana
j. Anuloma-Viloma/Nadishodana
k. Bhramari

7. Relaxation Techniques

a. Shavasana
b. Yoga Nidra

8. Meditation techniques- effect of meditation on chakras, method of meditation techniques.

COMPUTERS & INFORMATICS
BPT-110

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-110	**COMPUTERS & INFORMATICS**	**30**	**2**	**2**	**-**	**-**	**-**

COURSE DESCRIPTION- The students will be able to appreciate the role of computer technology. The course has focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data worksheet and PowerPoint presentation.

COURSE OBJECTIVE- The course is designed to create awareness among the students about basic operation of Computer.

COURSE OUTCOME-

CO1: Tell about the fundamentals of computer like generations, languages,input output devices, storage and memory and processes.

CO2: Describe the basic use of Windows, computer applications like MS word, Excel and power points.

CO3: describe different operating system, types and components of computer networks

CO4: Use the internet and application of computer in clinical settings.

CO5: To learn the use of Internet services for Research and DocumentationTopics to be covered under the subject are as follow:

1. Introduction to computer: I/O Devices, Operating Systems, Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.
2. Introduction to Excel: introduction, about worksheet, entering information, saving work books and formatting, printing the worksheet, creating graphs.
3. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.
4. Medical Record Keeping and Health Informatics
5. Application of Computers in clinical settings, Digital Equipment's, Medical Electronics
6. Robotics in Physiotherapy.Artificial Intelligence in Physical Therapy: What is Artificial Intelligence? AI-enabled devices, SWORD, Motion Coach, Physitrack, AI-enabled robotics, Deep learning frameworks.

PRACTICAL: Practical on fundamentals of Computers-Learning to use MS office: MS word, MS Power Point, MS Excel. Demonstration of Medical Electronic components. Demonstration of Robotics in Physiotherapy. Demonstration of AI based applications.

BPT THIRD SEMESTER

EXERCISE THERAPY-I

BPT-201

Course No.	Title	Total Hour	Hours / week	Credit	IA Mark	SE Mark	Total Mark
BPT-201	**EXERCISE THERAPY-I**	**144(80 T + 64 P)**	**6**	**6**	**20 (T) +20 (P)**	**80 (T) + 80 (P)**	**200**

COURSE DESRCIPTION- At this course, the students will have a better understanding of the principles of exercise therapy both basic and advanced as well as assessment techniques. The student's skill will be enhanced through hands on training provided during the practical hours.

COURSE OBJECTIVE- Describe basic concepts of exercise therapy- positions, types of movements, classification

COURSE OUTCOMES-

CO1: At the completion of course, the student shall be able to describe thebasics of mechanics involved in exercise therapy.

CO2: Describe and demonstrate fundamental and derived positions

CO3: Describe and demonstrate active, passive, resisted movements and softtissue manipulation

CO4: Demonstrate principles, application of techniques like goniometry, MMT

CO5: Describe the various assessment techniques needed

THEORY

1. Introduction to exercise therapy
2. Mechanical principle applied in human body – gravity, centre of gravity,
3. line of gravity, base of support, equilibrium, axis and planes
4. Lever and pulley
5. Disability models – ICIDH model of disability, Nagi model of disability, ICF model
6. Exercise physiology – effect of exercise in various systems – musculoskeletal, neuromuscular, cardiovascular, respiratory system
7. Assessment of patient's condition – Measurements of Vital parameters, Starting Positions – Fundamental positions & derived Positions, Planning of Treatment
8. Movements
   a. Passive Movements: Causes of immobility, Classification of Passive movements, Specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses, Techniques of giving passive movements.
   b. Active Movements

c. Definition of strength, power & work, endurance, muscle actions.
d. Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical events during contraction & relaxation, muscle fiber type, motor unit, force gradation.
e. Causes of decreased muscle performance
f. Physiologic adaptation to training: Strength & Power, Endurance.
g. Types of active movements

9. Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses.
10. **Active Assisted Exercise**: principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses Resisted Exercise: Definition, principles, indications, contraindications, precautions & techniques, effects and uses.
11. **Types of resisted exercises**: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise.
12. Stretching: Definition, properties of soft tissue, mechanical and neurophysiological properties of connective tissue, mechanical properties of non contractile tissue. Determinants, type and effect of stretching, precautions, general applications of stretching technique.
13. **Methods of Testing**
    a. Functional tests
    b. Measurement of Joint range: ROM- Definition, Normal ROM for all peripheral joints & spine, Goniometer- parts, types, principles, uses, Limitationsof goniometry, Techniques for measurement of ROM for all peripheral joints
    c. **Tests for neuromuscular efficiency**
        i. Electrical tests
        ii. Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations, Techniques of MMT for group & individual: Techniques of MMT for upper limb/Techniques of MMT for lower limb/Techniques of MMT for spine.
        iii. Anthropometric Measurements: Muscle girth– biceps, triceps, forearm, quadriceps, calf
        iv. Static power Test
        v. Dynamic power Test
        vi. Endurance test
        vii. Speed test
    d. Tests for Co-ordination
    e. Tests for sensation
    f. Pulmonary Function tests
    g. Measurement of Limb Length: true limb length, apparent limb length, segmental limb length
    h. Measurement of the angle of Pelvic Inclination

14. Relaxation a. Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indications of relaxation, Methods & techniques of relaxation- Principles & uses, Types: General, Local, Jacobson's, Mitchel's, Heartfulness Relaxation.
15. Therapeutic Massage :History and Classification of Massage Technique, Principles, Indications and Contraindications, Technique of Massage Manipulations, Physiological and Therapeutic Uses of Specific Manipulations
16. Suspension – definition, types, uses and therapeutic application
17. Therapeutic Gymnasium- Set-up of gymnasium & its importance, Various equipment in the gymnasium, Operational skills & uses of the equipment.

PRACTICAL

1. Different test methods
2. Demonstrate relaxation techniques.
3. Demonstrate Starting positions and derived positions
4. Demonstrate to apply the technique of passive movements
5. Demonstrate various techniques of Active movements
6. Demonstrate various relaxation techniques
7. Demonstrate massage technique application according to body parts.
8. Mechanical Principles applied in Physiotherapy like force, Torque, Centre ofGravity, etc.
9. Demonstration of different types of levers in the human body.
10. Demonstration of different types of pulleys and strings used inPhysiotherapy.

ELECTROTHERAPY-I
BPT-202

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-202	ELECTROTHERAPY-I	144(80 T + 64P)	6	6	20 (T) + 20 (P)	80 (T) + 80 (P)	200

COURSE DESCRIPTION- In this course the student will learn the Principles, Techniques, and Effects, Indication, Contra-Indication and the dosage parameter for various indications of electrotherapeutic modalities in the restoration of physical function.

COURSE OBJECTIVE- The objective of this course is that the student willbe able to list the indications, contraindications, dosages of electrotherapy modalities, demonstrates the different techniques, and describe their effects on various conditions.

COURSE OUTCOMES-

CO1: Acquire knowledge of various superficial thermal agents such as Paraffin wax bath, Cryotherapy, homemade remedies, etc.; their physiological and therapeutic effects, Merits/ demerits; and also acquire the skill of application.

CO2: Acquire knowledge of high frequency modalities, their basic physics, working, physiological and therapeutic effects.

CO3: Recall physics principles and Laws of Electricity, Electro-magnetic spectrum, and ultra -sound.

CO4: Describe effects of environmental & man-made electro- magnetic field at the cellular level & risk factors on prolonged exposure.

CO5: Describe the main electrical supply, Electric shock & precautions-

THEORY

Section I

Basic Electronics: P-N Junction, Transistor characteristics, Transistor as Amplifier, Cascade Amplifiers, DC coupling, Field effect Transistors, Light sensitive semiconductor devices, Oscillators -Phase shift, Wein Bridge, Relaxation Oscillators, Operational Amplifiers, Circuits and characteristics of OP-Amplifiers in different configuration, Concept of Digital Electronics, Binary number system, Binary Arithmetic, Analog to Digital conversion, Digital to Analog conversion, Counters, Shift Resistors, Memory, Introduction to Microprocessor, CRO- Design Working and Applications. Bioelectric Signal Monitoring and Recording. Origin and Characteristics of Bioelectric signals & recording, Electrodes-types Design and properties and Utility, Skin contact impedance of Electrodes, noise suppression techniques, recording system, Medical Display systems, Patient Monitoring systems, Biomedical Telemetry. Transducers and Measurement of Physiological event, Transducers-

properties and the principle of Transducers.

a. Current Electricity: Units of Electricity: farad, Volt, Ampere, Coulomb, Watt
b. Condensers: Definition, principle, Types, construction and working, capacity & uses.
c. Magnetism: Definition, Properties of magnets, Electromagnetic induction, Transmission by contact, Magnetic field and magnetic forces, Magnetic effects of an electric field.
d. Conductors, Insulators, Potential difference, Resistance and intensity
e. Ohm's law and its application to DC and AC currents, Fuse: construction, working and application.
f. Transmission of electrical energy through solids, liquids, gases and vacuum.
g. Rectifying Devices - Thermionic valves, Semiconductors,Transistors, Amplifiers, transducer and Oscillator circuits.
h. Display devices and indicators – analogue and digital.
i. Transformer: Definition, Types, Principle, Construction, Eddy current, working uses.
j. Chokes: Principle, Construction and working, Uses

Low frequency Currents

1. Basic types of current
   a. Direct Current: types, physiological & therapeutic effects.
   b. Alternating Current
2. Types of Current used in Therapeutics
   a. Modified D.C
      i. Faradic Current
      ii. Galvanic Current
   b. Modified A.C
      i. Sinusoidal Current
      ii. Diadynamic Current.
   c. Faradic Current: Definition, Modifications, Techniques of Application of Individual, Muscle and Group Muscle stimulation, Physiological & Therapeuticeffects of Faradic Current, Precautions, Indications & Contra-Indications, and Dangers.
3. Galvanic Current: Definition, Modifications, Physiological & Therapeutic effects of Galvanic Current, Indications & Contra-Indications, Dangers, Effect of interrupted galvanic current on normally innervated and denervated muscles and partially denervated muscles.
4. Sinusoidal Current & Diadynamic Current in Brief.
5. HVPGS– Parameters & its uses
6. Ionization/Iontophoresis: Techniques of Application of Iontophoresis, Indications, Selection of Current, commonly used Ions (Drugs) for pain,

hyperhidrosis, would heal.

7. Cathodal/Anodal galvanism.
8. Micro Current & Macro Current
9. Types of Electrical Stimulators

    a. NMES- Construction, component.
    b. Neuromuscular diagnostic stimulator- construction, component.
    c. Components and working Principles

10. Principles of Application: Electrode tissue interface, Tissue Impedance, Types of Electrodes, Size & Placement of Electrode – Water bath, Unipolar, Bi-polar, Electrode coupling, Current flow in tissues, Lowering of Skin Resistance.
11. Nerve Muscle Physiology: Action Potential, Resting membrane potential, Propagation of Action Potential, Motor unit, synapse, Accommodation, Stimulation of Healthy Muscle, Stimulation of Denervated Muscle, and Stimulation for Tissue Repair.

12. **TENS**: Define TENS, Types of TENS, Conventional TENS, and Acupuncture TENS, Burst TENS, Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placements of Electrodes, Dosage parameters, Physiological & therapeutic effects, indications & Contraindications.
13. **Pain**: Define Pain, Theories of Pain (Outline only), and Pain Gate Control theory in detail.
14. **DCS**- Principles, Physiology of action, indications, contraindications and techniques of application.

Radiation therapy/Actinotherapy:

1. **IRR**: Define IRR, wavelength & parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & frequency oftreatment, Indication & Contraindication. [2Hours]
2. **UVR**: Define UVR, Types of UVR, and UVR generators: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, Kromayer lamp, fluorescent tube, Theraktin tunnel, PUVA apparatus, Physiological & Therapeutic effects. Sensitizers & Filters, test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications, contraindications. Dangers. Dosages for different therapeutic effects, Distance in UVR lamp [8Hours]

3. <u>Superficial heating Modalities</u>

1. **Wax Therapy**: Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers.
2. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications.
3. **Moist Heat Therapy**: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications & Contraindications.

4. **Cyclotherm**: Principles of production, Therapeutic uses, Indications &Contraindications.
5. **Fluidotherapy**: Construction, Method of application, Therapeutic uses,Indications & Contraindications.
6. **Whirl Pool Bath**: Construction, Method of Application, TherapeuticUses, Indications & Contraindications.

Cryotherapy: Define- Cryotherapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, and Methods of application with dosages.

PRACTICAL

The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, choice of dosage parameters and safety precautions.

1. Demonstrate the technique for patient evaluation–receiving the patientand positioning the patient for treatment using electrotherapy.
2. Collection of materials required for treatment using electrotherapymodalities and testing of the apparatus.
3. Demonstrate placement of electrodes for various electrotherapymodalities.
4. Electrical stimulation for the muscles supplied by the peripheral nerves
5. Faradism under Pressure for UL and LL
6. Plotting of SD curve with chronaxie and rheobase
7. Demonstrate FG test
8. Demonstrate treatment techniques using SWD, IRR and Microwavediathermy
9. Demonstrate the technique of UVR exposure for various conditions–calculation of test dose
10. Technique of treatment and application of Hydro collator packs,cryotherapy, contrast bath, wax therapy
11. Demonstrate the treatment method using whirlpool bath
12. Winding up procedure after any electrotherapy treatment method.

BIOMECHANICS & KINESIOLOGY II

BPT-203

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-203	**BIOMECHANICS & KINESIOLOGY II**	**144 (80 T + 64P)**	**6**	**6**	**20 (T) + 20 (P)**	**80 (T) +80 (P)**	**200**

COURSE DESRCIPTION- This Course Supplements the Knowledge of anatomy and enables the student to have a better understanding of the principlesof biomechanics and their application in musculoskeletal and various other dysfunctions.

COURSE OBJECTIVE- Describe the joint structure, classification and function of joints and biomechanics of Connective tissue. Describe the muscle structure and function of muscles, types of muscles, contractions and factors effecting muscle recruitment and function. Describe the biomechanics of the thoracic and chest wall and patho-biomechanics associated with chest deformities. Describe the analysis of posture and gait during static and dynamic movement, relation with LOG, Pathomechanics of abnormal gait and posture.

COURSE OUTCOME-

CO1: On successful completion of this programme, students should be able to describe the understanding of basics of mechanics, muscle structure and contraction, factors effecting muscle contraction and recruitment

CO2: Describe mechanics of chest wall during various movements and the patho-mechanics associated with various chest conditions and deformities

CO3: Analyze normal mechanics of posture and gait in various planes and axis CO4: Analyze the patho mechanics associated with abnormal posture and gait. CO5: Describe biomechanics of shoulder, elbow, wrist, hip, knee, ankle joint,vertebral column.

Kinesiology of the vertebral column-

a. General structure and function
b. Regional structure and function– Cervical region, thoracic region, lumbar region, sacral region
c. Muscles of the vertebral column
d. General effects of injury and aging

Kinesiology of the peripheral joints-

a. The shoulder complex: Structure and components of the shoulder complex and their integrated function
b. The elbow complex: Structure and function of the elbow joint –

humeroulnar and humeroradial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.

c. The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; functional position of the wrist and hand.
d. The hip complex: structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur.
e. The knee complex: structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.
f. The ankle and foot complex.: structure and function of the ankle joint, subtalar joint, talocalcaneonavicular joint,transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints, structure and function of the plantar arches' muscles of the ankle and foot, deviations from normal structure and function – Pes Planus and Pes Cavus. Analysis of Posture and Gait – Static and dynamic posture, postural control, kinetics and kinematics of posture, ideal posture analysis of posture, effects of posture on age, pregnancy, occupation and recreation; general features of gait, gait initiation, kinematics and kinetics of gait, energy requirements,kinematic and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running, effects of age, gender, assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities, injuries and malalignments in gait; Movement Analysis: ADL activities like sitting–to standing, lifting, various grips, pinches.

PRACTICAL- shall be conducted for various joint movements and analysis of the same. Demonstration may also be given as how to analyze posture and gait. The student shall be taught and demonstrated to analysis for activities of daily living–ADL– (like sitting to standing, throwing, lifting etc.) The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur. The demonstrations may be done on models or skeleton.

MICROBIOLOGY
BPT-204

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-204	**MICROBIOLOGY**	**50 T**	**3**	**3**	**20**	**80**	**100**

COURSE DESCRIPTION- Microbiology involves the study of common organisms causing diseases including nosocomial infections and precautionary measures to protect one from acquiring infections. The knowledge and understanding of Microbiology of diseases is essential to institute appropriate treatment or suggest preventive measures to the patient. Particular effort ismade in this course to avoid burdening the student.

COURSE OBJECTIVE- Understand the importance of microbiology, the basic concepts of microbiology, the importance of sterilization & the nosocomial infection and its prevention in the relative field.

COURSE OUTCOMES

CO1: Know about prevalent communicable diseases
CO2: Describe the agents responsible for causing clinical infection to CNS, Musculoskeletal Respiratory, and Genitourinary system.
CO3: Illustrate the best method to prevent the development of infection.
CO4: Understand to recognize the sign and symptom considered red flag forserious diseases.
CO5: Acquire knowledge of common immunological disorders and their resultant effects on the human body. They will be able to perform, demonstrate, implement and apply the concept of microbiology in better understanding with relevance to human disease.

GENERAL MICROBIOLOGY:

a. Introduction and history of Medical Microbiology
b. Morphology, Nutritional Requirements, Metabolism, Growth, Classification and identification of Bacteria
c. Sterilizations and Disinfection

IMMUNOLOGY

a. Infection, Immunity, Antigens, antibody, antigen-Antibody Reaction, Complement System
b. Structure and Function of Immune system, Immune Response
c. Immunodeficiency Diseases, Hypersensitivity, Autoimmunity

BACTERIOLOGY

a. Staphylococcus, Streptococcus, Pneumococcus, Neisseria
b. Corynebacterium, Clostridium, Bacillus
c. Enterobacteriaceae, Pseudomonas, Vibrio

d. Mycobacteria, Treponema

VIROLOGY

a. General Characteristics and Classification of Virus
b. Virus-Host Interaction
c. DNA and RNA Virus
d. Measles, Mumps, Rubella, Polio, Influenza, Rabies, Dengue, Hepatitis, HIV

MISCELLANEOUS

a. Medical Mycology
b. Parasitology
c. Normal Microbial Flora of the Human Body
d. Hospital Acquired Infection 5. Universal Precautions

Clinical/Applied Microbiology-

a. Streptococcal infections: Rheumatic fever and Rheumatic heart disease,Meningitis.
b. Tuberculosis
c. Pyrexia of unknown origin, leprosy.
d. Sexually transmitted diseases, Poliomyelitis.
e. Hepatitis
f. Acute-respiratory infections, Central nervous System infections, Urinarytract infections.
g. Pelvic inflammatory disease, Wound infection, Opportunistic infections,HlV infection.
h. Malaria, Filariasis, Zoonotic diseases.
i. Culture and sensitivity tests
j. Hospital acquired infections

ENVIRONMENTAL SCIENCE
BPT-205

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-205	**ENVIRONMENTAL SCIENCE**	**30**	**2**	**2**	**-**	**-**	**-**

COURSE DESCRIPTION-

COURSE OBJECTIVE- The course gives the awareness on the ecosystem structure and process which interlinked with human survival, intensively need attention at global and regional level.

COURSE OUTCOMES-

CO1: To understand the concept and function of the environment and recognize the physical, chemical, and biological components of the earth's systems and their functions.

CO2: To identify common and adverse impacts of human activities on biotic communities, soil, water, and air quality and suggest sustainable strategies to mitigate these impacts.

CO3: Develop an understanding of environmental pollutions and hazards and general measures to control them.

CO4: To realize the importance of biodiversity for maintaining ecological balance and Global conservation practices and strategies.

CO5: To analyze the need for sustainable development in respect of environmental management through Policies, movements and social awareness.

Natural resources Renewable and non-Renewable resources:

Natural resources and associated problems.

a) Water Resources: Use and over utilization of surface and ground water, floods, drought, conflicts over water, dams- benefits and problems.

b) Mineral Resources: Use and exploitation, environmental effects of extracting and using mineralsresources, case studies.

c) Food Resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer -pesticide problems, Water logging, Salinity, case studies.

d) Energy Resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources, case studies.

e) Land Resources: Land as a resource, Land degradation, Man induced landslides, Soil erosion and desertification. - Role of an individual in conservation of natural resources - Equitable use of resources for

sustainable lifestyles.

Ecosystems:

a) Concept of an Ecosystem.
b) Structure and Function of an Ecosystem
c) Producer Consumer and decomposers.
d) Energy flow in the Ecosystem.
e) Ecological Succession.

Biodiversity and its conservation:

a) Introduction - Definition: Genetic, Species and Ecosystem diversity.
b) Bio-Geographical classification of India,
c) Value of Biodiversity: Consumptive use, productive use, Social, ethical, aesthetic and option values
d) Biodiversity at Global, National & Local levels.
e) Hotspots of Biodiversity
f) Threats to Biodiversity: Habitat Loss, Poaching of Wildlife, Man-

Wildlife Conflicts Environmental pollution:

a) Definition, Causes, effects and control measures of-Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear Hazards

b) Solid Waste Management: Causes, effects and control measures of urban and Industrial Wastes

c) Role of an Individual in prevention of pollution.

d) Pollution case studies

e) Disaster Management: floods, earthquake, cyclonesand landslides.

Social issues and Environments:

a) Resettlement and Rehabilitation of people; its problems and concerns, case studies.
b) Environmental ethics: issues and possible solutions
c) Greenhouse effect and global Warming, effects of acid Rain and their remedial measures and ozone Layer depletion.

Human pollution and the environments:

a) Population growth variation among nations, Population Explosion, Family welfare programme
b) Environment and Human Health
c) Human Rights.
d) Role of Information Technology in Environment and Human Health, Case studies.

Field Work

a) Visit to a local area to document environmental assets river/forest/grassland/hill/mountain
b) Visit to a local polluted site – Urban/Rural/Industrial/Agricultural
c) Study of common plants, insects, birds • Study of simple ecosystems-pond, river, hill slopes etc.

CLINICAL OBSERVATION

BPT-206

BPT FOURTH SEMESTER

EXERCISE THERAPY - II

BPT-207

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-207	**EXERCISE THERAPY-II**	**144 (80T + 64P)**	**6**	**6**	**20 (T) + 20 (P)**	**80 (T) + 80 (P)**	**200**

COURSE DESRCIPTION- At this course, the students will have a better understanding of the principles of exercise therapy both basic and advanced as well as assessment techniques. The student's skill will be enhanced through hands on training provided during the practical hours.

COURSE OBJECTIVE- Describe basic concepts of exercise therapy- positions, types of movements, classification.

COURSE OUTCOMES-

CO1: Analyze Normal human posture [static &dynamic] & various Normal Musculo skeletal movements during Gait, activities of daily living, & describe the movements of the Thorax during breathing.
CO2: Describe the Biophysical properties of connective tissue, effect of mechanical loading, factors influencing the Muscle strength, mobility of articular &peri-articular soft tissues.
CO3: Describe the physiological & Therapeutic uses, merits /demerits of various exercise modes.
CO4: Acquire the skill of assessment of isolated &group muscle strength, &Range of motion of the joints subjectively & objectively.
CO5: Describe the pattern of normal and abnormal movements of various joints and activities.

EXERCISE THERAPY II

1. **Joint mobilization:** Definition – Mobilization, Manipulation, indications, limitations, contraindications and precautions, applications of Mobilization technique to various joints. Principles of Maitland, Mulligan and Mecknzi joint Manipulation techniques.
2. **Resisted exercise:** Definition – strength, power, endurance. Guiding principle of resisted exercise, determinants, types Manual and Mechanical Resistance Exercise, Isometric Exercise, Dynamic Exercise - Concentric and Eccentric, Dynamic Exercise -Constant and Variable Resistance, Isokinetic Exercise, Open-Chain and Closed-Chain Exercise, precautions, contraindications. Progressive Resistance Exercise - de Lormes, Oxford, MacQueen, Circuit Weight Training, Plyometric Training—Stretch Shortening Drills, Isokinetic Regimens
3. **Proprioceptive Neuromuscular Facilitation** – Principles, Diagonal patterns of movements, Basic procedures, Upper Extremity Diagonal patterns, Lower Extremity Diagonal Patterns. Technique in PNF – Rhythmic Initiation, Repeated Contractions, Reversal of Antagonists, Alternating Isometrics, Rhythmic Stabilization.
4. **Aerobic Exercises** – Definitions, Physiological response to Aerobic Exercise, Evaluation of aerobic capacity – exercise testing, Determinant of Aerobic Exercise, Physiological Changes with Aerobic Training, Aerobic Exercise Program, Applications of Aerobic Program in patients with chronic illness.
5. **Hydrotherapy:** Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Therapeutic Exercises in Hydrotherapy,Special equipments used.
6. **Balance training:** Definition and Key terms, Balance control, Components of balance, Balance Impairment, Examination of Impaired Balance, Balance training Exercises.
7. **Posture:** Normal Postural Control, Postural Alignment, Postural Stability, Postural Impairment and Mal-Alignment, Postural Training.
8. **Breathing Exercises:** Aims and Goals of Breathing Exercises, Procedures of Diaphragmatic Breathing, Segmental Breathing, Pursed-Lip Breathing, Preventing and Relieving Episodes of Dyspnea, Positive Expiratory Pressure Breathing, Respiratory Resistance Training, Glossopharyngeal Breathing. Exercises to mobilize the chest, Postural Drainage, Manual Technique used in Postural Drainage, Postural Drainage Positions, Modified Postural Drainage.
9. **Gait Training:** Definition, Different methods of Gait Training, Gait Training in Parallel Bars, Walking Aids: Types: Crutches, Canes, Frames; Principles and training with walking aids.
10. **Instrument Assisted Soft Tissue Mobilization:** General Description of Inflammation and repair, Acute, Sub Acute, and Chronic stage, General Treatment Guidelines.Techniques and Principles of Mobilization andManipulation. Techniques and Principles of Cupping

therapy, IASTM and reflexology. Techniques and Principles of PRT (Position release techniques), MET (Muscle energy techniques),Active andPassive release of softtissues,Butler concepts and techniques.

11. **Bed Rest Complications:** Indications of prolonged bed rest,Complications after a period of prolonged immobilization related to Neurological, Musculoskeletal, Cardiovascular and gastrointestinal systems, prevention and treatment of the complications.

PRACTICAL

1. Joint Mobilisation to individual joint.
2. Stretching of individual and group muscles
3. Resisted exercises to individual and group muscles, open and closedkinematic exercises.
4. PNF patterns to upper and lower limb.
5. Various types breathing exercises, chest mobilization exercises, posturaldrainage
6. Gait training with various walking aids

ELECTROTHERAPY-II
BPT-208

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-208	**ELECTROTHERAPY-II**	**144 (80T + 64P)**	**6**	**6**	**20 (T) + 20 (P)**	**80 (T) + 80 (P)**	**200**

COURSE DESCRIPTION- In this course the student will learn the Principles, Techniques, and Effects, Indication, Contra-Indication and the dosage parameter for various indications of electrotherapeutic modalities in the restoration of physical function.

COURSE OBJECTIVE- The objective of this course is that the student will be able to list the indications, contraindications, dosages of electrotherapy modalities, demonstrates the different techniques, and describe their effects on various conditions.

COURSE OUTCOMES-

CO1: Describe the Production &Physiological effects, Therapeutic uses, merits, demerits indication &contraindications of various low/medium Frequency Currents modes.

CO2. Describe the Physiological effects &therapeutic uses of various therapeutic ions & Topical Pharmaco-therapeutic agents to be used for the application of Iontophoresis & sono/phonophoresis

CO3. Acquire the skill of Application of the Electro therapy modes like UVRand LASER on models, for the purpose of Assessment &Treatment.

CO4. Acquire an ability to select the appropriate mode as per the tissue specific& area specific application

CO5: Describe about magnetotherapy, its effect and therapeutic uses.

Electro-diagnosis

1. FG Test
2. SD Curve: Methods of Plotting SD Curve, Apparatus selection, Characters of Normally innervated Muscle, Characters of Partially Denervated Muscle; Characters of Completely denervated Muscle, Chronaxie & Rheobase.
3. Nerve Conduction Velocity Studies
4. EMG: Construction of EMG equipment.
5. Bio-feedback.

Medium Frequency Currents

1. Interferential Therapy: Define IFT, Principle of Production of IFT, Static Interference System, Dynamic Interference system, Dosage Parameters for IFT, Electrode placement in IFT, Physiological & Therapeutic effects, Indications & Contraindications.
2. Russian Current

3. Rebox type Current

High Frequency Currents

1. Electromagnetic Spectrum.
2. SWD: Define shortwave, Frequency & Wavelength of SWD, Principle ofProduction of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning, Testing of SWD Apparatus, physiological and therapeutic effects, indications, contraindications, dangers, dosage parameters.
3. Long wave diathermy- Principles of application, Indications and Contraindications, Physiological effects.
4. LASER: Define LASER, Types of LASER, Principles of Production, and Production of LASER by various methods, Methods of application of LASER. Dosage of LASER, Physiological & Therapeutic effects of LASER, Safety precautions of LASER, Classifications of LASER, Energy density & power density.
5. Pulsed Electromagnetic Energy: Principles, Production & Parameters of PEME, Uses of PEME.
6. Microwave Diathermy: Define Microwave, Wavelength & Frequency, Production of MW, Applicators, Dosage Parameters, Physiological & Therapeutic effects, Indications & Contraindications, Dangers of MWD.

Ultrasound:

Define Ultrasound, Frequency, Piezoelectric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous & Pulsed mode, Intensity, US Fields: Near field, Far field, Half value distance, Attenuation, Coupling Media, Thermal effects, Non-thermal effects, Principles & Application of US: Direct contact, Water bag, Water bath, Solid sterile gel pack method for wound. Uses of US, Indications & Contraindications, Dangers of Ultrasound, and Phonophoresis: Define Phonophoresis, Methods of application, commonly used drugs, Uses, Dosages of US.

Magnetotherapy

Magnetic Stimulation: Physiological Effect of Magnetism, Principles, Therapeutic uses, Indications & contraindication

PRACTICALS

1. The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, choice of dosage parameters and safety precautions.
2. Demonstrate the technique for patient evaluation–receiving the patient and positioning the patient for treatment using electrotherapy.
3. Collection of materials required for treatment using electrotherapymodalities and testing of the apparatus.
4. Demonstrate placement of electrodes for various electrotherapy

modalities.

5. Electrical stimulation for the muscles supplied by the peripheral nerves
6. Faradism under Pressure for UL and LL
7. Plotting of SD curve with chronaxie and rheobase
8. Demonstrate FG test
9. Application of Ultrasound for different regions- various methods ofapplication
10. Demonstrate treatment techniques using SWD, PSWD, PEMF,Microwave diathermy
11. Demonstrate treatment techniques using Magnetotherapy.
12. Demonstrate treatment method using IFT for various regions
13. Calculation of dosage and technique of application of LASER
14. Winding up procedure after any electrotherapy treatment method.
15. Demonstrate the technique of application of Long wave diathermy.

PHARMACOLOGY–BPT-209

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-209	PHARMACOLOGY	50	3	3	20	80	100

COURSE DESCRIPTION - This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy. The student after completing the course will be able tounderstand the general principles of drug action and the handling of drugs bythe body. The student will be aware of the contribution of both drug andphysiotherapy factors in the outcome of treatment.

COURSE OBJECTIVE- Introduce the students to basic pharmacology ofvarious common medication used and its effects on patients in physical therapy Treatment of ailment of cardiovascular system, GIT, endocrine system, by drugs. To make student understand the drug and physiotherapy contribution in the outcome of the treatment.

COURSE OUTCOME –

CO1: To understand the various routes of drugs administration, pharmacodynamics and pharmacokinetics of drugs.

CO2: To understand the various drugs used for the treatment of ANS, PNS and CNS conditions with their mechanism of action and adverse effects.

CO3: To understand the various drugs used for the treatment of endocrine system with their mechanism of action and adverse effects.

CO4: To understand the various drugs used for the treatment of GIT problems with their mechanism of action and adverse effects

CO5: To understand the various drugs used for the treatment of ailment of cardio vascular system, bronchial asthma, skin lesions with their mechanism of action and adverse effects.

1. **General Pharmacology**–

   Introduction, Definitions, Nomenclature of drugs, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, Adverse effects.

2. **Autonomic Nervous system –**

   General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System

   Cholinergic and Anticholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

3. **Cardiovascular Pharmacology–**

Drugs used in the treatment of heart failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators Antiarrhythmic Drugs.

Drugs used in the treatment of vascular disease and tissue ischemia: Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotic, Anticoagulants and Thrombolytics Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers, Cerebral Ischemia Peripheral Vascular Disease.

4. **Neuro pharmacology–**

Sedative – Hypnotic Drugs: Barbiturates, BenzodiazepinesAntianxiety Drugs: Benzodiazepines, Other Anxiolytics

Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium Antipsychotic drugs

5. **Disorders of Movement-**

Drugs used in Treatment of Parkinson's diseaseAntiepileptic Drugs Spasticity and Skeletal Muscle Relaxants

6. **Inflammatory/Immune Diseases-**

Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, non-aspirin NSAIDs, drug Interactions with NSAIDs

Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids

Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout

Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematous, Scleroderma, Demyelinating Disease

Respiratory Pharmacology: Obstructive Airway Diseases, Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis

7. **Digestion and Metabolism-**

Gastrointestinal Pharmacology: Peptic Ulcer Disease, Constipation, Diarrhea Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemic

8. **Geriatrics-**

Pharmacology and the geriatric Population: Adverse effects of special concern in the Elderly, Dementia, Postural hypotension.

9. **Chemotherapy and Antibiotics**

General principles of chemotherapy. Sulfonamides & Fluoroquinolones. Beta – Lactam antibiotics:

I (Penicillin) Beta – Lactam antibiotics

II (Cephalosporins) Macrolides aminoglycosides Tetracyclines and chloramphenicol (Broad spectrum antibiotics) Anti-Tuberculosis drugs Anti–Leprosy drugs

FIRST AID & EMERGENCY CARE
BPT-210

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-210	**FIRST AID & EMERGENCY CARE**	**60**	**3**	**3**	**20**	**80**	**100**

COURSE OBJECTIVE- To acquire knowledge about first aid, emergencies

Introduction of First Aid

Definition, aims and importance of First Aid.Rules/General principles of First Aid Concepts of Emergency

Procedure and Techniques in First Aid

Preparation of first Aid kit, Dressing bandaging and splintingTransportation of injured patient

CPR-Mouth to mouth, Sylvester, Schafer, External cardiac massage

First Aid in Emergency

Asphyxia, Drowning, shock

Wound and bleeding, Injuries of the soft and dense tissueInjury of joint and bone, Falls, Hanging

Foreign body ear, ear and nose and throatBurns and scalds

Poisoning- Ingestion, inhalation, bite and stings

Assessing a Casualty and vitals parameters Assessing the sick or injured, Mechanisms of injuryPrimary survey, Secondary survey

Head-to-toe examination, Monitoring vital signs.

Community Emergencies and Community Resources Fire, Explosion, Floods, Earth-Quakes and famines Role Of PT in disaster management

Community Resources-Police, Ambulance services Voluntary agencies-local, state national and International

Emergency Management

Principle of Emergency careTriage

Airways obstruction, Basic knowledge of First aid management of burnBasic knowledge of First aid for medical and surgical emergency

Basic knowledge of first aid management of heat stroke

Basic knowledge of First aid management of snake bite and poisoning

Emergency Disaster Management

Natural calamities-Flood, earthquake,Volcanic eruptions

Man-made disaster-Explosion, War, Fire Accidents

The Unconscious Casualty

Breathing and circulation, Life-saving priorities
Unconscious adult, Unconscious child, Unconscious infant, how to use an AED

Techniques and Equipment

Removing clothing, Removing headgear, Casualty handling, First aid materials, Dressings, Cold compresses, Principles of bandaging, Roller bandages, Tubular gauze bandages, square knots, hand and foot cover, Arm sling, Elevation sling, improvised slings.

BLS and ACLS

BLS guideline for adult and paediatrics
CPR techniques, choking
ACLS basic guidelines

PATHOLOGY

BPT-211

Course No.	Title		Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-211	PATHOLOGY		75	3	3	20	80	100

COURSE DESCRIPTION: This subject follows the basic subjects of Anatomy, Physiology and Biochemistry and it forms a vital link between pre-clinical subjects and clinical subjects. Pathology involves the study of causesand mechanisms of diseases. The knowledge and understanding of Pathology ofdiseases is essential to institute appropriate treatment or suggest preventive measures to the patient. Particular effort is made in this course to avoid burdening the student.

COURSE OBJECTIVE- The student will be able to understand the concepts of cell injury and changes in relation towards the pathological effects of infectious and non-infectious diseases &understand the disease process, the clinical significance (with special emphasis on neuro-musculoskeletal and cardio-respiratory system)

COURSE OUTCOMES-

CO1: Recall etiology pathogenesis and clinic pathological correlation ofcommon infections & non-infections disease.

CO2:. Illustrate the knowledge of cell injury and its healing process.

CO3: Describe normal and altered different organ system in different diseasesand their clinical significance

CO4: Understand common hematological disorders and investigationsnecessary to diagnose them.

CO5: Understand in brief, about the Hematological diseases and their resultanteffects on the human body.

CELL INJURY, INFLAMMATION & NEOPLASMS:

a. Cells: Brief outline of cell injury, hypertrophy, atrophy, degeneration,necrosis and gangrene

b. Inflammation: Definition, vascular and cellular phenomena, differencebetween transudate and exudates, granuloma

c. Neoplasm: Definition, characteristic features, benign and malignant tumor,spread of tumor, cancer pain syndrome.

VASCULAR & CARDIORESPIRATORY SYSTEM

a. Circulatory Disturbance: Odema, Hemorrhage, Embolism, Thrombosis, Infraction, Shock, Volkmann's ischemic contracture

b. Blood Disorder: Concepts of Anemia, Bleeding disorder- Hemophilia

c. **Cardiovascular System (CVS):** Etiopathogenesis and Gross pathology ofAtherosclerosis, coronary heart disease, Rheumatic heart disease

d. **Respiratory System:** Chronic Bronchitis, Asthma, Bronchiectasis, Emphysema

BONES, JOINTS & MUSCULAR SYSTEM

a. **Bones:** Etiopathogenesis and gross pathology of following conditions: Rickets/Osteomalacia, Osteoporosis, Osteomyelitis, Hyperparathyroidism

b. **Joint:** Osteoarthritis, Rheumatoid Arthritis, Gout, Spondyloarthopathy (including Ankylosing Spondylitis), Osteonecrosis, Paget's disease

c. **Muscles:** Myositis ossificans, Myofascial Pain syndrome, Septic arthritis

HEPATO-BILIARY, ENDOCRINE & INTEGUMENTARY SYSTEM

a. **Hepato-Biliary System:** Jaundice Types, etiopathogenesis and diagnosis

b. **Endocrine:** Diabetes Mellitus, Non-Neoplastic lesion of thyroid-Thyrotoxicosis, Myxedema

c. **Skin:** Brief outline of Scleroderma, Psoriasis, Pressure Ulcer, and Burn.

CENTRAL NERVOUS SYSTEM

a. **CNS:** Etiopathogenesis and gross pathology of following conditions- Meningitis, Encephalitis, Parkinson's, Amyotrophic lateral sclerosis, Ataxias, Multiple sclerosis, Neuropathies (Carcoat Marie Tooth disease, Compression and Entrapments, diabetics G.B. Syndrome), malformation, CVA, Extradural and Intra Dural Hematoma

b. **Myopathies:** Poliomyelitis, Myopathies, Myasthenia gravis, Muscular dystrophy.

MEDICAL/PHYSIOTHERAPY LAW AND ETHICS

BPT-212

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-212	MEDICAL/PHYSIOTHERAPY LAW AND ETHICS	30	2	2	-	-	-

COURSE DESCRIPTION- The students will enable to know about evolution of Physiotherapy, identify various laws and regulation that should be followed during clinical practice of Physical Therapy.

COURSE OBJECTIVE – To know about evolution of Physiotherapy, identify various laws and regulation that should be followed during clinical practice of Physical Therapy.

COURSE OUTCOMES-

CO1: On completion of the course the students should be able to know themedical law and ethics

CO2: Able to know the legal and illegal issues faced in hospital.

CO3: The students should understand the code of ethics for physiotherapist

CO4: They will be able to treat patient more lawfully in clinical and hospitalsetting and maintain their records.

CO5: Understand the importance of ethics in the relative field & basic conceptsof ethics.

Legal and ethical considerations are firmly believed to be an integral part of medical practice in planning patient care. Few of the important and relevant topics that need to focus on areas are as follows:

1. Medical ethics versus medical law – Definition – Goal - Scope
2. Introduction to Code of conduct
3. Basic principles of medical ethics – Confidentiality
4. Malpractice and negligence - Rational and irrational therapy
5. Autonomy and informed consent - Right of patients
6. Care of the terminally ill - Euthanasia
7. Organ transplantation
8. Medical diagnosis versus physiotherapy diagnosis.
9. Medico legal aspects of medical records – Medico legal case and type Records and documents related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information – Unauthorized disclosure - retention of medical records – other various aspects.
10. Professional Indemnity insurance policy
11. Development of standardized protocol to avoid near miss or sentinel

events

12. Obtaining informed consent.
13. Biomedical ethical principles
14. Code of ethics for physiotherapists
15. Ethics documents for physiotherapists
16. Laws affecting physiotherapy practice

BPT FIFTH SEMESTER

CARDIO PULMONARY MEDICINE & SURGERY

BPT-301

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-301	**CARDIO PULMONARY MEDICINE & SURGERY**	**144(80T+64P)**	**6**	**6**	**20T+ 20P**	**80 T+ 80 P**	**200**

COURSE DESCRIPTION - Following the basic science and clinical science course, this course introduces the student in pulmo-thoracic conditions which commonly cause disability.

COURSE OBJECTIVE-The objective of this course is that after lectures and demonstrations in addition to clinics the student will be able to demonstrate an understanding of pulmo-thoracic conditions causing disability and their management. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by cardiovascular pathology on the functioning of the individual.

COURSE OUTCOMES-

CO1: Interpretation of different invasive and noninvasive diagnostic investigation to make proper assessment in various respiratory and cardiovascular dysfunction

CO2: Develops the skills to execute different Physiotherapy techniques used in treatment of Cardio-respiratory dysfunctions.

CO3: To select strategies for cure, care & prevention; adopt restorative & rehabilitative measures for maximum possible functional independence of a patient at home, work place & in community.

CO4: Be able to execute the effective Physiotherapeutic measures with appropriate clinical reasoning to improve pulmonary function.

CO5: To design & execute effective tailored cardiopulmonary rehabilitation programme.

1. **Anatomy and Physiology**
   a. Respiratory system: Upper respiratory tract, Lower respiratory tract – Trachea, Bronchial tree, Bronchopulmonary segments,Respiratory unit, hilum of lung, Muscles of respiration, Pleura, intrapleural space, intrapleural pressure, surfactant, Mechanics of respiration – Chest wall movements, lung & chest wall compliance, V/Q relationship, airway resistance, Respiratory centre, Neural & chemical regulation of

respiration, Lung volumes and lung capacities, Spirometer, lung function test, Pulmonary circulation, Lungsounds, cough reflex.

b. Cardiovascular systems: Chambers of heart, semilunar and atrioventricular valves, Coronary circulation, conductive system of heart, Cardiac cycle, ECG, Heart sounds, Blood pressure, pulse, cardiac output

2. **CardioVascular system diseases**:

a. Define, etiology, pathogenesis, clinicalfeatures, complications,

b. Conservative and surgical management of the following conditions

i. Ischemic heart disease
ii. Myocardial infarction
iii. Heart failure
iv. Cardiac arrest
v. Rheumatic fever
vi. Hypertension
vii. Infective endocarditis
viii. Myocarditis & cardiomyopathy

Examination of the Cardiovascular System Investigations: ECG, Exercise Stress Testing, Radiology; Clinical manifestations of Cardiovascular disease; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases and disorders of the heart: Pericarditis, Myocarditis, Endocarditis, Rheumatic Fever – resulting in valve disorders, Ischemic Heart Disease, Coronary Valve Disease, Congenital disorders of the Heart, Cardiac Arrest; Examination and Investigations of diseases of arteries and veins; Hypertension: Definition, causes, classification, types, assessment, investigations and management.

c. **Disorders of the Heart** – Definition, Clinical features, diagnosis and choice of management for the following disorders :

Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease: Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetralogy of Fallot, Transposition of Great Vessels; Acquired Heart Disease – Mitral Stenosis & Insufficiency, Aortic Stenosis and Insufficiency, Ischemic Heart Disease – Coronary Artery Disease, Cardiac tumors.

3. Respiratory System

a. **Respiratory Disease**: Examination of the Respiratory System – Investigations: Chest Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis; Clinical manifestations of Lung disease; Patterns of lung disease

– Chronic Obstructive Lung Disease and Restrictive Lung

Disease; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following lung diseases:

– Chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic Fibrosis, Upper Respiratory Tract Infections, Pneumonia, Tuberculosis, Fungal Diseases, Interstitial Lung Diseases, Diseases of the pleura, diaphragm and chest wall; Respiratory failure – Definition, types, causes, clinical features, diagnosis and management.

b. **Chest wall disorders** - Definition, Clinical features, diagnosis and choice of management for the following disorders – chest wall deformities, chest wall tumors, Spontaneous Pneumothorax, Pleural Effusion, Empyema Thoracis, Lung abscess, Hemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal disruption, Cardiac and Pulmonary Contusions, Bronchiectasis, Tuberculosis, Bronchogenic Carcinoma, Bronchial Adenomas, Metastatic tumors of the Lung, tracheal Stenosis, Congenital tracheomalacia, Neoplasms of the trachea, Lesions of the Mediastinum, Carcinoma of the female breast.

4. **Thoracic surgeries** – Thoracotomy – Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications, Lung surgeries: Pneumonectomy, Lobectomy, segmentectomy – Indications, Physiological changes and Complications; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung, Cardiac surgeries – An overview of the Cardio-Pulmonary Bypass Machine – Extra cardiac Operations, Closed Heart surgery, Open Heart surgery, Transplant Surgery – Heart, Lung and Kidney – Indications, Physiological changes and Complications.

5. Diseases of the Arteries and Veins: Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases: Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins.

PRACTICAL

Examination of the Respiratory System, Spirometer, lung function test, Investigations: Chest Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis, Examination of the Cardiovascular System Investigations: ECG, Exercise Stress Testing, Radiology,etc.

GENERAL SURGERY
BPT-302

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-302	GENERAL SURGERY	100(80T + 20P)	4	4	20 T + 20 P	80 T+ 80 P	200

COURSE DESRCIPTION- It covers relevant aspects of General Surgery and surgical conditions in which Physiotherapy play a significant role. This courseis designed to develop the basic knowledge of surgery and to understand a surgical patient, its special needs in relation to physical therapy which will help them provide good rehabilitation.

COURSE OBJECTIVE- The objective of this course is that the student will be able to demonstrate a general understanding of the surgeries that therapistswould encounter in their practice. They should have a brief idea of the etiology and pathology, what the patient's symptoms and the resultant functionaldisability. This would help the candidates to understand the limitation imposedby the diseases on any therapy that may be prescribed.

COURSE OUTCOMES-

CO1: To understand fluid and electrolyte changes in surgical patient.
CO2: To understand changes in respiratory and cardiovascular parameters in surgical patients.
CO3: To understand the complications of surgery.
CO4: To understand investigations and management of common surgical conditions.CO5: The student will be able to differentiate surgical cases and handling the cases will become easier as they can relate theoretical knowledge with practical.

1. Fluid, Electrolyte and Acid-Base disturbances – diagnosis and management; Nutrition in the surgical patient; Wound healing –basic process involved in wound repair, basic phases in the healing process, clinical management of wounds, factors affecting wound healing, Scars – types and treatment, Hemostasis– components, hemostatic disorders, factors affecting bleeding during surgery, Transfusion therapy in surgery – blood components, complications of transfusion; Surgical Infections; General Post–Operative Complications and its management.

2. Reasons for Surgery; Types of anesthesia and its effects on the patient; Types of Incisions; Clips Ligatures and Sutures; General Thoracic Procedures – Radiologic Diagnostic procedures, Endoscopy – types, Biopsy – uses and types,Overview and Drainage systems and tubes used in

Surgery.

3. Definition, Indication, Incision, Physiological changes and Complications following Common operations like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias, Appendicectomy, Mastectomy, Nephrectomy, Prostatectomy.

4. Burn: Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management, Skin Grafts – Types, Grafting Procedures, Survival of Skin Graft; Flaps – Types and uses of Flaps.

5. ENT: Common problems of ear, otitis media, Otosclerosis, functional achonia and deafness, management facial palsy classification, medical and surgical management of lower motor neuron type of facial palsy.

6. Ophthalmology: Ophthalmologic surgical conditions, refraction's, conjunctivitis, glaucoma, corneal ulcer, iritis, cataract, retinitis, detachment of retina, defects of extra-ocular muscles – surgical management.

7. Surgical Oncology – Cancer – definition, types, clinical manifestations of cancer, Staging of Cancer, surgical procedures involved in the management of cancer.

8. Obstetrics and Gynecology: High risk pregnancy, prenatal and postnatal common complications , investigation and management. Prolapse of uterus and vagina. Principle of common gynaecological operations: hysterectomy, D&C, D&E, Pap smear, pelvic repair, caesarian section, nephrectomy, Hysterosalphyngography, Dilatation and Curettage, Laproscopy, Colposopy, Hysterectomy. Carcinoma of female reproductive organs – surgical management in brief. Mastectomy – Simple, radical, Hysterectomy.

9. Incontinence – Types, Causes, Assessment and Management.

GENERAL ORTHOPEDICS AND TRAUMATOLOGY
BPT-303

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-303	GENERAL ORTHOPEDICS AND TRAUMATOLOGY	144(80T +64 P)	6	6	20 T + 20 P	80 T + 80 P	200

COURSE DESCRIPTION - This subject follows the basic science subjects to provide the knowledge about orthopedic conditions the therapist would encounter in their practice.

COURSE OBJECTIVE-The objective of this course is that after completion of the lectures and discussion the student will be able to demonstrate an understanding of orthopedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

COURSE OUTCOMES

CO1: To understand the traumatology of upper and lower limb fractures with their management.

CO2: To understand the pathophysiology of various musculoskeletal conditions, congenital and acquired anomalies with its treatment protocol.

CO3: Demonstrate an understanding of orthopaedic conditions causing disability, list the aetiology, clinical features and methods of investigations and management.

CO4: To understand the management of various orthopaedic surgeries.

CO5: To understand various injuries, factures and deformities of musculoskeletal system with its treatment Protocol.

1. Introduction: Introduction to orthopedics, Clinical examination in an orthopedic patient, Common investigative procedures, Radiological and Imaging techniques in Orthopedics, Inflammation and repair, Soft tissue healing.
2. Traumatology: Fracture: definition, types, signs and symptoms, Fracture healing Complications of fractures, Conservative and surgical approaches, Principles of management – reduction (open/closed, immobilization etc.), Subluxation/dislocations – definition, signs and symptoms, management (conservative and operative)
3. Fractures and Dislocations of Upper Limb:
4. Fracture of Spine
5. Fractures and Dislocations of Lower Limb
6. Fracture of Pelvis and Lower Limb
7. Soft Tissue Injuries such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, and bursitis. Mechanism of injury of each, clinical features, managements –conservative and surgical
8. Hand Injuries

9. Peripheral Nerve Injuries, Classification of Nerve Injuries, Clinical features and management, including reconstructive surgery for Radial, median and ulnar nerve lesions, femoral nerve, Sciatic and lateral popliteal lesions. Brachial Plexus injuries including Erb's, Klumpke's and Crutch Palsy.
10. Amputations - Definition, levels of amputation of lower and upper limbs, indications, complications.
11. Traumatic Spinal Cord Injuries - Clinical features, complications, medical and surgical management of Paraplegia and Quadriplegia.
12. Deformities – Congenital and Acquired deformities.
13. Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors: Osteoma, Osteosarcoma, Osteochondroma, Enchondroma, Ewing's sarcoma, Giant cell tumor, Multiple myeloma, Metastatic tumors. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis.
14. Inflammatory and Degenerative Conditions: Osteoarthritis, Rheumatoid arthritis, Ankylosing spondylitis, Gouty arthritis, Psoriatic arthritis, hemophilic arthritis, Still's disease (juvenile rheumatoid arthritis), Charcot's joints.
15. Connective Tissue Disorders – Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease.
16. Neuromuscular Disorders: Cerebral palsy, Poliomyelitis, Spinal Dysraphism, Leprosy.
17. Orthopedic Surgeries: Arthrodesis, Arthroplasty (partial and total replacement), Osteotomy, External fixators, Spinal stabilization surgeries (Harrington's, Luque's, Steffi plating) etc. Limb reattachments.

PRACTICAL

Clinical examination in an orthopedic patient, Common investigative procedures, Radiological and Imaging techniques in Orthopedics, SOAP Assessment.

GENERAL MEDICINE
BPT-304

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-304	**GENERAL MEDICINE**	**100(80T+ 20P)**	**4**	**4**	**20 T**	**80 T**	**100**

COURSE DESCRIPTION- This subject follows the basic science subjects to provide the knowledge about relevant aspects of general medicine. The student will have a general understanding of the diseases the therapist would encounter in their practice.

COURSE OBJECTIVE- The objective of this course is that the student will be able to list the etiology, pathology, clinical features and treatment methods for various medical conditions. Infection: Effects of Infection on the body – Pathology – source and spread of infection – vaccinations – generalized infections – rashes and infection – food poisoning and gastroenteritis - Sexually transmitted diseases – HIV infections and Aids.

COURSE OUTCOMES-

CO1: To understand pathophysiological changes in infectious and metabolicdisorders with their treatment

CO2: To understand pathophysiological changes in respiratory and skindisorders with their treatment

CO3: To understand pathophysiological changes in cardiovascular and haematological disorders with their treatment

CO4: To understand clinical features, investigations and management ofpsychiatric disorders.

CO5: The student will be able to differentiate pediatric cases and handling the cases will become easier as they can relate theoretical knowledge with practical learning.

1. Poisoning: Clinical features – general management – common agents in poisoning – pharmaceutical agents – drugs of misuse – chemical pesticides - Envenomation.

2. Food and Nutrition: Assessment – Nutritional and Energy requirements; Deficiency diseases – clinical features and treatment; Protein – Energy Malnutrition: Clinical features and treatment; Obesity and its related

disorders: Causes – Complications – benefits of weight loss – management of Obesity – diet, exercise and medications.

3. Endocrine diseases: Common presenting symptoms of endocrine disease – common classical disease presentations, clinical features and its management; Diabetes Mellitus: Etiology and pathogenesis of diabetes – clinical manifestations of the disease – management of the disease – Complications of diabetes.

4. Diseases of the blood: Examinations of blood disorders – Clinical manifestations of blood disease; Anemia – signs and symptoms – types and management; Hemophilia - Cause – clinical features severity of disease – management – complications due to repeated hemorrhages –complications due to therapy.

5. Diseases of the digestive system : Clinical manifestations of gastrointestinal disease – Etiology, clinical features, diagnosis, complications and treatment of the following conditions : Reflux Oesophagitis, Achlasia Cardia, Carcinoma of Oesophagus, GI bleeding, Peptic Ulcer disease, Carcinoma of Stomach, Pancreatitis, Malabsorption Syndrome, Ulcerative Colitis, Peritonitis, Infections of Alimentary Tract; Clinical manifestations of liver diseases - Aetiology, clinical features, diagnosis, complications and treatment of the following conditions: Viral Hepatitis, Wilson's disease, Alpha 1-antitrypsin deficiency, Tumors of the Liver, Gallstones, Cholecystitis.

6. Diseases of the Skin: Examination and clinical manifestations of skin diseases; Causes, clinical features and management of the following skin conditions: Leprosy, Psoriasis, and Pigmentary Anomalies, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections.

7. Pediatrics : Problems and management of LBW infants, Perinatal problems and management, Congenital abnormalities and management, Respiratory conditions of childhood, Cerebral Palsy - causes, complications, clinical manifestations, treatment ; Spina Bifida - management and treatment, Epilepsies - types, diagnosis and treatment; Recognizing developmental delay, common causes of delay ; Orthopedic and Neuromuscular disorders in childhood, clinical features and management ; Sensory disorders - problems resulting from loss of vision and hearing ; Learning and behavioral problems - Hyperactivity, Autism, Challenging behaviors, Educational delay, The Clumsy Child.

8. Psychiatric Disorders: Classifications, Causes, Clinical manifestations and treatment methods used in Psychiatry, Modalities of psychiatric treatment, Psychiatric illness and physiotherapy, Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses – Anxiety neurosis, Depression, Obsessive compulsive neurosis, Psychosis, Maniac-depressive psychosis, Post-traumatic stress disorder, Psychosomatic reactions: Stress and Health, theories of Stress - Illness.
Etio-pathogenesis, manifestations, and management of psychiatric illnessDrug dependence and alcoholism,
Somato form and Dissociative Disorders – conversion reactions, Somatization,Dissociative Amnesia, and Dissociative Fugue,
Personality disorders

Child psychiatry - manifestations, and management of childhood disorders – attention deficit syndrome and behavioral disorders.
Geriatric psychiatry.

INTRODUCTION TO NATIONAL HEALTH CARE DELIVERY SYSTEM IN INDIA

BPT-305

Students' basic insight into the main features of the Indian health care delivery system and how it compares with the other systems of the world. Topics to be covered under the subject areas follow:

1. Introduction to health care delivery system: Health care delivery system in India at primary, secondary and tertiary care, Community participation in healthcare delivery system, Health system in developed countries. Private Sector, National Health Mission, National Health Policy, Issues in Health Care Delivery System in India
2. National Health Programme - Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.
3. Introduction to AYUSH system of medicine: Introduction to Ayurved, Naturopathy, Unani, Siddha, Homeopathy
   Need for integration of various system of medicine
4. Health scenario of India - past, present and future
5. Demography &Vital Statistics- Demography – its concept, Vital events oflife & its impact on demography, Significance and recording of vital statistics, Census & its impact on health policy.

CLINICAL EDUCATION

BPT-306

Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence based practice will be part of training.

1. Physiotherapy OPD
2. Neurology, Neurosurgery & Neuro ICU
3. Community-PHC
4. Orthopedics
5. General Medicine & MICU
6. General Surgery & CTS ICU

BPT SIXTH SEMESTER

REGIONAL ORTHOPAEDICS AND DIAGNOSTIC IMAGING BPT-307

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-307	REGIONAL ORTHOPAEDICS AND DIAGNOSTIC IMAGING	144(80 T + 64 P)	6	6	20 (T) + 20 (P)	80 (T) + 80 (P)	200

COURSE DESCRIPTION- This subject follows the basic science subjects to provide the knowledge about Orthopedic conditions the therapist would encounter in their practice.

COURSE OBJECTIVE- The objective of this course is that the student will be able to demonstrate an understanding of orthopaedic conditions causing disability, list the aetiology, clinical features and methods of investigations andmanagement.

COURSE OUTCOMES-

CO1: To understand the traumatology of upper and lower limb fractures with their management.

CO2: To understand the pathophysiology of various musculoskeletal conditions, congenital and acquired anomalies with its treatment protocol.

CO3: Demonstrate an understanding of orthopaedic conditions causing disability, list the aetiology, clinical features and methods of investigations andmanagement.

CO4: To understand the management of various orthopaedic surgeries.

CO5: To understand various injuries, factures and deformities of musculoskeletal system with its treatment Protocol.

1. **Regional Conditions**:
   a. **Shoulder**: Periarthritic shoulder (adhesive capsulitis), Rotator cuff tendinitis, Supraspinatus Tendinitis, Infraspinatus Tendinitis, Bicipital Tendinitis, Subacromial Bursitis.
   b. **Elbow**: Tennis Elbow, Golfer's Elbow, Olecranon Bursitis (student's elbow), Triceps Tendinitis.
   c. **Wrist and Hand**: De Quervain's Tenosynovitis, Ganglion, Trigger Finger/Thumb, Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture.
   d. **Pelvis and Hip**: IT Band Syndrome, Piriformis Syndrome, Trochanteric Bursitis.
   e. **Knee**: Osteochondritis Dissecans, Prepatellar and Suprapatellar Bursitis,

Popliteal Tendinitis, Patellar Tendinitis, Chondromalacia Patella, Plica Syndrome, Fat Pad Syndrome (Hoffa's syndrome).

f. **Ankle and Foot**: Ankle Sprains, Plantar Fasciitis/Calcaneal Spur, Tarsal Tunnel Syndrome, Achilles Tendinitis, Metatarsalgia, Morton's neuroma.

g. **Infective conditions**: Osteomyelitis (Acute/chronic), Brodie's abscess, TB spine and major joints like shoulder, hip, knee, ankle, elbow etc.

h. **Arthritic conditions**: Pyogenic arthritis, Septic arthritis, Syphiliticinfection of joints

i. **Syndromes**: Cervico brachial syndrome, Thoracic outlet syndrome, Vertebro-basilar syndrome, Scalenus syndrome, Costoclavicular syndrome, Levator scapulae syndrome, Piriformis syndrome.

j. Cervical and Lumbar Pathology: Prolapsed intervertebral disc (PID), Spinal Canal Stenosis, Spondylosis (cervical and lumbar), Spondylolysis, Spondylolisthesis, Lumbago/Lumbosacral strain, Sacralisation, lumbarisation, Coccydynia, Hemivertebra.

Introduction of types of imaging are most commonly use in orthopaedics and traumatology

1. **X-Ray-**Indication, Contraindication, Advantages, Disadvantages, Common views for different joint, spine and bones, X-ray image reading, clinico- radiological correlation
2. **CT-Scan-**Indication, Contraindication, Advantages, Disadvantages, Types, image and report reading, clinic-radiological correlation
3. **Color Doppler Ultrasound-**Indication, Contraindication, Advantages, Disadvantages for musculoskeletal structure, Types, and report reading, clinic- radiological correlation
4. **MRI-**Indication, Contraindication, Advantages, Disadvantages, Types, image sequence, for spine knee and shoulder, image and report reading, clinic- radiological correlation
5. **Bone Scan-**Indication, contraindication, Advantages, Disadvantages clinico-radiological correlation
6. **PET-Scan-**Indication contra indication, clinic-radiological correlation
7. **BMD-**Indication contra indication and reports correlation with physical findings

PRACTICAL - Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

Bedside case presentations and case discussions

Lab sessions consist of evaluation and assessment methods on studentmodels, patients, treatment techniques and practice sessions

Clinical examination of various regional conditions and diagnostic/clinical tests, investigations of various regional conditions with differential diagnosis.

CLINICAL NEUROLOGY & NEUROSURGERY
BPT-308

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-308	**CLINICAL NEUROLOGY & NEUROSURGERY**	**144 (80T + 64P)**	**6**	**6**	**20 (T) + 20 (P)**	**80 (T) + 80 (P)**	**200**

COURSE DESCRIPTION – This subject follows the basic science subjects to provide the knowledge about relevant aspects of neurology & neurosurgery. An understanding of the approach of neurologists to the health care of people with neurologic conditions. The student will have a general understanding of the diseases the therapist would encounter in their practice.

COURSE OBJECTIVE- The objective of this course is that after 60hrs of lectures and discussion the student will be able to list the etiology, pathology, and clinical features and treatment methods for various neurological conditions. Following the basic science and clinical science course, this course introduces the student to the neurological conditions which commonly cause disability.

COURSE OUTCOMES-

CO1: To understand pathophysiological changes in neurological disorders withtheir assessment

CO2: To understand the management of various neurological disorders CO3: Clinical decision-making ability and management expertise

CO4: Plan a better rehabilitation care for patients pre and post neurosurgery

CO5: To understand the medical and surgical management of various neurological condition.

1. Disorders of function in the context of Pathophysiology, Anatomy in Neurology and Cortical Mapping.
2. Classification of neurological involvement depending on level of lesion.
3. Neurological assessment: Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system.
4. Investigations: principles, methods, views, normal/abnormal values/features, types of following investigative procedures - skull x-ray, CT, MRI, evoked potentials, lumbar puncture, CSF examination, EMG, NCV.
5. Neuro-ophthalmology: Assessment of visual function – acuity, field, colour vision, Pupillary reflex, accommodation reflex, abnormalities of optic disc, disorders of optic nerve, tract, radiation, occipital pole,

disorders of higher visual processing, disorders of pupil, disorders of eye movements, central disorders of eye movement.

6. Deafness, vertigo, and imbalance: Physiology of hearing, disorders of hearing, examination & investigations of hearing, tests of vestibular function, vertigo, peripheral vestibular disorders,central vestibular vertigo.

   Lower cranial nerve paralysis – Etiology, clinical features, investigations, and management of following disorders - lesions in trigeminal nerve, trigeminal neuralgia, trigeminal sensory neuropathy, lesions in facial nerve, facial palsy, bell's palsy, hemifacial spasm, Glossopharyngeal neuralgia, lesions of Vagus nerve, lesions of spinal accessory nerve, lesions of hypoglossal nerve, Dysphagia – swallowing mechanisms, causes of dysphagia, symptoms, examination, and management of dysphagia.

7. Cerebro-vascular diseases: Define stroke, TIA, RIA, stroke in evolution, multi-infarct dementia and Lacunar infarct, Classification of stroke – Ischemic, hemorrhagic, venous infarcts, Risk factors, cause of ischemic stroke, causes of hemorrhagic stroke, Classification of hemorrhagic stroke, classification of stroke based on symptoms, stroke syndrome, investigations, differential diagnosis, medical and surgical management.

8. Head injury: Etiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications.

9. Higher cortical, neuro psychological and neurobehavioral disorders: Causes of blackouts, physiological nature of Epilepsy, classification, clinical features, investigations, medical & surgical management of following disorders

   – Non-epileptic attacks of childhood, Epilepsy in childhood, Seizures, and Epilepsy syndromes in adult, Classification and clinical features of Dyssomnias,Parasomnias, Dementia, Obsessive – compulsive disorders. Neural basis ofconsciousness, causes & investigations of Coma, criteria for diagnosis of Brain death, Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Perceptual disorders and Speech disorders.

10. Movement disorders: Definition, etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of followingdisorders – Parkinson's disease, Dystonia, Chorea, Ballism, Athedosis, Tics, Myoclonus and Wilson's disease.

11. Cerebellar and coordination disorders: Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Congenital ataxia, Friedreich's ataxia, Ataxia telangiectasia, Metabolic ataxia, Hereditary cerebellar ataxia, Tabes dorsalis and Syphilis.

12. Spinal cord disorders: Functions of tracts, definition, etiology, risk factors, pathophysilogy, classification, clinical signs & symptoms,

investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Spinal cord injury, Compression by IVD prolapse, Spinal epidural abscess, Transverse myelitis, Viral myelitis, Syringomyelia, Spina bifida, Sub acute combined degeneration of the cord, Hereditary spastic paraplegia, Radiation myelopathy, Progressive encephalomyelitis, Conus medullaris syndrome, Bladder & bowel dysfunction, and Sarcodosis.

13. Brain tumors and spinal tumors: Classification, clinical features, investigations, medical and surgical management.
14. Infections of brain and spinal cord: Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of followingdisorders – Meningitis, Encephalitis, Poliomyelitis and Post-polio syndrome, Complications of systemic infections on nervous system – Septic encephalopathy, AIDS, Rheumatic fever, Brucellosis, Tetanus, and Pertussis.
15. Motor neuron diseases: - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications of following disorders - Amyotrophic lateral sclerosis, Spinal muscular atrophy, Hereditary bulbar palsy, Neuromyotonia andPost-irradiation lumbosacral polyradiculopathy.
16. Multiple sclerosis - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications.
17. Disorders of neuromuscular junction – Etiology, classification, signs & symptoms, investigations, management, of following disorders Myasthenia gravis, Eaton-Lambert syndrome, and Botulism.
    Muscle diseases: Classification, investigations, imaging methods, Muscle biopsy, Management of muscle diseases, genetic counseling, Classification, etiology, signs & symptoms of following disorders – Muscular dystrophy, Myotonic dystrophy, myopathy, non-dystrophic myotonia.
18. Polyneuropathy – Classification of Polyneuropathies, Hereditary motor sensory neuropathy, hereditary sensory and Autonomic neuropathies, Amyloid neuropathy, acute idiopathic Polyneuropathies, Guillain-Barre syndrome - Causes, clinical features, management of GBS, Chronic Idiopathic Polyneuropathies, diagnosis of polyneuropathy, nerve biopsy.
19. Focal peripheral neuropathy: Clinical diagnosis of focal neuropathy, neurotmesis, Axonotmesis, Neuropraxia, Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – RSD, Nerve tumors, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & Intercostal nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, Sciatic nervepalsy, Tibial nerve

palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, Pudendal nerve palsy.

20. Paediatric neurology: Neural development, Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders - Cerebral palsy, Hydrocephalus, Arnold-chiari malformation, Basilar impression, Klippel-Feil syndrome, Achondroplasia, Cerebral malformations, Autism, Dandy walker syndrome and Down's syndrome.
21. Toxic, metabolic and environmental disorders: Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – Encephalopathy, Alcohol toxicity, Recreational drug abuse,Toxic gases & Asphyxia, Therapeutic & diagnostic agent toxicity, Metal toxicity, Pesticide poisoning, Environmental & physical insults, Pant & Fungal poisoning, Animal poisons, & Complications of organ transplantation.
22. Introduction, Indications and Complications of following Neurosurgeries: Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr- hole, Shunting, Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery, Endarterectomy, Embolization, Pituitary surgery, Ablative surgery - Thalamotomy and Pallidotomy, coiling of aneurysm, Clipping of aneurysm, and Neural implantation.

PRACTICAL - Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

Bedside case presentations and case discussions

Lab sessions consist of evaluation and assessment methods on student models, patients, treatment techniques and practice sessions

Clinical examination of various neurological conditions and diagnostic/clinical tests, investigations of various neurological and neurosurgical conditions with differential diagnosis.

Neurological assessment: Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system.

Investigations: principles, methods, views, normal/abnormal values/features, types of following investigative procedures - skull x-ray, CT, MRI, evoked potentials, lumbar puncture, CSF examination, EMG, NCV.

COMMUNITY PHYSIOTHERAPY AND REHABILITATION

BPT-309

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-309	**COMMUNITY PHYSIOTHERAPY AND REHABILITATION**	**144(80 T + 64 P)**	**6**	**6**	**20 (T) + 20 (P)**	**80 (T) + 80 (P)**	**200**

COURSE DESCRIPTION- The subject serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.

COURSE OBJECTIVE- The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease.

COURSE OUTCOMES-

CO1: To understand the team approach in rehabilitation of disability. To understand the role of community and other institutions for rehabilitation.

CO2: Identification of residual potentials in patients with partial or total disability (temporary or permanent). Formulation of appropriate goals (long & short term) in treatment & rehabilitation will be discussed.

CO3: Application of various orthosis, prosthesis, wheelchairs and other assistive devices for different medical and Physical conditions.

CO4: To understand the importance of administration in setting of department.

CO5: To understand the organizational structure of a department or an organization.

Health scenario of India - past, present and future. Demography & Vital Statistics- Demography – its concept,Vital events of life & its impact on demography, Significance and recording of vital statistics, Census & its impact on health policy,

Epidemiology: Principles of Epidemiology, Natural History of disease, Methods of Epidemiological studies, Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance.

1. Rehabilitation: Definition, Types, Rehabilitation Team.
2. Introduction to Community Based Rehabilitation: Definition, Historical review, Concept of CBR, Need for CBR, Difference between Institution based and Community based Rehabilitation, Objectives of CBR, Scope of CBR,Role of each member of CBR team, Models of CBR.
3. W.H.O. `s policies-about rural health care-concept of primary / tertiary health centers-district hospitals etc-Role of P.T. -
4. Disability: Definition of Impairment, Handicap and Disability, Disability Process, Difference between impairment, handicap and disability, Causes of disability, Types of disability, Prevention of disability, Disability Evaluation.
5. Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies- National level and International NGO's, Multilateraland Bilateral agencies. International Health Organizations: WHO, UNICEF,UNDP, UNFPA, FAO, ILO, World bank, USAID, SIDA, DANIDA, Rockfeller, Ford foundation, CARE, REDCROSS.
6. National District Level Rehabilitation Programme: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker
7. Modifications in physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL.
8. Extension services and mobile units: Introduction, Need, Camp approach.
9. Geriatrics - Role of Physiotherapy in Hospital based care, Half-way homes, Residential homes, Meals on wheels etc. Home for the aged, Institution based Geriatric Rehabilitation. Few conditions: - Alzheimer's disease, Dementia, Parkinson's disease, Incontinence, Iatrogenic drug reactions, etc. Ethics of Geriatric Rehabilitation.
10. Industrial Health & Ergonomics-Occupational Hazards in the industrial area overuse/fatigue injuries, ergonomic evaluation of work place- mechanical stresses per hierarchy–
11. Health and Disease: Definitions, Concepts, Dimensions and Indicators of Health, Concept of well-being.
12. Mental Health: Characteristics of a mentally healthy person, Types of mental illness, Prevention and Management through Physiotherapy.
13. Physiotherapy in Obstetrics, Paediatrics and Geriatrics:, Antenatal, Intranatal and post natal care, Care of children.
14. Occupational Health: Prevention of occupational diseases. Prevention practice: a holistic perspective for physiotherapy. Physiotherapist role for a healthy community
15. Marketing health and wellness.
16. Role of family on individual's health, effects of sickness and disability on other members of family.
17. Social factors in disease and health, Social Problems of diabled and

role of social worker.

18. Introduction to Bio-Engineering; Classification of Orthoses and prostheses; Introduction to surgical anatomy and various pathological deviations with respect to brace fitting, Biomechanical principles of orthoticand prosthetic application, Rationale of prescribing Prosthetic and Orthoticdevices, Types of Prosthetic and Orthotic devices: Spinal, Lower limb, and Upper limb, checkout, usage advice, precautions, and follow-up. Walking aids and wheel chairs: prescription, usage advice, and follow-up.
19. Psychological aspects of orthotic and prosthetic application
20. Occupational Therapy

PRACTICAL:

This will consist of Field visits to urban and rural PHC's, Visits to regional rehabilitation training center, Regular mobile camps, Disability surveys in villages, Disability screening, Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, paediatric, gynecological and geriatric problems in community, Demonstration of evaluation and prescription techniques for ambulatory and assistive devices, Fabrication of low cost assistive devices with locally available materials.

1. Demonstration of methods of using orthotics & prosthetics devices.
2. Methods of organization of community-based rehabilitation centres.
3. Visit of different rehabilitation centres and preparing a report of the visit & viva voce of the aforesaid report.
4. Fabrication & Designing of upper extremity, lower extremity and spinal orthosis, indications and check out;
5. Fabrication & Designing of upper extremity and lower extremity prostheses, indications and check out; prescription and designing of footwear and modifications;
   Fabrication & Designing and construction of adaptive devices

RESEARCH METHODOLOGY & BIOSTATISTICS

BPT-310

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-310	**RESEARCH METHODOLOGY & BIOSTATISTICS**	**60**	**3**	**2**	**20**	**80**	**100**

COURSE OBJECTIVE-

The objective of this module is to help the students understand the basic principles of research and methods. Applied to draw inferences from the research findings.

COURSE OUTCOMES-

CO1: Understand the importance of research in the relative field. Understand the basic concepts and methods of research.

CO2: Interpret differences in data distributions via visual displays. Calculate standard normal scores and resulting probabilities

CO3: Calculate and interpret confidence intervals for population means and proportions. Interpret and explain a p-value.

CO4: Perform a two-sample t-test and interpret the results; calculate a 95% confidence interval for the difference in population means.

CO5: Select an appropriate test for comparing two populations on a continuous measure, when the two-sample t-test is not appropriate. Understand and interpret results from Analysis of Variance (ANOVA), a technique used to compare means amongst more than two independent populations.

RESEARCH METHODOLOGY

1. Introduction to Research methodology: Meaning of research, objectivesof research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research, Problems encountered by researchers in India.
2. Research problem: Statement of research problem, Statement of purpose and objectives of research problem, Necessity of defining the problem
3. Research design: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design
4. Sampling Design: Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design
5. Measurement & scaling techniques: Measurement in research - Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification, important scaling techniques.

6. Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.
7. Sampling fundamentals, need for sampling & some fundamental definitions, important sampling distributions.
8. Processing & analysis of data: Processing operations, problems in processing, Types of analysis, Statistics in research, Measures of central tendency, Dispersion, Asymmetry, relationship.
9. Testing of hypothesis: What is hypothesis? Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, limitations of the tests of hypothesis
10. Computer technology: Introduction to Computers, computer applicationin research, computers & researcher.
11. Format of scientific documents (Structure of protocols, formats reportingin scientific journals, systematic reviews and meta-analysis).
12. Research Ethics and Brief introduction to Clinical trials registry.

BIOSTATISTICS

1. Introduction: Meaning, definition, characteristics of statistics, Importanceof the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.
2. Tabulation of Data: Basic principles of graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve.
3. Measure of Central Tendency: Need for measures of central Tendency, Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped, Meaning and calculation of mode, Comparison of the mean, median and mode, Guidelinesfor the use of various measures of central tendency.
4. Probability and Standard Distributions: Meaning of probability of standard distribution, the binomial distribution, the normal distribution,Divergence from normality – skewness, kurtosis.
5. Sampling techniques: Need for sampling – Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors, Sampling variation and tests of significance.
6. Analysis of variance & covariance: Analysis of variance (ANOVA), whatis ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Covariance (ANACOVA).

INTRODUCTION TO QUALITY AND PATIENT SAFETY
BPT311

1. Quality assurance and management- 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 programs in the health system.
   a. Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norms, Quality Improvement Tools, Introduction to NABH guidelines

2. Basics of emergency care and life support skills-

   Basic life support (BLS) is the foundation for saving lives following cardiac arrest. Fundamental aspects of BLS include immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), and rapid defibrillation with an automated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS. The student is also expected to learn about basic emergency care including first aid and triage. Topics to be covered under the subject are as follows:
   a. Vital signs and primary assessment
   b. Basic emergency care – first aid and triage
   c. Ventilations including use of bag-valve-masks (BVMs)
   d. Choking, rescue breathing methods
   e. One- and Two-rescuer CPR
   f. Using an AED (Automated external defibrillator).
   g. Managing an emergency including moving a patient

   At the end of this topic, focus should be to teach the students to perform the maneuvers in the simulation lab and to test their skills with focus on airways management and chest compressions. At the end of the foundation course, each student should be able to perform and execute/operate on the above-mentioned modalities.

3. Biomedical waste management and environment safety- The aimof this section will be to help prevent harm to workers, property, the environment and the general public. Topics to be covered under the subject are as follows:
   a. Definition of Biomedical Waste
   b. Waste minimization
   c. BMW – Segregation, collection, transportation, treatment and disposal (including color coding) Liquid BMW, Radioactive waste, Metals/Chemicals/Drug waste

d. BMW Management & methods of disinfection
e. Modern technology for handling BMW
f. Use of Personal protective equipment (PPE)
g. Monitoring & controlling of cross infection (Protective devices)

4. Infection prevention and control - The objective of this section will be to provide a broad understanding of the core subject areas of infection prevention and control and to equip AHPs with the fundamental skillsrequired to reduce the incidence of hospital acquired infections and improve health outcomes. Concepts taught should include–

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

PROFESSIONALISM AND VALUES

BPT-312

The module on professionalism will deliver the concept of what it means to be a professional and how the physiotherapy profession is different from a usual vocation. It also explains how relevant professionalism is in terms of the healthcare system and how it affects the overall patient environment.

1. Professional values - Integrity, Objectivity, Professional competence and due care, Confidentiality. Core values - Accountability, Altruism, Compassion/ caring, excellence, integrity, professional duties, social responsibility.
2. Personal values – ethical or moral values
3. Attitude and behavior – professional behavior, treating people equally
4. Code of conduct, professional accountability and responsibility, misconduct
5. Differences between professions and importance of team efforts
6. Cultural issues in the healthcare environment
7. Entry level healthcare practitioner, direct access, autonomy in profession,practitioner of practice and evidence-based practice.

<u>The five roles of the Physiotherapist-</u>

1. The Physiotherapist as Patient/Client manager

   Evaluation and diagnosis, Diagnosis as clinical decision making, Prognosis, Discharge planning and discontinuance of care, Discontinuance of care, Outcomes, Clinical decision making, Referral relationships, Interpersonal relationships, Ethical and legal issues, Informed consent, Managed care and fidelity.
2. The Physiotherapist as Consultant

   Physiotherapy consultation, Building a consulting business, The consulting process, The skills of a good consultant, Trust in the consultant/client relationship, Ethical and legal issues in consultation, Components of a consulting agreement.
3. The Physiotherapist as Critical Inquirer

   a. History of critical inquiry, Evidence-based practice, Outcomes research Whose responsibility is research? Roles of the staff physiotherapist in criticalinquiry, Collaboration in clinical research, Ethical and legal issues in critical inquiry.

4. The Physiotherapist as Administrator

History of physiotherapy administration, Contemporary physiotherapy administration, Patient/client management, First-line management, Mid level managers and chief executive officers, Leadership, Ethical and legal issues.

5. The Physiotherapist as Educator

History of physiotherapy education, Contemporary educational roles of the physiotherapist, teaching opportunities in continuing education, Academic teaching opportunities, Theories of teaching and learning in professional education, Ethical and legal issues in physiotherapy education.

CLINICAL EDUCATION

BPT-313

Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence based practice will be part of training.

1. Physiotherapy OPD
2. Neurology, Neurosurgery & Neuro ICU
3. Community-PHC
4. Orthopedics
5. General Medicine & MICU
6. General Surgery & CTS ICU

BPT SEVENTH SEMESTER

PHYSIOTHERAPY IN ORTHOPEDICS-I

BPT-401

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-401	**PHYSIOTHERAPY IN ORTHOPEDICS-I**	**100(60 T + 40P)**	**4**	**4**	**20 (T) + 20 (P)**	**80 (T) + 80 (P)**	**200**

COURSE DESCRIPTION- The subject serves to integrate the knowledge gained by the students in orthopedics and traumatology with skills to apply these in clinical situations of dysfunction and musculoskeletal pathology.

COURSE OBJECTIVE- The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to do functional diagnosis and identify disabilities due to musculoskeletal dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function.

COURSE OUTCOMES-

CO1: To understand traumatology of Upper and lower limb fractures, withtheir treatment protocols.

CO2: Assess the patients with musculoskeletal conditions.

CO3: To understand the pathophysiology of various inflammatory and infective conditions of musculoskeletal system with its treatment protocol. CO4: To understand PT evaluation of Orthopedics conditions.

CO5: To understand PT management of Orthopedics conditions.

PT functional diagnosis and assessment for orthopedic conditions – SOAP format, Subjective-history taking, informed consent, personal, past, medical and socio-economic history, chief complaints, history of present illness. Pain assessment - intensity, character, aggravating and relieving factors, site and location. Objective - on observation - body built swelling, muscle atrophy, deformities, posture and gait, on palpation- tenderness- grades, muscle spasm, swelling- methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination – ROM – active and passive, resisted isometric tests, limb length - apparent, true and segmental, girth measurement, muscle length testing - tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination - dermatomes,

myotomes and reflexes, special tests and functional tests, prescription of home program, Documentation of case records, and follow up.

Fractures - types, classification, signs and symptoms, complications, Fracture healing – factors affecting fracture healing, Principles of fracture management - reduction - open and closed, immobilization - sling, cast, brace, slab, traction - manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing, PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and malunion, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases, Aims of PT management in fracture cases - short- and long-term goals, Principles of PT management in fractures – Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.

1. Specific fractures and dislocations: PT assessment and management of upper limb fractures and dislocations, PT assessment and management of lower limb fractures and dislocations including pelvis, PT assessment and management spinal fractures.
2. Selection and application of physiotherapeutic techniques, maneuver's, modalities for preventive, curative and rehabilitative means in all conditions.
3. Principles of various schools of thought in manual therapy (Briefly Maitland and Mckenzie).
4. Degenerative and inflammatory conditions: Definition, signs and symptoms, clinical features, pathophysiology, radiological features, deformities,medical, surgical management, describe the PT assessment and management and home program for the following conditions – Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritis shoulder.
5. Infective conditions: Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management, Describe PT assessment and management for following conditions – Osteomyelitis – acute and chronic, Septic arthritis, pyogenic arthritis, TB spine and major joints- knee and hip.
6. Define; review the postural abnormalities of spinal column, clinical features, and deformities, medical and surgical management, Describe PT assessment and management and home program.
7. Deformities: Review in detail the causes, signs and symptoms, radiological features, medical and surgical management, Describe the PT assessment and management of the following conditions: Congenital: CTEV, CDH, Torticollis, pes planus, pes cavus and other

common deformities, Acquired: scoliosis, kyphosis, coxa vara, genu varum, valgum and recurvatum.

8. Cerebral palsy: Definition, etiology, classification, clinical features, complications, deformities, medical and surgical management and home program with special emphasis on carrying techniques, PT management after surgical corrections.
9. Poliomyelitis: Definition, etiology, types, pathophysiology, clinical features, deformities, medical and surgical management, PT assessment and management after surgical corrections and reconstructive surgeries- emphasis on tendon transfer and home program.
10. Leprosy: Definition, cause, clinical features, medical and surgical management, PT assessment, aims, and management after surgical procedures such as tendon transfer both pre and post operatively.
11. Amputations: Definition, levels, indications, types, PT assessment, aims, management pre and post operatively PT management with emphasis on stump care and bandaging, Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management.
12. Effects of spinal traction, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction.
13. Osteoporosis- causes, predisposing factors, investigations and treatment.
14. Orthopedic surgeries: Pre and post-operative PT assessment, goals, precautions and PT management of following surgeries such as : Arthrodesis, Osteotomy, Arthroplasty - partial and Total - Excision arthroplasty, excision arthroplasty with implant, inter positional arthroplasty and Total replacement;Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Reattachment of limbs, External fixators, Synovectomy.

PRACTICAL

Practical shall be conducted for all the relevant topics discussedin theory in the following forms: 1. Bedside case presentations and case discussions 2. Lab sessions consist of evaluation and assessment methods on student models, treatment techniques and practice sessions.

PHYSIOTHERAPY IN NEUROLOGY-I

BPT-402

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT- 402	PHYSIOTHERAPY IN NEUROLOGY -I	100(60 T + 40 P)	4	4	20 (T) + 20 (P)	80 (T) + 80 (P)	200

SUBJECT DESCRIPTION- The subject serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology.

COURSE OBJECTIVE- The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to do functional diagnosis and identify disabilities due to neurological dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function.

COURSE OUTCOMES-

CO1: Be able to develop psychomotor skills to implement timely and appropriate physiotherapy assessment tools/techniques to ensure a holistic approach to patient evaluation in order to prioritize patient's problems.

CO2: Be able to select timely physiotherapeutic interventions to reduce morbidity and physiotherapy management strategies, suitable for the patients' problems and indicator conditions based on the best available evidence.

CO3: Implement appropriate neuro-physiotherapeutic approaches

CO4: Be able to develop behavioral skills and humanitarian approach while communicating with patients, relatives, society and co-professionals, to promote individual and community health.

CO5: Implement electrotherapeutic modalities, joint and soft tissue mobilizations and ergonomic advice for neuromuscular.

1. **Neurological Functional diagnosis and Assessment**: Required materials for examination, Chief complaints, History taking – Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function – Consciousness, Orientation, Wakefulness, memory, Speech, Reading, Language, Writing, Calculations, Perception, Left right confusion, Reasoning, and Judgment, Motor Examination– Muscle power, Muscle tone, Spasticity, Flaccidity, Reflexes–Developmental reflexes, deep tendon reflexes, Superficial reflexes, Sensory examination– Superficial, Deep and Cortical sensations, Special tests– Romberg's, Kernig's sign, Brudenzki sign, Tinels's sign, Slump test, Lehermitte's sign, Bell's Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc, Balance examination, coordination examination, Gait analysis – Kinetics & Kinematics (Quantitative & Qualitative analysis), Functional Analysis,

Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading, Differential diagnosis.

2. **Neuro physiological Techniques** – Concepts, Principles, Techniques, Effects of following Neurophysiological techniques: NDT, PNF, Vojta therapy, Rood's Sensory motor Approach, Sensory Integration Approach, Brunnstorm movement therapy, Motor relearning program, Contemporary task-oriented approach, Muscle re-education approach and Constraint induced movementtherapy.
3. **Paediatric Neurology**: Paediatric Examination, Developmental milestones, developmentalreflexes, Neurodevelopmental screening tests,Evaluation & Management- History, Observation, Palpation,Milestone Examination, developmental reflex Examination, Higher mental function,cranial nerve examination, Motor & Sensory examination,Reflextesting, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & LongTerm goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches &Modalities in Risk babies, Minimum brain damage, Developmental disorders,Cerebral palsy, Autism, Down's Syndrome, Hydrocephalus, Chorea, Spina bifida, and syringomyelia.
4. **Evaluation and Management of Brain and Spinal Cord Disorders** : History, Observation, Palpation, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neuro physiological approaches & Modalities in Cerebrovascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumors, Perceptual disorders, Amyotrophic lateral sclerosis and Multiple sclerosis.

   Evaluation and Management of Cerebellar, Spinal Cord and Muscle Disorders : History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neuro physiological approaches & Modalities in Ataxia, Sensory Ataxia, Parkinson's disease, Muscular dystrophy (DMD), Myasthenia gravis, Eaton- Lambert syndrome, Spinal Tumors, Spinal cord injury, Transverse myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post-Polio Syndrome.
5. **Evaluation and Management of Peripheral Nerve Injuries and Disorders:** History, Observation, Palpation, Motor & Sensory examination, Reflex testing,

differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neuro physiological approaches & Modalities in Hereditary motor sensory neuropathy, Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudendal nerve palsy.

6. Assessment and management of Neurological gaits: Quantitative and Qualitative (Kinetic & Kinematics) analysis, List of Problems, short- & Long- Term goals, Management of following Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, waddlinggait, Scissoring gait, Spastic gait, Choreaform Gait, Diplegic Gait, and Myopathic Gait.
7. Pre and post-surgical assessment and treatment following conditions-Spinal disc herniation, Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine, Spinal cord and peripheral nerves, Cerebral aneurysms, Subarachnoid hemorrhages, epilepsy, Parkinson's disease, Chorea, Hemiballism, Psychiatric disorders, Malformations of the nervous system, Carotid artery stenosis, Arteriovenous malformations, and Spina bifida.
8. Vertigo-Assessment and Management.
9. Applied Yoga in Neurological conditions.

PRACTICAL

Practical shall be conducted for all the relevant topicsdiscussed in theory in the following forms:

1. Bedside case presentations and case discussions.
2. Lab sessions consist of evaluation and assessment methods on student models, treatment techniques and practice sessions.

PHYSIOTHERAPY IN CARDIOPULMONARY CONDITIONS-I

BPT-403

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT- 403	PHYSIOTHERAPY IN CARDIOPULMONARY CONDITIONS -I	100(60T + 40 P)	4	4	20 (T) + 20 (P)	80 (T) +80 (P)	200

COURSE DESCRIPTION- The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra- indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

COURSE OUTCOMES-

CO1: Interpretation of different invasive and non-invasive diagnostic investigation to make proper assessment in various respiratory and cardiovascular dysfunction

CO2: Develops the skills to execute different Physiotherapy techniques used in treatment of Cardio-respiratory dysfunctions.

CO3: To select strategies for cure, care & prevention; adopt restorative & rehabilitative measures for maximum possible functional independence of a patient at home, work place & in community.

CO4: Be able to execute the effective Physiotherapeutic measures with appropriate clinical reasoning to improve pulmonary function.

CO5: To design & execute effective tailored cardiopulmonary rehabilitation programme.

THEORY-

1. Anatomical and Physiological differences between the Adult and Pediatric lung.
2. Bedside assessment of the patient- Adult & Pediatric.
3. Investigations and tests – Exercise tolerance Testing – Cardiac & Pulmonary, Radiographs, PFT, ABG, ECG, Hematological and Biochemical Tests.
4. Physiotherapy techniques to increase lung volume – controlled mobilization, positioning, breathing exercises, Neuro physiological Facilitation of Respiration, Mechanical aids – Incentive Spirometry, CPAP, IPPB.
5. Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, mechanical aids– IPPB, CPAP, BiPAP.
6. Physiotherapy techniques to clear secretions – Hydration, Humidification

& Nebulisation, Mobilisation and Breathing exercises, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical Aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Nasopharyngeal Suctioning.

7. Drug therapy– Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulizers.
8. Neonatal and Pediatric Physiotherapy– Chest physiotherapy for children, the neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit.

PHYSIOTHERAPY IN SPORTS-I
BPT-404

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-404	**PHYSIOTHERAPY IN SPORTS-I**	**100(60T + 40 P)**	**4**	**4**	**20 (T) + 20 (P)**	**80 (T) + 80 (P)**	**200**

COURSE OBJECTIVE- Be able to identify, discuss & analyze, the Musculo skeletal dysfunction in terms of Biomechanical, Kinesiological and Biophysical basis & co-relate the same with the provisional diagnosis, routine radiological& Electro-physiological investigations and arrive at appropriate functional diagnosis with clinical reasoning for fitness training & rehabilitation.

COURSE OUTCOMES-

CO1: Understand the psychosocial factors, environmental factors & individual factors affecting the performance.

CO2: Use the anatomical rationale for the clinical tests used in differential diagnosis.

CO3: Be able to identify, discuss & analyse, the various cardio-respiratory function & co-relate the same with the provisional diagnosis, for fitness training & rehabilitation.

CO4: Lay down rehabilitation protocol for sports specific injuries focusing an early rehabilitation to injuries. Identify the causes prone for injury &prevent them.

CO5: Guide participants for a confident sports activity & rehabilitation to attain maximal achievement and to understand the role of Sports physiotherapist in the team

1. Pre-exercise evaluation
2. Principles of injury prevention.
3. Principles of training & Rehabilitation in sports injuries.
4. Physiological effects of exercise on body systems - Muscular system,Endocrine system, Cardio-respiratory system, Nervous system
5. Sports injuries
   Shoulder – instability, rotator cuff injury, biceps tendonitis and rupture, pectoralis major rupture, scapular dyskinesis and acromio-clavicular joint injuries, Elbow – tennis elbow, golfer's elbow, Wrist and hand – carpal tunnel syndrome, gamekeeper's thumb.
6. Doping

PRACTICAL

1. Practical demonstration of basic principles of physiotherapy assessment, functional Assessment and application of sports physiotherapy

   Students must maintain a logbook. The duly completed logbook should besubmitted during practical examination.

PHYSIOTHERAPY IN GENERAL MEDICAL & SURGICAL CONDITION
BPT-405

Course No.	Title	Total Hour	Hours week	Credit	IA Mark	SE Mark	Total Mark
BPT-405	PT IN GENERAL MEDICAL & SURGICAL CONDITION	100(60T + 40P)	4	4	20 (T) + 20 (P)	80 (T) + 80 (P)	200

COURSE DESRCIPTION- Acquire the knowledge of evaluation and physiotherapeutic treatment for medical and surgical conditions. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation.

COURSE OBJECTIVE- To Identify discuss and analyze cardiovascular and pulmonary dysfunction. Acquire knowledge of rational of basic investigative approaches in the medical system and surgical intervention.

COURSE OUTCOME-

CO1: To understand pathophysiological changes during antenatal and infectious andmetabolic disorders with their PT treatment
CO2: To understand pathophysiological changes in respiratory and cardiovasculardisorders with their PT treatment
CO3: To understand pathophysiological changes in burn and oncology with their PTtreatment
CO4: Diagnose condition from history taking, clinical evaluation and investigation in patients with skin disorders and wound.
CO5: To understand various injuries with its treatment Protocol

Review of the pathophysiology and principles of Physiotherapeutic management in the following conditions:

1. Metabolic and Deficiency Diseases: Diabetes Mellitus, Osteoporosis, Obesityetc. Physiotherapy management of Hypertension.
2. Oncology
a. Classification and Characteristics of common tumours
b. Carcinoma breast.
c. Carcinoma head and neck.
d. Complications of Tumors
3. Common condition of Skin - Acne, Psoriasis, Alopecia, Leucoderma, Leprosy.
4. AIDS
5. Oedema -Definition, types, factors controlling tissue fluid circulation, causeof edema, Physiotherapy assessment and management of edema

6. Inflammation -Signs of inflammation, stages
   a. Acute, chronic and suppurative
   b. Physiotherapy management
7. Gangrene
   a. Types and their management
8. Psychiatric Disorders
   - **Introduction:** Definition, defence mechanism, symptomatology, types &causes of mental disorders, psychosomatic disorders.
   - **Disorders:-**

   a. Psychosis – Schizophrenia (including paranoid), Manic Depressive psychosis
   b. Obsessive-compulsive Disorders
   c. Dementia – types & principles of management.
   d. Depressive disorders
   e. Anxiety Disorders
   f. Neurosis
   g. Alzheimer's Disease

   - Therapies –

   a. Psychotherapy–Group therapy, Psychodrama,
   b. Behaviour modification,
   c. Family therapy
   d. Play therapy,
   e. Psychoanalysis,
   f. Hypnosis.
9. Geriatric Medicine
   - Normal aging – definition, the anatomical, physiological and cognitivechanges related to aging
   - The examination & assessment of a geriatric patient.
   - Common Problems with Elderly-Its assessment and Management
   - Falls in Elderly
   - Physiotherapy Management
   -

PRACTICAL:

Practical shall be conducted for all the relevant topicsdiscussed in theory in the following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consist of evaluation and assessment methods on studentmodels, treatment techniques and practice sessions.

PHYSIOTHERAPY IN GENERAL SURGICAL CONDITIONTHEORY

1. Physiotherapy in mother and child care – ante and post-natal management, early intervention and stimulation therapy in childcare (movementtherapy)
2. Applied Yoga in Obstetric and Gynecological conditions
3. Complication common to all operations
4. Abdominal incisions.
5. Physiotherapy in pre and post-operative stages.
6. Operations on upper G.I.T.- oesophagus, stomach, duodenum
7. Operations on large and small intestine–Appendectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, herniorrhaphy, hernioplasty.
8. Physiotherapy in dentistry
9. Burns and its treatment– physiotherapy in burns, skin grafts, and reconstructive surgeries.
10. Management of wound ulcers- Care of ulcers and wounds- Care of surgical scars- U.V.R and other electro therapeutics for healing of wounds, prevention of Hyper-granulated Scars Keloids, Electro therapeutics measures for relief of pain during mobilization of scars tissues.
11. Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases.
12. Physiotherapy in dermatology - Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. Faradic foot bath for Hyperhidrosis. Massage maneuvers for cosmetic purposes of skin; use of specific oil as medium; Care of anesthetic hand and foot; Evaluation, planning and management of leprosy-prescription, fitting and training with prosthetic andorthotic devices.
13. ENT– sinusitis, non-suppurative and chronic suppurative otitis media, osteosclerosis, labrynthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngeo – laryngectomy, facial palsy.
14. Sexual Rehabilitation- Male and female Sexual health issues post disability, Role of physiotherapist in counselling about sexual health of patients with special needs, stroke and post-ICU discharge patients. Erectile dysfunction and role of Physiotherapy. Principles and techniques of Pilates and allied therapeutics in sexual dysfunction.
15. Physiotherapy management in Peripheral Vascular diseases.

PRACTICAL ;

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

Bedside case presentations and case discussions

Lab sessions consist of evaluation and assessment methods on student models, treatment techniques and practice sessions.

EVALUATION METHODS AND OUTCOME MEASURES
BPT-406

Implement methods to assess individual and collective outcomes of patients/clients with disorders of the musculoskeletal, neuromuscular, cardiovascular, pulmonary and integumentary systems using valid and reliable measures that take into account the setting in which patients/clients receive services, the variables of cultural competence, and the effect of societal factors.

CLINICAL REASONING AND EVIDENCE BASED PHYSIOTHERAPY PRACTICE-
BPT-407

1. Introduction to Evidence Based Practice: Definitions, Evidence Based Practice.
2. Concepts of Evidence based Physiotherapy: Awareness, Consultation, Judgement, and Creativity.
3. Development of Evidence based knowledge, The Individual Professional, Professionals with in a discipline, and Professionals across disciplines
4. Evidence Based Practitioner: The Reflective Practitioner, The E Model,Using the E Model
5. Finding the Evidence: Measuring outcomes in Evidence Based Practice, Measuring Health Outcomes, Measuring clinical outcomes, Inferential statistics and Causation
6. Searching for the Evidence: Asking Questions, identifying different sourcesof evidence, Electronic Bibliographic databases and World Wide Web, Conducting a literature search. Step by-step search for evidence
7. Assessing the Evidence: Evaluating the evidence; Levels of evidence in research using quantitative methods, Levels of evidence classification system, Outcome Measurement, Biostatistics, the critical review of research using qualitative methods.
8. Systematically reviewing the evidence: Stages of systematic reviews, Meta- analysis, The Cochrane collaboration
9. Economic evaluation of the evidence: Types of economic evaluation, conducting economic evaluation, critically reviewing economic evaluation, locating economic evaluation in the literature.
10. Using the evidence: Building evidence in practice; Critically Appraised Topics (CATs), CAT format, Using CATs, Drawbacks of CATs
11. Practice guidelines, algorithms, and clinical pathways: Recent trends in health care, Clinical Practice Guidelines (CPG), Algorithms, Clinical pathways, Legal implications in clinical pathways and CPG, Comparison of CPGs, Algorithms and Clinical Pathways
12. Communicating evidence to clients, managers and funders: Effectively communicating evidence, Evidence based communication in the face of uncertainty; Evidence based communication opportunities in everyday practice. Research dissemination and transfer of knowledge: Models of research transfer, Concrete research transfer strategies, Evidence based policy

CLINICAL EDUCATION

BPT-408

Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence based practice will be part of training.

1. Physiotherapy OPD
2. Neurology, Neurosurgery & Neuro ICU
3. Community-PHC
4. Orthopedics
5. General Medicine & MICU
6. General Surgery & CTS ICU

BPT EIGHTH SEMESTER

PHYSIOTHERAPY IN ORTHOPEDICS-II
BPT-409

Course No.	Title	Total Hour	Hours / week	Credit	IA Mark	SE Mark	Total Mark
BPT- 409	PHYSIOTHERAPY IN ORTHOPEDICS -II	100(60 T + 40 P)	4	4	20 (T) + 20 (P)	80 (T) +80(P)	200

COURSE DESCRIPTION- The subject serves to integrate the knowledge gained by the students in orthopedics and traumatology with skills to apply these in clinical situations of dysfunction and musculoskeletal pathology.

COURSE OBJECTIVE- The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to do functional diagnosis and identify disabilities due to musculoskeletal dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function.

COURSE OUTCOMES-

CO1: To understand traumatology of upper and lower limb fractures, withtheir treatment protocols.
CO2: Assess the patients with musculoskeletal conditions.
CO3: To understand the pathophysiology of various inflammatory and infective conditions of musculoskeletal system with its treatment protocol.
CO4: To understand PT evaluation of Orthopedics conditions.
CO5: To understand PT management of Orthopedics conditions.

1. **Amputations**: Definition, levels, indications, types, PT assessment, aims, management pre and post operatively PT management with emphasis on stump care and bandaging, Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management.
2. **Spinal conditions**: Review the causes, signs and symptoms, investigations, radiological features, neurological signs. PT assessment, aims, and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta.

3. Effects of spinal traction, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction.
4. Osteoporosis- causes, predisposing factors, investigations and treatment.
5. **Orthopedic surgeries**: Pre and post-operative PT assessment, goals, precautions and PT management of following surgeries such as : Arthrodesis, Osteotomy, Arthroplasty - partial and Total - Excision arthroplasty, excision arthroplasty with implant, interpositional arthroplasty and Total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy,lengthening; Arthroscopy, Spinal stabilization, Reattachment of limbs, External fixators, Synovectomy.
6. **Shoulder joint**: Shoulder instabilities, TOS, RSD, Impingement syndrome - conservative and post-operative PT management. Total shoulder replacement and Hemi replacement. - Postoperative PT management. AC joint injuries – rehabilitation, Rotator cuff tears- conservative and surgical repair, Subacromial decompression- Post operative PT management.
7. **Elbow and forearm**: Excision of radial head - Post operative PT management. Total elbow arthroplasty-Post operative PT management.
8. **Wrist and Hand**: Total wrist arthroplasty, Repair of ruptured extensor tendons, Carpal tunnel syndrome, Flexor and extensor tendon lacerations- Post operative PT management.
9. **Hip**: Joint surgeries - hemi and Total hip replacement - Post operative PT management Tendonitis and bursitis - Management.
10. **Knee**: Lateral retinacular release, chondroplasty- Post operative management. Realignment of extensor mechanism, ACL and PCL reconstruction surgeries - Post operative rehabilitation, Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome- conservative management. TKR- rehabilitation protocol, Patellar tendon ruptures and Patellectomy- rehabilitation.
11. Ankle and foot: Ankle instability, Ligamentous tears- Postoperative management.
12. Applied Yoga in orthopedic conditions.

PRACTICAL ;

Practical shall be conducted for all the relevant topicsdiscussed in theory in the following forms:

- Bedside case presentations and case discussions
- Lab sessions consist of evaluation and assessment methods on student models, treatment techniques and practice sessions.

PHYSIOTHERAPY IN NEUROLOGY-II

BPT-410

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT-410	**PHYSIOTHERAPY IN NEUROLOGY II**	**100(60T + 40P)**	**4**	**4**	**20 (T) + 20 (P)**	**80 (T) + 80 (P)**	**200**

COURSE DESCRIPTION- The subject serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology.

COURSE OBJECTIVE- The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to do functional diagnosis and identify disabilities due to neurological dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapyin these clinical situations to restore neurological function.

COURSE OUTCOMES-

CO1: Be able to develop psychomotor skills to implement timely and appropriate physiotherapy assessment tools/techniques to ensure a holistic approach to patient evaluation in order to prioritize patient's problems.

CO2: Be able to select timely physiotherapeutic interventions to reduce morbidity and physiotherapy management strategies, suitable for the patients' problems and indicator conditions based on the best available evidence.

CO3: Implement appropriate neuro-physiotherapeutic approaches

CO4: Be able to develop behavioral skills and humanitarian approach while communicating with patients, relatives, society and co-professionals, to promote individual and community health.

CO5: Implement electrotherapeutic modalities, joint and soft tissue mobilizations and ergonomic advice for neuromuscular.

1. **Evaluation and Management of Brain and Spinal Cord Disorders** : History, Observation, Palpation, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neuro physiological approaches & Modalities in Cerebrovascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumors, Perceptual disorders, Amyotrophic lateral sclerosis andMultiple sclerosis.
2. **Evaluation and Management of Cerebellar, Spinal Cord and Muscle Disorders**: History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance &

Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neuro physiological approaches & Modalities in Ataxia, Sensory Ataxia, Parkinson's disease, Muscular dystrophy (DMD), Myasthenia gravis, Eaton- Lambert syndrome, Spinal Tumors, Spinal cord injury, Transverse myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post-Polio Syndrome.Evaluation and Management of Peripheral Nerve Injuries and Disorders: History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications,short & Long Term goals, Management of systemic complications, Management ofMechanical Complications, Use of various Neuro physiological approaches & Modalities in Hereditary motor sensory neuropathy, Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudendal nerve palsy.

3. Assessment and management of Neurological gaits: Quantitative and Qualitative (Kinetic & Kinematics) analysis, List of Problems, short & Long Term goals, Management of following Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Choreaform Gait, Diplegic Gait, and Myopathic Gait.
4. Pre and post-surgical assessment and treatment following conditions- Spinaldisc herniation, Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine, Spinal cord and peripheral nerves, Cerebral aneurysms, Subarachnoid hemorrhages, epilepsy, Parkinson's disease, Chorea, Hemiballism,Psychiatric disorders, Malformations of the nervous system, Carotid artery stenosis, Arteriovenous malformations, and Spina bifida.
5. Vertigo-Assessment and Management.
6. Applied Yoga in Neurological conditions.

PRACTICAL: Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consist of evaluation and assessment methods on student models, treatment techniques and practice sessions.

PHYSIOTHERAPY IN CARDIOPULMONARY CONDITIONS – II
BPT-411

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT- 411	PHYSIOTHERAPY IN CARDIOPULMONARY CONDITIONS-II	100(60T + 40 P)	4	4	20 (T) + 20 (P)	80 (T) + 80 (P)	200

COURSE DESCRIPTION- The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra- indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

COURSE OUTCOMES

CO1: Interpretation of different invasive and non-invasive diagnostic investigation to make proper assessment in various respiratory and cardiovascular dysfunction

CO2: Develops the skills to execute different Physiotherapy techniques used in treatment of Cardio-respiratory dysfunctions.

CO3: To select strategies for cure, care & prevention; adopt restorative & rehabilitative measures for maximum possible functional independence of a patient at home, work place & in community.

CO4: Be able to execute the effective Physiotherapeutic measures with appropriate clinical reasoning to improve pulmonary function.

CO5: To design & execute effective tailored cardiopulmonary rehabilitation programme.

THEORY

1. Physiotherapy in Obstructive lung conditions.
2. Physiotherapy in Restrictive lung conditions.
3. Management of breathlessness.
4. Pulmonary Rehabilitation.
5. Physiotherapy following Lung surgeries
6. Respiratory failure– Oxygen Therapy and Mechanical Ventilation.
7. Introduction to ICU : ICU monitoring – Apparatus, Airways and Tubes used in the ICU - Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, NearDrowning, ARDS, Shock; Dealing with an Emergency Situation in the ICU. assessment and management of ICU acquired weakness and anxiety.

8. Physiotherapy management following cardiac surgeries.
9. Cardiac Rehabilitation.
10. Physiotherapy management following PVD.
11. Abdominal Surgeries- Management of Pulmonary Restorative Dysfunction following surgical procedures on Abdomen and Thorax.
12. Home program and education of family members in patient care.
13. Applied Yoga in Cardio-respiratory conditions

PRACTICAL:

Practical shall be conducted for all the relevant topics discussed in theory inthe following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consist of evaluation and assessment methods on studentmodels, treatment techniques and practice sessions.

PHYSIOTHERAPY IN SPORTS-II
BPT-412

Course No.	Title	Total Hour	Hours/ week	Credit	IA Mark	SE Mark	Total Mark
BPT- 412	**PHYSIOTHERAPY IN SPORTS-II**	**100(60 T+40 (P)**	**4**	**4**	**20(T) +20 (P)**	**80 (T) +80 (P)**	**200**

COURSE DESCRIPTION : The subject serves to integrate the knowledge gained by the students in biomechanics with physiotherapy skills to apply these in clinical situations of sports injuries.

COURSE OBJECTIVE: Be able to identify, discuss & analyze, the Musculo skeletal dysfunction in terms of Biomechanical, kinesiological and biophysical basis & co-relate the same with the provisional diagnosis, routine radiological& Electro-physiological investigations and arrive at appropriate functional diagnosis with clinical reasoning for fitness training & rehabilitation.

COURSE OUTCOMES:

CO1: Understand the psychosocial factors, environmental factors & individual factors affecting the performance.

CO2: Use the anatomical rationale for the clinical tests used in differential diagnosis in sports physiotherapy.

CO3: Be able to identify, discuss & analyze, the various sports injuries & co-relate the mechanism of injury with the provisional diagnosis, for fitness training & rehabilitation.

CO4: Lay down rehabilitation protocol for sports specific injuries focusing an early rehabilitation to injuries. Identify the causes prone for injury & prevent them.

CO5: Guide participants for a confident sports activity & rehabilitation to attain maximal achievement and to understand the role of Sports physiotherapist inthe team

1. **Sports injuries** –

Spine – PIVD, Kissing spine, cervical whiplash injuries, facet joint syndrome, SI joint dysfunction.
Hip – muscle strain, piriformis syndrome, ITB syndrome, osteitis pubis.
Knee – menisci, cruciate, collateral, osteochondritis, chondromalacia patellae, biceps femoris tendonitis, swimmers knee, patello-femoral pain syndrome.

Leg & ankle – shin splint, achilles tendonitis & rupture, TA bursitis, ankle sprain, plantar fasciitis, foot injuries.
Head & face – maxill orofacial injuries, helmet compression syndrome.

2. **Sports in Special age groups**: Female athlete triad, Younger athlete- Musculoskeletal problems, management, children with chronic illness and nutrition. Older Athlete- Physiological changes with aging, benefits, risks of exercise in elderly, exercise prescription guidelines for elderly.

3. **Fitness**: Key concepts of fitness
    a. Defining & Measuring Fitness
    b. Assessment of Stress with a Survey.
    c. Visualizing Fitness
    d. Screening for Mental and Physical Fitness
    e. Body Mass Index calculations.

4. Fitness training

- Physical Activities Readiness Questionnaire
- Physical activities pyramid
- Exercise programs and evidence – based practice
- Measurement of fitness components and sports skills - Measurement of muscular Strength, Measurement of muscular endurance,
- Measurement of flexibility, Determination of exercise endurance.

5. Sports Massage and Dry needling in Athletes.

PRACTICAL

1. Practical demonstration of basic principles of physiotherapy assessment,functional.
2. Assessment and application of sports physiotherapy
3. Students must maintain a logbook. The duly completed logbook shouldbe submitted during practical examination.

RESEARCH PROJECT
BPT-413

The student need to submit a minimum of two case studies based on Evidence based physiotherapy evaluated during the clinical training hours and submit the same to the department at the end of fourth year before final examination. The student shall not be allowed to appear for the final examination without submission of research project.

CRITIQUE ENQUIRY, CASE PRESENTATION AND CASE DISCUSSION
BPT-414

The central goal of the case presentation and discussion is to enable students to create and critique methodologically sophisticated case study research designs in the physiotherapy. This will also will look at the epistemological assumptions, comparative strengths and weaknesses, and proper domain of case study methods and alternative methods, particularly statistical methods and formal modeling, and address ways of combining these methods in a single research project. The seminar then examines field research techniques, including archival research and interviews.

CLINICAL EDUCATION
BPT-415

Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence based practice will be part of training.

1. Physiotherapy OPD
2. Neurology, Neurosurgery & Neuro ICU
3. Community-PHC
4. Orthopedics
5. General Medicine & MICU
6. General Surgery & CTS ICU