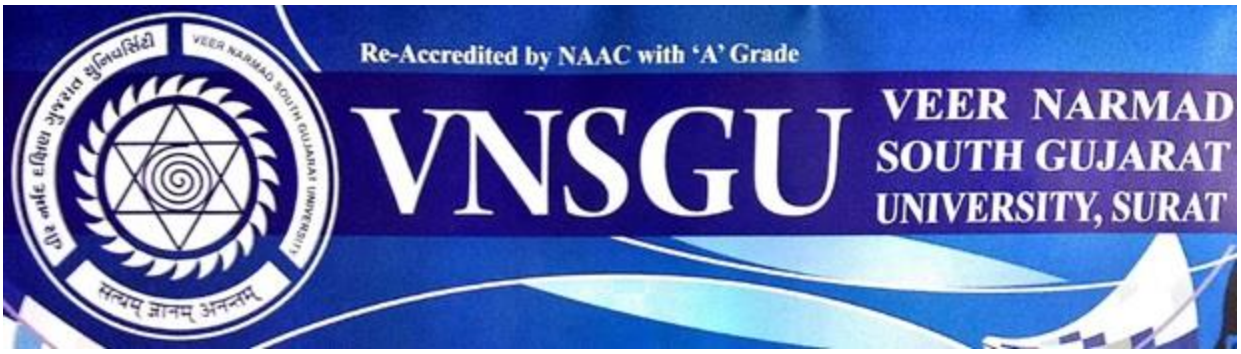

ACADEMIC REGULATIONS – BACHELOR OF PHYSIOTHERAPY (B. PT) PROGRAMME (4½ years Degree Course)

FACULTY OF MEDICINE

WITH EFFECT FROM ACADEMIC YEAR 2019-2020

BACHELOR OF PHYSIOTHERAPY – YEAR WISE SUBJECT CONTENT

First Year B. PT	Second Year B. PT	Third Year B. PT	Fourth Year B. PT
EXAM PAPERS			
Paper I: Human Anatomy	Paper I: Pathology & Microbiology	Paper I: General Medicine & Pediatrics	Paper I: Neuromuscular Physiotherapy
Paper II: Human Physiology	Paper II: Biochemistry & Pharmacology	Paper II: Surgery	Paper II: Musculoskeletal Physiotherapy
Paper III: Exercise Therapy – I & Basic Biomechanics	Paper III: Exercise Therapy – II & Exercise Physiology	Paper III: Orthopedics & Traumatology	Paper III: Cardiopulmonary Physiotherapy
Paper IV: Psychology & Sociology	Paper IV: Electrotherapy	Paper IV: Neurology, Obstetrics & Gynecology	Paper IV: Physiotherapy in Rehabilitation
Paper V: Biomedical Physics	Paper V: Kinesiology & Biomechanics	Paper V: Physical & Functional Diagnosis	Paper V: Sports Physiotherapy & Allied Therapeutics
Paper VI: English	Paper VI: Research Methodology	Paper VI: Biostatistics	Paper VI: Evidence based Physiotherapy & Ethics
NON-EXAM PAPERS			
A: Orientation to Physiotherapy	A: ENT & Dermatology conditions	A: Basics in Radiology & diagnostic procedures	A: Administration & management skills
B: First Aid	B: Basic Nursing	B: Psychiatry	B: Computer Applications

A. REGULATIONS GOVERNING BPT DEGREE COURSE:

1. These ordinances shall be called "The Ordinances, Syllabus and Scheme of Examination pertaining to the **Bachelor of Physiotherapy course, BPT."**
2. The Bachelor of Physiotherapy program shall be under the Faculty of Medicine.
3. The name of the Degree program shall be **Bachelor of Physiotherapy [BPT].**
4. This revised syllabus will be applicable from academic year 2019-20.

B. AIMS & OBJECTIVES OF BPT DEGREE COURSE:

1. AIM OF THE COURSE

The aim of the course in **"Bachelor of Physiotherapy"** is to qualify students who complete it satisfactorily to work independently as Physiotherapists, including working in interdisciplinary teams. The course must train students to plan, execute, evaluate and document physiotherapeutic work within the areas of promotion of good health, prevention of illness, treatment, habilitation, rehabilitation, and development of the profession, so that students acquire professional competence in the field of physiotherapy.

On the **Bachelor of Physiotherapy** course, acquiring professional competence means that the student must be able to:

I. Contribute to developing, supporting, maintaining and restoring people's optimal movement and functional abilities, with the aim of promoting good health and quality of life to prevent restrictions and loss of functionality in individuals.

II. Direct physiotherapeutic intervention aim is to focus on individuals and groups of all ages in interaction with their environment, leisure activities, work and taking into account ergonomic factors.

III. Work in cooperation with patients and their relatives, colleagues, and professionals from other disciplines, irrespective of their cultural and linguistic backgrounds.

IV. Initiate and participate in professionally-related research and development work.

V. Take further courses in theory and clinical practice after completing the basic education, including diploma, master's degree and special postgraduate degree courses.

Satisfactory completion of the course gives the right to use the title **Bachelor of Physiotherapy (BPT).**

2. OBJECTIVE OF THE COURSE

This course shall allow the students:

I. To acquire adequate knowledge of basic medical subjects and to develop skills and techniques of therapeutic exercises and therapeutic modalities so that they can manage various medical surgical conditions of patients.
II. To acquire knowledge so that they can point out by assessing the medical and surgical conditions of the patient.
III. To acquire skills in management, research and teaching as well as guidance and counseling of patients.
IV. To acquire proper attitude for compassion and concerns for patients and welfare of physically handicapped in the community.
V. To practice moral and ethical values with regard to physiotherapy.

3. ELIGIBILITY

3.1 Qualifying Examination:

As prescribed by the Admission Committee of Education department of Govt. of Gujarat from time to time.

3.2 Age:

A candidate seeking admission to Bachelor of Physiotherapy course should have completed 17 years of age, as on 31st December of the year of admission.

3.3 Medical Fitness Certificate:

Every candidate before admission to the course shall furnish to Principal of the Institution a certificate of Medical Fitness from an authorized Medical Officer to the effect, that the candidate is physically fit to undergo Physiotherapy course.

4. DURATION OF THE COURSE

The duration of the BPT course shall be **four and half years** including internship of six months.

5. MEDIUM OF INSTRUCTION

English shall be the medium of instruction for all the subjects of study and for the examinations of the BPT Course.

6. ATTENDANCE

A candidate is required to attend at least **80%** of the total classes conducted in a year in all subjects prescribed for that year, separately, in theory and practical / clinical to become eligible to appear for the university examination in the first attempt. Principals should notify at their college, the attendance details at the end of each academic year without fail, under intimation to the University.

No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc. Condone of shortage of attendance rests with the discretion of Vice-Chancellor.

Filling of University examination form: Candidates desirous of appearing for University examination must forward their applications in the prescribed form to the registrar through the Principal of the Institutions on or before the date prescribed for the purpose.

7. INTERNAL ASSESSMENT

There should be a minimum of two (2) internal examinations during I, II, III and IV year. Distribution of 20 marks in internals is as follows:

a. Internal examination marks (Theory and Practical separately) – 10 marks

b. Attendance: 5 marks (3 marks for 80% to 90% and 5 marks for > 90%)

c. Seminar presentations, workshops and conferences attended, journal submission and discipline: 5 marks

The calculated internal marks must be sent to the University **twenty days** before the University examination as per notification. Proper record which forms the basis of the Internal Assessment should be maintained for all students and should be available for scrutiny. The marks of periodical tests should be displayed on the student notice board by Principals.

A Candidate must obtain a 35% mark in theory and practical separately in internal assessment to be eligible to write the university examination. Any student who fails in paper(s) of an academic year may re-appear for Internal Assessment Examination of the failed paper(s) again to improve the internal assessment marks. The fresh marks will be submitted to the university.

8. DETAILED COURSE CONTENT

FIRST YEAR B. PT

Paper No.	Subject Code	Subject title	Allotted Hours		Total Hours of study	No. of Hours / Week
			Theory	Practical		
I	PT0101	Human Anatomy*	150	100	250	7-8
II	PT0102	Human Physiology*	150	50	200	6-7
III	PT0103	Exercise Therapy – I & Basic Biomechanics	100	100	200	6-7
IV	PT0104	Psychology & Sociology	40+40	***	80	2-3
V	PT0105	Biomedical Physics	80	***	80	2-3
VI	PT0106	English	40	***	40	1-2
Non-Exam Papers						
A.	PTs0107	Orientation to Physiotherapy	30	***	30	1-2
B.	PTs0108	First Aid	40	***	40	1-2

* These medical subjects should be taken by respective medical faculty

SECOND YEAR B. PT

Paper No.	Subject Code	Subject title	Allotted Hours		Total Hours of study	No. of Hours / Week
			Theory	Practical		
I	PT0201	Pathology & Microbiology*	40+40	***	80	2-3
II	PT0202	Biochemistry & Pharmacology*	40+40	***	80	2-3
III	PT0203	Exercise Therapy – II & Exercise Physiology	100	150	250	7-8
IV	PT0204	Electrotherapy	100	150	250	7-8
V	PT0205	Kinesiology & Biomechanics	150	***	150	6-7
VI	PT0206	Research Methodology	50	***	50	2-3
Non-Exam Papers						
A.	PTs0207	ENT & Dermatology conditions	30	***	30	1-2
B.	PTs0208	Basic Nursing	30	***	30	1-2

* These medical subjects should be taken by respective medical faculty

THIRD YEAR B. PT

Paper No.	Subject Code	Subject title	Allotted Hours		Total Hours of study	No. of Hours / Week
			Theory	Practical		
I	PT0301	General Medicine & Pediatrics*	50+30	***	80	2-3
II	PT0302	Surgery*	80	***	80	2-3
III	PT0303	Orthopedics & Traumatology*	80	***	80	2-3
IV	PT0304	Neurology, Obstetrics & Gynecology*	50+30	***	80	2-3
V	PT0305	Physical & Functional Diagnosis	100	100	200	6-7
VI	PT0306	Biostatistics	50	***	50	2-3
		Non-Exam Papers				
A.	PTs0307	Basics in Radiology & diagnostic procedures	40	***	40	1-2
B.	PTs0308	Psychiatry	40	***	40	1-2

* These medical subjects should be taken by respective medical faculty

FOURTH YEAR B. PT

Paper No.	Subject Code	Subject title	Allotted Hours		Total Hours of study	No. of Hours / Week
			Theory	Practical		
I	PT0401	Neuromuscular Physiotherapy	80	70	150	6-7
II	PT0402	Musculoskeletal Physiotherapy	80	70	150	6-7
III	PT0403	Cardiopulmonary Physiotherapy	80	70	150	6-7
IV	PT0404	Physiotherapy in Rehabilitation	80	70	150	6-7
V	PT0405	Sports Physiotherapy & Allied Therapeutics	80	70	150	6-7
VI	PT0406	Evidence based Physiotherapy & Ethics	60	***	60	5-6
		Non-Exam papers				
A.	PTs0407	Administration & management skills	20	***	20	1-2
B.	PTs0408	Computer Applications	20	***	20	1-2

* These medical subjects should be taken by respective medical faculty

INTERNSHIP

S. No	Description	Course Hours / Week	Total (Approx.)
1.	Internship	46-48	1100
2.	Research	6-7	180
Total			1280

9. SCHEDULE OF EXAMINATION

Colleges will be conducting one internal examination and one preliminary examination and the internally assessed and calculated marks (as specified in clause 7) to be sent to the university at least 15 days before the commencement of the final university examinations in the format prescribed by the University.

The final university examinations will be held at the end of the respective years of study. The dates of examinations will be notified by the university from time to time.

10. CRITERIA FOR PASSING

10.1 Regular University Examination

Students are declared to have passed University examination in a subject, if they secure 50% of the marks in theory and 50% in practical separately. For computation of 50% marks in theory and practical, the marks scored in the internal assessment (theory and practical) shall be added to the University conducted written and practical examination. It is **not** compulsory to pass in section – I and section – II separately.

10.2 Promotion Criteria / Carry over system:

i. It is not mandatory to pass in 1st year B.P.T Examination to proceed to 2nd year B.P.T class. However, it is mandatory to pass in all subjects of 1st year B.P.T examination to be conducted in the month of February, to be eligible to appear for regular 2nd year B.P.T University examination.

ii. It is not mandatory to pass in 2nd year B.P.T Examination to proceed to 3rd year B.P.T class. (Students can be allowed to attend classes in 3rd B.P.T only if he/she has passed 1st B.P.T University exam.) However, it is mandatory to pass in all subjects of 2nd year B.P.T examination to be conducted in the month of February, to be eligible to appear for 3rd year B.P.T University examination.

iii. It is not mandatory to pass in 3rd year B.P.T Examination to proceed to 4th year B.P.T class. (Students can be allowed to attend classes in 4th B.P.T only if he/she has passed 2nd B.P.T University exam.) However, it is mandatory to pass in all subjects of 3rd year B.P.T examination to be eligible to appear for 4th year B.P.T University examination.

iv. A candidate cannot be declared to have passed the examination until he/she has passed in all the subjects in that particular examination.

11. SCHEME OF EXAMINATIONS

FIRST YEAR B. PT

Paper No.	Subject Code	Subject title	Duration of theory exam	Mark Distribution				
				Theory		Practical		Total Marks
				External	Internal	External	Internal	
I	PT0101	Human Anatomy	3 Hours	80	20	80	20	200
II	PT0102	Human Physiology	3 Hours	80	20	80	20	200
III	PT0103	Exercise Therapy – I & Basic Biomechanics	3 Hours	80	20	80	20	200
IV	PT0104	Psychology & Sociology	3 Hours	80 (40+40)	20	****	****	100
V	PT0105	Biomedical Physics	3 Hours	80	20	****	****	100
VI	PT0106	English	2 Hours	40	10	****	****	50

SECOND YEAR B. PT

Paper No.	Subject Code	Subject title	Duration of theory exam	Mark Distribution				Max. Marks
				Theory		Practical		
				External	Internal	External	Internal	
I	PT0201	Pathology & Microbiology	3 Hours	80 (40+40)	20	****	****	100
II	PT0202	Biochemistry & Pharmacology	3 Hours	80 (40+40)	20	****	****	100
III	PT0203	Exercise Therapy – II & Exercise Physiology	3 Hours	80	20	80	20	200
IV	PT0204	Electrotherapy	3 Hours	80	20	80	20	200
V	PT0205	Kinesiology & Biomechanics	3 Hours	80	20	****	****	100
VI	PT0206	Research Methodology	2 Hours	40	10	****	****	50

THIRD YEAR B. PT

Paper No.	Subject Code	Subject title	Duration of theory exam	Mark Distribution				Max. Marks
				Theory		Practical		
				External	Internal	External	Internal	
I	PT0301	General Medicine & Pediatrics	3 Hours	80 (50+30)	20	****	****	100
II	PT0302	Surgery	3 Hours	80	20	****	****	100
III	PT0303	Orthopedics & Traumatology	3 Hours	80	20	****	****	100
IV	PT0304	Neurology, Obstetrics & Gynecology	3 Hours	80 (50+30)	20	****	****	100
V	PT0305	Physical & Functional Diagnosis	3 Hours	80	20	80	20	200
VI	PT0306	Biostatistics	2 Hours	40	10	****	****	50

FOURTH YEAR B. PT

Paper No.	Subject Code	Subject title	Duration of theory exam	Mark Distribution				Max. Marks
				Theory		Practical		
				External	Internal	External	Internal	
I	PT0401	Neuromuscular Physiotherapy	3 Hours	80	20	80	20	200
II	PT0402	Musculoskeletal Physiotherapy	3 Hours	80	20	80	20	200
III	PT0403	Cardiopulmonary Physiotherapy	3 Hours	80	20	80	20	200
IV	PT0404	Physiotherapy in Rehabilitation	3 Hours	80	20	80	20	200
V	PT0405	Sports Physiotherapy & Allied Therapeutics	3 Hours	80	20	80	20	200
VI	PT0406	Evidence based Physiotherapy & Ethics	2 Hours	40	10	****	****	50

12. EXAMINERS

There shall be two (2) examiners for practical subjects; external examiner from outside the university and internal examiner from the same university.

(a) It is mandatory for the staffs involved in examination duty (Paper setting, paper evaluation and practical) in Physiotherapy subjects, to have a Master degree in Physiotherapy with a minimum of 3 years of experience and designation of Assistant Professor and above from an UGC recognized institution/University.

(b) All examiners should compulsorily fulfill the norms and standards as specified by UGC Regulations on Minimum Qualification for Appointment of Teachers and other academic staff in Universities and Colleges and other measures for the maintenance of standards in Higher Education, July 2018

Note: Number of students examined per day per examiner should not exceed 50. In case of increase in number of students, more pair of internal and external examiners should be included to conduct practical and to evaluate theory papers.

13. GRACE MARKS

If a student fails in a subject (theory or practical) in the annual University examination, a total of 10 grace marks will be given to the student by the University before the declaration of result irrespective of the number of heads under which the student has failed.

14. DECLARATION OF CLASS

First Class with Distinction – 75% and above marks in any subject in first attempt
First Class – 60% - 74% marks in aggregate in first attempt
Second Class – 50% - 59% marks in aggregate in first attempt
Pass class – passed in more than 1 attempt irrespective of the % of marks secured

15. EXEMPTION FROM RE-EXAMINATION

Candidates who have failed in the examination, but obtained pass marks in any subjects shall be exempted from re-examination in those subjects. Candidates who have failed in theory &/or practical in any subject, will have to appear in theory & practical both again for that particular subject.

16. INTERNSHIP PROGRAM

a. There shall be six months of Internship after the final year examination for students, declared to have passed the examination in all the subjects.
b. During the internship students shall have to work full time, average 7 hours per day, for 6 Calendar months.
c. The Internship should be rotatory and cover clinical branches concerned with Physiotherapy such as Neurology, Neurosurgery, Orthopaedics, Cardiothoracic including ICU, Sports, Paediatrics, General Medicine, General Surgery, Obstetrics and Gynaecology, both inpatient and outpatient services.
d. Internship completion certificates will be issued only after submission of the research project.
e. An internee shall be entitled for maximum 6 days leave during six months period of internship posting. An internee will not be permitted to avail more than 2 days leave in any department. Period of leave in excess of 2 days in a department will have to be extended in the same department. Under any circumstances this period will not be condoned by any authority. However, if any student wants to attend any state/national/international conference, workshop or seminar, then maximally 3 days study leave can be granted to the students with production of the proper documents or certificate. It should not be more than 3 days in any conditions.
f. If any students discontinue the compulsory rotatory internship more than 50% of internship duration, official permission under the preview of the Vice Chancellor of University is mandatory.
g. In case of any exigencies during which the students remain absent for a period more than 6 days, he/she will have to work for the extra days during which the students have remained absent.
h. Based on the attendance and work done during posting the Head of institution/department shall issue '**Certificate of Satisfactory completion**' of training following which the University shall award the Bachelor of Physiotherapy Degree or declare the students eligible for the same.

No student shall be awarded degree without successfully completing six-month internship.

Head of the institution (of colleges not having their own hospital) can at his/her discretion grant NOC to the students to do the Internship at the place of their choice provided the concerned Hospital has its own Physiotherapy clinic fully furnished with all the necessary equipment as per the curriculum of the Program. For the purpose of granting NOC the candidate shall have to submit to the Institution the status of Physiotherapy services available at the place where they intend to do their Internship.

It is mandatory for Internee to obtain NOC from the concerned Hospital/Institute prior to applying NOC from the head of Institute.

It is mandatory for interns to undertake a research project during internship period. Head of the institutions should appoint appropriately qualified guides to guide interns in their research project. Duly approved and completed research projects should be submitted to the college before completion of the internship period.

Internship completion certificates will be issued only after submission of the research project.

TRANSCRIPT

Paper No.	Subject Title	Total hours
First Year B. PT		
Papers for University Examination		
I	**Human Anatomy**	**250**
II	**Human Physiology**	**200**
III	**Exercise Therapy – I**	**200**
IV	**Psychology & Sociology**	**80**
V	**Biomedical Physics**	**80**
VI	**English**	**40**
Non-Exam Papers		
A.	**Orientation to Physiotherapy**	**30**
B.	**First Aid & CPR**	**40**
	Clinical Observation	**140**
	Extra-curricular Activities (Conferences, Educational Tours, Sports and Cultural Activities)	**100**
Total Hours in First Year		**1160**
Second Year B. PT		
Papers for University Examination		
I	**Pathology & Microbiology**	**80**
II	**Biochemistry & Pharmacology**	**80**
III	**Exercise Therapy – II & Exercise Physiology**	**250**
IV	**Electrotherapy**	**250**
V	**Kinesiology & Biomechanics**	**150**
VI	**Research Methodology**	**50**
Non-Exam Papers		
A.	**ENT & Dermatology**	**30**
B.	**Basic Nursing**	**30**
	Supervised Clinical Observation	**140**
	Extra-curricular Activities (Conferences, Seminars, Educational Tours, Sports and Cultural Activities)	**100**
Total Hours in Second Year		**1160**
Third Year B. PT		
Papers for University Examination		
I	**General Medicine & Pediatrics**	**80**
II	**General Surgery, Neurosurgery & Cardiothoracic Surgery**	**80**
III	**Orthopedics & Traumatology**	**80**
IV	**Neurology, Obstetrics & Gynecology**	**80**

V	**Physical & Functional Diagnosis**	**200**
VI	**Biostatistics**	**50**
Non-Exam Papers		
A.	**Basics in Radiology & diagnostic procedures**	**40**
B.	**Psychiatry**	**40**
	Supervised Clinical Training	**450**
	Extra-curricular Activities (Conferences, Seminars, Workshops, Educational Tours, Sports and Cultural Activities)	**100**
Total Hours in Third Year		**1200**
Fourth Year B. PT		
Papers for University Examination		
I	**Neuromuscular Physiotherapy**	**150**
II	**Musculoskeletal Physiotherapy**	**150**
III	**Cardiopulmonary Physiotherapy**	**150**
IV	**Physiotherapy in Rehabilitation**	**150**
V	**Sports Physiotherapy & Allied Therapeutics**	**150**
VI	**Evidence based Physiotherapy & Ethics**	**60**
Non-Exam Papers		
A.	**Administration & management skills**	**20**
B.	**Computer Applications**	**20**
	Supervised Clinical Training	**450**
	Extra-curricular Activities (Conferences, Seminars, Workshops, Educational Tours, Sports and Cultural Activities)	**100**
Total Hours in Fourth Year		**1400**
Internship Program including Research work		
I	**Internship**	**1100**
II	**Research Work**	**180**
Total Hours in Internship		**1280**
Total Transcript Hours		**6200**

DETAILED SYLLABUS

&

COURSE CONTENT


FIRST YEAR BPT

Paper I: HUMAN ANATOMY

Subject Code: PT0101 Theory: 150 Hours Practical: 100 Hours

Method of Assessment: Written, Practical and Oral

Course Description: 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.

S. No	Description of topics	Hours
Basic Structure – Not for Exam		
1.	**HISTOLOGY**	**5**
1.1	General Histology & basic tissues of body	
1.2	Cell, Epithelium, Connective tissues, Cartilage, bone, muscular tissues, Nervous tissue, lymphoid tissue, skin & appendages	
2.	**EMBRYOLOGY**	**4**
2.1	Ovum, Spermatozoa, Fertilization and formation of germ layers	
2.2	Development of skin, fascia, blood vessels and lymphatics	
2.3	Development of bones and muscles	
2.4	Development of neural tubes and spinal cord	
2.5	Development of brain and its structures	
Detailed structural anatomy		
1.	**MUSCULOSKELETAL ANATOMY – GENERAL**	**10**
1.1	Anatomical terminologies, Positions, planes and axes	
1.2	Osteology - Bone composition, functions, Classification, surface landmarks	
1.3	Arthrology - Joint Classification, structure, movements, blood supply and nervous supply	
1.4	Myology – Types of muscles and its functions	
2.	**MUSCULOSKELETAL ANATOMY – REGIONAL**	
2.1	***Upper Extremity***	**25**
2.1.1	Osteology: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals and Phalanges	
2.1.2	Arthrology: Shoulder complex, Elbow joint, Radioulnar joint, Wrist Joint, Carpometacarpal joints, Metacarpophalangeal joints, intercarpal joints and phalangeal joints	
2.1.3	Myology: Origin, insertion, nerve supply and action of muscles that	

	move the shoulder, elbow, wrist and hand joints along with scapular muscles	
2.1.4	Structural anatomy of pectoral region, axilla, cubital fossa, palm, arches of the hand, blood vessels of arm, forearm and hand, lymphatic drainage of upper extremity	
2.2	***Lower Extremity***	**25**
2.2.1	Osteology: Pelvic bones, femur, Patella, Tibia, Fibula, Tarsals, Metatarsals and Phalanges	
2.2.2	Arthrology: Hip complex, knee complex, ankle joint, tibiofibular joints, intertarsal joints, metatarsophalangeal joints and phalangeal joints	
2.2.3	Myology: Origin, insertion, nerve supply and action of muscles that move the hip, knee, ankle and foot joints, pelvic floor muscles	
2.2.4	Structural anatomy of pelvic region, femoral triangle, inguinal region, popliteal fossa, foot, arches of foot, blood vessels of foot, lymphatic drainage of lower extremity	
2.3	***Trunk & Spine***	**20**
2.3.1	Osteology: Cervical, Thoracic, Lumbar, Sacral and coccygeal vertebrae, Ribs and sternum	
2.3.2	Arthrology: Intervertebral joints, joints of thoracic cage	
2.3.3	Myology: Origin, insertion, nerve supply and action of muscles that move the spinal column and thoracic region	
2.3.4	Structural anatomy of intervertebral disc	
2.4	***Head & Neck***	**10**
2.4.1	Osteology: Bones of the skull, facial bones and Mandible	
2.4.2	Arthrology: Joints of the skull and facial bones	
2.4.3	Myology: Origin, insertion, nerve supply and action of muscles of the face and neck	
2.4.4	Structural anatomy of the triangles of neck	
3.	**NEURO ANATOMY**	**25**
3.1	Classification of Nervous system	
3.2	Nerve structure and classification	
3.3	Neuron structure and classification	
3.4	Parts of spinal nerve	
3.5	Simple reflex arc	
3.6	Central Nervous system	
3.6.1	Parts of CNS	
3.6.2	Brain – Anatomy and blood supply of Cerebrum, Cerebellum, mid brain and brainstem, medulla oblongata, Pyramidal and extrapyramidal system, Thalamus and Hypothalamus	
3.6.3	Structural anatomy of meninges	
3.6.4	Structural anatomy of ventricles (Brief) and CSF circulation	

3.6.5	Spinal Cord – Anatomy, blood supply and pathways	
3.7	Cranial nerves – Course, function and testing	
3.8	Sympathetic and parasympathetic system	
3.9	Peripheral nervous system	
4.	**CARDIOVASCULAR ANATOMY**	**6**
4.1	Structural anatomy of veins, arteries and capillaries	
4.2	Heart – internal and external features, blood supply	
4.3	Conductive system of heart	
4.4	Lymphatic circulation, lymph nodes	
5.	**RESPIRATORY ANATOMY**	**6**
5.1	Structural anatomy of upper and lower respiratory tracts	
5.1.1	Nasal air passages, Trachea, Lungs, pleura, bronchial tree, bronchopulmonary segments	
5.1.2	Diaphragm – Origin, insertion, nerve supply, action	
5.2	Mechanism of respiration	
5.3	Accessory muscles of respiration	
6.	**ANATOMY OF DIGESTIVE ORGANS**	**3**
6.1	Components of the digestive system	
6.2	Divisions of the Abdominal cavity, Surface anatomy	
6.3	Muscles of abdominal wall	
6.4	Digestive organs (Brief)	
7.	**ANATOMY OF ENDOCRINE SYSTEM**	**6**
7.1	Structural anatomy of endocrine glands	
8.	**URINARY AND REPRODUCTIVE ANATOMY**	**5**
8.1	Structural anatomy of urinary system and organs	
8.2	Structural anatomy of genital system of male and female	

Recommended Books:

1. Human Anatomy - B.D. Chaurasia
2. Textbook of Anatomy - Inderbir Singh
3. Handbook of Osteology - Poddar
4. Neuroanatomy – Vishram Singh
5. Principles of Anatomy and Physiology – Tortora
6. Cunningham’s Manual of Practical Anatomy
7. Anatomy and Physiology – Smout & McDowell
8. Gray’s Anatomy
9. Clinical Anatomy for Medical Students - Richard Snell

QUESTION PAPER PATTERN FOR THEORY EXAMINATION

Section – I: 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 1 Long Essay Type	(Any One out of Two)	10x1=10
Q: 2 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 3 Short Answer Type	(Any Five out of Six)	3x5=15
Section – II: 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 4 Long Essay Type	(Any One out of Two)	10x1=10
Q: 5 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 6 Short Answer Type	(Any Five out of Six)	3x5=15

PRACTICAL (100 Hours)

- ✓ Identification of dissected parts of Upper extremity, lower extremity, thoracic, abdominal viscera and brain including muscles and nerves **(60 Hours)**
- ✓ Identification of bones and joints – articulated and disarticulated **(20 Hours)**
- ✓ Demonstrate and practice of Surface Anatomy of bones, ligaments, muscles, nerves of body **(20 Hours)**

PRACTICAL EXAM FORMAT

1. Spots **(10 x 3 = 30 marks)**
    a. 10 spots based on
        i. Bones
        ii. Organs – Only Brain, Heart, Kidney and Lungs

2. Journal of Anatomy **(5 marks)**
3. Viva on structural anatomy of bones, muscles, nerves and organs (Only Brain, Heart, Kidney and Lungs**) (45 marks)**

Paper II: HUMAN PHYSIOLOGY

Subject Code: PT0102 Theory: 150 Hours Practical: 50 Hours

Method of Assessment: Written, Practical and Oral

Course Description: At the end of the course the student will be able to explain the normal functioning of all the organ systems and their interaction for well co-ordinated total body functions with special reference to musculoskeletal, nervous, cardio-respiratory, female urogenital system and alteration in functions of organs due to aging, analyze physiological responses & adaptation to environmental stresses with special emphasis on physical activity and temperature. Acquire the skill of basic clinical examination with special emphasis to peripheral and central nervous system, cardio-vascular and respiratory system, exercise tolerance.

S. No	Description of topics	Hours
Basic Structure – Not for Exam		
1.	**GENERAL PHYSIOLOGY**	**5**
1.1	Cell, Organelles – Structure and Function	
1.2	Structure of cell membrane	
1.3	Transport mechanisms across cell membrane	
1.4	Body fluids – Composition	
1.	**BLOOD**	**10**
1.1	Composition and functions	
1.2	Plasma - composition and functions	
1.3	Plasma proteins – Types and functions	
1.4	RBC, WBC, Platelets – Structure, formation and functions	
1.5	Lymph-Composition, Circulation and functions	
1.6	Hemoglobin – Structure and functions	
1.7	Anemia – Types	
1.8	Hemostasis, blood coagulation mechanisms, disorders in coagulation	
1.9	Bleeding time, clotting time, ESR and blood indices	
1.10	Blood grouping, Rh Factor – Types and Significance	
2.	**CARDIOVASCULAR SYSTEM**	**20**
2.1	Structure and functions of arteries, arterioles, capillaries and veins	
2.2	Structure, properties and function of heart, heart valves, blood and nerve supply of heart	
2.3	Conducting system of the heart	
2.4	Cardiac Cycle – Description of phases	
2.5	Heart sounds – Types, characteristics and identification	
2.6	Cardiac output, Stroke Volume, Heart Rate, Blood pressure, Peripheral vascular resistance– Definitions, normal values, regulations and variations	
2.7	Basic understanding of Electrocardiography	

3.	**RESPIRATORY SYSTEM**	**20**
3.1	Structure and functions of upper and lower Respiratory tracts including nasal passages, trachea, bronchi, bronchioles and alveoli	
3.2	Primary and accessory muscles of respiration	
3.3	Neural and chemical regulation of respiration	
3.4	Mechanism of respiration	
3.5	Gaseous exchange in respiration	
3.6	Pulmonary function tests, Spirometry, lung volumes and capacities	
3.7	Anatomical and Physiologic dead space	
3.8	Pulmonary circulation	
3.9	Hypoxia, Asphyxia, Cyanosis – Description and types	
3.10	Artificial Respiration	
4.	**NERVE AND MUSCLE PHYSIOLOGY**	**20**
4.1	Nerves - Structure and function, classification, properties	
4.1.1	Neurophysiology of nerve injuries and classification of nerve injuries	
4.2	Muscle – Classification, Structure and properties	
4.2.1	Contractile mechanism of muscles, excitation – coupling reactions	
4.2.2	Motor Unit, neuromuscular junction, muscle tone, Fatigue	
5.	**DIGESTIVE SYSTEM**	**10**
5.1	Digestive Organs - Structure and function of stomach, pancreas, liver, gall bladder and intestine	
5.2	Salivary secretions and gastric juices – Functions and regulation	
5.3	Mastication and swallowing – Stages and mechanism	
5.4	Digestion and absorption of nutrients	
6.	**EXCRETORY SYSTEM**	**15**
6.1	Excretory organs - Structure and function of kidneys, nephrons and Juxta medullary apparatus	
6.2	Renal blood flow and regulation	
6.3	Formation of Urine, Glomerular Filtration Rate (GFR)	
6.4	Regulation of water excretion from body	
6.5	Structure and function of urinary bladder	
6.5.1	Types of bladder in pathological conditions	
6.6	Mechanism of defecation	
6.7	Skin and temperature regulation	
7.	**SPECIAL SENSES**	**5**
7.1	Vision – Structure and functions of eye ball and its components	
7.1.1	Visual Pathways, visual reflexes, adaptation to light and dark	
7.1.2	Pathology of vision	
7.2	Hearing - Structure and function of external, middle and inner ear	
7.2.1	Auditory pathway and testing of hearing	
7.2.2	Pathology of hearing	
7.3	Taste - Structure and function of tongue	

7.3.1	Gustatory pathway and testing for taste	
7.3.2	Pathology of taste	
7.4	Smell - Structure and function of nose	
7.4.1	Olfactory pathway and testing of olfaction	
7.4.2	Pathology of olfaction	
7.5	Touch - Structure and function of skin	
7.5.1	Sensory pathway, superficial reflexes, types of sensation	
7.5.2	Sensory affection in pathological conditions	
8.	**ENDOCRINE SYSTEM**	**15**
8.1	Physiology and classification of Endocrine glands and hormones	
8.2	Functions, classification and regulation of secretion of hormones – Pituitary, Thyroid, Parathyroid, Adrenal, Gonads and Pancreas	
9.	**NERVOUS SYSTEM**	**25**
9.1	Physiology and classification of nervous system	
9.2	Structure and function of Brain	
9.2.1	Structure and function of Cerebral cortex, Sensory and motor Homunculus	
9.2.2	Structure and function of Corpus Callosum	
9.2.3	Structure and function of Basal Ganglia	
9.2.4	Structure and function of Thalamus and Hypothalamus	
9.2.5	Structure and function of Brain Stem – Pons, Midbrain and Medulla Oblongata	
9.2.6	Structure and function of Cerebellum	
9.2.7	Structure and function of Limbic system	
9.3	Structure and function of Spinal Cord	
9.3.1	Spinal nerves, Reflex arc and monosynaptic reflexes	
9.4	Structure and functions of Peripheral nerve	
9.5	Ascending and descending pathways	
9.6	Structure and functions of ventricles	
9.6.1	Cerebrospinal Fluid – Formation, composition, circulation and functions	
9.7	Upper and lower motor neurons - Functional significance	
9.8	Structure and function of Cranial nerves and their examination	
9.9	Postural and Equilibrium mechanisms	
9.10	Autonomic nervous system – Functions	
9.11	Neurophysiology of Pain – Pain pathways, Gate control theory of pain and pain modulation	
10.	**REPRODUCTIVE SYSTEM**	**5**
10.1	Male - Functions of testes, pubertal changes in males, testosterone - action and regulations of secretion	
10.2	Female - Functions of ovaries and uterus, pubertal changes, menstrual cycle, estrogens and progesterone - action and regulation	

Recommended Books:

1. Human Physiology - Chatterjee
2. Concise Medical Physiology - Chaudhuri
3. Human Physiology - Sembulingam
4. A Textbook of Practical Physiology - Ghai C L
5. Practical physiology - Vijaya Joshi
6. Samson and Wright's Applied Physiology
7. Textbook of Medical Physiology - Guyton & Hall
8. Principles of Anatomy & Physiology - Tortora

QUESTION PAPER PATTERN FOR THEORY EXAMINATION

Section – I: 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 1 Long Essay Type	(Any One out of Two)	10x1=10
Q: 2 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 3 Short Answer Type	(Any Five out of Six)	3x5=15
Section – II: 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 4 Long Essay Type	(Any One out of Two)	10x1=10
Q: 5 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 6 Short Answer Type	(Any Five out of Six)	3x5=15

PRACTICAL (50 Hrs)

- ✓ Demonstration of RBC, WBC, Platelet count, ESR, Bleeding and clotting time, Hemoglobin estimation and blood grouping **(10 Hrs)**
- ✓ Identification of graphs displaying properties of muscles, lung volumes and capacities and ECG wave forms **(5 Hrs)**
- ✓ Practical application of clinical examination of Health-related Physical Fitness – Cardiovascular endurance, Muscular Endurance, Muscular strength, Flexibility and Body composition **(10 Hrs)**
- ✓ Practical application of clinical examination of Blood Pressure measurement – Palpatory and auscultatory methods **(5 Hrs)**
- ✓ Practical application of clinical examination of Auscultation of Heart sounds and Breath sounds **(5 Hrs)**
- ✓ Demonstration of Spirometry – Recording of lung volumes and capacities **(2 Hrs)**
- ✓ Practical application of clinical examination of heart rate, respiratory rate, superficial, deep and cortical reflexes **(5 Hrs)**
- ✓ Practical application of clinical examination of cranial nerves **(8 Hrs)**

PRACTICAL EXAM FORMAT

1. Spots **(10 x 3 = 30 marks)**
    a. 10 spots based on
        i. Graphs – Muscle properties, ECG, Lung volumes and capacities
        ii. Tools used for assessment of physical fitness
        iii. Stethoscope and its parts
        iv. Sphygmomanometer and its parts
        v. Spirometer
2. Journal of Physiology **(5 marks)**
3. Viva on structure and functions of various systems of the body covered in the syllabus **(45 marks)**

Paper III: EXERCISE THERAPY – I AND BASIC BIOMECHANICS

Subject Code: PT0103 Theory: 100 Hrs Practical: 100 Hrs

Method of Assessment: Written, Practical and Oral

Course Description: In this course, the students will learn the basic principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions and basic biomechanics involves the study of basic concepts of human movements.

S. No	Description of topics	Hours
1.	**INTRODUCTION TO EXERCISE AND EXERCISE THERAPY**	**4**
1.1	Significance of assessment in prescribing exercise	
1.2	Physiological effects and uses of exercise	
1.3	Planning treatment through exercise	
2.	**BASIC BIOMECHANICS**	**5**
2.1	Terminologies related to movements – Axis, Planes, Kinetics, Kinematics, types of muscle contraction and work, Closed and Open chain activities, shunt and spurt muscles, Angle of pull	
3.	**SIMPLE MACHINES**	**4**
3.1	Definition, properties, types and uses of Levers, pulley and springs	
3.2	Mechanical Advantage	
4.	**THERAPEUTIC GYMNASIUM**	**6**
4.1	Tools and equipment used in exercise therapy-Uses and application	
5.	**STARTING POSITIONS**	**5**
5.1	Fundamental and derived starting positions	
5.2	Effects, uses and muscle work	
6.	**MOVEMENTS CLASSIFICATION**	**15**
6.1	Active movements	
6.1.1	Free exercises – Principles, techniques of application, indications, contraindications, effects and uses	
6.1.2	Active Assisted exercise - Principles, Classification, techniques of application, indications, contraindications, effects and uses	
6.1.3	Resisted exercise (in general and brief) - Principles, Classification, techniques of application, indications, contraindications, effects and uses	
6.2	Passive movements - Principles, Classification, techniques of application, indications, contraindications, effects and uses	
6.3	End feel – definition, types of normal and abnormal end feel	
7.	**GONIOMETRY**	**10**
7.1	Causes for restriction of range of motion	
7.2	Definition – goniometry, Active range of motion, passive range of	

	motion	
7.3	Types of goniometer, uses	
7.4	Principles, techniques of application, indications, contra indications, limitations of goniometry for joints of upper limb and lower limb	
7.5	Tools used to measure range of motion of spine, Principles, techniques of application, indications, contra indications, limitations of goniometry for spine	
7.6	Normal range of motion of upper limb, lower limb joints and spine	
7.7	Trick movements – Definition, types and its significance in exercise	
8.	**SUSPENSION THERAPY**	**6**
8.1	Definition, types, principles of application, therapeutic effects and uses, indications and contra indications	
9.	**BREATHING EXERCISES**	**6**
9.1	Patterns of breathing, types of breathing exercises - Techniques and principles of application, therapeutic effects and uses, indications and contra indications	
10.	**LIMB LENGTH MEASUREMENTS – TYPES, TECHNIQUES OF MEASURING**	**5**
11.	**GIRTH MEASUREMENTS**	**5**
12.	**AMBULATORY DEVICES AND WALKING AIDS**	**8**
12.1	Crutches – Types, measurement methods, uses	
12.2	Application of 2 point, 3 point and 4 point gait patterns	
13.	**SOFT TISSUE MOBILIZATION (MASSAGE)**	**15**
13.1	Definition, classification of massage	
13.2	Principles of application, Physiological effects and therapeutic uses, indications and contra indications of different types of massage techniques	
13.3	Massage for upper limb, neck, face, chest, back, and lower limb	
14.	**GROUP EXERCISE AND HOME EXERCISE**	**6**

Recommended Books:

1. Principles of Exercise Therapy - Dena Gardiner.
2. Practical Exercise Therapy - Margaret Hollis.
3. Therapeutic Exercise - Kisner & Colby
4. Principles and Practices of Therapeutic Massage - Sinha A G
5. Measurement of Joint Motion – a guide to Goniometry - Cynthia Norkins
6. Therapeutic exercise - Hall & Brody

QUESTION PAPER PATTERN FOR THEORY EXAMINATION

Section – I: 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 1 Long Essay Type	(Any One out of Two)	10x1=10
Q: 2 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 3 Short Answer Type	(Any Five out of Six)	3x5=15
Section – II: 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 4 Long Essay Type	(Any One out of Two)	10x1=10
Q: 5 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 6 Short Answer Type	(Any Five out of Six)	3x5=15

PRACTICAL (100 Hours)

Practical skillful application of techniques of

- ✓ Observation of muscle work of various positions
- ✓ Active assisted movements, Passive movements, Resisted exercises
- ✓ Goniometry
- ✓ Suspension exercises
- ✓ Breathing exercises
- ✓ Limb length measurements
- ✓ Girth measurements
- ✓ Soft tissue mobilization

PRACTICAL EXAM FORMAT

1. Spots **(10 x 3 = 30 marks)**
    a. Based on therapeutic Gymnasium
2. Demonstration of techniques of application of any two of the following: **(30 marks)**
    a. Free Exercise
    b. Active/Active-Assisted/Resisted Exercise
    c. Passive movements of limbs
    d. Goniometry of joints of limbs
    e. Suspension therapy
    f. Breathing exercises
    g. Limb length measurements
    h. Girth measurements
    i. Soft tissue mobilization
3. Viva on basic biomechanics, principles, indications and contra indications of various techniques covered in the syllabus **(15 marks)**
4. Journal of Exercise Therapy **(5 marks)**

PAPER IV: SECTION – I PSYCHOLOGY

Subject Code: PT0104A **Theory: 40 Hours**

Method of Assessment: Written

Course description: Human Psychology involves the study of various behavioral patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional and language development, communication and interaction skills appropriate to various age groups. Sociology will introduce student to the basic sociology concepts, principles and social process, social institutions (in relation to the individual, family and community) and the various social factors affecting the family in rural and urban communities in India will be studied. The study of these subjects will help the student to understand their clients while assessment and while planning appropriate treatment methods.

S. No	Description of topics	Hours
1.	**INTRODUCTION TO PSYCHOLOGY**	**4**
1.1	Definition, Branches and methods	
1.2	Role of Psychology in Physiotherapy	
1.3	Influence of heredity and environment on individual – Nature Vs Nurture	
1.4	Development and growth of behavior in infancy and childhood, adolescence, adulthood and old age, normal and abnormal	
2.	**MOTIVATION**	**3**
2.1	Definition and types	
2.2	Motivation cycle	
2.3	Theories of motivation	
3.	**ATTENTION AND PERCEPTION**	**3**
3.1	Types of attention, Factors determining attention	
3.2	Principles of perceptual grouping	
3.3	Errors or abnormalities in perception – Illusions and Hallucinations	
4.	**PERSONALITY**	**3**
4.1	Definition, types and theories of personality	
4.2	Factors influencing personality	
4.3	Assessment of Personality and personality disorders	
5.	**LEARNING**	**5**
5.1	Theories of learning – Trial and error, Classical and Operant conditioning	
5.2	Learning disabilities	
6.	**ATTITUDE AND BEHAVIOR MODIFICATION**	**3**
6.1	Definition and theories of attitude and behavior	

6.2	Methods and therapies for behavioral modification	
6.3	Factors affecting attitude and behavior	
7.	**MEMORY**	**3**
7.1	Types and Theories	
7.2	Methods to improve memory	
8.	**THINKING**	**3**
8.1	Types and Process of thinking	
8.2	Problem solving, decision making and creative thinking	
9.	**EMOTION**	**3**
9.1	Theories of emotion and stress	
9.2	Physiological and psychological changes to stress	
9.3	Stress management	
10.	**FRUSTRATION AND CONFLICT**	**2**
10.1	Types of frustration and conflict	
10.2	Defense mechanism – Denial, Identification, regression, repression, projection, sublimation and rationalization	
11.	**INTELLIGENCE**	**2**
11.1	Theories of intelligence	
11.2	Intelligence tests and their uses	
12.	**COMMUNICATION**	**4**
12.1	Different types	
12.2	Effective communication skills	
13.	**COUNSELING**	**2**
13.1	Principles of psychological counseling, its significance	

Recommended Books:

1. Introduction to psychology - S.K.Mangal
2. Introduction to psychology - Morgan and King,
3. Psychology for Physiotherapists - Ramalingam

PAPER IV: SECTION – II SOCIOLOGY

Subject Code: PT0104B **Theory: 40 Hours**

Method of Assessment: Written

S. No	Description of topics	Hours
1.	**INTRODUCTION TO SOCIOLOGY**	**3**
1.1	Definition and Branches	
1.2	Role of sociology in Physiotherapy	
2.	**SOCIAL FACTORS IN HEALTH AND DISEASE**	**3**
2.1	Definition and role of social factors in health and disease conditions	
3.	**SOCIALIZATION**	**4**
3.1	Meaning and nature	
3.2	Primary, secondary and anticipatory socialization	
3.3	Agencies of socialization	
4.	**FAMILY AND SOCIAL GROUPS**	**6**
4.1	Role of social groups in health and disease	
4.2	Types of social groups – Primary, secondary and Formal, informal	
4.3	Family as a social group	
4.4	Types of family and their functions; Advantages and disadvantages	
4.5	Role of family in health and disease	
5.	**COMMUNITY**	**4**
5.1	Advantages and disadvantages of Urban and Rural community	
5.2	Health Hazards in urban and rural communities	
6.	**CULTURE**	**4**
6.1	Definition and significance	
6.2	Role of culture in health and disease	
7.	**SOCIAL CHANGE**	**5**
7.1	Meaning and significance	
7.2	Factors affecting social change	
7.3	Stress related to social change	
7.4	Social change and its role in health and disease	
8.	**SOCIAL PROBLEMS**	**6**
8.1	Common Social problems encountered in the society	
8.2	Consequences of the following social problems and their remedies	
8.2.1	Population explosion	
8.2.2	Poverty and unemployment	
8.2.3	Beggary	
8.2.4	Alcoholism	
8.2.5	Juvenile delinquency	
8.2.6	Prostitution	

8.2.7	Geriatric issues	
9.	**SOCIETY AND THE DISABLED**	**4**
9.1	Meaning of disability	
9.2	Social security and legislation for the disabled	
10.	**SOCIAL WORKER**	**1**
10.1	Role of Medical Social Worker in rehabilitation	

Recommended Books:

1. Introduction to the study of Sociology - Sachdeva and Vidyabushan
2. Textbook of Sociology for Physiotherapy Students - KP Neeraja
3. Text Books of Sociology for Graduates Nurses and Physiotherapy Students - Indrani T K
4. Sociology for Physiotherapists - Dibyendunarayana Bid

QUESTION PAPER PATTERN FOR THEORY EXAMINATION

Section – I (Psychology): 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 1 Long Essay Type	(Any One out of Two)	10x1=10
Q: 2 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 3 Short Answer Type	(Any Five out of Six)	3x5=15
Section – II (Sociology): 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 4 Long Essay Type	(Any One out of Two)	10x1=10
Q: 5 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 6 Short Answer Type	(Any Five out of Six)	3x5=15

PAPER V: BIOMEDICAL PHYSICS

Subject Code: PT0105 **Theory: 80 Hours**

Method of Assessment: Written

Course Description: At the end of the course the candidate will be able to Describe the fundamentals of general physics and able to relate its application in Physiotherapy, Understand basic physical principles of sound, light and heat and their application in Physiotherapy, Understand basic aspects of electricity and electronics as related to its application in electrotherapy instruments, Describe in brief certain common electrical components such as capacitors, transformers, valves and transistors; and will be able to identify such components.

S. No	Description of topics	Hours
1.	**GENERAL PHYSICS**	**15**
1.1	Force	
1.1.1	Definition, types, unit	
1.1.2	Motion and its types, Newton's Laws of motion	
1.2	Equilibrium	
1.2.1	Definition and types	
1.3	Work, power, energy and torque	
1.3.1	Definition, types and unit	
1.4	Friction	
1.4.1	Definition and types, Laws governing friction	
1.5	Fluid mechanics and Hydrodynamics	
1.5.1	Physical properties of water	
1.5.1.1.	Buoyancy, Specific Heat and Thermal Conductivity, Viscosity, Hydrostatic pressure	
1.5.1.2	Archimedes principles, Pascal's Law	
1.6	Elasticity	
1.6.1	Principles, Hook's Law	
2.	**HEAT**	**10**
2.1	Properties of heat and temperature	
2.2	Heat transfer and conducting properties	
2.3	Kirchoff's law, Joule's law of heat production, Grothus law and laws of thermodynamics, cosine law, inverse square law	
2.4	Biophysics of superficial heat and cold	**10**
3.	**SOUND**	
3.1	Frequency, Wavelength, Amplitude, vibration and phases of sound	

3.2	Newton's formula for velocity of sound	
3.3	Lap lace's correction	
3.4	Interference and resonance of sound waves	
3.5	Doppler effect and Echo	
3.6	Ultrasonic sound waves – production and application	
4.	**LIGHT**	**10**
4.1	Electromagnetic spectrum	
4.2	Laws of emission, reflection, refraction, absorption and interference	
4.3	Fiber optics and LASER	
5.	**ELECTRICITY**	**15**
5.1	Definition, types and units	
5.2	Characteristics of charged body and lines of forces	
5.3	Electromagnetic induction, Potential difference and EMF	
5.4	Resistance in series and parallel	
5.5	Current	
5.5.1	Types – Direct current, alternate current and modified current; units of measurement of current	
5.5.2	Ohm's law, Faraday's law, Lenz's law, Fleming's right hand rule and Eddy currents	
5.6	Valves, Transformers	
5.6.1	Principles, types, construction and working	
5.7	Fuse	
5.7.1	Uses and practical implications	
5.8	Electric Shock	
5.8.1	Definition, types and safety precautions	
6.	**MODERN PHYSICS**	**10**
6.1	X-ray – Production, properties and application	
6.2	IR rays and UV rays – Short wave and microwave diathermy.	
	Therapeutic currents –Iimpulses, definition and types, pulse duration and depletion times	
	Galvanic current, Faradic currents, Surging current, exponentially progressive current, biphasic current	
7.	**ELECTRONICS**	**10**
	Thermionic valves and their characteristics, semi-conductor devices: diode, its characteristics, types and uses	
	Rectifier, half wave, full wave, its characteristics, types and uses	
	Transistor: types, mode of connection, characteristics, use as an amplifier,	
	Oscillating circuit, production of shaped pulses	
	Triode valve as amplifier and oscillator	
	Cathode Ray Oscilloscope	

Recommended Books:

1. Biophysical Bases of Electrotherapy - Alex Ward, 1st Edition
2. Physical Principles Explained - Low & Reed
3. Biophysics: An Introduction - Roland Glaser
4. Principal of Electronics - V. K. Mehta
5. Fundamentals of Physics - Robert Resnik

QUESTION PAPER PATTERN FOR THEORY EXAMINATION

Section – I: 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 1 Long Essay Type	(Any One out of Two)	10x1=10
Q: 2 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 3 Short Answer Type	(Any Five out of Six)	3x5=15
Section – II: 40 Marks		
Type of question	**Number of Questions**	**Marks for Each Question**
Q: 4 Long Essay Type	(Any One out of Two)	10x1=10
Q: 5 Short Essay Type	(Any Three out of Four)	5x3=15
Q: 6 Short Answer Type	(Any Five out of Six)	3x5=15

PAPER VI: ENGLISH

Subject Code: PT0106 **Theory: 40 Hours**

Method of Assessment: Written

Course Description: This course is designed to help the student acquire a good command and comprehension of the English language through individual, papers and conferences. The student at the end of training is able to Read and comprehend English language, Speak and write grammatically correct English, Appreciates the value of English literature in personal and professional life.

S. No	Description of topics	Hours
1.	**GRAMMAR**	**10**
1.1	Vocabulary, framing sentences	
1.2	Phonetics	
2.	**COMPREHENSION**	**5**
2.1	Reading and comprehending	
3.	**COMPOSITION**	**15**
3.1	Various forms of composition	
3.1.1	Letter writing	
3.1.2	Notes taking	
3.1.3	Resume and curriculum vitae development	
4.	**SPOKEN ENGLISH**	**10**
4.1	Verbal communication	
4.2	Discussion, debate and Public speaking skills	

Recommended Books:

1. English Grammar Collins, Birmingham University, International Language Data Base
2. Wren and Martin - Grammar and Composition
3. Spoken English - V Shasikumar and P V Dhanija

NON-EXAM PAPERS

A. ORIENTATION TO PHYSIOTHERAPY

Course Description: This course is designed to help the student acquire the geographical orientation of the various concerned sections of the education department and clinical training areas and to get an overall idea about the graduate programme and its scope in the professional practice.

S. No	Description of topics	Hours
1.	History of Physiotherapy	3
2.	Definition, Scope, branches, code of conduct, governing bodies – National and International	4
3.	Status of Physiotherapy profession in India and abroad	4
4.	Modes of management of disorders and diseases in Physiotherapy	4
5.	Role of Physiotherapists in the health care system	4
6.	Branches and fields in Physiotherapy	5
7.	Scope and areas of practice for Physiotherapy professionals	4
8.	Basic guidelines of Code of conduct in Physiotherapy	2

B. FIRST AID

Course Description: At the completion of this course the student of First Aid and CPR must be able to identify and manage situation of common emergencies.

S. No	Description of topics	Hours
1.	Significance of First Aid	2
2.	Principles of emergency care and First Aid	2
3.	Basic instrumentations used in First Aid	3
4.	First Aid for accident victims	3
5.	First Aid during natural disaster and calamities	3
6.	First Aid in fractures and spinal cord injuries	3
7.	First Aid in cardiac arrest	3
8.	First Aid in respiratory distress and failure	3
9.	First Aid in Burns	3
10.	First Aid in poisoning	3
11.	First Aid in drowning	3
12.	First Aid in Shocks	3
13.	Concept of Cardiopulmonary resuscitation	6