



# **BHARATI VIDYAPEETH**

## **(Deemed to be University)**

### **SYLLABUS FOR BACHELOR OF PHYSIOTHERAPY (BPT<sub>h</sub>)**

**FACULTY OF SKILL DEVELOPMENT & ALLIED HEALTH  
SCIENCES**

**SCHOOL OF PHYSIOTHERAPY  
BHARATI VIDYAPEETH  
(Deemed to be University)**

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# PHYSIOTHERAPY

## 1. DEFINITION:

„Physiotherapy“ is a branch of modern medical science which includes examination, assessment, interpretation, physical diagnosis, planning and execution of treatment and advice to any person for the purpose of preventing, correcting, alleviating and limiting dysfunction, acute and chronic bodily malfunction including life saving measures via chest physiotherapy in the intensive care unit, curing physical disorders or disability, promoting physical fitness, facilitating healing and pain relief and treatment of physical and psychological disorders through modulating psychological and physical response using physical agents, activities and devices including exercise, mobilization, manipulations, therapeutic ultrasound, electrical and thermal agents and electrotherapy for diagnosis, treatment and prevention. (Definition as per the Maharashtra State Council for Occupational therapy & Physiotherapy, 2004)

‘Physiotherapist’ is a qualified professional who has acquired all the above mentioned knowledge and skills for entry into practice after being awarded a bachelor degree in the subject of ” Physiotherapy” from a recognized institute affiliated to the University conducting a fulltime course not less than four years and six months of internship.

## 2. VISION

To Provide quality medical education and professional skills in the field of physiotherapy by creating and enriching environment for learning and research, and nurturing excellence through dynamic social transformation.

## 3. MISSION

1. To prepare students to face global health care needs in the field of Physiotherapy by providing conducive atmosphere and infrastructure for effective learning.
2. To stimulate and extend the frontiers of knowledge through faculty development and foster research culture among the students and faculty for continuous up gradation of knowledge and Skills.
3. To develop students into quality physiotherapist well equipped with Cognitive, Psychomotor and Affective skills.
4. To uplift the proficiency of physiotherapist by providing a Platform for growth through Regional, National and international collaboration.

#### **4. Statement of Philosophy:**

Physiotherapy practice spans the continuum from health promotion to prevention to rehabilitation for individuals and populations throughout the lifespan. Physiotherapy diagnoses movement dysfunctions based on skillful examination and evaluation regardless of the cause or etiology and provide skilled therapeutic intervention to foster improvement in physical functioning and maximizing overall quality of life.

Physiotherapists provide the initial access into the health care system for persons with impairments and functional limitations amenable to physiotherapy and engage in collegial referral relationships with other health care professionals.

Physiotherapist's role also includes that of case manager, teacher, researcher, and consultant. The faculty believes the first priority of education is to prepare people for a well-rounded, balanced life with broad social and cultural interests and as involved, active citizens of our country.

Physiotherapist must have commitments to lifelong learning and to search for the evidence that supports and advances practice. Critical thinking, problem solving, intellectual perseverance and courage are all essential characteristics of the successful physiotherapist.

#### **About Physiotherapy:**

Physiotherapists are health care professionals with a significant role in health promotion and treatment of injury and diseases. They combine their in-depth knowledge of the body and how it works with specialized hands-on clinical skills to assess, diagnose and treat symptoms of illness, injury or disability.

All physiotherapists registered to practice are qualified to provide safe and effective physiotherapy. They have met national entry-level education and practice standards, and have successfully passed a standardized physiotherapy competence examination.

#### **5. Scope of Practice:**

Physiotherapists plan and administer physiotherapy/ rehabilitation treatments independently and also being a part of the multidisciplinary team. The minimum education requirement is often a baccalaureate degree or postgraduate degrees in Physiotherapy.

Physiotherapy is an essential part of the health and community/welfare services delivery system. Physiotherapists practice independently of other health care/service providers and also within multidisciplinary rehabilitation/habilitation programmes to prevent, gain, maintain or restore optimal function and quality of life in individuals with loss and disorders of movement.

Physiotherapists are guided by their own code of ethical principles. Thus, they may be concerned with any of the following purposes:

- a. Promoting the health and well-being of individuals and the general public/society, emphasizing the importance of physical activity and exercise.
- b. Preventing impairments, activity limitations, participatory restrictions and disabilities in individuals at risk of altered movement behaviors due to health or medically related factors, socio-economic stressors, environmental factors and lifestyle factors.
- c. Providing interventions/treatment to restore integrity of body systems essential to movement, maximize function and recuperation, minimize incapacity, and enhance the quality of life, independent living and workability in individuals and groups of individuals with altered movement behaviors resulting from impairments, activity limitations, participatory restrictions and disabilities
- d. Modifying environmental, home and work access and barriers to ensure full participation in one's normal and expected societal roles Physiotherapists may also contribute to the development of local, national and international health policies and public health strategies.

**6. Career Opportunities:** Currently there is demand for Physiotherapy specialty, abroad. Physiotherapy is delivered in a variety of settings which allow it to achieve its purpose. Prevention, health promotion, treatment/intervention, habilitation and rehabilitation take place in multiple settings that may include, but are not confined to, the following:

- a. Community based rehabilitation programmes
- b. Community settings including primary health care centres, individual homes, and field settings
- c. Education and research centres
- d. Fitness clubs, health clubs, gymnasias and spas
- e. Hospices
- f. Hospitals
- g. Nursing homes
- h. Occupational health centres
- i. Out-patient clinics
- j. Physiotherapist private offices, practices, clinics
- k. Prisons
- l. Public settings (e.g., shopping malls) for health promotion
- m. Rehabilitation centres and residential homes
- n. Schools, including pre-schools and special schools
- o. Senior citizen centres
- p. Sports centres /clubs
- q. Workplaces/companies

**7. Professional Recognition:** The award of Bachelor of Physiotherapy qualifies the graduates for membership of Maharashtra State Council for Physiotherapy & Occupational Therapy, Indian Association of Physiotherapists. They can also apply to different councils or associations in India and abroad

**Degree Awarded:**

After completion of the entire duration of Course and internship, successful students will be awarded the degree of '**Bachelor of Physiotherapy**' (BPT<sub>h</sub>).

**Recognition of Title and qualification:**

The recommended title thus stands as the "Physiotherapist" with the acronym –"PT" for this group of professionals

**8. BPT<sub>h</sub> Course duration:**

It is Four years and six months program (including six months of internship) - Bachelor's degree level.

**9. Eligibility:**

a. He/she has passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board with pass marks (50%) in physics, chemistry & biology (botany & zoology) i.e. (Physics, chemistry and biology as mandates requirements). SC/ST candidates will get concession in entry qualification as per rules.

b. Candidates who have studied abroad and have passed the equivalent qualification as determined by the Association of Indian Universities will form the guideline to determine the eligibility and must have passed in the subjects: Physics, Chemistry, Biology and English up to 12<sup>th</sup> Standard level.

c. Candidates who have passed the Senior Secondary school Examination of National Open School with a minimum of 5 subjects with any of the following group subjects.

i. English, Physics, Chemistry, Botany, Zoology

ii. English, Physics, Chemistry, Biology and any other language

d. He/she has attained the age of 17 years as on 31<sup>st</sup> December of current year.

i. Admission to Bachelor of Physiotherapy course shall be made on the basis of eligibility and an Entrance test, to be conducted by the Bharati Vidyapeeth Deemed to be University.

**10. Medium of Instruction:** The medium of instructions for this course shall only be English. This includes Theory Lectures, Practical's, Laboratory Works and Assignments, Seminars, Clinical Training.

## **PROGRAMME OUTCOMES:**

The Undergraduate program in Physiotherapy would earn a Bachelor of Physiotherapy (BPT) degree at the completion of this course.

At the completion of the curriculum, student should be able to -

1. The learning outcomes that a student should be able to demonstrate on completion of a degree level program include academic, personal, behavioural, entrepreneurial and social competencies.
  1. To delineate the cognitive, affective and psychomotor skills deemed essential for completion of this program and to perform as a competent physiotherapist who will be able to examine, evaluate, diagnose, plan, execute and document Physiotherapy treatment independently or along with the multidisciplinary team.
  2. Evaluate patients for impairments and functional limitations and able to execute all routine physiotherapeutic procedures as per the evaluation.
  3. Able to operate and maintain advanced physiotherapeutic Equipments used in treatment of patient, physiotherapy treatment planning (both Electrotherapy and Kinesio therapy) & procedures independently.
  4. Able to provide patient education about various physiotherapeutic interventions to the Patient and care givers.
  5. To demonstrate skill in manoeuvres of exercise therapy, passive movements, massage, stretching, strengthening, ergonomic applications, electrotherapy, manual therapy and various movement therapy techniques. Students will integrate Physiotherapy evaluation skills including electro diagnosis in musculoskeletal, neurological, cardiovascular and pulmonary conditions, community based rehabilitation, industrial rehabilitation, paediatric, geriatric, women's health, sports and other conditions
  6. Achieve competence in holistic practice encompassing promotive, preventive curative and rehabilitative aspects of disease and disorders.
  7. Develop scientific approach, acquire educational experience and promote healthy living.
  8. Become exemplary citizen by observation of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations

## **PROGRAM SPECIFIC OUTCOMES:**

1. Coursework entitles independent physiotherapy assessment and treatment in any health care delivery centres in India by graduates.
2. The course work is designed to train student 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 works will skill the graduates physical / functional diagnosis, treatment planning, and management, administration of physiotherapy treatment and for patient support, appreciating the psycho-social, cultural, economical & environmental factors with in complete empathy towards the patients.
4. Graduates can obtain employment opportunities in hospitals, sports teams, fitness centres, Community Rehabilitation, Health planning boards, Health promotions services in both private and public sectors as well as in Independent Physiotherapy Clinics.
5. The graduates will utilize critical enquiry and evidence based practice to make clinical decisions essential for autonomous practice.
6. The graduates will function as an active member of professional & community organisations. The graduates will be a service – oriented advocate dedicated to the promotion and improve of Community Health.
7. The graduates will demonstrate lifelong commitment to learning and professional development and seek further expertise in Research.
8. Acquire basic management skills in areas of human resources, materials & resource management related to health care delivery , general & hospital management , inventory skills and counselling .
9. Be able to work as leading partner in health care teams and acquire proficiency in communication skills.
10. Development basic values such as personal integrity, sense of responsibility and dependability & ability to relate to others.



## COMPETENCIES

**Competencies: The graduates passing out of this Institute should** obtain the following set of competencies at the time of graduation

1. As a **Physiotherapist** demonstrate knowledge of normal and abnormal human structure , function and development , societal, ethical and humanitarian principles that influence health care , national and regional health care policies , ability to elicit and record histories ,perform relevant physical examinations ,effective clinical problem solving , judgment and ability to interpret and integrate available data ,maintain accurate clear and appropriate records of the patient, choose the appropriate diagnostic tests , prescribe and safely administer therapies , provide a continuum of care at the primary or secondary level, ability to appropriately identify and refer patients and familiarity with basic, clinical and translational Research as it applies to the care of the patient.
2. As a **Leader and member of the health care team and system** work effectively and appropriately with colleagues in an inter-professional healthcare team leader, educate and motivate other members of the team , access and utilize components of the health care system and health delivery participate appropriately in measures that will advance quality of health care and patient safety , recognize and advocate health promotion ,disease prevention and health care quality improvement through prevention and early recognition in life style diseases.
3. As a **Communicator** demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients ,establish professional relationships with patients and families, be respectful to patients preferences values , prior experience ,beliefs, confidentiality and privacy and in a manner that encourages participation and shared decision – making .
4. As **Lifelong Learner** committed to continuous improvement of skill and knowledge demonstration ability to perform an objective self assessment, apply newly gained knowledge or skill to care of the patients , introspect and utilize experiences , search, and critically evaluate and apply medical lecture for patient care and identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.
5. As a **Professional who is committed to excellence**, practice selflessness, integrity ,responsibility, accountability and respect , respect and maintain professional boundaries between patients ,colleagues and society, demonstrate ability to recognize and manage ethical and professional conflicts, abide by prescribed ethical and legal codes of conducts and practice and demonstrate a commitment to the growth of the professional as a whole

## First year BPTb

SN	SUBJECT CODE	SUBJECT	Hrs.	UNIVERSITY EXAM	IA	TOTAL	UNIVERSITY EXAM	IA	TOTAL	GRAND TOTAL	
				TH	TH	TH	PR	PR	PR		
1	P101	Professional practice & Ethics	15	College Examination will be conducted in Final Year BPTb							
2	P102	Human Anatomy	212	80	20	100	80	20	100	200	
3	P103	Human Physiology	200	80	20	100	80	20	100	200	
4	P104	Biochemistry	54	40	10	50				50	
5	P105	Fundamentals of Kinesiology & Kinesiotherapy	250	80	20	100	80	20	100	200	
6	P106	Fundamentals of Electrotherapy	200	80	20	100	80	20	100	200	
				<b>Total marks</b>						<b>850</b>	
7		Seminar	69	This will be included in the attendance							
8		Observational clinical practice	400	This will be included in the attendance							
<b>Total Hrs.</b>			<b>1400</b>								

## Second Year BPTb

SN	SUBJECT CODE	SUBJECT	Hrs.	UNIVERSITY EXAM	IA	TOTAL	UNIVERSITY EXAM	IA	TOTAL	GRAND TOTAL	
				TH	TH	TH	PR	PR	PR		
1	P101	Professional practice & Ethics	15	College Examination will be conducted in the Final Year BPTb.							
2	P201	Pharmacology	50	40	10	50				50	
3	P202	Pathology & Microbiology	85	80	20	100				100	
4	P203	Psychology	30	40	10	50				50	
5	P204	Kinesiology	100	80	20	100				100	
6	P205	Kinesiotherapy	245	80	20	100	80	20	100	200	
7	P206	Electrotherapy	200	80	20	100	80	20	100	200	
8	P207	Computer Application	40	College Exam at the end of Course (30marks Exam)							Grade
9	P208	Environmental Studies	30	University Examination at the end of the course							50
				<b>Total</b>						<b>750</b>	
10		Seminar	105	This will be included in the attendance							
11		Supervised Clinical Practice	500	This will be included in the attendance							
<b>TOTAL</b>			<b>1400</b>								

### Third Year BPTb

SN	SUBJECT CODE	SUBJECT	Hrs.	UNIVERSITY EXAM	IA	TOTAL	UNIVERSITY EXAM	IA	TOTAL	GRAND TOTAL	
				TH	TH	TH	PR	PR	PR		
1	P101	Professional Practice & Ethics	15	College Examination will be conducted in the Final Year BPTb.							
2	P301	Surgery	55	40	10	50				50	
3	P302	Orthopaedics	80	40	10	50				50	
4	P303	Medicine	55	40	10	50				50	
5	P304	Neurology	50	40	10	50				50	
6	P305	Paediatrics	45	40	10	50				50	
7	P306	Community Medicine & Sociology	60	80	20	100				100	
8	P307	Obstetrics & Gynaecology	30	40	10	50				50	
9	P308	Psychiatry	30	40	10	50				50	
10	P3109	Dermatology	15	College Exam at the end of Course (30marks Exam)							GRADE
11	P3110	Functional Diagnosis & Physiotherapeutic Skills	460	80	20	100	80	20	100	200	
				<b>Total Marks</b>						<b>650</b>	
12		Seminar (including I.C.F.) :	50	This will be included in the attendance							
13		Supervised clinical practice:	455	This will be included in the attendance							
<b>Total Hrs.</b>			<b>1400</b>								

### Fourth Year BPTb

SN	SUBJECT CODE	SUBJECT	Hrs.	UNIVERSITY EXAM	IA	TOTAL	UNIVERSITY EXAM	IA	TOTAL	GRAND TOTAL
				TH	TH	TH	PR	PR	PR	
1	P101	Professional Practice & Ethics	30	College Examination (30 Marks only)						GRADE
2	P401	Administration, Management & Marketing	15	College Examination (30 Marks Only)						GRADE
3	P402	Musculoskeletal Physiotherapy	212	80	20	100	80	20	100	200
4	P403	Neuro Physiotherapy	210	80	20	100	80	20	100	200
5	P404	Cardiovascular Respiratory Physiotherapy	218	80	20	100	80	20	100	200
6	P405	Community Physiotherapy	210	80	20	100	80	20	100	200
7	P406	Principles of Bio-engineering	30	College Examination (30 Marks Only)						GRADE
8	P407	Research Methodology & Biostatistics	30	University Examination at the end of the course						50
9	P408	Diagnosing Imaging for Physiotherapy	20	College Examination (30 Marks Only)						GRADE
				<b>Total Marks</b>						<b>850</b>
10		Seminar (including I.C.F.) :	50	This will be included in the attendance						
11		Supervised clinical practice	455	This will be included in the attendance						
12		Project work	10	This will be included in the attendance						
<b>Total Hrs.</b>			<b>1480</b>							

### INTERNSHIP

SN	Clinical Posting	Hrs.
1	Six Month – Minimum 130 days Working	1040

17. **Clinical Education Training:** There are dedicated clinical hours in the course where students learn assessment and treatment on patient supervised by faculty members is distributed throughout every year of the curriculum. To ensure a depth of knowledge, clinical learning will be guided and workplace skills will be supervised and assessed by Practicing and Qualified Physiotherapists.
18. **Attendance:** 75% attendance in Theory and 85% attendance in Practical's are mandatory in each academic year. A candidate lacking in the prescribed attendance and progress in any subjects in theory or practical/clinical shall not be permitted to appear for the University examination in those subjects.
19. **Internal Assessment:** Internal Assessment will be calculated on the basis of two Internal Examinations conducted in the academic year, Terminal and Prelim. The marks should be sent to the University before the commencement of University examination as notified by the examination section from time to time. Internal assessment paper records should be maintained for all students & should be available for scrutiny. The marks of internal assessment tests should be displayed on notice board for the students. In each Academic year the internal assessment (20% of aggregate marks) will be calculated from Terminal and Preliminary Examination separately for theory and practical.

SUBJECTS	TERMINAL		PRELIM		TOTAL		IA	
	TH	PR	TH	PR	TH	PR	TH	PR
	Max. 80/40	Max. 80/40	Max. 80/40	Max. 80/40	Max. 160/80	Max. 160/80	Max. 20/10	Max. 20/10

\*For passing the IA 50% scoring is mandatory.

20. **Monitoring Process:** Attendance, performance in Internal Examinations, Classroom and clinical Performance is monitored by faculty members. Every student shall attend Lectures, Practical's, Laboratory Works, Seminars, Class tests, Weekly Case Discussions, Review Meeting, Tele-Physiotherapy Sessions and State Level Conferences, National Level Conferences or occasionally International Conferences during each year. Every candidate shall maintain a log book and record of his/her participation in the training programs conducted by the department. The log book / Journals shall be scrutinized and certified by the Head of the Department and the Principal, School of Physiotherapy, and need to present in the „University Practical Examination“. Every clinical Case Discussion, Case Presentation, Seminars, will be monitored by Faculty Members, Guides and Peers.

21. **Schedule of Examination:** Two internal examinations will be conducted in a year, an annual examination, „Terminal“ at midterm and „Prelim“ at the end of the academic year prior to University Examination, as per notification issued by the University from time to time.

The students who fail to clear I year University examination, will appear for Supplementary examination. This exam will be conducted one month after the university examination. Students, who pass in the supplementary exam, will be promoted to second year (regular student's batch). If students fail in the supplementary exam, they will attend classes with the newly admitted I year batch.

22. **Eligibility for Examination:** To be eligible to appear for University examination a Candidate:

- a) Should have undergone satisfactorily the approved course of study in the subject or subjects for the prescribed duration.
- b) Should have attended at least 75% of the total number of classes in theory and 85 % of total number of practical's to become eligible to appear for examination in those subject/ subjects.
- c) Should secure at least 35% of total marks assigned for internal assessment in particular subject in order to be eligible to appear in the University examination of that subject.
- d) Who fails in any other subject/subjects of first year BPT, has to put one academic term before he/she becomes eligible to appear for the next examination.
- e) Should secure at least 35% of total marks in college exam in subjects for which University Exam not recommended.
- f) Shall fulfill any other requirement that may be prescribed by the University from time to time.

23. **Criteria for Passing:** For declaration of pass in any subject in the university examination, a candidate should pass both in Theory & Practical examinations components separately as stipulated below:

- a) For a pass in theory a candidate shall secure not less than 50% marks in aggregate i.e., marks obtained in written examination and internal assessment (theory) added together
- b) For a pass in practical examination, a candidate shall secure not less than 50% marks in aggregate, i.e., marks obtained in University Practical Examination, Viva-Voce Examination and Internal Assessment (practical) added together.
- c) A candidate not securing 50% marks in theory and practical examination in a subject shall be declared to have failed in that subject and is required to appear for both theory and practical, again in the subsequent examination in the subject.
- d) In order to pass the university examination the student should score minimum 50% marks in both theory and practical of each subject.

**24. Declaration of class:**

- a) A candidate having appeared in the entire subject in the same examination and passed that examination in the first attempt and secure 75% of marks or more of grand total marks prescribed will be declared to have passed the examination with distinction.
- b) A candidate having appeared in the entire subject in the same examination and passed that examination in the first attempt and secure 60% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed the examination in First class.
- c) A candidate having appeared in the entire subject in the same examination and passed that examination in the first attempt and secure 50% of marks or more but less than 60% of grand total marks prescribed will be declared to have passed the examination in Second class.
- d) A candidate passing the University examination in more than one attempt shall be placed in pass class irrespective of the percentage of marks secured by him/her in the examination.

[Please note fraction of marks should not be rounded off for causes (a), (b) and (c)]

Result will be announced with grades and students meeting the required criteria will be declared as promoted to higher class.

**25. Award of Class:** Student will be awarded the class based on marks obtained in the university examination every year (First Year, Second Year, Third Year, and Fourth Year) as follows:

<b>Marks in percentage</b>	<b>Class</b>
Aggregate 75% and above	First class with distinction
Aggregate 60% & above but less than 75%	First class
Aggregate 50% & above but less than 60%	Second class
Less than 50%	Fail

**26. Carry over or allowed to keep term (ATKT):** A candidate who has failed in their respective Academic Year University Examination can carry over a maximum of two subjects to their next academic year, but will have to pass the subjects in the subsidiary examination before writing the examination of the next academic year, except First year BPTH.

**27. Scheme of Examination and Pattern of University Question Paper:-**

University examination of each subject is of 80/40 marks.

Internal Assessment (to be calculated from the internal examinations) is of 20 marks.



**Theory and Practical Examination:-** Theory Examination and Practical examination is of 80 marks each.

28. **Examiners:** University Examination will be conducted by one Internal Examiner from the same college or as decided by the University and one External Examiner outside the University.

<b>SR.NO</b>	<b>UNIVERSITY EXAMINER</b>	<b>EXPERIENCE</b>
1	Internal Examiner	3 Years" Experience In Teaching
2	External Examiner	5 Years" Experience In Teaching
3	Paper Setter	5 Years" Experience In Teaching
4	Paper Evaluator	5 Years" Experience In Teaching
5	Paper Moderator	8 Years" Experience In Teaching

29. **Internship:** An internship program is of six months which includes clinical postings in all specialties (Musculoskeletal Physiotherapy, Neuro Physiotherapy, Cardiovascular and Respiratory Physiotherapy and Community Physiotherapy)

## FIRST YEAR BPT<sub>h</sub> SYLLABUS

**Transcript Hours-1400**

SR.NO	SUBJECT & CODE	TOPIC		DIDACTIC HRS
1	<b>PROFESSIONAL PRACTICE &amp; ETHICS P101</b>	1	Introduction to the history of Physiotherapy ,	15
		2	Orientation to the curriculum, clinical areas and geographical location,	
		3	Concept of morality and ethics,	
		4	Concept of professionalism and Professional dress code	
2	<b>ANATOMY P102</b>	1	General Anatomy And Histology	212
		2	Musculoskeletal System	
		3	Neuro Anatomy	
		4	Systemic Anatomy	
		5	Cardio Vascular & Respiratory Anatomy	
		6	Abdomen	
		7	Sensory Organs	
		8	Endocrine & Exocrine System	
		9	Radiology	
3	<b>PHYSIOLOGY P103</b>	1	General Physiology	200
		2	Nervous System	
		3	Excretory System	
		4	Temperature Regulation	
		5	Endocrine System	
		6	Reproductive System	
		7	Special Senses	
		8	Respiratory System	
		9	Cardiovascular System	
		10	Gastro Intestinal System	
		11	Exercise Physiology	
		12	Physiology Of Ageing	
4	<b>BIOCHEMISTRY P104</b>	1	Carbohydrates	54
		2	Proteins	
		3	Enzymes	
		4	Vitamins	
		5	Minerals	
		6	Hormones	
		7	Nutrition	

		8	Clinical Biochemistry	
		9	Lipid	
		10	Muscle Contraction	
5	<b>FUNDAMENTALS OF KINESIOLOGY &amp; KINESIOTHERAPY P105</b>	1	Mechanics & Basic Biomechanics	250
		2	Bio-Physics Related To Kinesiotherapy	
		3	Classification Of Movements	
		4	Basic Evaluation	
		5	Massage	
		6	Relaxation	
		7	Aerobic Exercise	
		8	Yoga	
6	<b>FUNDAMENTALS OF ELECTROTHERAPY P106</b>	1	Medical Electronics And Electricity	200
		2	Electrical Modalities	
		3	Superficial Thermal Agents	
7	<b>SEMINAR</b>	1	Seminar ( applied to Anatomical structures and Physiological functions, Fundamentals of Kinesiology & Kinesiotherapy, Fundamentals of Electrotherapy )	69
8	<b>OBSERVATIONAL CLINICAL PRACTICE</b>	1	He /She shall observe and no technical aspects of fixation of electrotherapeutic modalities, basic movements and starting positions used, learn bedside manners and communication skills with the seniors, peers and patients	400

# PROFESSIONAL PRACTICE AND ETHICS -P101

Total 15hrs

(COLLEGE EXAMINATION IN FINAL YEAR)

## COURSE DESCRIPTION:

This subject will be taught in continuum from first year to final year. An exam will be conducted only in final year. Professional and ethical practice curriculum content addresses the Knowledge, Skills and Behaviors required of the physiotherapist in a range of practice relationships and roles. The course will discuss the role, responsibility, ethics administration issues and accountability of the physical therapists. The course will also cover the history and change in the profession, responsibilities of the professional to the profession, the public and to the health care team. This includes the application of professional and ethical reasoning decision-making strategies and professional communication.

## COURSE OBJECTIVES:

At the end of the course, the student will be compliant in following domains:

**Cognitive:** The student will

- Be able to understand the moral values and meaning of ethics.
- Acquire bed side manners and communication skills in relation with patients, peers, seniors and other professionals.

**Psychomotor:** The student will be able to:

- Develop psychomotor skills for physiotherapist-patient relationship.

SR.NO	TOPIC	HRS	SUPERVISION HOURS
1	Introduction to the history of Physiotherapy	2	05
2	Orientation to the curriculum, clinical area sand Geographical location	3	
3	Concept of morality and ethics	3	
4	Concept of professionalism and Professional Dress code	2	

## **HUMAN ANATOMY- P102**

**Theory 150hrs+ Practical/Laboratory 62hrs = Total-212hrs**

**(UNIVERSITY EXAMINATION)**

### **COURSE DESCRIPTION:**

The focus of this course is an in-depth study and analysis of the regional and systemic organization of the body. Emphasis is placed up on structure and function of human movement. A comprehensive study of human anatomy with emphasis on the nervous, musculoskeletal and circulatory systems is incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in the cadaver supplemented with the study of charts, models, prosecuted material and radiographs are utilized to identify anatomical landmarks and configurations.

### **COURSE OBJECTIVES:**

At the end of the course, the candidate will be able to

#### **Cognitive:**

- Acquire the knowledge of Anatomical aspects of muscles, bones, joints, their attachments & to understand and analyses movements.
- Acquire the knowledge of anatomy on the living (living anatomy).
- Acquire the knowledge of the Anatomical basis of various clinical conditions.
- Able to identify various parts of nervous system.
- Understand the circulation blood of C.N.S. & spinal cord.
- To identify the course of peripheral nerve.
- Acquire the knowledge of various structures of the Cardio Vascular & Respiratory system and the course of blood vessels
- Identify and describe various structures of Thoracic cage and mechanisms of Respiration
- Able to apply knowledge of Living anatomy with respect to Cardio Vascular & Respiratory system.
- Able to acquire anatomical basis of clinical conditions of cardiovascular & Respiratory system

#### **Psychomotor:**

- Describe the Anatomical aspects of muscles, bones, joints, their attachments & analyze the movements
- Describe various parts of nervous system and describe the blood circulation of brain & spinal cord

- Describe the course of peripheral nerves, its supply and action to each muscle.
- Describe various structures of the Cardio Vascular & Respiratory system and the course of blood vessels
- Describe various structures of Thoracic cage and mechanisms of Respiration

**COURSE OUTCOMES:**

- To understand the basics terminology and various anatomical structures of the body.
- To understand the bones, joints, muscles, vascular and nerve supply of upper limb.
- To understand the various parts of brain and spinal cord with its pathways and vascularity of brain.
- To understand the bones, joints, muscles, vascular and nerve supply of head and neck.
- To understand the routes and functions Cranial nerves.
- To understand the various parts and surfaces of Heart, Lungs and viscera.
- To understand the bones, joints, muscles, vascular and nerve supply of lower limb.
- To understand the various parts of bones and joints of thorax, intercostal muscles, movements of thorax.
- To understand the various parts and surfaces of stomach, GIT, pancreas and liver.
- To understand various anatomical parts of reproductive system.

SR.NO	REGIONS	THEORY HOURS	PRACTICAL HOURS
1	<b>GENERAL ANATOMY, HISTOLOGY AND EMBRYOLOGY</b>	19	3
a	<b>General Anatomy:</b>	6	
	i. Fascia ii. Muscles iii. Bones iv. Joints v. Nerve vi. Vessels		
b	<b>General Histology</b>	7	3
	i. Epithelial ii. Connective tissue iii. Muscle iv. Bone and cartilage v. Nerve and vessels		

c	<b>Embryology</b>	6	
	i. Formation of Germ layers & Neural Tube ii. Formation of Bones, Muscles & Nervous Tissue iii. Formation of Limbs iv. Formation of Brain & Spinal cord v. Formation of Heart & Lungs		
2	<b>MUSCULOSKELETAL SYSTEM</b>	64	34
a	Upper extremity	15	10
b	Lower extremity	15	10
c	Back & Thoracic Cage	10	5
	Back Muscles Ribs & Sternum Intercostal Muscles Diaphragm & Mechanism of respiration		
d	Abdomen and Pelvis	7	2
	Muscles of Abdomen Muscles of Pelvic Floor and Cavity Vertebral Column & vertebrae		
e	<b>Head, Neck &amp; Face</b>	13	5
	Skull and Mandible Facial Muscle, blood supply, nerve supply Triangles of neck, Glands, Tongue & Palate Larynx & Pharynx Muscles of mastication & T.M Joint Extra ocular muscles with never supply Nose & Para nasal sinuses		
f	<b>Living Anatomy:</b>	4	2
	i. Upper extremity ii. Lower extremity iii. Head, Neck & Face iv. Trunk		
3	<b>NEUROANATOMY</b>	32	12
a	General organization of Nervous System	5	
b	Central Nervous System	15	8
c	Cranial nerves	10	4
d	Peripheral Nerves (should be done with Respective parts)	2	
	i. Autonomic Nervous System: ii. Sympathetic iii. Parasympathetic		
4	<b>SYSTEMIC ANATOMY</b>	17	11
A	<b>Abdominal &amp; Pelvic Organs</b>	4	2
a	Alimentary system		
b	Urinary System		

c	Genital system		2
	i. Male organs ii. Female organs		
B	<b>CARDIOVASCULAR &amp; RESPIRATORY ANATOMY</b>	9	3
a	Thoracic wall		
b	Mediastinum		
c	Heart and major blood vessels		2
d	Lungs		1
5	<b>SENSORY ORGANS</b>	4	2
a	Ear		
b	Eye		
c	Skin		
6	<b>ENDOCRINE &amp; EXOCRINE SYSTEM</b>	4	
7	<b>RADIOLOGY</b>	10	

### **RECOMMENDED TEXTBOOKS**

1. B. D. Chaurasia, Volume- I, II , III & IV ; Human Anatomy; CBS Publishers and Distributers
2. Inderbir Singh; Neuroanatomy; Jaypee Brothers Medical Publishers
3. Kadasne, Human Anatomy; Volume- I, II & III; Jaypee Brothers Medical Publishers
4. B D Chaurasia; General Anatomy; CBS Publishers and Distributers
5. Sampath Madhyastha : Manipal Manul of Anatomy , CBS Publishers.

### **RECOMMENDED REFERENCE BOOKS**

1. Richard Drake, A. Wayne Vogl, Adam Mitchell; Gray's Anatomy; Elsevier
2. Quining Wasb; Extremities; Lippincott Williams and Wilkins
3. Mariano De Fiore; Atlas of Histology; Lea & Febiger
4. Smoutand McDowell; Anatomy & Physiology; Edward Arnold
5. Katherine Wells; Kinesiology; Saunders (W.B.) Co Ltd
6. Splittgerber; Snell's Neuroanatomy; Wolters Kluwer
7. Textbook of Clinical Neuroanatomy; Vishram Singh; Elsevier India
8. G. J. Romanes; Cunningham's- Practical Anatomy; Volume I II and III; Oxford University Press

### **INTERNAL ASSESSMENT:**

1. Two exams –Terminal and prelims of 80 marks each (Theory & Practical) TOTAL-160 marks
2. I.A. to be calculated out of 20 marks (Theory & Practical)
3. Internal assessment as per University pattern.



**SCHEME OF UNIVERSITY EXAMINATION**

<b>ANATOMY THEORY</b>		<b>Marks</b>
80MARKS +I.A.– 20MARKS		
*The question paper will give appropriate weightage to all the topics in the Syllabus		<b>100</b>
<b>Section- A S.A.Q.</b>	Q-1-Answer any FIVE out of SIX <span style="float: right;">[5x 3=15]</span>  Should be based on: Digestive/ Uro-genital /Reproductive system / Special senses- Eye / Ear / Skin / Circulatory system / General Anatomy/General Histology	<b>50</b>
	Q-2-Answer any FIVE out of SIX <span style="float: right;">[5 x 7 =35]</span>  This question should include: Thorax / Soft parts Upper Limb / Soft part Lower Limb/Soft partsThorax/Spine/Neck/ Abdominal /Pelvic Muscle	
<b>Section B L.A.Q.</b>	Q-3]A L.A.Q <span style="float: right;">1x 15 =15 marks</span> OR Q-3] B L.A.Q <span style="float: right;">1x 15 =15 marks</span>  (should be based on Musculoskeletal anatomy)	<b>30</b>
	Q-4] A L.A.Q <span style="float: right;">1x15=15 marks</span>  OR Q-4] B L.A.Q <span style="float: right;">1x15=15 marks</span> (Should be based on Neuro -Anatomy –including cranialnerves with emphasis to III to XII nerves) LAQ should give break up of 15 marks e.g.[3 +5+7]	
<b>Total Marks</b>		<b>80</b>

<b>ANATOMY PRACTICAL</b>		<b>Marks</b>
80 MARKS+ I.A.– 20 MARKS		<b>100</b>
<b>Spots</b>	Based on: i. Musculoskeletal (7x3) = 21 marks ii. Systemic (5x3) = 15 mark iii. Neuro anatomy (3x3) = 09 marks	<b>45</b>
	<b>Radiology</b>	<b>05</b>
	<b>Living anatomy</b>	<b>05</b>
<b>Viva</b>	iv. Hard parts v. Soft parts	<b>20</b>
<b>Journal</b>	Year work on practical's performed	<b>05</b>
<b>Total Marks</b>		<b>80</b>

## **HUMAN PHYSIOLOGY-P103**

**Theory-150hrs + Practical /Laboratory-50hrs= Total 200hrs**

**(UNIVERSITY EXAMINATION)**

### **COURSE DESCRIPTION:**

The course is designed to study the function of the human body at the molecular, cellular, tissue and systems levels. The major underlying themes are; the mechanisms for promoting homeostasis, cellular processes of the metabolism, membrane function and cellular signaling; the mechanisms that match supply of nutrients to tissue demands at different activity levels; the mechanisms that match the rate of excretion of waste products to their rate of production; the mechanisms that defend the body against injury and promote healing.

These topics address the consideration of nervous and endocrine regulation of the cardio vascular, hematopoietic, pulmonary, renal, gastro-intestinal and musculoskeletal systems including the control of cellular metabolism. The course stresses on the integrative nature of physiological responses in normal function and disease.

This course will serve as a pre-requisite/foundation for the further courses i.e. Exercise physiology or Pathology.

### **COURSE OBJECTIVES:**

At the end of the course, the candidate will:

#### **Cognitive:**

- Acquire the knowledge of the relative contribution of each organ system in maintenance of the Milieu Interior (Homeostasis)
- Be able to understand physiological functions of various systems, with special reference to Musculo-skeletal, Neuro-motor, Cardio-respiratory, Endocrine, Uro- genital function, & alterations in function with aging
- Analyse physiological response & adaptation to environmental stresses-with special emphasis on physical activity, altitude, temperature
- Acquire the skill of basic clinical examination, with special emphasis to Peripheral & Central Nervous system, Cardiovascular & Respiratory system, & Exercise tolerance.

#### **Psychomotor:**

- Describe the basic function of Cell, its morphology and composition of Blood.
- Describe various physiology of Respiratory system, Muscular system, Cardio Vascular System, Nervous System, digestive system, Autonomic Nervous System,

- Able to describe the basic physiology of exercises and its effects on various system.

**COURSE OUTCOMES:**

- To understand the basic function of Cell and its morphology.
- To understand the basic function and composition of Blood.
- To understand the basic physiology of Respiratory system.
- To understand the basic physiology of digestive system.
- To understand the basic physiology of Muscular system and its contraction mechanism

<b>SR.NO.</b>	<b>REGIONS</b>	<b>THEORY HOURS</b>
A	<b>GENERAL PHYSIOLOGY</b>	
1	<b>Cell</b>	8
	Structure of cell membrane Transport a cross cell membrane R.M.P& action potential Homeostasis	
2	<b>BLOOD</b>	8
	Composition and functions of blood(WBC, RBC, Platelets) Blood group systems Immunity Hemostasis	
3	<b>NERVE -MUSCLE PHYSIOLOGY</b>	14
	<b>Nerve:</b>	6
	Structure, classification & Properties	1
	EMG	1
	Propagation of nerve impulse	1
	iii. Nerve injuries–degeneration, regeneration and reaction of degeneration	1
		2
	<b>Muscle:</b>	8
	i. Structure properties classification-smooth, skeletal, cardiac, excitation/contraction coupling	3
	ii. Factors affecting development of muscle tension, fatigue,load.	3
	iii. Neuro -muscular transmission; applied physiology: Myasthenia gravis, Lambert Eaton Syndrome.	2

<b>4</b>	<b>NERVOUS SYSTEM</b>	<b>30</b>
a.	Introduction of nervous system, classification – C.N.S., P.N.S.& A.N.S.	4
b.	Synapse-structure, properties & transmission;	1
c.	Reflexes-classification & properties;	3
d.	Receptor physiology: classification, properties.	3
e.	Physiology of Touch, Pain, Temperature & Proprioception	2
f.	Sensory and motor tracts: effect of transaction (complete and incomplete) at various levels	4
g.	Physiology of Muscle Tone (muscle spindle); Stretch reflex	2
h.	Connection & function of Basal ganglia, Thalamus , Hypothalamus ,Sensory and Motor cortex, Cerebellum, Limbic system ,Vestibular Apparatus	8
i.	Autonomic nervous system: Structure and functions of the sympathetic and the parasympathetic nervous system.	1
j.	Learning, memory & conditioned reflex	1
k.	Physiology of Voluntary movement	1
<b>5</b>	<b>EXCRETORY SYSTEM:</b>	<b>10</b>
a.	Kidneys- structure &function;	1
b.	Urine formation; (to exclude concentration and dilution)	2
c.	Juxta glomerular apparatus	1
d.	Fluid and electrolyte balance–Na, K, H <sub>2</sub> O	1
e.	Neural control of Micturition	1
f.	Applied physiology: Types of bladder	2
g.	Temperature Regulation:	2
<b>6</b>	<b>ENDOCRINE SYSTEM:</b>	<b>10</b>
a.	Secretion-regulation & function of Pituitary, Thyroid, Adrenal, Parathyroid, Pancreas	9
b.	Applied physiology (abnormalities) of the above mentioned Glands	1
<b>7</b>	<b>REPRODUCTIVE SYSTEM:</b>	<b>8</b>
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	
8	<b>SPECIAL SENSES:</b>	9
a.	Structure and function of the eye	
b.	Applied physiology: errors of refraction, accommodation, reflexes– dark and light adaptation, photosensitivity.	
c.	Structure and function of the ear	
d.	Applied physiology –types of deafness	
9	<b>RESPIRATORY SYSTEM:</b>	14
a.	Introduction, structure and function of the RS	
b.	Mechanics of respiration;	
c.	Pulmonary Volumes & capacities;	
d.	Anatomical & Physiological Dead space- ventilation/ perfusion ratio, alveolar ventilation	
e.	Transport of respiratory gases	
f.	Nervous & Chemical control of respiration	
g.	Pulmonary function tests- Direct & indirect method of Measurement	
h.	Physiological changes with altitude & acclimatization	
10	<b>CARDIOVASCULAR SYSTEM:</b>	19
a.	Structure & properties of cardiac muscle	
b.	Cardiac impulse- initiation and conduction	
c.	Cardiac cycle	
d.	Heart rate	
e.	Cardiac output regulation& function affecting Peripheral Resistance, venous return.	
f.	Blood pressure, definition , regulation	
g.	Regional circulation-coronary-muscular, cerebral, pulmonary.	
h.	Normal ECG.	
11	<b>GASTRO INTESTINAL SYSTEM:</b>	6
a.	Absorption and digestion in brief	
b.	Liver function	
12	<b>EXERCISE PHYSIOLOGY</b>	12
a.	Basal Metabolic Rate and Respiratory Quotient	
b.	Energy metabolism	

c.	Fatigue		
d.	Oxygen debt		
e.	Acute cardio vascular changes during exercise, difference between mild, moderate and severe exercise, concept of Endurance		
f.	Acute respiratory changes during exercise		
g.	Concept of training/conditioning, effects of chronic exercise / effect of training on the cardio vascular & respiratory system		
h.	Body temperature regulation during exercise		
i.	Hormonal and metabolic effects during exercise		
j.	Effects of exercise on muscle strength, power, endurance		
k.	Physical fitness and its components		
13	<b>PHYSIOLOGY OF AGEING (With respect to all systems)</b>		2

Sr. .NO	PRACTICALS	HRS
1	Haematology – (demonstration only)	6
2	GRAPHS:	5
	a. Skeletal muscle and its properties	
	b. Cardiac muscle-properties-effect of Ach & Adrenaline	
3	Examination of pulse	2
4	Blood pressure- effects of change in posture & exercise	4
5	ECG	2
6	Physical fitness:	6
	a. Breath holding	
	b. Mercury column test;	
	c. Cardiac efficiency test- Harvard step test- Master step test	
7	Spirometry,	2
	Lung volumes and capacities	
8	Perimetry	
9	Clinical examination: History taking and general examination / Respiratory system / cardio vascular system / Higher functions / Cranial nerves /Reflexes / Motor & Sensory system	20
10	Test of Deafness	1
11	I. Visual Acuity & II. Visual Reflexes	1

## **RECOMMENDED TEXTBOOKS**

1. Chatterjee cc; Text book of Physiology; CBS Publishers and Distributers
2. Sujit Kumar Chaudhuri; Concise Medical Physiology; NCBA Publications

## **RECOMMENDED REFERENCE BOOKS**

1. Ganong; Review of Medical Physiology; McGraw-Hill Education / Medical
2. Keele A. Cyril; Samson & Wright's Applied Physiology; OUP India
3. Bruce M. Koeppen ; Bern and Levy Textbook of Medical Physiology; Elsevier
4. Textbook on Medical Physiology–Guyton; Elsevier
5. K Sambulingam, Essentials of Medical Physiology, Jaypee Brothers, 7<sup>th</sup> Edition

## **INTERNAL ASSESSMENT:**

1. Two exams–Terminal and prelims of 80 marks each (Theory & Practical)  
TOTAL –160 marks
2. I. A. to be calculated out of 20 marks (Theory & Practical)
3. Internal assessment as per University pattern

**SCHEME OF UNIVERSITY EXAMINATION**

<b>PHYSIOLOGY THEORY</b>		<b>Marks</b>
<b>80 MARKS+I.A.– 20 MARKS</b>		
*The question paper will give appropriate weightage to all the topics in the syllabus.		<b>100</b>
<b>Section-A S.A.Q.</b>	Q-1-Answer any FIVE out of SIX [5 x3 =15 marks]  Based on: Cardio-vascular system / Respiratory system / Exercise Physiology/Special Senses (Eye/Ear/Skin)/ Reproductive system/ GIT/ Excretory.	<b>50</b>
	Q-2-Answer any FIVE out of SIX [5 x7 =35 marks]  Based on: Blood/ Electrolyte balance / Endocrine/ /General physiology/Nerve Muscle Physiology/ Exercise Physiology.	
<b>Section-B L.A.Q.</b>	Q-3] A L.A.Q [1x15=15marks] (Compulsory from Musculoskeletal) OR Q. 3] B L.A.Q [1x15=15marks] (Compulsory from C.V.S./R.S.)	<b>30</b>
	Q-4] A [1x15=15 marks] OR Q-4] B [1x15=15marks] (Based on: C.N.S.)	
	LAQ should give break up of 15marks–e.g. [3+5+7 Marks]	
<b>Total Marks</b>		<b>80</b>

<b>PHYSIOLOGY PRACTICAL</b>		<b>Marks</b>
<b>80 MARKS+I.A.– 20 MARKS</b>		<b>100</b>
<b>Spots</b>	Based on: Topic 1,2,5,7,8,10,11 (10X2Marks)	<b>20</b>
<b>Viva</b>	Based on theory	<b>20</b>
<b>Demonstration</b>	On Clinical Physiology C.V.S. 10Marks R.S. 10Marks C.N.S. Cranial Nerves and Special Senses 15Marks	<b>35</b>
<b>Journal</b>	Year work on practical's performed	<b>05</b>
<b>Total Marks</b>		<b>80</b>



## **BIOCHEMISTRY-P104**

**Theory 50 hrs+ Demonstrations 4 hrs =Total 54 hrs**

**(UNIVERSITY EXAMINATION)**

### **COURSE DESCRIPTION:**

This course provides the knowledge and skills in fundamental organic chemistry and introductory biochemistry that are essential for further studies. It covers basic biochemical, cellular, biological and microbiological processes, basic chemical reactions in the prokaryotic and eukaryotic cells, the structure of biological molecules, introduction of other nutrients i.e. Carbohydrates, fats, enzymes, nucleic acids and amino acids.

### **COURSE OBJECTIVES:**

**At the end of the course, the candidate will:**

#### **Cognitive:**

- Able to understand the biochemical change of the various elements of the body at cellular level and extra cellular level
- Able to understand various biomolecules which are present in the body and functions
- Acquire the knowledge of the formation and fate of these biomolecules
- Able to understand their normal levels in body fluids required for functioning and their abnormal levels to understand the disease process

#### **Psychomotor:**

- Describe biochemical change of the various elements of the body at cellular level and extra cellular level
- Describe various biomolecules which are present in the body and functions
- Describe their normal levels in body fluids required for functioning and their abnormal levels

### **COURSE OUTCOMES:**

- To understand the metabolism, function and mechanism of action of various elements of the body.
- To understand the transport system of electron and its effects on body
- To understand the metabolism, function and mechanism of action of various elements of the body like minerals, vitamins and nucleic acid.
- To understand the role of nutrition on body with biochemical changes.
- To understand the biochemical changes in connective tissues, muscles and nerves.
- To understand the biochemical markers for diagnosis of various disease conditions

SR .NO.	REGIONS	THEORY HOURS
1	<b>CARBOHYDRATES</b>	9
a	Chemistry, Definition, Classification with Examples, Functions	
b.	Digestion and Absorption, Glycogenesis, Gluconeogenesis, Glycogenolysis and HMP pathway, Glycolysis, Electron transport chain for ATP synthesis, TCA cycle.Hormonal regulation of blood	
c.	Glucose, Glycogen storage disorders, Diabetes mellitus,Glycosuria, changes in Carbohydrate, Protein & Lipid metabolism.	
d.	All the metabolisms should be taught based on the followingpoints such as starting and ending products, tissues of occurrence and the conditions when the pathway is activated,deactivated and significance of the pathway.	
2	<b>PROTEINS</b>	6
a.	Definition, Importance, Functional Classification, Digestion & Absorption, decarboxylation, deamination, transamination, transmethylation, Urea cycle, clinical significance of serum urea,function of glycine, Phenylalanine, tryptophan, methioninetyrosine.	
b.	There should be an emphasis on understanding the structure ofprotein, the essential and non- essential amino acids.	
3	<b>ENZYMES</b>	4
	Definition, Modern Classification, Factors affecting enzymes Action, diagnostic & therapeutics uses & enzymes, Isoenzymes,	
	Competitive & Non competitive inhibition.	
4	<b>VITAMINS</b>	4
	Definition, Classification, Fat & water soluble vitamins, functions, Deficiency manifestations, sources & RDA (Vit. C,B12, Folic acid, Thiamin)	
	Rest all vitamins	
5	<b>MINERALS</b>	5
	Ca, P, Fe, I, Zinc, Selenium, Fluorine, Magnesium included Naand K. Function sources, Deficiency manifestations	
6	<b>HORMONES</b>	5
	Definition with mechanism of action, classification. Thyroid Hormone- Synthesis, Biochemical functions ,Assessment of abnormality with thyroid function test	

7	<b>NUTRITION</b>	3
	Composition of food ,balanced diet, Kwashiorkor, Marasmus, Nitrogen balance, major Dietary constituent & their importance.Include energy requirements, factors affecting B.M.R., S.D.A. (Specific Dynamic Action) and R.Q. (Respiratory Quotient)	
8	<b>CLINICAL BIOCHEMISTRY</b>	6+4(demo)
a.	Liver Function Test, Renal Function Test, Lipid profile in serum	
b.	Starvation metabolism, Haemoglobin chemistry and metabolism	
c.	Demonstrations: Demonstration of estimation of various biomolecules and their interpretation Interpret reports of various conditions (including Diabetic profile, Cardiac profile, Uric acid and Gout)	
9	<b>LIPID</b>	4
	Definition, classification with examples biomedical importance, Phospholipids & lipoproteins functions. Digestion & absorption of lipid, $\beta$ oxidation of fatty acid with Energetics, Ketone bodies and their metabolism, Prostaglandins and essential fatty acids , Cholesterol, importance of Cholesterol, obesity	
10	<b>MUSCLE CONTRACTION</b>	4
	Mechanism & Biochemical events Connective Tissue- Biochemistry of connective tissue Collagen Glycoprotein proteoglycans	

### RECOMMENDED TEXTBOOKS

1. U Satyanarayana; Biochemistry; Elsevier India
2. Vasudevan DM; Textbook of Biochemistry for Medical students; Jaypee Brothers Medical Publishers
3. Naik Pankaja; Essentials Of Biochemistry; Jaypee Brothers Medical Publishers

### RECOMMENDED REFERENCE BOOK

1. Robert K. Murray; Harpers Biochemistry (24th ed); Appleton & Lange

### INTERNAL ASSESEMENT

1. Two exams –Terminal and prelims of 40 marks each TOTAL - 80marks
2. I.A.to be calculated out of 10 marks (Theory only)
3. Internal assessment as per University pattern.

## SCHEME OF UNIVERSITY EXAMINATION

<b>BIOCHEMISTRY THEORY</b>		<b>Marks</b>
40marks + <b>I.A.</b> –10Marks [There shall be no LA Q in this paper] *The question paper will give appropriate weightage to all the topics in the syllabus.		40
<b>Section-A- Q-1 &amp; Q-2</b>	SAQ-to answer any FIVE out of SIX [5x3=15 marks] ( Brief Answers)	15
	SAQ-to answer any FIVE out of SIX [5x5=25 marks] (Short Answers)	25
<b>Total Marks</b>		<b>40</b>

## **FUNDAMENTALS OF KINESIOLOGY & KINESIOTHERAPY- P105**

**Didactic 100 Hrs +Practical / Laboratory 150 Hrs = Total 250 Hrs**

**(UNIVERSITY EXAMINATION)**

### **COURSE DESCRIPTION:**

This course covers the definition of various terms used in mechanics, biomechanics kinesiology as well as its importance in physical therapy. It applies the mechanical principles to simple equipment's of therapeutic gymnasium and familiarizes the candidate to its use. It covers the types of human motions as well as planes and relative axes of motion. It also explains the inter-relationship among kinematic variables and utilizes this knowledge to describe and analyze motion. It covers the classification of the joints and muscles along their distinguishing characteristics and skill of measurement of its ranges in various planes and axes. This course additionally covers therapeutic principles and skills of application of massage, yoga, aerobic exercise and use of suspension therapy. It also enhances the skill of evaluation of vital parameters & sensory system.

### **COURSE OBJECTIVE:**

#### **Cognitive:**

At the end of the course, the candidate will be able to:

- Define the various terms used in relation to Mechanics, Biomechanics & Kinesiology
- Recall the basic principles of Biophysics related to mechanics of movement / motion & understand the application of these principles to the simple equipment designs along with their efficacy in Therapeutic Gymnasium & various starting positions used in therapeutics.

#### **Psychomotor:**

At the end of the course, the candidate will be able to:

- Describe & also acquire the skills of use of various tools of the Therapeutic Gymnasium.
- Demonstrate the movement's in terms of various anatomical planes and axes.
- Demonstrate various starting & derived positions used in therapeutics.
- Describe physiological principles & acquire the skills of application of therapeutic massage.
- Acquire the skills of assessment of basic evaluation like sensations, reflexes & vital parameters.
- Acquire the skill of objective assessment of Range of Motion of the joints by Goniometry.

- Describe physiological basis and principle of relaxation and acquire the skills of relaxation methods.
- Describe physiological responses and principles of aerobic exercises for general fitness & demonstrate fitness skills on self & group.
- Describe physiological principles and acquire the skill of performing Pranayama & Yogasanas.

**Affective:**

- To maintain proper communication with the model/ subjects for correct delivery of instruction during demonstration
- To follow the appropriate principle of the handling technique eg. Hand placement, stabilization, fixation etc.
- To perform safe, respectful and effective handling during demonstration.

SR.NO	TOPICS	THEORY HOURS	PRACTICAL HOURS
1	<b>MECHANICS &amp; BASIC BIOMECHANICS</b>	<b>25</b>	
	<b>a. Mechanics &amp; Application to human body</b> i. Explain in Detail: Mechanics (Statics & Dynamics), Biomechanics, Kinetics ,Kinematics (Osteo kinematics, Arthrokinematics, Open Chain & Closed Chain kinematics) ii. Axes /planes, iii. Laws of inertia & motion, iv. Gravity, C.O.G, L.O.G. and B.O.S. v. Equilibrium–Types and affecting factors vi. Mechanics of Forces Work, Energy, Speed, Power, Friction, Momentum, Parallelogram of Forces vii. Torque viii. Pendulum ix. Mechanical and Anatomical pulleys x. Levers xi. Fluid mechanics related to Hydrotherapy (physics, statics & dynamics)	20	

	<b>b.Muscle Mechanics</b> i. Types of Muscles-Anatomical & Physiological ii. Types of muscle work / Contraction iii. Muscle Action: Roles as Agonist, Antagonist, Fixators, Synergist iv. Active & Passive insufficiency vi. Range of muscle work, Angle of pull – with importance to efficiency of muscle work and stability of joint	5	
2	<b>BIO-PHYSICS RELATED TO KINESIOTHERAPY</b>		37
	<b>a. Starting Positions &amp; Derived Positions</b> i. Application of stability ii. BOS, Gravity and muscle work in relation to various positions iii. Application of Position & uses	10	5
	<b>b. Therapeutic Gymnasium</b> i) Stability training equipment"s: Swiss Ball, wobble board, Bosu ball ii) Mobility training equipment"s: Walking aids, pulleys, shoulder wheel, finger ladder, ankle mobilize, knee ratchets, foam roller, roller skates iii) Strength training equipment"s: Weights, resistance bands and wands, medicineball, springs, ankle mobilize, dumbbells iv) Effects, uses and Applied mechanics of allabove accessories	5	17
	<b>c. Suspension Therapy</b> i.Principles ii.Suspension Apparatus iii. Types of Suspension Iv.Effects and uses	5	15

	v. Techniques for individual joints		
<b>3</b>	<b>CLASSIFICATION OF MOVEMENTS</b>	<b>10</b>	<b>15</b>
	i. Definition and classification ii. Principles of movements iii. Effects, uses and Techniques (active:assisted, free,assisted- resisted, resisted & passive)		
<b>4</b>	<b>BASIC EVALUATION</b>	<b>15</b>	<b>35</b>
	<b>a. Assessment of Vital Parameters</b> i. Temperature ii. Blood Pressure iii. Heart Rate/ Pulse rate iv. Respiratory Rate v. Chest expansion	5	5
	<b>b. Assessment of Sensations and Reflex testing</b>	5	5
	<b>c. Goniometry</b> i. Definition and Types of Goniometers ii. Principles iii. Techniques for individual joints with biomechanical principles iv. Uses	5	25
<b>5</b>	<b>MASSAGE</b>	<b>5</b>	<b>8</b>
	a. Definition b. Classification c. Principles d. Effects & uses e. Indications and contra indications f. Techniques- Upper limb, Lower Limb, Neck, Back, Abdomen, Face & Scalp		
<b>6</b>	<b>RELAXATION</b>	<b>5</b>	<b>10</b>



	<p>a.Principles,  b.Techniques along with their effects &amp; uses  i. i.General-Jacobson's,  Shavasana &amp; Reciprocal(Laura Mitchell)  ii Local -Heat, Massage ,Gentle / Rhythmicpassive movements</p>		
7	<p><b>AEROBIC CONDITIONING AND BASIC PRINCIPLES OF GENERALFITNESS</b>  (as applied to self and group)</p>	5	5
	<p>a. Physiology of aerobic and anaerobic exercise.  b. Components of fitness (definition of termsonly)  c. Warm up &amp; d. Cool down exercises and itseffects.  e. Group &amp; Recreational activities</p>		
8	<p><b>YOGA</b></p>	15	40
	<p>a.Definition  b.Principles of Yoga  c.Yogasana- Technique, Benefits, Indications, Contraindications &amp; cautions for each Asanas:</p>	2	
	<p>i. Asanas in supine  a. Pawanamuktasana  b.Ardha Halasana  c.Halasan  d.Setubandhasana  e.Naukasana  f.Matsyasana  g.Shavasana  h.Sarvangasana</p>	3	
	<p>ii.Asanas in prone  a. Bhujangasana  b. Ardha-Shalabhasana  c.Dhanurasana  d. Makarasana</p>	3	

	iii. Asanas in sitting a. Padmasana, Siddhasana, Sukhasana b. Yogamudrasana c. Virasana d. Vajrasana e. Gomukhasana f. Pashchimottanasana	2	
	iv. Asanas in standing a. Padhasthasana, Padangusthasana, Uttanasana b. Utkatasana c. Tadasana d. Trikonasana V. Pranayama i. Anulom-vilom ii. Kapalbhati	2	

### RECOMMENDED TEXTBOOKS

1. M. Dena Gardiner; Principles of Exercise Therapy; CBS Publishers and Distributers
2. M. Hollis; Massage for Therapists: A Guide to Soft Tissue therapy; Wiley-Blackwell
3. Margaret Hollis, Phyllis Fletcher Cook; Practical Exercise therapy; Wiley
4. Hydrotherapy– Kisner ,Hollis
5. Cynthia C Norkin, D Joyce White;. Measurement of Joint Motion: A Guide to Goniometry; Jaypee Brothers Medical Publishers
6. Cynthia C. Norkin, Pamela Levangie; Joint Structure and Function; F.A. Davis Company
7. S. Datta Ray; Yogic Exercises-Physiologic and Psychic processes; Jaypee Brothers Medical Publishers
8. Lynn Allen Colby Carolyn Kisner John Borstad; Therapeutic Exercise: Foundations and Techniques; F A Davis C

### RECOMMENDED REFERENCE BOOKS

1. Sidney Licht; Massage, Manipulation & Traction; Krieger Pub Co
2. Sydney Litch; Therapeutic Exercise; Weaverly Press
3. Omprakash Tiwari; Asanas Why & How; Zen Publications
4. Peggy a Houghlum“ Dolores B. Beroti; Brunstrom'S Clinical Kinesiology

### INTERNAL ASSESSMENT:

Two exams–Terminal and preliminary examination (Theory & Practical)  
of 80marks eachTOTAL – 160 marks

1. Internal Assessment to be calculated out of 20marks.
2. Internal Assessment as per University pattern.

<b>FUNDAMENTAL OF KINESIOLOGY AND KINESIOTHERAPY</b>		<b>Marks</b>
<b>THEORY</b> 80MARKS+I.A.– 20MARKS *The question paper will give appropriate weight age to all the topics in the syllabus.		<b>100</b>
<b>Section A-S.A.Q.</b>	Q-1- Answer any FIVE out of SIX [5x3=15marks] Q-2- Answer any FIVE out of SIX [5 x7 =35marks]	<b>50</b>
<b>Section B-L.A.Q.</b>	Q-3]A [1x15=15 marks] OR Q-3] B [1x15=15 marks Q-4] [1x15=15 marks] OR Q-4] [1x15=15marks] Based on Mechanics & application / Starting positions& Derived positions/ Classification of Movements/Goniometry/Suspension therapy LAQ should give break up of 15marks– e.g.[ 3+5+7]	<b>30</b>
<b>Total Marks</b>		<b>80</b>

<b>FUNDAMENTAL OF KINESIOLOGY &amp; KINESIOTHERAPY</b>		<b>Marks</b>
<b>PRACTICAL</b>		<b>100</b>
80 MARKS+ I.A.– 20 MARKS		
<b>LONG CASE</b>	Based on Suspension Therapy/Goniometry/Movements ( passive) Cognitive– Biophysics, Biomechanical principles, indications, contraindication Documentation of findings etc -20 Marks Psychomotor + Affective skills -10 Marks	<b>30</b>
<b>SHORT CASE</b>	Two Short case based on Basic evaluation ( <b>any one</b> ):Sensation / Reflex testing / B.P./ & Pulse Rate/ Chest Expansion /Respiratory Rate/Aerobic fitness for self Skill performance ( <b>any one</b> ):Relaxation / Yoga posture / Starting / Derived position & Massage (2x20=40marks) Cognitive – 05Marks Psychomotor - 15Marks	<b>40</b>
<b>COMMUNICATION SKILL</b>		<b>5</b>
<b>JOURNAL</b>	Year work on practical's performed.	<b>5</b>
<b>Total Marks</b>		<b>80</b>

# **FUNDAMENTALS OF ELECTROTHERAPY- P106**

**Didactic 95 hrs+ Practical 105 hrs =Total-200hrs**

**(UNIVERSITY EXAMINATION)**

## **COURSE DESCRIPTION:**

This course will cover the basic principles of Physics that are applicable in medical equipment's used in Physiotherapy. It will also help to understand the fundamentals of currents, sound waves, Heat & its effects, electro medical radiations and their effects as well as their application in physical therapy. It covers the skill of application of superficial thermal agent sand Cryotherapy.

## **COURSE OBJECTIVES:**

### **Cognitive:**

At the end of the course, the candidate will be able to:

- Recall the physics principles & Laws of Electricity, Electromagnetic spectrum, & Ultrasound
- Describe effects of environmental & manmade electromagnetic field at the cellular level & risk factors on prolonged exposure.
- Describe the Main electrical supply, Electric shock, precautions
- Enumerate Types & Production of various Therapeutic electrical currents & describe the panel diagrams of the machines

### **Psychomotor:**

At the end of the course the candidate will be able to—

- Test the working of the various electro therapeutic equipment's.
- 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, multi meter] of the circuit; & will be able to identify such components.
- Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.
- Acquire knowledge of various superficial thermal agents such as Paraffin wax bath, Cryotherapy, Hydro collator packs, Home remedies, their physiological & therapeutic effects, Merits / demerits & acquire the skill of application.

**Affective:**

- To maintain proper communication with the model/ subjects for correct delivery of instruction during demonstration
- To follow the appropriate testing of electrotherapeutic equipment's.
- To perform safe, respectful and effective handling during demonstration.

<b>SR. NO.</b>	<b>TOPIC</b>	<b>THEORY HOURS</b>	<b>PRACTICAL HOURS</b>
<b>1</b>	<b>MEDICAL ELECTRONICS AND ELECTRICITY</b>	<b>55</b>	<b>15</b>
<b>A.</b>	<b>Fundamentals of Low frequency currents</b>	<b>32</b>	<b>9</b>
<b>i.</b>	<b>Basic Physics:</b>	<b>3</b>	
	Structure of atom, Isotopes, States of matter; Compound formation-(covalent formation), Properties of Electric lines of forces, Conductors, Non-conductors, Latent heat, Transmission of heat		
<b>ii.</b>	<b>Condenser</b>	<b>3</b>	
a)	Principles		
b)	Capacity		
c)	Types & construction		
d)	Electric field		
e)	Charging and discharging of the condenser		
f)	Duration of Discharge		
g)	Discharge through inductance		
h)	Capacitive reactance & uses of condenser		
<b>iii.</b>	<b>Main supply:</b>	<b>3</b>	<b>3</b>
a)	Production of Electricity		
b)	Types: A.C. / D.C.		
c)	Distribution/Grid system wiring of the house, colour coding of electrical supply to the apparatus		
d)	Earthing and its importance		
e)	Types of Plugs & Switches		
<b>iv.</b>	<b>Shock</b>	<b>2</b>	
a)	Definition		
b)	Types (Electric Shock & Earth shock)		
c)	Severity Causes, Effects & Precaution		
<b>v.</b>	<b>Static Electricity:</b>	<b>3</b>	
a)	Theory of Electricity		

b)	Production of Electric Charge		
c)	Characteristics of charged electrical body and capacitor and inductance: types & uses		
d)	Potential difference		
<b>vi.</b>	<b>Current electricity</b>	<b>6</b>	<b>6</b>
a)	EMF		
b)	Resistance: Combination of resistance in series and parallel		
c)	Ohms Law		
d)	D.C., A.C.		
e)	Devices for regulating current: Identification, functioning & Uses- Rheostat Potentiometer, Ammeters, Oscilloscopes, Voltmeter		
f)	Voltage and Power		
g)	Thermal effects of electric current- Joule's Law.		
<b>vii.</b>	<b>Electrical Skin Resistance:</b>	<b>2</b>	
a)	Skin Resistance		
b)	Factors affecting Skin resistance: types of electrodes used, electrode gels, skin threshold, skin type, skin temperature, exercises		
c)	Methods to reduce skin resistance		
<b>viii.</b>	<b>Faradic currents:</b> Duration, frequency, wave forms & graphical representation, surging, faradic type current, pulse width modulation,	<b>5</b>	
<b>ix.</b>	<b>Galvanic currents/Direct current:</b> and interrupted galvanic current, duration, frequency, waveforms & graphical representation	<b>5</b>	
<b>B.</b>	<b>Fundamentals of High frequency currents</b>	<b>13</b>	<b>6</b>
<b>i.</b>	<b>Electro Magnetic Induction:</b>	<b>3</b>	
a)	Production		
b)	Direction of induced EMF		
c)	Strength of induced EMF		
d)	Type–Self & Mutual induction		
e)	Inductive Reactance		
f)	Eddy currents		
g)	Principles and Laws–Faraday's, Lenz's		
h)	Dynamo		
<b>ii.</b>	<b>Apparatus for Modification of Currents:</b>	<b>2</b>	

a)	Interruption of current–Switch &Valve		
b)	C-R timing circuit		
c)	Multi vibrator Circuit, Pulse Generator		
d)	Current supplied to patient – Impulse type		
<b>iii.</b>	<b>Magnetism:</b>	<b>2</b>	
a)	Nature and Types		
b)	Molecular theory of Magnetism		
c)	Property of Magnet		
d)	Magnetic effect of electric current– Electro Magnets		
e)	Meters for measuring A.C.		
<b>iv.</b>	<b>Sound:</b>	<b>2</b>	
a)	Wave motion in sound		
b)	Infrasonics		
c)	Normal hearing band		
d)	Characteristics of sound waves and their velocities		
e)	Ultrasonics		
f)	Reflection, Refraction and Attenuation of Sound waves		
g)	Interference of sound waves		
<b>v.</b>	<b>D.C. and A.C.:</b>	<b>4</b>	<b>6</b>
a)	Source–Cell and rectified AC		
b)	Rectification of AC		
c)	Thermionic valves– Diode and Triode		
d)	Metal Rectifier		
e)	Types of Rectification		
f)	Transformers-Types &Functions		
g)	Smoothing circuit		
h)	Semiconductor and its types		
i)	Diodes & Transistors		
j)	Choke coil		
<b>C.</b>	<b>Electro Magnetic Spectrum</b>	<b>5</b>	
i.	Laws of transmission, Reflection, Refraction, Absorption, Attenuation		
ii.	Electro Magnetic Radiation		



iii.	Laws Governing E.M.R.		
iv.	Laws of Reflection, Refraction, Absorption, Attenuation, Cosine Law, Inverse Square Law, Grothus Law.		
<b>D.</b>	<b>Cellular Bio-physics</b>	<b>3</b>	
i.	Action potential,		
ii.	Resting membrane potential		
iii.	Transmission of impulses: Saltatory conduction		
iv.	Reception & emission of E.M.F. signals		
<b>E.</b>	<b>Environmental currents</b>	<b>2</b>	
	Environmental currents & fields risk factors on Prolonged exposure to E.M. field.		
<b>2</b>	<b>ELECTRICAL MODALITIES:</b>	<b>25</b>	<b>40</b>
	<b>Production, Physical principles, Panel diagrams,</b>		
	<b>Testing of apparatus of the following:</b>		
a.	S.W.D		
b.	Ultrasound		
c.	U.V.R.		
d.	I.F.T.		
e.	I.R.		
f.	LASER (no panel diagram)		
g.	Diagnostic Electrical muscle Stimulator		
h.	T.E.N.S.		
<b>3</b>	<b>SUPERFICIAL THERMAL AGENTS</b>	<b>15</b>	<b>50</b>
	Construction/ Design of the Modalities, Scales of temperature, Specific heat & modes of energy transfer, Physiological effects, Therapeutic effects/ Uses, Merits/ demerits, Indications/ contra-indications, Skills of application:		
a.	Home remedies		
b.	Paraffin wax bath		
c.	Whirl pool		
d.	Contrast bath		
e.	Hydro-collator hot packs		
f.	Cryotherapy		

## RECOMMENDED TEXT BOOKS

1. FORSTER A.; Claytons Electrotherapy Theory And Practice –3rd & 10th edition; CBS Publishers and Distributers
2. Val Robertson PhD, Alex Ward PhD, John Low et el; Electrotherapy explained Principles and Practice; Butterworth-Heinemann
3. Joseph Kahn; Principles and Practice of Electrotherapy; Churchill Livingstone
4. Sheila Kitchen; Electrotherapy Evidence Based Practice 11th edition; Churchill Livingstone

## RECOMMENDED REFERENCE BOOK

1. Roger M. Nelson, Dean P. Currier, Karen W. Hayes; Clinical Electrotherapy; **Pearson**

## INTERNAL ASSESSMENT:

Two exams –Terminal and preliminary examination (Theory & Practical) of 80 marks each . TOTAL – 160 marks

1. Internal Assessment to be calculated out of 20marks.
2. Internal Assessment as per University pattern.

<b>FUNDAMENTALS OF ELECTROTHERAPY THEORY</b>			<b>Marks</b>
80 MARKS+ I.A.– 20 MARKS *The question paper will give appropriate weightage to all the topics in the syllabus.			<b>100</b>
<b>Section A-S.A.Q.</b>	Q-1- Answer any FIVE out of SIX [5x3=15] Q-2- Answer any FIVE out of SIX [5 x7 =35]		<b>50</b>
<b>Section B-L.A.Q.</b>	Q-3] A L.A.Q [1 x15 =15 marks] OR Q-3] B LAQ [1x15=15 marks *Based on superficial Thermal agents Q-4](Based on Production /Panel Diagram of high frequency current) [1 x15 =15marks] OR Q-4] (Based on Production / Panel Diagram of low/Medium frequency current) [1 x15 =15marks] LAQ should give break up of 15 marks –e.g. [ 3+5+7]		<b>30</b>
<b>Total Marks</b>			<b>80</b>

<b>FUNDAMENTALS OF ELECTROTHERAPY THEORY</b>		<b>Marks</b>
<b>PRACTICAL</b>		<b>100</b>
<b>80 MARKS+ I.A.– 20 MARKS</b>		
<b>LONG CASE</b>	Based on Superficial thermal agent: Cognitive – Medical Electronic, Physiological, Biophysical principles, Therapeutic effects, indications-contraindications -20Marks Psychomotor + Affective skills -10 Marks	<b>30</b>
<b>SHORT CASE</b>	Two Short case on Testing of equipment's: Low & Medium frequency High frequency/ Actino-therapy (2 x 20=40marks) •Cognitive – 05Marks •Psychomotor - 15Marks	<b>40</b>
<b>COMMUNICATION SKILL</b>		<b>5</b>
<b>JOURNAL</b>	Year work of practical's performed.	<b>5</b>
<b>Total Marks</b>		<b>80</b>

## **SECOND YEAR BPTH SYLLABUS**

**Transcript Hours-1400**

<b>SR.NO.</b>	<b>SUBJECT</b>	<b>TOPIC</b>	<b>DIDACTIC HOURS</b>
1	<b>PROFESSIONAL PRACTICE &amp; ETHICS P101</b>	i. Ethical code of conduct	15
		ii. Communication Skill	
2	<b>PHARMACOLOGY P201</b>	i. General Pharmacology	50
		ii. Drugs acting on C. N. S	
		iii. Drugs acting on Autonomic Nervous System	
		iv. Drugs acting on C.V.S	
		v. Drugs acting on Respiratory System	
		vi. Chemotherapy	
		vii. Other Chemo therapeutic drugs	
		viii. Endocrine	
		ix. Drugs in G.I. Tract	
		x. Haematinics	
		xi. Dermatological drugs	
3	<b>PATHOLOGY &amp; MICROBIOLOGY P202</b>	<b>PATHOLOGY</b>	50
		i. General Pathology	
		ii. Inflammation & Repair	
		iii Immunopathology	
		iv. Circulatory disturbances	
		v. Pathologic changes in vitamin deficiencies	
		vi. Growth disturbances	
		vii. Specific pathology	
		viii. Muscular disorders	
		ix. Neuro-muscular junction	
		x. Bone & joints	
		xi. G. I. System	
		xii. Endocrine	
		xiii. Hepatic diseases	
xiv. Clinical Pathology			

		<b>MICROBIOLOGY</b>	35
		i. General microbiology	
		ii. Laboratory diagnosis of infection	
		iii. Immunology	
		iv. Systemic bacteriology	
		v. Mycology	
		vi. Virology	
		vii. Parasitology	
		viii. Applied microbiology	
4	<b>PSYCHOLOGY P203</b>	i. Psychology: Nature & its fields	30
		ii. Developmental Psychology	
		iii. Theories of Learning	
		iv. Memory	
		v. Attention & Perception	
		vi. Motivation and Theories	
		vii. Conflict and Frustration	
		viii. Anxiety Disorders	
		ix. Affective Disorders	
		x. Psychotic Disorders	
5	<b>KINESIOLOGY P204</b>	i. Muscle Biomechanics	100
		ii. Joint Biomechanics	
		iii. Vertebral Column	
		iv. Thorax and Chest wall Mechanics	
		v. Shoulder Complex	
		vi. Elbow Joint	
		vii. Wrist and Hand Complex	
		viii. Hip Joint	
		ix. Knee Complex	
		x. Ankle Foot complex	
		xi. Temporo-Mandibular Joint	
		xii. Kinetics and kinematics of various activities of daily living	
		xiii. Motor Control	
6	<b>KINESIOTHERAPY P205</b>	i. Biophysics	245
		ii. Posture	
		iii. Motor & Postural control and Balance	
		iv. Functional Re-education	
		v. Neuromuscular co-ordination	
		vi. Gait	
		vii. Walking Aids	

		viii. Bronchial Hygiene	
		ix. Posture	
7	<b>ELECTROTHERAPY P206</b>	i. Pain	200
		ii. Low frequency Currents	
		iii. Medium frequency Currents	
		iv. High frequency Currents	
		v. Biofeedback	
		vi. Sound	
		vii. Actinotherapy	
		viii. Electrotherapy: wound care	
8	<b>COMPUTER APPLICATION P207</b>	i. Basics Of Computer	40
		ii. Hardware and Software	
		iii. Multimedia	
		iv. Operating System	
		v. Network	
		vi. Microsoft	
		vii. Power Point Presentation	
		viii. Scientific Poster Designing	
9	<b>ENVIRONMENTAL SCIENCES P208</b>	i. Introduction To Evs	30
		ii. Natural Resources	
		iii. Ecosystems	
		iv. Biodiversity And Conservation	
		v. Environmental Pollution	
		vi. Social Issues And Environment	
		vii. Human Population And Environment	
		viii. Field Work	
10	<b>SEMINAR</b>	Seminar: On Biomechanics, Electrotherapy, Kinesiotherapy.Kinesiology	105
11	<b>SUPERVISED CLINICAL PRACTICE</b>	To practice clinical skills under the supervision, at the O.P.D./ I.P.D. set up. Clinical assignments should include Observation, Clinical History taking & technical assistance to the clinicians	500

## **PROFESSIONAL PRACTICE AND ETHICS- P101**

**Total -15 HRS**

**(COLLEGE EXAMINATION IN FINAL YEAR)**

### **COURSE DESCRIPTION:**

This subject would be taught in continuum from first year to final year. An exam in theory would be conducted only in final year. Professional and ethical practice curriculum content addresses the Knowledge, Skills and Behaviors required of the physiotherapist in a range of practice relationships and roles. The course will discuss the role, responsibility, ethics administration issues and accountability of the physical therapists. The course will also cover the history and change in the profession, responsibilities of the professional to the profession, the public and to the health care team. This includes the application of professional and ethical reasoning and decision-making strategies, professional communication.

### **COURSE OBJECTIVES:**

**At the end of the course the candidate will be compliant in following domains:**

#### **Cognitive:**

- Be able to understand the moral values and meaning of ethics
- Will acquire bedside manners and communication skills in relation with patients, peers, seniors and other professionals.

#### **Psychomotor:**

- Be able to develop psychomotor skills for physiotherapist-patient relationship.
- Skill to evaluate and make decision for plan of management based on socio-cultural values and referral practice.

#### **Affective:**

- Be able to develop behavioral skills and humanitarian approach while communicating with patients, relatives, society at large and co-professionals.
- Be able to develop bedside behavior, respect & maintain patient's confidentiality.

<b>SR. NO.</b>	<b>TOPIC</b>	<b>THEORY HOURS</b>	<b>SUPERVISION HOURS</b>	<b>TOTAL HOURS</b>
1	Ethical code of conduct	3	10	15
2	Communication skills			
	a. Physiotherapist -Patient Relationship	1		
	b. Interviewing -Types of interviews, Skills of interviewing	1		



## **PHARMACOLOGY- P201**

**Total Hours = 50 hrs**

**(UNIVERSITY EXAMINATION)**

### **COURSE DESCRIPTION:**

This course covers the basic knowledge of Pharmacology including administration, physiologic response and adverse effects of drugs under normal and pathologic conditions. Topics focus on the influence of drugs in rehabilitation patient/client management. Drugs used in iontophoresis and phonophoresis will be discussed in detail.

### **COURSE OBJECTIVES:**

At the end of the course, the candidate will be able to:

#### **Cognitive:**

- Describe Pharmacological effects of commonly used drugs by patients referred for Physiotherapy; list their adverse reactions, precautions, contraindications, formulation & route of administration.
- Identify whether the pharmacological effect of the drug interferes with the Therapeutic response of Physiotherapy & vice versa
- Indicate the use of analgesics & anti-inflammatory agents with movement disorders with consideration of cost, efficiency, & safety for individual needs.

#### **Psychomotor:**

Get the awareness of other essential & commonly used drugs by patients- The bases for their use & common as well as serious adverse reactions.

### **COURSE OUTCOME:**

- To understand the various routes of drugs administration, pharmacodynamics and pharmacokinetics of drugs.
- To understand the various drugs used for the treatment of ANS, PNS and CNS conditions with their mechanism of action and adverse effects.
- To understand the various drugs used for the treatment of endocrine system with their mechanism of action and adverse effects.
- To understand the various drugs used for the treatment of GIT problems with their mechanism of action and adverse effects.
- To understand the various antibiotic drugs with their mechanism of action and adverse effects.
- To understand the various drugs used for the treatment of ailment of cardio vascular system with

their mechanism of action and adverse effects.

- To understand the various drugs used for the treatment of Bronchial Asthma, Skin lesions and heavy metal poisoning.

<b>SR.NO</b>	<b>TOPICS</b>	<b>DIDACTIC HOURS</b>
1	<b>GENERAL PHARMACOLOGY</b>	<b>4</b>
	i. Pharmacokinetics	
	ii. Routes of administration	
	iii. Adverse drug reaction and reporting	
	iv. Factors modifying drug effect	
2	<b>DRUGS ACTING ON C.N.S.</b>	<b>11</b>
	i. Introduction	1
	ii. Alcohols + Sedatives & Hypnotics	2
	iii. Anti-convulsant	1
	iv. Drug therapy in Parkinsonism	2
	v. Analgesics & antipyretics –especially Gout & R.A.	3
	vi. Psycho Therapeutics	1
	vii. Local anesthetics, counter irritants	1
3	<b>DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM</b>	<b>7</b>
	i. Adrenergic	
	ii. Cholinergic	
	iii. Skeletal muscle relaxants	
4	<b>DRUGS ACTING ON C.V.S.</b>	<b>7</b>
	i. Antihypertensives	2
	ii. Antianginal- Antiplatelets, Myocardial Infarction	2
	iii. C.C.F.	1
	iv. Shock	1
	v. Coagulants and Anticoagulants	1
5	<b>DRUGS ACTING ON RESPIRATORY SYSTEM</b>	<b>3</b>
	i. Cough	
	ii. Bronchial Asthma	
	iii. C.O.P.D.	
6	<b>CHEMOTHERAPY</b>	<b>3</b>
	i. General principles	

	ii. Anti-Tuberculosis	
	iii. Anti –Leprosy	
	<b>OTHER CHEMO THERAPEUTIC DRUGS</b>	<b>3</b>
7	i. Drugs used in Urinary Tract Infection	
	ii. Tetra / chloral	
	iii. Penicillin	
	iv. Cephalosporin	
	v. Aminoglycosides	
	vi. Macrolides	
8	<b>ENDOCRINE</b>	<b>8</b>
	i. Insulin and oral Anti diabetic drugs	2
	ii. Steroids-Anabolic steroids	2
	iii .Drugs for osteoporosis, Vitamin D, Calcium, ii. Phosphorus	2
	iv. Thyroid & Antithyroid	1
	v. Estrogen + Progesterone	1
9	<b>DRUGS IN G.I. TRACT</b>	<b>2</b>
	i. Peptic ulcer	
ii. Diarrhea, Constipation & Antiemetics		
10	<b>HEAMATINICS</b>	<b>1</b>
	i. Vitamin B, Iron	
11	<b>DERMATOLOGICAL DRUGS</b>	<b>1</b>
	i. Scabies, Psoriasis, Local antifungal	

### RECOMMENDED TEXT BOOKS

1. Padmaja Udaykumar ,Pharmacology For Physiotherapy ;(Cbs)
2. H. L. Sharma, K. K. Sharma, Pharmacology For Physiotherapist; (JaypeeBrothers Medical)
3. K. D. Tripathi , Essentials Of Medical Pharmacology – (Jaypee Brothers Medical)

### RECOMMENDED REFERENCE TEXT BOOKS

1. Pharmacology And Pharmacotherapeutics – Dr. R S Satoskar, Dr. Nirmala N. Rege, Dr. S. D. Bhandarkar (Elsevier India)

## INTERNAL ASSESSMENT

1. Two exams – Terminal and preliminary examination of 40 marks each  
TOTAL - 80 marks
2. Internal Assessment to be calculated out of 10 marks.
3. Internal assessment as per University pattern.

## SCHEME OF UNIVERSITY EXAMINATION (THEORY ONLY)

<b>THEORY- PHARMACOLOGY</b>			<b>Marks</b>
<b>40 marks + I.A. 10 Marks</b> [There shall be no LAQ in this paper]			
* Emphasis should be given to the drugs related to Musculo-skeletal /Neurological, Cardio-Vascular (excluding anti arrhythmic and shock) / Respiratory conditions, analgesics & anti-inflammatory conditions			50
<b>Section-ASAQ</b>	Q1 Answer any FIVE out of SIX	[5 x 3 = 15 marks]	15
	Q-2 Answer any FIVE out of SIX	[5 x 5 = 25 marks]	25
<b>Total Marks</b>			<b>40</b>

## **PATHOLOGY & MICROBIOLOGY- P202**

**Theory 50 + 35 = Total 85Hrs**

**(UNIVERSITY EXAMINATION)**

### **PATHOLOGY (Theory 50 Hrs)**

#### **COURSE DESCRIPTION:**

Students will develop an understanding of pathology underlying clinical disease states involving the major organ systems and epidemiological issues. Students will learn to recognize pathology signs and symptoms considered red flags for serious disease. Students will use problem-solving skills and information about pathology to decide when referrals to another health care provider or alternative interventions are indicated. Students will develop the ability to disseminate pertinent information and findings, and ascertain the appropriate steps to follow.

The course more deals with structural impairments as an important part in ICFClassification.

#### **COURSE OBJECTIVES:**

At the end of the course, the candidate:

##### **Cognitive:**

- Will have sound knowledge of concepts of cell injury & changes produced by different tissues, organs and capacity of the body in healing process.
- Acquire the knowledge of general concepts of neoplasia with reference to the Etiology, gross & microscopic features, & diagnosis, in different tissues, & organs of the body.
- Acquire knowledge of common immunological disorders & their resultant effects on the human body.

##### **Psychomotor:**

- Recall the Etiology–pathogenesis, the pathological effects & the clinico–pathological correlation of common infections & non- infectious diseases.
- Understand in brief, about the common Hematological disorders & investigations necessary to diagnose them.
- Correlate normal & altered morphology of different organ systems in different diseases needed for understanding disease process & their clinical significance

## COURSE OUTCOME:

At the end of the course, the student will be able to

- Acquire the knowledge of concepts of cell injury and changes Produced thereby in different tissues and organs; Capacity of the body in healing Process.
- Recall the Etio-pathological effects and the Clinico pathologicalCorrelation of common infection and noninfectious diseases.
- Acquire the knowledge of concepts of Neoplasia with reference to the Etiology, gross and microscopic features diagnosis and prognosis in different tissues and organs of the body.
- Correlate normal and altered morphology of different organ systems in different diseases needed for understanding disease process and their clinical significance (with special emphasis on neuro-musculoskeletal and cardio-respiratory system).
- Acquire knowledge of common immunological disorders and their resultant effects on the human body.
- Understand in brief, about the Hematological diseases and their resultant effects on the human body

SR.NO	TOPIC	THEORY HOURS
1	<b>GENERAL PATHOLOGY</b>	4
	a. Cell injury-Causes, Mechanism & Toxic injuries with special reference to Physical including ionizing radiation, Chemical & Biological	
	b. Reversible injury (degeneration)- types morphology -cloudy swelling, hyaline, fatty changes	
	c. Intra-cellular Accumulation- Mucin, Protein	
	d. Irreversible cell injury-types of necrosis, Apoptosis – Calcification- Dystrophic & Metastasis	
	e. Extra-cellular accumulation-Amyloidosis.	
2	<b>INFLAMMATION &amp; REPAIR</b>	6
	a. Acute inflammation – features, causes, vascular & cellular events	
	b. Morphologic variations-Ulcers	
	c. Inflammatory cells & Mediators	
	d. Chronic inflammation: Causes, Types, Non- specific & Granulomatous – with examples	

	e. Wound healing by primary & secondary union, factors promoting & delaying healing process	
	f. Healing at various sites- bone, nerve & muscle	
	g. Regeneration & Repair	
<b>3</b>	<b>IMMUNO –PATHOLOGY</b> a. Immune system: organization-cells- antibodies regulation of immune responses b. Hyper-sensitivity (types and examples including graft rejection) c. Secondary Immuno-deficiency including H.I.V. d. Basic concepts of autoimmune disease (emphasis on S.L.E. & R.A.)	<b>4</b>
<b>4</b>	<b>CIRCULATORY DISTURBANCES</b> a. Oedema - pathogenesis - types - transudates / exudates b. Chronic venous congestion- lung, liver g. Thrombosis – formation – fate – effects d. Embolism – types- clinical effects e. Infarction – types – common sites f. Gangrene – types etiopathogenesis g. Shock – Pathogenesis, types	<b>4</b>
<b>5</b>	<b>PATHOLOGIC CHANGES IN VITAMIN DEFICIENCIES</b>	<b>1</b>
<b>6</b>	<b>GROWTH DISTURBANCES</b> a. Atrophy, Hypertrophy, Hypoplasia, Metaplasia, Agenesis, Dysplasia b. Neoplasia classification, Histogenesis, Biologic behaviors, difference between Benign & Malignant tumour c. Malignant neoplasms- grades-stages-local & distal spread c. Carcinogenesis: Physical, Chemical, Occupational, Heredity, Viral, Nutritional e. Precancerous lesions & Carcinoma in situ g. Tumour & host interactions–local and systemic effects-metastatic (special reference to bones and C.N.S.)	<b>4</b>
<b>7</b>	<b>MEDICAL GENETICS</b> Classification with examples of genetic disorders	<b>01</b>
<b>8</b>	<b>SPECIFIC PATHOLOGY</b> a. C.V.S. i. Atherosclerosis - Ischemic Heart Diseases – Myocardial Infarction– Pathogenesis /Pathology	

	ii. Hypertension	<b>10</b>
	iii. C.C.F	
	iv. Rheumatic Heart Diseases	
	v. Peripheral Vascular Diseases	
	<b>b. Respiratory</b>	
	i. C.O.P.D	
	ii. Pneumonia (lobar, bronchial, viral), Lung Abscess	
	iii. T. B.: Primary, Secondary – morphologic types	
	iv. Pleuritis & its complications	
	v. Lung collapse – Atelectasis	
	vi. Occupational Lung diseases (with special emphasis on Silicosis, Asbestosis, Anthracosis)	
	vii. A.R.D.S.	
	<b>c. Neuropathology:</b>	
	i. Reaction of nervous tissue to injury, infection & ischemia	
	ii. Meningitis: Pyogenic, T.B.M., Viral	
	iii. Cerebro-vascular diseases – Atherosclerosis – Thrombosis, Embolism, Aneurysm, Hypoxia Infarction & Hemorrhage, Hydrocephalous, Increased Intracranial Pressure,	
	iv. Leprosy	
	v. Parkinsonism	
<b>7</b>	<b>MUSCULAR DISORDERS</b>	<b>3</b>
	a. Classification of Muscular disorders with emphasis on Muscular Dystrophies	
<b>8</b>	<b>NEURO-MUSCULAR JUNCTION</b>	<b>1</b>
	a. Myasthenia gravis	
	b. Myasthenic syndrome	
<b>9</b>	<b>BONE &amp; JOINTS</b>	<b>5</b>
	a. Osteomyelitis – Rickets – Osteomalacia –Osteoporosis	
	b. Arthritis- degenerative (Osteoarthritis, Calcaneal spur, Periarthritis, Spondylosis) inflammatory (R.A., Ankylosing Spondylitis, Gout)	
	c. Miscellaneous- P.I.D., Haemarthosis	



	d. Infective-T.B.	
<b>10</b>	<b>ENDOCRINE</b>	<b>2</b>
	a. Hypo and Hyperthyroidism	
	b. Diabetes	
<b>11</b>	<b>HEPATIC DISEASES</b>	<b>1</b>
	a. Cirrhosis – emphasis to systemic effects of portal hypertension	
<b>12</b>	<b>G.I. SYSTEM</b>	<b>1</b>
	a. Gastric / Duodenal ulcer, Enteric fever, T.B., Enteritis, Gastritis(related to consumption of NSAID)	
<b>13</b>	<b>CLINICAL PATHOLOGY</b>	<b>3</b>
	a. Anemia – (deficiency) – T.C./D.C./ Eosinophilia Anaemia	
	b. Muscle / Skin / Nerve biopsy	
	c. Microscopic appearance of muscle necrosis – fatty infiltration	
	d. Histopathology	

### RECOMMENDED TEXT BOOKS

1. Harsh Mohan ; Text Book Of Pathology ;( Jaypee Brothers Medical)
2. Bhende ; General Pathology –(Popular Prakashan Ltd)

### RECOMMENDED REFERENCE BOOKS

1. Cotran, Kumar; Robbins; Pathologic Basis Of Disease - (Elsevier India)
2. Robbins ; Basic Pathology;(Elsevier India)

**MICROBIOLOGY (35hrs)**  
**Theory 31 Hrs + Demonstration 4 Hrs**

**COURSE DESCRIPTION:**

Students will develop an understanding of pathology underlying clinical disease states and involving the major organ systems and epidemiological issues. Epidemiological issues will be presented and discussed. Students will learn to recognize pathology signs and symptoms considered red flags for serious disease. Students will use problem-solving skills and information about pathology to decide when referral to another health care provider or alternative intervention is indicated. Students will develop the ability to disseminate pertinent information and findings, and ascertain the appropriate steps to follow

**COURSE OBJECTIVE:**

- To identify common infectious agents and the disease.
- To evaluate methods used to identify infectious agents in the clinical microbiology lab.

**COURSE OUTCOME:**

At the end of the course, the candidate will

- Have sound knowledge of prevalent communicable diseases and the agents responsible for causing clinical infections, pertaining to C.N.S, C.V.S, Musculoskeletal system, Respiratory system, Genitourinary system, wound infections and of newer emerging pathogens
- Know the importance and practices of best methods to prevent the development of infections in self and patients (universal safety precautions)

S.N.	TOPICS	THEORY HOURS	DEMONSTRATIO NHOURS
<b>1</b>	<b>GENREAL MICROBIOLOGY</b>	<b>4</b>	<b>1</b>
	a. Introduction & scope		
	e. Classification of Micro-organisms and Bacterial Anatomy (cell wall, capsule, spore, flagella and types as per their shape and arrangement)		
	c. Sterilization		
	D . Disinfection		

	e. Demonstration for General Microbiology		
<b>2</b>	<b>LABORATORY DIAGNOSIS OF INFECTION</b>	<b>2</b>	<b>1</b>
	a. Culture media and identification of bacteria		
	b. Sample collection for smear examination and cultures		
	f. Demonstration of Gram staining, ZN staining and culture media		
	<b>IMMUNOLOGY</b>	<b>5</b>	
<b>3</b>	a. Innate immunity & acquired immunity		
	c. Structure and function of immune system and Immune response – normal / abnormal		
	d. Define Antigen, Antibody and Antigen antibody reaction & application for diagnosis		
	d. Hyper – sensitivity		
	e. Auto-immunity		
<b>4</b>	<b>SYSTEMIC BACTERIOLOGY</b>	<b>7</b>	
	a. Infection caused by gram +ve cocci Staphylococcus, Streptococcus and Pneumococcus		
	b. Infection caused by gram –ve cocci Gonococci and Meningococci		
	c. Clostridium		
	d. Enterobacteriaceae (E. Coli, Klebsiella) and Pseudomonas		
	e. Salmonella and Vibrio		
	f. Mycobacterial infection:		
	i. Tuberculosis-Leprosy		
	ii. Atypical Mycobacterium		
	h. Syphilis and Leptospirosis- Morphology & pathogenesis		
<b>5</b>	<b>MYCOLOGY</b>	<b>2</b>	<b>1</b>
	a. Introduction and Superficial mycosis		
	b. Mycetoma and opportunistic fungal infection		
	c. Mycology and Virology demonstration		
<b>6</b>	<b>VIROLOGY</b>	<b>5</b>	

	a .Introduction & general properties,		
	b.DNA virus		
	c.Measles, Mumps, Rubella, polio and congenital viral infections		
	d.Hepatitis and Rabies		
	e.H.I.V.		
	<b>PARASITOLOGY</b>	<b>3</b>	<b>1</b>
<b>7</b>	a.Introduction- Entamoeba histolytica		
	b.Malaria, Filaria		
	c.Toxoplasma – Cystisarcosis & Echinococcus		
	<b>APPLIED MICROBIOLOGY</b>	<b>3</b>	
<b>8</b>	a.Hospital acquired infections, Universal safety precautions and Waste disposal		
	b. Diseases involving Bones, Joints- Nerves-Muscles- Skin-Brain- Cardiopulmonary system, Burn and wound infections		

### RECOMMENDED TEXT BOOKS

1. Ananthnarayan ; Concise Textbook Of Microbiology – (The Orient Blackswan)
2. C.P.Baweja ; Concise Textbook Of Microbiology- (Apc)
3. Nagoba ; Textbook Of Microbiology- (Wolters Kluwer India)

### RECOMMENDED REFERENCE BOOK

1. R. Ananthnarayan & C.K. Jayram Panikar Text book of Microbiology – (The Orient Blackswan)

### INTERNAL ASSESSMENT:

1. Two exams – Terminal and preliminary examination of 80 marks each TOTAL - 160 marks
2. Internal Assessment to be calculated out of 20 marks
3. Internal assessment as per University pattern

**SCHEME OF UNIVERSITY EXAMINATION (THEORY ONLY)**

<b>THEORY - PATHOLOGY &amp; MICROBIOLOGY</b>		<b>Marks</b>
Pathology-50 marks + Microbiology-30 marks 80marks + I.A.:20 marks [There shall be no LAQ in this paper] *Emphasis to be given to topics related to Musculo Skeletal / Neurological / Cardiovascular / Respiratory conditions & Wound / Ulcers.		100
<b>Section A</b>	Questions based on <b>PATHOLOGY</b>	50
	SAQ -1 -Answer any SEVEN out of EIGHT [7 x 5 = 35 marks] LAQ -2- Answer any ONE out of TWO [1 x 15 = 15 marks]	
<b>Section B</b>	Questions based on <b>MICROBIOLOGY</b>	30
	SAQ -3 – Answer any FIVE out of SIX [5 x 3 = 15 marks] LAQ-4 - Answer any ONE out of TWO [1 x 15 = 15 marks]	
<b>Total Marks</b>		<b>80</b>

**PSYCHOLOGY-P203**  
**Total 30hrs**  
**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

The course design increases awareness of psychosocial issues faced by individuals. Their significance at various points on the continuum of health and disability should be emphasized. The course discusses personal and professional attitudes and values as they relate to developing therapeutic relationships. It emphasizes on communication skills for effective interaction with patients, health-care professionals and others. It expects students to identify common psychiatric conditions.

**COURSE OBJECTIVES:**

At the end of the course, the candidate will be able to:

**Cognitive:**

- Define the term Psychology & its importance in the Health delivery system, & will gain knowledge of Psychological maturation during human development & growth & alterations during aging process.
- Understand the importance of psychological status of the person in health & disease; environmental & emotional influence on the mind & personality.
- Have the knowledge and skills required for good interpersonal communication.

**Psychomotor:**

- Enumerate various psychological disorders with special emphasis to movement / Pain & ADLs
- Acquire the knowledge in brief, about the pathological & etiological factors, signs / symptoms & management of various Psychiatric conditions.
- Understand the patient more empathetically.

**COURSE OUTCOME:**

- At the end of the course student will understand importance of psychology to physiotherapy practice.
- At the end of the course student will have thorough knowledge of psychological aspects related to other systemic diseases.

SR.NO	TOPIC	THEORY HOURS
1	Psychology: Definition, understanding, Nature & its fields and subfields	1
2	Developmental psychology (childhood, adolescence, adulthood and old age) and its theories in brief	2
3	Learning – Role of learning in human life – Conditioning	2
4	Memory – types – Forgetting causes	2
5	Attention & perception Nature of attention ,Nature of perception Principles of Grouping	1
6	Conflict & Frustration – Types –Common Defense mechanism stress- common reactions, frustrations	2
7	Clinical Psychology i. Introduction ii. difference between normal & abnormal psychology iii. Anxiety disorders – Phobias, Obsessive – compulsive, Hysterical convulsion disorder iv. Affective disorders – Depression, mania, Bipolar disorders v. Psychotic disorders – Types of Schizophrenia	20

### RECOMMENDED TEXT BOOKS

1. Morgan C.T. & King R.A. Introduction To Psychology Recent Edition (Tata Mcgraw-Hill Publication)
2. Munn N.L. Introduction To Psychology (Premium Oxford, I.B.P. Publishing Co.)
3. Clinical Psychology – Akolkar, (Asia Publishing House)
4. Developmental Psychology - Elizabeth B. Hurlock (Tata Mc-Graw Hill)

### RECOMMENDED REFERENCE BOOKS:

1. Ahuja ; A Short Book Of Psychiatry - (Jaypee Bros – Medical Publishers)
2. M.S. Bhatia: Short Textbook of Psychiatry- (New Age International Pvt Limited)
3. Shah L.P.; Handbook of Psychiatry (Vora Medical Publication)

**INTERNAL ASSESMENT:**

1. Two exams – Terminal and preliminary examination (Theoryonly) of 40marks each  
TOTAL - 80 marks
2. Internal Assessment to be calculated out of 10 marks (Theory only)
3. Internal assessment as per University pattern.

**SCHEME OF UNIVERSITY EXAMINATION**

<b>THEORY- PSYCHOLOGY</b>		Marks
40 marks + <b>I.A.</b> – 10 Marks [There shall be no LAQ in this paper]  * The question paper will give appropriate weightage to all the topics in the syllabus.		50
<b>Section-A-Q-1</b>	SAQ- 1 Answer any FIVE out of SIX (5x 3=15)	15
<b>Section A- Q-1</b>	SAQ –2 Answer any FIVE outof SIX (5x 5=25)	25
<b>Total Marks</b>		<b>40</b>



**KINESIOLOGY - P204**  
**Total 100 hrs**  
**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

This course is based on anatomical, physiological & related kinesiological principles for normal human movement. Students have the opportunity to develop and acquire understanding of kinesiological responses for the efficacy in various kinesiotherapeutic applications

**COURSE OBJECTIVES:**

**At end of the course:**

**Cognitive:**

- Able to understand the Basics of mechanics of force system, equilibrium, lever and pulley.
- Able to Describe the joint structure, classification and function of joints And biomechanics of Connective tissue
- Able to Describe the muscle structure and function of muscles, types of muscles, contractions and factors effecting muscle recruitment and function
- Able to Describe all the regional joint biomechanics and its applied

**Psychomotor:**

- Acquire the skills of analysis of kinetic and kinematics of vertebral column.
- Acquire the skills of analysis of kinetic and kinematics of all peripheral joints

**COURSE OUTCOME:**

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 , explain mechanics of chest wall during various movements and the patho-mechanics associated with various chest conditions and deformities, understand normal mechanics and patho mechanics of TMJ associated with various conditions, explain mechanics of all peripheral joints and the patho-mechanics.

SR. NO	TOPIC	THEORY HOURS
1	<b>INTRODUCTION TO BIOMECHANICS</b>	<b>20</b>
	<b>a.Muscle Biomechanics</b>	
	h.Elements of muscle structure – fiber, size, motor unit,length tension, arrangement & number relationship	10

	ii. Classification of muscles	
	iii. Mobility and Stability of muscles	
	iv. Types of muscle contraction and factors affecting muscle function	
	<b>b. Joint Biomechanics</b>	
	i. Basic principles of joint design	
	ii. Classification of joints	
	iii. Osteokinematics & Arthrokinematics	
	iv. Concave Convex Rule	10
	v. Joint function, kinetics & kinematics	
	<b>REGIONAL KINESIOLOGY</b>	<b>60</b>
2	a. Vertebral Column	15
	b. Thorax	5
	c. Shoulder Complex	6
	d. Elbow joint	3
	e. Wrist And Hand Complex	6
	f. Hip Joint	6
	g. Knee Complex	10
	h. Ankle – Foot complex	6
	i. Temporo-Mandibular Joint	3
		<b>MOTOR CONTROL</b>
3	a. Motor Control	
	b. Postural Alignment & Weight Distribution	
	c. Sensory Organisation	
	d. C.N.S. Integration	
	e. Motor Strategies	10
	<b>KINETICS AND KINEMATICS OF VARIOUS ACTIVITIES OF DAILY LIVING</b>	
4	i. Supine to Sitting, Sitting to Standing, Squatting, Climbing up & down	
	ii. Lifting, Pulling, Pushing, Overhead activities	
	iii. Running, Jogging.	10

## RECOMMENDED TEXT BOOKS

1. Cynthia .C. Norkins ; Joint Structure And Function – (F.A. Davis Company)
2. Brunnstrom ; Clinical Kinesiology – (F.A. Davis Company)
3. Physiology Of The Joints – Kapandji Vol.- I,ii,&iii (Churchill Livingstone)

## RECOMMENDED REFERENCE BOOKS

1. Steindler ;Kinesiology Of The Human Body – (Charles Thomos Publisher)
2. Neumann & Donald ;Kinesiology Of The Musculoskeletal System – (Mosby)
3. Oatis& Carol ;Kinesiology – The Mechanics And Pathomechanics Of Human Motion – (Lippincot Williams And Wilkins)
4. Joseph And Hamill ;Biomechanical Basis Of Human Motion – (Lippincot Williams And Wilkins)

## INTERNAL ASSESSMENT:

1. Two exams – Terminal and preliminary examination  
(Theory&Practical) of 80 marks each **TOTAL - 160 marks.**
2. Internal Assessment to be calculated out of 20 marks.
3. Internal assessment as per University pattern

## SCHEME OF UNIVERSITY EXAMINATION

<b>THEORY- KINESIOLOGY</b>		<b>Marks</b>
80 MARKS + I.A. – 20 MARKS * The question paper will give appropriate weightage to all the topics in the syllabus.		<b>100</b>
<b>Section A- S.A.Q</b>	- Answer any FIVE out of SIX [5 x 3 =15marks]Based on the topics 1(a & b) Q-2 - Answer any FIVE out of SIX [5 x 7 =35marks]	<b>50</b>
<b>Section B L.A.Q.</b>	Q-3] A L.A.Q [1x15=15 marks] OR Q-3]B LAQ [1x15=15 marks Q-4] A L.A.Q [1x15=15 marks] OR Q-4] B L.A.Q LAQ should give break up of 15 marks – e.g. [ 3 +5+7]	<b>30</b>
<b>Total Marks</b>		<b>80</b>

## **KINESIOTHERAPY- P205**

**Theory-83 Hrs + Practical/ Laboratory- 162 Hrs = Total - 245 Hrs**

**(UNIVERSITY EXAMINATION)**

### **COURSE DESCRIPTION:**

This course is based on anatomical and physiological & related kinesiological principles for normal human movement and for the efficacy in the assessment methods for mobility, muscle strength. Students have the opportunity to develop and acquire understanding of physiological responses to various types of training and develop skills of exercise programs (on models). Exercise components of muscle strength, flexibility, balance, breathing and gait are examined. Evidence of appropriate, safe and effective exercise design and proper exercise biomechanics and prescription parameters are addressed with all interventions

### **COURSE OBJECTIVES**

At the end of the course, the candidate will be able to

#### **Cognitive:**

- Describe the Biophysical properties of connective tissue, & effect of mechanical loading, & factors which influence the muscle strength, & mobility of articular & periarticular soft tissues.

#### **Psychomotor:**

- Apply the biomechanical principles for the efficacy in the assessment methods for mobility, muscle strength
- Acquire the skill of subjective and objective assessment of individual & group muscle strength
- Acquire the skills of subjective and objective methods of muscle strengthening
- Describe the physiological effects, therapeutic uses, merits / demerits of various exercise modes including Hydrotherapy
- Demonstrate various therapeutic exercises on self; & acquire the skill of application on models with Home Programs
- Analyze normal Human Posture [static & dynamic].
- Acquire the skill of functional re-education techniques on models
- Acquire the skill of Balance and Coordination Exercises
- Acquire the skill of using various walking aids for Gait Training
- Acquire the skill of demonstrating breathing exercises and retraining on self and others
- Acquire the skill of demonstrating Postural Drainage on models

**Affective:**

- Be able to develop behavioral skills and humanitarian approach while communicating with models
- Be able to develop bed side behavior, respect & maintain confidentiality

**COURSE OUTCOME:**

At the completion of course the student shall be able to describe the basics of neuromuscular coordination involved in exercise therapy, describe and demonstrate functional reeducation, describe and demonstrate soft tissue manipulations, demonstrate and apply different techniques to correct posture & gait and able to perform various assessment techniques needed during patient assessment

SR.NO	THEORY TOPIC	THEORY HOURS	PRACTICAL HOURS
1	<b>Biophysics</b>	<b>40</b>	<b>111</b>
	<b>a. Biophysical Principles:</b>	2	
	i. Structures & Properties of connective and non-connective tissues		
	<b>b. Stretching :</b>	3	12
	i. Definition		
	ii. Types		
	iii. Assessment of muscle length and fascia around the joint		
	iv. Principles of stretching		
	v. Techniques for all joints Individual muscle stretching		
	<b>c. Joint Mobility :</b>	10	17
	i. Definition		
	ii. Causes of limitation		
	iii. Indication and contra indications		
	iv. Principles		
	v. Techniques		
	vi. Assessment methods		
	vii. Individual joints mobility Exercises– Upper Limb, Lower Limb & Spine (Using active, assisted,		

	passive movements)		
	<b>d. Manual Muscle Testing and assessment (subjective &amp; objective) :</b>	6	35
	i.Principle		
	ii. Trick movements		
	iii.Group Muscle Testing		
	iv.Individual Muscle testing – Upper & Lower Limbs, Trunk & Face		
	<b>e. Muscle Strengthening</b>	10	45
	i. Concepts -Strength, Power, Endurance		
	ii. Factors influencing the Strength of normal muscle/ hypertrophy, recruitment of motor units, change after the training, training with isometric, isotonic & Isokinetic muscle contraction		
	iii. Principles: Overload, Intensity, Motivation, Learning, Duration, Frequency, Reversibility, Specificity, Determinants		
	iv. Methods : Subjective & Objective		
	v. Individual joint Strengthening Exercises Upper Limb, Lower Limb & Spine		
	vi. Concepts- 1 RM, 10 RM & Dynamometry		
	vii. Progressive Resisted Exercise - Delorme,Zinoveiff, Mc queen protocols		
	viii. Use of gymnasium equipments		
	<b>f. Hydrotherapy</b>	4	
	i. Physiological effects		
	ii. Indication and Contraindications		
	iii.Techniques		
	<b>g. Traction (Cervical &amp; Lumbar):</b>	3	2
	i.Introduction		
	ii. Types( Mechanical / Electrical,		

	Continuous/Intermittent)		
	iii.Indications and Contra indications		
	iv. Techniques v. Effects and uses		
	<b>h. Home Program</b>	2	
	i. Principles		
	ii. Ergonomic advice for ADLs		
	iii. Home based exercise program		
2	<b>POSTURE</b>	<b>5</b>	<b>5</b>
	a. Definition		
	b. Human posture –Changes from quadruped to biped		
	c. Correct and faulty posture		
	d. Postural patterns and Postural Mechanism		
	e. Factors affecting posture		
	f. Physiological deviations		
	g. Analysis of all views		
3	<b>FUNCTIONAL REEDUCATION</b>	<b>5</b>	<b>5</b>
	a.Principles & Indications		
	b. Mat exercises- mobility, strength and balance training		
	c. Progression to sitting, standing and walking		
	d. Transfers		
4	<b>NEUROMUSCULAR CO-ORDINATION AND BALANCE</b>	<b>5</b>	<b>5</b>
	a. Definition		
	b. Physiology related to coordination & Balance		
	c. Frenkels exercise ( Principles & Techniques)		
	d. Balancing Exercise		
5	<b>GAIT</b>	<b>10</b>	<b>10</b>
	i. Definition		
	ii. Subjective & Objective evaluation		

	iii. Gait cycle and measurable Parameters (Step Length, Step Width, Stride Length, Foot Angle, Cadence)		
	iv. Kinetics and kinematics of gait		
	v. Determinants of gait		
6	<b>WALKING AIDS</b>	<b>6</b>	<b>5</b>
	i. Types		
	ii. Indications		
	iii. Selection / Prescription		
	iv. Pre Crutch training		
	v. Measurements		
	vi. Gait with walking aids		
7	<b>BRONCHIAL HYGIENE</b>	<b>12</b>	<b>21</b>
	<b>a. Humidification &amp; Nebulisation</b>	<b>3</b>	<b>1</b>
	i. Definition		
	ii. Types		
	iii. Method of delivery		
	iv. Indications and contraindications		
	<b>b. Breathing Exercise</b>	<b>5</b>	<b>10</b>
	i. Types – Inspiratory , Expiratory (including forced expiratory technique)		
	ii. Goals & Uses		
	iii. Techniques		
	iv. ACBT		
	v. Autogenic drainage		
	<b>c. Postural Drainage:</b>	<b>4</b>	<b>10</b>
	i. Definition		
	ii. Indications & Contraindications		
	iii. Assessment & Principles		
	iv. Techniques		



## **RECOMMENDED TEXT BOOKS**

1. Margaret Hollis ;Progressive Resisted Exercises – ( Wiley)
2. Carolyn Kisner ; Therapeutic Exercise Foundation And Techniques - (Fa Davis)
3. Daniel Kendall ; Muscle Testing - (Lippincot Williams And Wilkins)
4. Dena Gardiner ; Principles Of Exercise Therapy – (Cbs)
5. Cash"s Textbook For Physiotherapists In Chest, Heart & Vascular Diseases ( Mosby)

## **RECOMMENDED REFERENCE BOOKS**

1. Basmajian & Wolf.; Therapeutic Exercise - Lippincot Williams And Wilkins)
2. David Magee ; Orthopedic Physical Assessment – ( Elsevier India)
3. O"sullivan ; Physical Rehabilitation- (Jaypee Brothers Medical)
4. Prior & Prasad; Physiotherapy for Respiratory and Cardiac Problems , Adults & Paediatrics , Elsevier India .

## **INTERNAL ASSESSMENT:**

1. Two exams – Terminal and preliminary examination (Theory&Practical) of 80 marks each TOTAL - 160 marks.
2. Internal Assessment to be calculated out of 20 marks.
3. Internal assessment as per University pattern

**SCHEME OF UNIVERSITY THEORY EXAMINATION**

<b>THEORY- KINESIOTHERAPY</b>		<b>Marks</b>
80 MARKS + I.A. – 20 MARKS * The question paper will give appropriate weightage to all the topics in the syllabus.		<b>100</b>
<b>Section-A</b> <b>S.A.Q</b>	- Answer any FIVE out of SIX [5 x 3 =15marks] - Answer any FIVE out of SIX [5 x 7 =35marks]	<b>50</b>
<b>Section-B</b> <b>L.A.Q.</b>	Q-3] A L.A.Q [1x15=15 marks] OR Q-3]B LAQ [1x15=15 marks]  Q-4] A L.A.Q - [1x15=15marks]  OR  Q-4] B L.A.Q-  *LAQ should give break up of 15 marks – e.g. [ 3+5+7]	<b>30</b>
<b>Total Marks</b>		<b>80</b>

**SCHEME OF UNIVERSITY PRACTICAL EXAMINATION**

<b>PRACTICAL- KINESIOTHERAPY</b>		<b>Marks</b>
80 MARKS + I.A. – 20 MARKS		<b>100</b>
<b>LONG CASE</b>	Muscle Strengthening / Stretching /Bronchial hygiene (On models)	<b>30</b>
<b>SHORT CASE</b>	<b>TWO SHORT CASES:</b>  <b>SHORT CASE ONE:</b> M.M.T./Coordination/Posture/Gait (Measurable parameters Only) [1x20=20 marks]  <b>SHORT CASE TWO:</b> Walking aids/ Functional Reeducation / Breathing Exercises [1 x 20 = 20 marks]	<b>40</b>
<b>COMMUNICATION SKILL</b>		<b>5</b>
<b>JOURNAL</b>	Documentation- Principles & applications for various Kinesiotherapeutic.	<b>5</b>
<b>Total Marks</b>		<b>80</b>

## **ELECTROTHERAPY- P206**

**Theory 100 hrs+ Practical / Laboratory 100 = Total 200 Hrs  
(UNIVERSITY EXAMINATION)**

### **COURSE DESCRIPTION:**

This course tends to explore fundamental skills in application of electrotherapeutic modalities and knowledge of indications, contraindications and physiological principles needed for appropriate patient care. It includes topics such as Electrical stimulation, T.E.N.S., Iontophoresis, Ultrasound / Phonophoresis, Diathermy and Electro diagnostic testing etc.

### **COURSE OBJECTIVES:**

At the end of the course, the candidate will be able to:

#### **Cognitive:**

- Acquire the knowledge about the physiology of pain, Pain pathways & Methods of pain modulation, selection of appropriate modality for Pain modulations.
- Describe the Physiological effects, Therapeutic uses, indication & contraindications of various Low/ Medium & High Frequency modes / Actinotherapy
- Describe the Physiological Effects & therapeutic uses of various therapeutic ions & topical pharmacological -therapeutic agents to be used for the application of iontophoresis & sono/ phonophoresis

#### **Psychomotor:**

- Acquire the skills of application of the Electro therapy modes on models, for the purpose of Assessment & Treatment.
- Acquire an ability to select the appropriate mode as per the tissue specific & area specific application.

#### **Affective:**

- Be able to develop behavioral skills and humanitarian approach while communicating with models
- Be able to develop bedside behavior, respect & maintain confidentiality

### **COURSE OUTCOMES:**

- Able to demonstrate the techniques of application of various electrotherapy modalities.
- Able to select the appropriate modalities in different conditions
- Able to select the appropriate dosages of different Electrotherapy modalities to achieve the different goals.

SR.NO	TOPIC	THEORY HOURS	PRACTICAL HOURS
1	<b>Pain</b>	<b>3</b>	
	i.Introduction to Pain		
	ii.Physiological response to pain		
	iii.Pain pathways		
	iv.Pain Gate mechanism		
2	<b>Low Frequency Currents</b>	<b>37</b>	<b>44</b>
	<b>a. Faradic Currents</b>	12	12
	Faradic currents: Physiological & Therapeutic effects indications, contraindications		
	i.Faradic type		
	ii. Strong Surged Faradic		
	iii. Sinusoidal currents		
	Application of Faradic current - Faradism Under pressure – Indications, Principle of application, Technique of application		
	Faradic re-education: Indications, Principle of application, Technique Of application		
	Short/Long pulse currents Motor Points: Definition., Identification		
	<b>b. Galvanic Currents</b>	12	10
	Galvanic / Direct currents (Continuous DC & Interrupted DC) :Physiological & Therapeuticeffects, Indications, Contraindications		
	a.Definition: Galvanic & Interrupted Galvanic Currents		
	ii. Property of Accommodation		

	iii. Technique & Methods of Application of Galvanic currents		
	iv. Types – Anodal & Cathodal, Therapeutic		
	v. Ionization /Iontophoresis: Theory of Medical Ionisation, Effects & Uses of various Ions, Indications and contraindications, Dangers and precautions		
	<b>c. TENS</b>	5	12
	Introduction to Pain relieving Modalities, Definition TENS, Types of TENS		
	To Know Physiological & Therapeutic effects of TENS		
	To Know Techniques and Methods of Applications of TENS		
	To know Indications & contraindications of TENS		
	<b>d. High Voltage Currents</b>	1	1
	<b>e. Micro Currents e. Didynamic Currents Topic</b>	1	1
	<b>f. S-D Curve</b>	6	8
	i. Principle of S-D curves		
	ii. Technique of plotting		
	iii. Interpretation of normal curves.		
	iv. Chronaxie and Rheobase		
3	<b>Medium Frequency Currents</b>	<b>10</b>	<b>12</b>
	a) To know interferential current, Definition IFT, and its principle		
	b) To Know Physiological & Therapeutic effects of IFT		
	c) To know Indications & contraindications of IFT		
	d) To know Technique & Methods of Application of IFT		
	e) To know Russian current, Definition, Indication, contraindication & its Parameters		

4	<b>Biofeedback</b>	<b>5</b>	
	i. Different types of feedback		
	ii. Principles of using biofeedback		
	iii. Uses of Biofeedback EMG		
5	<b>High Frequency Currents</b>	<b>20</b>	<b>20</b>
	<b>a. Short Wave Diathermy</b>	10	10
	i. Definition of electromagnetic fields		
	ii. Introduction to short wave diathermy		
	iii. Physiological effects of SWD		
	iv. Therapeutic effects of SWD		
	v. Principles of application		
	<b>b. Ultrasound</b>	10	10
	i. Definition of ultrasound, infrasonics and hearing band.		
	ii. Physiological effects		
	iii. Therapeutic effects		
	iv. Inference of sound waves		
	v. Phonophoresis		
	vi. Indication and contraindications of ultrasound		
	vii. Dangers of ultrasound		
	viii. Precautions of ultrasound		
	ix. Technique of application		
	x. Methods of application		
6	<b>Actinotherapy</b>	<b>17</b>	<b>21</b>
	<b>a. Infra-Red Radiations</b>	5	11
	i. Introduction to infrared radiations, physiological and therapeutic effects		

	ii. Technique and method of application		
	iii. Effects and uses		
	iv. Indications and contraindications		
	v. Precautions and potential dangers		
	<b>b. Ultraviolet Radiations</b>	8	10
	i. Types : a, b, c		
	ii. Physiological & Therapeutic effects		
	iii. Technique & Method of application		
	iv. Effects & uses		
	v. Indications & contraindications		
	vi. Dangers & Precautions		
	<b>c. LASER</b>	4	
	i. Physiological & Therapeutic effects		
	ii. Technique & Methods of Application		
	iii. Effects & Uses		
	iv. Indications & Contraindications		
	v. Dangers & Precautions		
	vi. Dosage		
7	<b>Advanced Electrotherapeutics</b>	<b>5</b>	
8	<b>Wound Care</b>	<b>3</b>	<b>3</b>
	i. Types of wound		
	ii. Application of Therapeutic currents, Ultrasound, U.V.R. & LASER		

### RECOMMENDED TEXT BOOK

1. Clayton's Electro Therapy (Cbs)
2. Low & Reed ; Electro Therapy Explained – (Elsevier India)
3. Principle And Practice Of Electro Therapy – (Churchill Livingstone)
4. Kahn ; Therapeutic Electricity – Sydney Litch (Waverly Press)
5. Sheila Kitchen ; Electrotherapy Evidence Based Practice – (Churchill Livingstone)
6. Basics of Electrotherapy – Subhash M. Khatri (Jaypee)

## RECOMMENDED REFERENCE BOOK

1. Clinical Electro Therapy – Nelson & Currier (Pearson)

### INTERNALASSESSMENT:

1. Two exams – Terminal and preliminary examination (Theory & Practical)  
Of 80 marks each TOTAL - 160 marks.
2. Internal Assessment to be calculated out of 20 marks
3. Internal assessment as per University pattern

### SCHEME OF THEORY UNIVERSITY EXAMINATION

<b>THEORY- ELECTROTHERAPY</b>		<b>Marks</b>
80 MARKS + I.A. – 20 MARKS		
* The question paper will give appropriate weightage to all the topics in the syllabus.		<b>100</b>
<b>Section A- S.A.Q.</b>	Q-1 - Answer any FIVE out of SIX[5 x 3 =15]Q-2- Answer any FIVE out of SIX [5 x 7 =35]	<b>50</b>
<b>Section B-L.A.Q.</b>	Q-3] A- Based on High frequency modalities [1 x 15 =15marks] OR Q-3] B- Based on High frequency modalities [1 x 15 =15marks]  Q-4] A Based on Low/Medium freq. modalities [1 x15=15marks] OR Q-4] B Based on Low /Medium freq. modalities [1x15=15marks]  LAQ should give break up of 15 marks – e.g. [ 3 +5+7]	<b>30</b>
<b>Total Marks</b>		<b>80</b>



**SCHEME OF PRACTICAL UNIVERSITY EXAMINATION**

<b>PRACTICAL- ELECTROTHERAPY</b>		<b>Marks</b>
<b>80 MARKS + I.A. – 20 MARKS</b>		<b>100</b>
<b>LONG CASE</b>	Motor points /Strength Duration Curve / Faradism underpressure (On models)	<b>30</b>
<b>SHORT CASES</b>	1. Based on Low or Medium Frequency modalities / HighFrequency modalities 2. Actinotherapy (I.R./U.V.R./LASER) 2 x 20 = 40marks (Skill of application on models & rationale for selection of modality)	<b>40</b>
<b>COMMUNICATION SKILL</b>		<b>5</b>
<b>JOURNAL</b>	Documentation- Principles & applications for various Electrotherapy Modalities.	<b>5</b>
<b>Total Marks</b>		<b>80</b>

**COMPUTER APPLICATION- P207**  
**Total 40 Hrs**

**(COLLEGE EXAMINATION)**

**COURSE DESCRIPTION:**

This Course describes –Basic Operation of Computer, Various Input and Output devices, Secondary Storage Devices, Detailed study of Components of CPU and Introduction to MS Word, MS Power point, MS Excel

**COURSE OBJECTIVES:**

- The course is designed to create awareness among the students about basic operation of Computer.
- Creating the MS documents, power point presentation and Excel

**COURSE OUTCOME:**

At the end of the session students would be able to understand the basic operation of computer and creating the documents, power point presentation and making spreadsheets in Excel along with the formulas

<b>SR.NO</b>	<b>TOPIC</b>	<b>THEORY HOURS</b>
<b>1</b>	<b>Basics of Computer</b> i. Input devices ii. Output devices ii. Secondary storage device iii. Components of CPU iv. Working of Word pad	<b>5</b>
<b>2</b>	<b>Hardware and Software</b> i. Working of hardware and software ii. Working of MS power point	<b>5</b>
<b>3</b>	<b>Multimedia</b> Basics of utility of multi- media	<b>5</b>
<b>4</b>	<b>Operating system</b> i. Develop basic knowledge of Linux, Unix, DOS, Windows OS	<b>5</b>
<b>5</b>	<b>Network</b> i. Intranet, Extranet and Internet ii. Skills of web surfing for literature, research relevant to the field of medicine	<b>5</b>

<b>6</b>	<b>Microsoft</b> i. Working and preparing of MS –Excel, Word iii. Skill of spread sheet software. iv.	<b>5</b>
<b>7</b>	<b>Power Point Presentation</b>	<b>5</b>
<b>8</b>	<b>Scientific Poster Designing</b> b.Scientific Posters using Microsoft office publisher	<b>5</b>

### RECOMMENDED TEXT BOOK

1. Priti Sinha ;Computer Fundamentals : Concept System And Application By (Bpb)
2. Soumya Behera ;Computer Application, (B.K.Publicatios Private Limited)
3. Renu Kapoor ;Introduction To Computer-. Lotus Publishers

### SCHEME OF PRACTICAL COLLEGE EXAMINATION-

<b>COMPUTER APPLICATION</b>		<b>Marks- 30</b>
COMPUTER APPLICATION BASED CASE 1		10
COMPUTER APPLICATION BASED CASE 2		10
COMPUTER APPLICATION BASED CASE 3		10
<b>Total</b>		<b>30</b>

### Passing in the exam is Mandatory:-

Grades: A+ = 75% & above, A = 66 to 74.5%, B + = 55 to 65 %, B = 50 to 54.5%, C= Fail, less than50%.

**ENVIRONMENTAL STUDIES-P208**  
**Ability Enhancement Compulsory Course: UGC**

**Theory 30 Hours**  
**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

The course is designed to develop the basic knowledge about the biodiversity and Ecosystem with respect to natural resources. It also helps to describe the social issues and environment.

**COURSE OBJECTIVES:**

The objective of this course is that, the student will be able to understand the population growth, human rights and value education. In addition, student will also be aware about the Women and Child Welfare. Student will also be aware about the rural and urban problems and its conservation.

**COURSE OUTCOME:**

At the end of the course, the student will be able to understand the

- The multidisciplinary nature of environmental studies
- Natural Resources Renewable and non-renewable resources
- Ecosystems, Biodiversity and its conservation
- Social Issues and the Environment
- Human Population and the Environment

**COGNITIVE:**

- Acquire the knowledge about nature, scope and importance of environmental studies, Ecosystem, Renewable and non-renewable resources.
- Describe environmental Hazards and laws, policies and practices.
- Describe the human communities and the environments.

SN	TOPIC	THEORY HOURS
1	<b>Introduction to environmental studies</b>	<b>2</b>
	i. Multidisciplinary nature of environmental studies;	

	ii. Scope and importance; Concept of sustainability and sustainable development.	
2	<b>Ecosystems</b>	<b>4</b>
	<ul style="list-style-type: none"> <li>• What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems :</li> <li>a) Forest ecosystem</li> <li>b) Grassland ecosystem</li> <li>c) Desert ecosystem</li> <li>d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)</li> </ul>	
3	<b>Natural Resources: Renewable and Non-renewable Resources</b>	<b>5</b>
	<ul style="list-style-type: none"> <li>• Land resources and land use change; Land degradation, soil erosion and desertification.</li> <li>• Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.</li> <li>• Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international &amp; inter-state).</li> <li>• Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.</li> </ul>	
4	<b>Biodiversity and Conservation</b>	<b>4</b>
	<ul style="list-style-type: none"> <li>• Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots.</li> </ul>	

	<ul style="list-style-type: none"> <li>• India as a mega-biodiversity nation; Endangered and endemic species of India</li> <li>• Threats to biodiversity : Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.</li> <li>• Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.</li> </ul>	
5	<b>Environmental Pollution</b>	<b>4</b>
	· Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution	
	· Nuclear hazards and human health risks	
	Solid waste management: Control measures of urban and industrial waste.	
	· Pollution case studies.	
6	<b>Environmental Policies &amp; Practices</b>	<b>4</b>
	<ul style="list-style-type: none"> <li>• Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture</li> <li>• Environment Laws: Environment Protection Act; Air (Prevention &amp; Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).</li> <li>• Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.</li> </ul>	

7	<b>Human Communities and the Environment</b>	<b>4</b>
	<ul style="list-style-type: none"> <li>• Human population growth: Impacts on environment, human health and welfare.</li> <li>• Resettlement and rehabilitation of project affected persons; case studies.</li> <li>• Disaster management: floods, earthquake, cyclones and landslides.</li> <li>• Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.</li> <li>• Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.</li> <li>• Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).</li> </ul>	
8	<b>Field work</b>	<b>3</b>
	<ul style="list-style-type: none"> <li>• Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.</li> <li>• Visit to a local polluted site-- Urban/Rural/Industrial/Agricultural.</li> <li>• Study of common plants, insects, birds and basic principles of identification.</li> <li>• Study of simple ecosystems--pond, river, Delhi Ridge, etc.</li> </ul>	

### **Suggested Readings:**

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.

4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.
7. McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books.
8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
14. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
19. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
20. World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press.



**SCHEME OF EXAMINATION**

<b>ENVIRONMENTAL STUDIES</b>		<b>Marks</b>
THEORY 50 MARKS		<b>50</b>
<b>SECTION I</b>		
<b>Q.1</b>	Answer ant <b>TWO</b> Question from following <b>THREE</b> (2 X 10)	<b>20</b>
<b>SECTION II</b>		
<b>Q.2</b>	Answer ant <b>SIX</b> Question from following <b>EIGHT</b> ( 6X5)	<b>30</b>
<b>Total Marks</b>		<b>50</b>

**ANNEXTURE**  
**SCHEME OF EXAMINATION**