Ordinance Governing Bachelor of Physiotherapy (BPT) Degree Course

Syllabus / Curriculum 2022-23 (RS3)

KLE ACADEMY OF HIGHER EDUCATION & RESEARCH

JNMC Campus, Nehru Nagar, Belgaum- 590010, Karnataka, India.
Phone: + 91- 831- 2472777,24793777 FAX: +91 831 2493777
E-mail: info@kleuniversity.edu.in Website: kleuniversity.edu.in

Edition Year: 2009
Revised: 2012
Revised 1: 2016
Revised Syllabus 2 (2019-20)
Revised Syllabus 3 (2022-23)

© **Registrar**
E-mail: registrar@kleuniversity.edu.in

Director, Academic Affairs
KAHER
JNMC Campus, Nehru Nagar,
Belgaum-590010
Ph: 0831-2472777
e-mail:info@kleuniversity.edu.in

Price Rs: 250/- only

Printed at:

VISION

To be an outstanding University of excellence ever in pursuit of newer horizons to build self-reliant global citizens through assured quality educational programs.

MISSION

- To promote sustainable development of higher education consistent with statutory and regulatory requirements.
- To plan and continuously provide necessary infrastructure, learning resources required for quality education and innovations.
- To stimulate to extend the frontiers of knowledge, through faculty development and continuing education programs.
- To make research a significant activity involving staff, students and society.
- To promote industry/organization, interaction/collaborations with regional / national / international bodies.
- To establish healthy systems for communication among all stakeholders for vision oriented growth.
- To fulfill the national obligation through rural health missions.

OBJECTIVES

The objectives are to realize the following at university and its constituent institutions:

- To implement effectively the programs through creativity and innovation in teaching, learning and evaluation.
- To make existing programs more careers oriented through effective system of review and redesign of curriculum.
- To impart spirit of enquiry and scientific temperament among students through research oriented activities.
- To enhance reading and learning capabilities among faculty and students and inculcate sense of life long learning.
- To promulgate process for effective, continuous, objective oriented student performance evaluation.
- To ordinate periodic performance evaluation of the faculty.
- To incorporate themes to build values, civic responsibilities & sense of national integrity.
- To ensure that the academic, career & personal counseling are in-built into the system of curriculum delivery.
- To strengthen, develop and implement staff and student welfare programs.
- To adopt and implement principles of participation, transparency and accountability in governance of academic and administrative activities.
- To constantly display sensitivity and respond to changing educational, social, and community demands.
- To promote public- private partnership.

INSIGNIA

The Emblem of the University is a Philosophical statement in Symbolic.

The Emblem…

A close look at the emblem unveils a pillar, a symbol of the "University of Excellence" built on strong values & principles.

The Palm and the Seven Stars…

The Palm is the palm of the teacher - the hand that acts, promises & guides the students to reach for the Seven Stars…

The Seven Stars signify the 'Saptarishi Dnyanamandal', the Great Bear- a constellation made of Seven Stars in the sky, each signifying a particular Domain. Our culture says: The true objective of human birth is to master these Knowledge Domains.

The Seven Stars also represent the Saptarishis, the founders of KLE Society whose selfless service and intense desire for "Dnyana Dasoha" laid the foundation for creating the knowledge called KLE Society.

Hence another significance of the raised palm is our tribute to these great Souls for making this University a possibility.

Empowering Professionals…

'Empowering Professionals', inscription at the base of the Emblem conveys that our Organization with its strength, maturity and wisdom forever strive to empower the student community to become globally competent professionals. It has been a guiding force for many student generations in the past, and will continue to inspire many forth coming generations.

NOTIFICATION

This page is intentionally kept blank

CONTENTS

Section-I

PREAMBLE

The disability profile has been increasing as indicated in the recent surveys by Government of India. New fields like community health centers, industrial health centers, homes for elderly, hospices, rehabilitation centers, schools for disabled, research centers, sports medicine and training centers, non-governmental organizations have a lack of qualified Physiotherapists. Hence, there is a growing need for qualified Physiotherapists in our country.

Physiotherapy is an allied health care profession characterized by treatment of various diseases and disorders with the help of skilled use of physiologically-based movement techniques, supplemented when necessary by electrotherapy and other physical means for the prevention and treatment of injury and disease. It is used to assist the process of rehabilitation and restoration of function, including the achievement of personal independence. The work of the Physiotherapist is therefore essential to ensure a good quality of life for individuals ranging from children to the elderly with various disabilities like physical, neurological, psychosocial and sensory, to fulfill their rehabilitation needs and their integration in the community. The specific objective of a therapist is to function as an integral part of a multidisciplinary team to enable those whose abilities in productivity, self-maintenance and leisure are threatened, restricted or lost due to impairment, developmental delay, ageing or lack of opportunity, to become full and productive members of the community. Physiotherapists are therefore of paramount importance in the effective operation of the health care, social welfare and education systems. Physiotherapists play an important role in preventive medicine which includes pathologies of musculo-skeletal, neuromuscular & cardiovascular systems at all ages.

The first three years of study have been designed to equip students with the basic training needs of a Physiotherapist for general practice, including implementation of treatment after effective Physiotherapy assessment, good communication and interpersonal skills and commitment to ethical and social responsibility. The fourth year of study leads to the award of Bachelor of Physiotherapy degree and is designed to meet the research and administrative and management needs of the profession, with exposure to clinical electives. The practical and clinical education training provides the opportunity for translation of theoretical knowledge into hands-on practice of immediate relevance and helps students in acquiring further professional competence. Graduates with this degree can either pursue higher studies like Master of Physiotherapy and post graduate diploma or seek employment locally and internationally. Physiotherapists are employable in a wide range of areas like clinics, hospitals, hospices, homes for elderly, schools, industries, sports medicine centers etc and can also choose independent practice after graduation.

Section-II

GOALS OF PHYSIOTHERAPY EDUCATION

Various goals of education & training in Physiotherapy at KAHER are as follows:

- Impart knowledge of common heath conditions and the National Health programs.
- Provide an educational experience with hands on experience both in hospital as well as in community setting.
- Exert maximum efforts to encourage integrated teaching methods
- Undertake responsibilities of physiotherapist and be capable of functioning independently in both urban and rural settings
- Utilize learner centric methods which encourage clarity of expression, independence of judgment, scientific disposition, problem solving abilities, self-initiated and self-directed learning.
- Use of active methods of learning such as group discussions, seminars, role play, field visits, demonstrations, peer interaction, etc which enable personality development, communication skills and leadership qualities.
- Evolution of the role of physiotherapy teachers from knowledge provider to that of a facilitator of learning and student motivator
- Establish a physiotherapy education unit for enhancing faculty development, preparation of learning resources and implementing newer & relevant evaluation methods.

Section-III

AIMS AND OBJECTIVES OF BPT PROGRAM

Aims: The Physiotherapy graduates undergoing training in the Institution should acquire adequate knowledge, necessary skills and reasonable attitudes required to carry out activities appropriate to general physiotherapy practice including prevention, diagnosis and treatment of health conditions. The graduate also should be able to understand the concept of community physiotherapy education and be able to participate in the rural health care delivery programs existing in the country.

Objectives: The objectives are dealt under three headings such as knowledge and understanding, skills and attitudes.

Knowledge and understanding: The graduate should acquire the following during the period of training:

- Adequate knowledge of the scientific foundation of Physiotherapy practice and adequate understanding of the relevant scientific methods, principles of biological functions and the ability to evaluate and scientifically analyze various established facts and data.
- Adequate knowledge of the development, structure and function of the human body systems, both in health and disease, and their relationship and effect on general health status, including the social wellbeing of an individual.
- Adequate knowledge of clinical disciplines and methods of evaluation & treatment in order to understand, interpret & formulate preventive, diagnostic, and therapeutic plans for various health conditions encountered during Physiotherapy practice.
- Adequate clinical experience & expertise required for independent Physiotherapy practice.
- Adequate knowledge of the constitution, biological and behavior of persons in health and sickness as well as the influence of the natural and social environment on the health status relevant to Physiotherapy.

Skills: A graduate should be able to demonstrate the following skills necessary for independent Physiotherapy practice:

- Able to diagnose and manage common functional impairments encountered in general Physiotherapy practice keeping in mind the expectations and the rights of the society to receive the best possible treatment available wherever possible.
- Acquire the skills to prevent and manage complications if encountered while carrying out various surgical and other procedures.
- Possess skill to carry out certain investigative procedures and ability to interpret laboratory findings.
- Promote overall health (fitness) and prevent diseases whenever possible.
- Competent in the control of pain and anxiety during Physiotherapy treatment.

Attitudes: A graduate should develop during the training period the following attitudes:

- Willingness to apply the current knowledge of Physiotherapy in the best interest of the patients and the community.
- Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
- Seek to improve awareness and provide possible solutions for overall health problems and needs of the community.
- Willingness to participate in the Department of Physiotherapy Education (DOPE) programs to update the knowledge and professional skills from time to time.
- To participate implementation of the national health programs.

Section-IV

GRADUATE ATTRIBUTES FOR BPT PROGRAM

A Physiotherapy graduate completing the BPT program at KAHER Institute of Physiotherapy will be/ have the following attributes:
First Contact Practitioner/Clinician
Communicator
Team Leader &/or member
Professional
Lifelong Learner

1**. First Contact Practitioner/Clinician** who understands and provides preventive, promotive, curative and holistic care with compassion

a) Demonstrate knowledge of normal & abnormal human structure, function and development from a clinical, behavioural and social perspective.
b) Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to identification & prevention of functional limitations and health promotion.
c) Demonstrate ability to perform a physical examination that is complete and relevant to identification & prevention of functional limitations and health promotion.
d) Demonstrate effective clinical decision making, problem solving, judgment and ability to interpret and integrate available data to address patient problems, generate differential diagnoses and develop individualized management programs that include preventive, promotive and therapeutic goals.
e) Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frameworks.
f) Demonstrate ability to prescribe and safely administer appropriate therapies based on the scientific principles of Physiotherapy
g) Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.
h) Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced medical or surgical care.
i) Demonstrate familiarity with basic and applied research as applicable to patient care.

2) **Communicator** with patients, families, colleagues and community

a) Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
b) Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.
c) Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.
d) Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision making.

3) **Leader and/or member** of the health care team
a) Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
b) Recognize and function effectively, responsibly and appropriately as a health care team leader in first contact health care settings.
c) Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.
d) Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
e) Recognize and advocate health promotion, disability prevention and health care quality improvement through awareness programs in collaboration with other members of the health care team.

4) **Professional** who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession
a) Practice selflessness, integrity, responsibility, accountability and respect.
b) Respect and maintain professional boundaries between patients, colleagues and society.
c) Demonstrate ability to recognize and manage ethical and professional conflicts.
d) Abide by prescribed ethical and legal codes of conduct and practice.
e) Demonstrate a commitment to the growth of the Physiotherapy profession as a whole.

5) **Lifelong learner** committed to continuous improvement of skills and knowledge
a) Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.
b) Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
c) Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.
d) Demonstrate ability to search (including through electronic means), and critically revaluate the available scientific literature and apply the information to patient care.
e) Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

Section V
Program Outcomes
Bachelor of Physiotherapy

1. Physiotherapy knowledge:

Possess an understanding & knowledge of the scientific basis of Physiotherapy, principles of biological functions & analysis of scientific data & facts. Demonstrate an adequate understanding of the effects of disease on normal bodily functions & to apply this in the evaluation, management & rehabilitation of patients

2. Planning abilities:

Demonstrate effective patient evaluation & treatment planning skills including time management & follow-up program

3. Communication Skills:

Demonstrate effective communication skills with patients, caregivers, other scientific/ medical personnel & community at large with regard to health promotion, education & rehabilitation

4. Professional Identity & Ethics:

Understand, analyze & communicate their professional role in the society (health promoters, rehabilitation specialists, health educators, employers, employee, managers).

Demonstrate an understanding of human values & humanitarian approach in patient care. Apply ethical principles during day to day professional practice & take ownership of results/outcome of treatment

5. Problem analysis:

Utilize the principles of scientific enquiry, analytical thinking, clearly and critically, while solving problems and making decisions relating to patient care during daily practice. Find, analyze, evaluate and apply information systematically and make defensible decisions.

6. Physiotherapist & Society:

Apply informed contextual reasoning supported by evidence to assess societal, health, safety and legal issues and the consequent responsibilities relevant to professional Physiotherapy practice

7. Leadership skills:

Develop the ability to independently evaluate & plan patient care programs. Develop the ability to work as a team in the holistic management of patients. Demonstrate an ability to lead & mentor a peer team or juniors in the best interest of the patient, profession & society at large.

8. Research Acumen:

Develop a keen sense of research in the field of Physiotherapy. Develop a sense of scientific inquiry in the evaluation & management of patients & aim to cover the lacuna in the knowledge pool by conducting good quality research & presenting the same at scientific forums & publish quality papers in order to aid evidence based practice.

9. Lifelong learning:

Recognize the need for & engage in independent and life-long learning in the broadest context. Self -assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

Section-VI

REGULATIONS GOVERNING BPT DEGREE COURSE

Eligibility: A candidate seeking admission to first year BPT course should have passed Pre-University examination of Karnataka Pre-University Board with English as one of the subjects and Physics, Chemistry and Biology as optional subjects OR should have passed any other examination conducted by Boards/Councils/ Intermediate examination established by State/Central Governments or equivalent studies within India or abroad, with English as one of the subjects and Physics, Chemistry and Biology as optional subjects. The candidate should have completed 17 years of age on or before 31st day of December of the year of admission. The selection of students to the physiotherapy course shall be based on:

i) A Candidate must have passed in the qualifying examination individually in the subjects of Physics, Chemistry, Biology and English obtaining not less than 40% marks taken together and should also have scored 40% marks in English language.

ii) The candidate must appear for KAHER UGAIET competitive entrance examination and must have come in the merit list by securing not less than 40% marks in Physics, Chemistry and Biology taken together.

Duration of the Course: Every student shall undergo a period of certified study extending over 4 academic years from the date of commencement of his/her study for the subject comprising the physiotherapy curriculum to the date of completion of the examination followed by six months compulsory rotatory internship.

Academic terms: All candidates admitted beyond the last date stipulated by the University shall have to appear for first professional examination after completion of the prescribed duration.

Attendance: Every candidate should have attendance not less than 75% of total classes conducted in theory and practical in each calendar year calculated from the date of commencement of the term to the last working day as notified by the University, in each of the subjects prescribed to be eligible to appear for the University examination. 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.

Internal assessment: It is based on regular evaluation of periodic tests (theory & practical), assignments & clinical presentations. There will be a minimum of 3 sessional/ internal examinations and the average of all three internal marks will be sent to the University prior to annual examination as per notification. Proper record is maintained for all students & is available for scrutiny. The marks of periodical tests are displayed on the student notice board.

Schedule of Examination: There will be two examinations in a year, i) an annual examination and ii) a supplementary examination to be conducted as per notification issued by the University from time to time. The particulars of subjects for various examinations and distribution of marks are shown separately in tables V TO VIII.

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 practical jointly to become eligible to appear for examination in those subject/subjects.
c) Should secure at least **40%** 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 50% of total marks in college exam in subjects for which university exam not prescribed
f) Shall fulfill any other requirement that may be prescribed by the University from time to time.

Criteria for Pass: 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, viva–voce 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 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.

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)]

Carry over: A candidate who has failed in their respective year university examination can carry over a maximum of two subjects to their next year, but will have to pass the subjects in the subsidiary examination before writing the examination of the next academic year.

Internship: There shall be six months of rotatory structured Internship after the final examination for candidate declared to have passed the examination in all the subjects. Internship should be done in a teaching hospital recognized by the university. No candidate shall be awarded degree certificate without successfully completing six months internship. The internship should be rotatory and cover all clinical branches concerned with physiotherapy. End of the posting oral evaluation will be done.

Project work: Interns has to take up a project work in the internship period. The project work shall be termed as Short Project. The protocol approval shall be obtained in the 1st month of Internship; data shall be collected in the next 3 months after the approval of the protocol and project shall be submitted at the mid of 6th month. Submission of article to the journal shall be completed by end of 6th month. The written text of the project shall be of minimum 50 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") times new Roman, 12 font and bound properly. Spiral binding should be avoided. The intern shall provide plagiarism declaration in his/her project. The guide, head of the institution shall certify the written text of the project. Three copies of project work thus prepared shall be submitted to the head of the institution. The completion certificate of internship will be issued only after completing the research project.

Section- VII

SUBJECTS AND TEACHING SCHEDULE

Table I: FIRST YEAR BACHELOR OF PHYSIOTHERAPY (I BPT)

Subject code	Name of the subject	Teaching hours		
		Theory	Practical	Total
PT 1101	Human Anatomy	120	100	220
PT 1102	Human Physiology	120	100	220
PT 1103	Human Biochemistry	100	-	100
PT 1104	Human Biomechanics	150	100	250
PT 1105	Part-A Psychology Part-B Sociology	50 50	-	100
PT 1106	Basic Nursing and First Aid*	60	-	60
PT 1107	Computer application and Management in Physiotherapy*	50	-	50
PT 1108	**Language A. English*** **B. Kannada***	25 25		50
PT 1109	**NSS**	60	40	100
PT 1110	Clinical Education and Training	-	500	500

TOTAL	**810**	**840**	**1650**

*No University examination

Table II: SECOND YEAR BACHELOR OF PHYSIOTHERAPY (II BPT)

Subject code	Name of the subject	Teaching hours		
		Theory	**Practical**	**Total**
PT 1111	Exercise Therapy	100	200	300
PT 1112	Electrotherapy & Physical Agents	100	200	300
PT 1113	Prosthetics and Orthotics	100	100	200
PT 1114	Part-A Pathology Part -B Microbiology	40 40	10 10	100
PT 1115	Pharmacology	100	-	100
PT 1116	Constitution of India*	**25**	**-**	**25**
PT 1117	Environmental studies & Disaster management *	**25**		**25**
PT 1118	Clinical Education & Training	-	500	500
	TOTAL	**610**	**1040**	**1650**

*No University examination

Table III: THIRD YEAR BACHELOR OF PHYSIOTHERAPY (III BPT)

Subject code	Name of the subject	Teaching hours		
		Theory	**Practical**	**Total**
PT 1119	General Medicine	100	100	200
PT 1120	General Surgery	100	100	200
PT 1121	**Physiotherapy in general medicine and surgery Including OBG**	100	100	200
PT 1122	**Physiotherapy in Cardio-Vascular-Thoracic**	100	100	200
PT 1123	Research Methodology, Ethics & Evidenced Based Practice	70	--	70
PT 1124	Community Medicine	100	100	200
PT 1125	Clinical Education & Training	-	470	470
	TOTAL	**630**	**1010**	**1640**

Table IV: FOURTH YEAR BACHELOR OF PHYSIOTHERAPY (IV BPT)

Subject code	Name of the subject	Teaching hours		
		Theory	**Practical**	**Total**
PT 1126	Clinical Orthopedics	100	100	200
PT 1127	Part A Neurology Part B Neurosurgery	50 50	50 50	200
PT 1128	Community Physiotherapy & Rehabilitation	90	70	160
PT 1129	Physiotherapy in Orthopedics	90	90	180
PT 1130	**Physiotherapy in Pediatrics**	80	70	150
PT 1131	Physiotherapy in Neurology & Neurosurgery	90	90	180
PT 1132	Clinical Education & Training	-	580	580
	TOTAL	**550**	**1100**	**1650**

*No University Examination

Section- VIII

Table V: SCHEME OF EXAMINATION FOR I BPT

Sl. No.	Subject	Theory			Practical			Grand Total
		Written		Internal Assessment	Practical	Viva Voce	Internal Assessment	
		Time	Maximum Marks	Maximum Marks	Maximum marks	Maximum marks	Maximum marks	
1	Human Anatomy	3hours	80	20	50	30	20	200
2	Human Physiology	3hours	80	20	50	30	20	200
3	Human Biochemistry	3hours	80	20	-	-	-	100
4	Human Biomechanics	3hours	80	20	50	30	20	200
5	Part-A Psychology Part-B Sociology	3hours	40 40	10 10	-	-	-	100
6	Basic Nursing and First Aid*	2hours		50				50
7	Computer application and Management in Physiotherapy*	2hours		25 25				50
8	Language A. English* B. Kannada*	2hours		25 25				50
9	*NSS	2hours		50				50

* No University Examination

Table VI: SCHEME OF EXAMINATION FOR II BPT

Sl. No.	Subject	Theory			Practical			Grand Total
		Written		Internal Assessment	Practical	Viva Voce	Internal Assessment	
		Time	Maximum Marks	Maximum Marks	Maximum marks	Maximum marks	Maximum marks	
1	Exercise Therapy	3hours	80	20	50	30	20	200
2	Electrotherapy & Physical Agents	3hours	80	20	50	30	20	200
3	Prosthetics and Orthotics	3hours	80	20	-	-	-	100
4	Part-A Pathology Part-B Microbiology	3hours	40 40	10 10	10 10	10 10	05 05	150
5	Pharmacology	3hours	80	20	-	-	-	100
6	*Constitution of India	2hours		50				50
7	*Environmental Studies & disaster management	2hours		50				50

* No University Examination

Table VII: SCHEME OF EXAMINATION FOR III BPT

Sl. No.	Subject	Theory			Practical			Grand Total
		Written		Internal Assessment	Practical	Viva Voce	Internal Assessment	
		Time	Maximum Marks	Maximum Marks	Maximum marks	Maximum marks	Maximum marks	
1	General Medicine	3hours	80	20	20	20	10	150
2	General Surgery	3hours	80	20	20	20	10	150
3	Physiotherapy in General medicine and surgery including OBG	3hours	80	20	50	30	20	200
4	Physiotherapy in CVTS	3hours	80	20	50	30	20	200
5	Research Methodology, Ethics & Evidenced Based Practice	3hours	80	20	-	-	-	100
6	Community Medicine	3hours	80	20	-	-	-	100

*No University Examination

Table VIII: SCHEME OF EXAMINATION FOR IV BPT

Sl. No.	Subject	Theory			Practical				Grand Total
		Written		Internal Assessment	Practical	Viva Voce	Internal Assessment		
		Time	Maximum Marks	Maximum Marks	Maximum marks	Maximum marks	Maximum marks		
1	Clinical Orthopedics	3 hours	80	20	20	20	10		150
2	Part A Neurology (50) Part B Neurosurgery (50)	3 hours	80	20	-	-	-		100
3	Community Physiotherapy & Rehabilitation	3 hours	80	20	50	30	10 marks Practical	10 marks for Journal	200
4	Physiotherapy in Orthopedics	3 hours	80	20	50	30	20		200
5	Physiotherapy in Pediatrics	3 hours	80	20	50	30	20		200
6	Physiotherapy in Neurology & Neurosurgery	3 hours	80	20	50	30	20		200

GUIDELINES FOR UNIVERSITY THEORY EXAMINATIONS

Type of Questions	**Marks**	
	For 80 marks Paper	**For 40 marks Paper**
Multiple choice question	20(twenty question of one marks)	10(ten question of one marks)
Long Essay Question	20(2 questions x10)	10(1question s x10)
Short Essay Type	20 (4 questions X 5)	10 (2questions x 5)
Very short answer questions	20(10questions x2)	10(5Questions x2)
Total	**80**	**40**
Duration	**3Hours**	**1Hours and 30 minutes**

GUIDELINES FOR UNIVERSITY PRACTICAL EXAMINATIONS

Human Anatomy

Type of Questions	**Marks**
Gross anatomy Spotter (5x2)	10
Gross anatomy Practical (2x10)	20
Surface anatomy (2x5)	10
Histology spotter (1x10)	10
Total	**50**
Viva Voce	**30**
Duration	**8Hours**
Students allotted	**25/day**

Human Physiology

Type of Questions	**Marks**
Lab Experiment 1	25
Lab Experiment 2	25
Total	**50**
Viva Voce	**30**
Duration	**8Hours**
Students allotted	**25/day**

Pathology, Microbiology

Type of Questions	**Marks**
Spotter (10Patho + 10 Micro)	20(10+10)
Viva Voce	**20**
Total	**20**
Duration	**8Hours**
Students allotted	**40/day**

Human Biomechanics

Type of Questions	**Marks**
10 Spotters (2 marks each)	20
Lab Experiment 1	15
Lab Experiment 2	15
Total	**50**
Viva Voce	**30**
Duration	**8Hours**
Students allotted	**25/day**

Exercise therapy, Electrotherapy

Type of Questions	**Marks**
Lab Experiment 1(Long)	20
Lab Experiment 2(Short)	15
Lab Experiment 3(Short)	15
Total	**50**

Viva Voce	**30**
Duration	**8Hours**
Students allotted	**25/day**

III- & IV-Year Physiotherapy subjects

Type of Questions	**Marks**
One long case (on patient)	25
One short case (on Model)	15
Spotters (5x2marks)	10
Total	**50**
Viva Voce	**30**
Duration	**8Hours**
Students allotted	**25/day**

III & IV Year Clinical subjects – Gen. Medicine, Gen. Surgery, Orthopedics

Type of Questions	**Marks**
1 long case	20
Viva Voce	20
Total	**40**
Duration	**8Hours**
Students allotted	**40/day**

Evaluation system	Double evaluation
Examiners	1 internal and 1 external Criteria - Post graduate with Minimum 3 years of teaching experience.

Maximum Duration to complete the course = Double the duration of course. If a candidate fails to complete the course in that period, then he/she has to reregister. **Maximum Number of attempts = 10**

INSTITUTIONAL EXAMS

These below mentioned subjects will have institutional exams only; candidate has to mandatorily pass in these subjects to be eligible to appear for university examination.

Subject code	**Subject**	**Theory**	
		Written	
		Time	**Maximum Marks**
PT 1106	Basic Nursing and First Aid	2hours	50
PT 1107	Computer application and Management in Physiotherapy	2hours	25 25
PT 1108	Language A. English B. Kannada	2hours	25 25
PT 1109	NSS	2hours	50
PT 1116	Constitution of India	2hours	50
PT 1117	Environmental studies & Disaster management	2hours	50

Section-IX- A

FIRST YEAR BPT (BPT I) SUBJECTS AND COURSE CONTENTS

HUMAN ANATOMY (SUBJECT CODE: PT 1101)

Teaching Hours: 220 hours (Theory: 120 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical & Viva - voce 100)
Assessment: Written, Oral and Practical, Internal and University examination.
Internal Examination: 20 marks Theory and 20 marks Practical.
University Examination: 80 marks Theory and 40 marks Practical and Viva – voce

Objectives: The objectives are to develop an understanding about various integral parts of human body, their structure, function and location with reference to the surface anatomy with an emphasis on musculoskeletal, nervous and cardio respiratory systems.

Course Outcome
At the completion of the course, students will be able to:

1.1.1	Develop an understanding of the normal anatomical structures & common terminology used for describing the human body with respect to structure, location & function
1.1.2	Understand the structure and function of various systems of the body with emphasis on musculoskeletal, CNS, cardiac and respiratory systems
1.1.3	Demonstrate the ability to identify & describe pro-sectioned body parts & bones
1.1.4	Develop an understanding of the applied aspects of human anatomy

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. General anatomy

Must Know

- Introduction to anatomy, terms and terminology
- Regions of body, cavities and systems outline
- Connective tissue & its modification, tendons, membranes, special connective tissue
- Bone structure, blood supply, growth, ossification, and classification
- Muscle classification, structure and functional aspect
- Nerve – structure, classification, microscopy with examples
- Neurons, classification with examples
- Parts of a typical spinal nerve, Simple reflex arc
- Dermatome
- Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy

Good to know (Desirable to Know)

- Circulatory system – major arteries and veins of the body, structure of blood vessels

Nice to know

- Cell structure and function of cell organelles (brief outline only)
- Lymphoid system – circulation, function, lymphoid organs- and their structure & functions

2. Upper extremity

Must Know

- Bony architecture
- Joints – structure, range of movement
- Muscles – origin, insertion, actions, nerve supply
- Major nerves – course, branches and implications of nerve injuries
- Radiographic identification of bone and joints **(Nice to know)**

3. Lower extremity

Must know

- Bony architecture
- Joints – structure, range of movement
- Muscles – origin, insertion, actions, nerve supply
- Major nerves – course, branches and implications of nerve injuries
- Radiographic identification of bone and joints (**Nice to know**)

4. Spine

Must know

- Back muscles - superficial layer, deep muscles of back, their origin, insertion, action and nerve supply
- Vertebral column – structure & development, structure & joints of vertebra
- Radiographic identification of bone and joints **(Nice to Know)**

5. Thorax

Must Know

- Thoracic cage
- Lungs and respiratory tree
- Heart and great vessels
- Diaphragm

Good to know

- Pleural cavities & pleura

6. Head and neck

Must know

- Temporo-Mandibular Joint
- Facial Muscles
- Neuroanatomy (Central nervous system – disposition, parts and functions of Cerebrum, Cerebellum, Midbrain & brain stem)
- Blood supply & anatomy of brain
- Spinal cord- anatomy, blood supply, nerve pathways

Good to know

- Cranium
- Pyramidal, extra pyramidal system
- Thalamus, hypothalamus
- Ventricles of brain, CSF circulation
- Cranial nerves – special emphasis on V, VII, X, XI, XII (course, distribution and palsies)

Nice to know

- Development of nervous system & defects (brief description)
- Sympathetic nervous system, its parts and components (brief description)
- Parasympathetic nervous system (brief description).

7. Miscellaneous

Must know

- Histology: cells, tissues of the various organs of the body, epithelium, connective tissues, and blood vessels and lymphoid tissue
- Muscles of abdominal wall, pelvic floor, innervations
- Bony pelvis

Good to know

- Embryology in brief covering neuro-musculo-skeletal developmental aspects
- Urinary system – kidney, ureter, bladder, urethra

Nice to know

- Endocrine - system – pituitary, thyroid, parathyroid (brief description)
- Special senses (brief description): nerve receptors, eye, ear, labyrinth
- Abdomen and pelvis (brief descriptions only):
- Genital system – male and female
- Digestive system (liver & pancreas, alimentary canal)

Practical Contents

1. Topics for prosection

- Upper extremity, lower extremity, head & neck, brain and spinal cord, thorax and abdomen.
- Surface anatomy of all the above

2. Practical demonstrations

- Histology- identifying the bone, cartilage, all connective tissues, blood vessels, nervous system cells
- Embryology- models, charts

3. Demonstrations (in a cadaver)

- All muscles of the whole body.
- Organs in thorax and abdomen
- All joints with periarticular structures
- Points of palpation of peripheral nerves and blood vessels of upper and lower limbs
- Brain parts and spinal cord

4. Living Anatomy

5. Identification of body prominences on inspection and by palpation especially of extremities

Suggested Readings

1. Standring Susan: Gray's Anatomy – The Anatomical Basis of Clinical Practice. 39th Ed, Elsevier Churchill Livingstone, London, 2005.
2. Anne MR, Dalley AF: Grant's Anatomy. 11th Ed, Lippincott Williams, Baltimore, 2005.
3. Snell RS: Clinical Anatomy for Medical Students. 7th Ed, Little Brown Publishers, Boston, 1995.
4. Derek F: Anatomy – Palpation & Surface Markings, Butterworth Heinman, London, 1997.
5. Romanes GJ: Cunningham Manual of Practical Anatomy. Vol I, II, III, 15th Ed, Oxford Medical Publication, Oxford, 1986 (Reprinted with corrections 2002).
6. Chaurasia BD: Human Anatomy – Regional and Anatomy – Dissection & Clinical. 4th Ed, Vol I, II, III, CBS Publications & Distributors, New Delhi, 2004.
7. Faruqi NA: Handbook of Osteology. 1st Ed, CBS Publications & Distributors, New Delhi, 2007.
8. Inderbir Singh: Text Book of Human Histology. 4th Ed, Jaypee Brothers, New Delhi, 2002.
9. Inderbir Singh: Text Book of Human Embryology. 6th Ed, McMillan India Ltd, New Delhi, 1996.
10. Sinnatamby SC: Last's Anatomy – Regional & Applied. 10th Ed, Churchill Livingstone, Edinburgh, 1999.

HUMAN PHYSIOLOGY (SUBJECT CODE: PT 1102)

Teaching Hours: 220 hours (Theory: 120 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva-voce: 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks Practical
University Examination: 80 marks Theory, 80 marks Practical and Viva – voce

Objectives: The objectives are to develop thorough understanding of the Physiological functions of the various systems of human including exercise and work physiology in relation to physical therapy with major emphasis on Cardio-Respiratory, Musculo-skeletal and Nervous Systems body; and the clinical application of various physiological functions.

Course Outcome

At the completion of the course, students will be able to:

1.2.1	Develop an understanding of the normal physiological functions of various systems of body
1.2.2	Develop an understanding of functioning/responses of various systems such as cardiac, respiratory, musculoskeletal and CNS to exercise
1.2.3	Demonstrate basic skills relating to common laboratory assessment of normal functioning of the body systems
1.2.4	Develop an understanding of the applied physiology & clinical applications of various systems of the body in relation to Physiotherapy

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1) GENERAL PHYSIOLOGY — 08 Hours

MUST KNOW

- Homeostasis: Basic concept, Feed back mechanisms
- Structure and Functions of cell membrane and cell organelles, transport across cell membrane
- Membrane potentials-definitions
- Blood volume: Normal values, variations.
- Body fluids : distribution of total body water, intracellular & extracellular compartments

2) BLOOD — 10 Hours

MUST KNOW

- Composition & functions of blood.
- Plasma proteins - Types, concentration, functions & variations.
- Erythrocyte - Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis.
- Hemoglobin - Normal concentration, method of determination & variation in concentration.
- Anemia - Definition, classification, life span of RBC's destruction of RBC's , formation & fate of bile pigments, Jaundice - types.
- Leucocytes : Classification, number, percentage, distribution morphology, properties, functions &variation. Role of lymphocytes in immunity , leucopoiesis life span & fate of leucocytes.
- Thrombocytes - Morphology , number, variations, function

- Hemostasis - Role of vasoconstriction, platelet plug formation in hemostasis, coagulation ,factors, intrinsic& extrinsic pathways of coagulation, clot retraction, platelet count, clotting time, bleeding time – normal, Bleeding disorders.
- Blood groups: ABO & Rh system, method of determination, importance, indications& dangers of Mis matched blood Transfusion

DESIRABLE TO KNOW

- Blood substitutes.
- Tissue fluids &lymph : Formation of tissue fluid, composition, circulation & functions of lymph.
- Oedema - causes.
- Functions of reticuloendothelial system.

3) MUSCLE & NERVE 10 Hours

- Classification of nerves, structure of skeletal muscle - Molecular mechanism of muscle contraction,neuromuscular transmission.
- Properties of skeletal muscle. Isotonic and Isometric contraction.
- Concept of nerve injury & Wallerian degeneration
- Structure and properties of cardiac muscle

4) DIGESTIVE SYSTEM 10 Hours

- Introduction to digestion : General structure of G.I. tract, Innervation.
- Salivary glands: Structure of salivary glands, composition,regulation & functions of saliva.
- Stomach: Composition and functions of gastric juice,
- Exocrine Pancreas - Structure, composition of pancreatic juice, functions of each component,
- Liver : structure , composition of bile, functions of bile
- Gall bladder : functions
- Small intestine - Composition, functions
- Large intestine – Functions
- Motor functions of GIT: Mastication, deglutition.

DESIRABLE TO KNOW

Defecation.

5) EXCRETORY SYSTEM 8 Hours

- Structure & functions of kidney, functional unit of kidney & functions of different parts.
- Juxta glomerular apparatus- structure and functions
- Formation of Urine : Glomerular filtration rate - definition, normal values,
- Factors influencing G.F.R Micturition : anatomy & innervation of Urinary bladder, mechanism of micturition

6) ENDOCRINOLOGY 8 Hours

- General endocrinology - Enumeration of endocrine glands & hormones – actions,
- Hypothalamic regulation of anterior pituitary function.
- Disorders of secretion of anterior pituitary hormones.
- Posterior pituitary : Functions Hormones of Posterior pituitary & their actions,
- Thyroid: Histology, synthesis, secretion & transport & actions of hormones
- Calcium homeostasis
- Actions of Insulin, Diabetes Milletus – Signs & Symptoms

DESIRABLE TO KNOW

- Thyroid function tests.
- Adrenal cortex and Medulla hormones

7) REPRODUCTION 14 Hours

- Physiological anatomy of male and female sex organs,
- Female reproductive system : Menstrual cycle, functions of ovary, actions of Oestrogen& Progesterone
- Male reproductive system :spermatogenesis, semen and & its composition.

DESIRABLE TO KNOW

- Tests for ovulation, fertilisation, implantation, maternal
- Changes during pregnancy, pregnancy tests & parturition.
- Lactation, composition of milk, factors co ntrolling lactation, milk ejection, reflex, contraception.

8) CARDIOVASCULAR SYSTEM 12 Hours

- Functional anatomy and innervation of heart.
- Properties of cardiac muscle
- Origin & propagation of cardiac impulse and heart block.
- Electrocardiogram - Normal electrocardiogram.
- Cardiac cycle – Phases and Events
- Heart sounds
- Heart rate: Normal value,
- Cardiac output: Definition, normal values, factors affecting heart rate and stroke volume.
- Arterial blood pressure: Definition, normal values & regulation

DESIRABLE TO KNOW

- Coronary circulation.
- Cardio vascular homeostasis - Exercise & posture.

9) RESPIRATORY SYSTEM 12 Hours

- Physiology of Respiration : External
- Functional anatomy of respiratory passage & lungs.
- Respiratory movements: Muscles of respiration, Mechanism of inflation & deflation of lungs.
- Intra pleural & Intra pulmonary pressures & their changes during the phases of respiration.
- Mechanics of breathing – Surfactant, compliance-Definition
- Spirometry: Lung volumes & capacities definition, normal values, significance,
- Transport of Oxygen & Carbon dioxide in the blood.
- Hypoxia & Types

DESIRABLE TO KNOW

- Regulation of respiration – neural & Chemical.
- Cyanosis, Dyspnoea, Periodic breathing
- Acclimitization, Deep sea diving ,Artificial respiration

NICE TO KNOW

Exchange of gases: Diffusing capacity

10) CENTRAL NERVOUS SYSTEM 12 Hours

- Organisation of central nervous system
- Neuronal organisation at spinal cord level
- Synapse, receptors, reflexes,- Definition

- Tracts/Pathways
  a.Motor –Pyramidal tract and its function.
  b.Sensory tracts- Physiology of pain pathway-(Lateral column tract),
  c.Dorsal column tract, Anterior tract and their Function)
- Functions of Cerebellum, Thalamus, Hypothalamus and Cerebral cortex.
- Formation and functions of CSF

Desirable to Know-

- Autonomic nervous system Classification and- Function

11) SPECIAL SENSES 8 Hours

- Vision—Functions of different parts of eye & Refactive errors
- Audition- functions of outer,inner,middle ear
- Taste- Taste pathway
- Smell- Olfactory pathway

DESIRABLE TO KNOW

- Fundamental knowledge of vision, hearing, taste and smell.

12) EXERCISE PHYSIOLOGY 8 Hours

- Introduction to exercise physiology
- Effects of exercise on neuro-muscular system, cardio-pulmonary system, musculoskeletal system, hormonal system, blood, metabolic functions

Practical Contents – 80 Hours

The following list of practicals is minimum and essential. All the practicals have been categorised as procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. All the procedures are to be included in the University practical examination.
Those categorised as demonstrations are to be shown to the students during practical classes. However, these demonstrations would not be included in the University examinations but question based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

1.HAEMATOLOGY PRACTICALS

1. Enumeration of Red Blood Cells
2. Enumeration of White Blood Cells
3. Differential leucocyte counts
4. Determination of Haemoglobin
5. Determination of blood group
6. Determination of bleeding time and clotting time

2. Clinical Practicals

1.Clinical examination of Radial Pulse
2.Recording of Blood pressure,
3. Effect of posture & exercise on BP
4.Clinical examination of
   1. Cardio vascular system
   2. Respiratory system

3. CNS – Motor & sensory

3.DEMONSTRATION:

Pulmonary funtion tests (spirometry), artificial respiration, normal ECG interpretation, ergography & work done

4. SKELETAL MUSCLE EXPERIMENTS.

1.Study of laboratory appliances in experimental physiology. Frog's gastrocneminus sciatic preparation.
2.Simple muscle curve,
3.Effects of two successive stimuli,
4.Effects of temperature
5. Genesis of fatigue and tetanus.
6.Effect of after load and free load on muscle contraction,

Suggested Readings [Latest Editions]

TEXTBOOKS

- Guyton AC, Hall JE: Textbook of Medical Physiology, W.B.Saunders, Philadelphia.
- Jain A. K: Text book of Medical Physiology, Avichal Publishing Company.
- Toratora GJ & Grabowski RS: Principles of Anatomy and Physiology, Harper Collins College Publishers, USA.
- Sembulingam K & Sembulingam P: Essentials of Medical Physiology, Jaypee Brothers, New Delhi.
- Chaudhuri: Concise Medical Physiology, New Central Book Agency, Kolkata.

PRACTICAL MANUAL

- Jain A. K: Manual of Practical Physiology, Arya Publications.

HUMAN BIOCHEMISTRY (SUBJECT CODE: PT1103)

Teaching Hours: 100 hours (Theory: 100 hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examinations
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Objectives: The objective is to enable the student to understand biochemical basis of life sciences.

Course Outcome:
At the completion of the course, students will be able to:

1.3.1	Develop an understanding of the normal bio-chemical basis of various systems of the human body
1.3.2	Develop an understanding of the applied aspect of bio-chemical processes of various systems of the human body
1.3.3	Develop an understanding of the importance of common clinical biochemistry tests of various systems of the human body

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

MUST KNOW

1. Cell Biology [3 Hours]
- Introduction, Cell structure, Cell membrane structure and function, various types of absorption.
- Intracellular organelles and their functions

2. Nutrition [7 Hours]
- Introduction, Calorific values,
- Respiratory quotient – Definition, and its significance
- Energy requirement of a person -
- Basal metabolic rate: Definition, Normal values, factors affecting BMR
- Special dynamic action of food
- Physical activities - Energy expenditure for various activities.
- Calculation of energy requirement of a person
- Balanced diet
- Recommended dietary allowances
- Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers
- Role of lipids in diet
- Role of proteins in diet: Quality of proteins - Biological value, net protein utilization, Nutritional aspects of proteins- essential and non- essential amino acids. Nitrogen balance
- Nutritional disorders

3. Carbohydrates [8 Hours]
- Carbohydrates: Definition , Classification
- Physiologically important mono, di and polysaccharides- Glycogen, starch, cellulose
- Mucopolysaccharides – hyaluronic acid, chondroitin sulphate, heparin
- Digestion and absorptions of carbohydrates.
- Glycolysis (aerobic, anaerobic, energetic regulation, Cori's cycle)
- Glycogenesis and Glycogenolysis (their regulation, role of liver and muscle glycogen),
- Gluconeogenesis, Citric acid cycle with its energetics.

- Hormonal regulation of blood sugar level
- Clinical aspects: lactose intolerance, diabetes mellitus, diabetic keto-acidosis, hypoglycemia

4. Proteins [8 Hours]

- Amino Acids Classification based on structure and nutritional importance
  Optical activity, isoelectric pH, physiologically active peptides
- Proteins - Definition ,Functions ,Classification and Structure ,Denaturation
  Plasma Proteins and their separation by electrophoresis
- Digestion and absorption of proteins.
- Clinical aspects: PEM, kwashiorkor, marasmus, common protein deficiency disorders
- Enzymes: definition, classification, co-enzymes, factors affecting enzyme activity.

5. Lipids [8 Hours]

- Definition, classifications of lipids and fatty acids, examples and functions of common lipids ,
- Essential fatty acids and their importance
- Lipoproteins: classification, sources, functions
- Digestion and absorption of lipids.
- B-oxidation and its energetics with regulation
- Cholesterol and its importance.
- Clinical aspects: ketone body formation and utilization(outline of pathways)

6. Vitamins [8 Hours]

- Definition, Classification, Chemistry, Sources, Requirement, Functions and Deficiency manifestations of vitamins: A, D, E, K, C,. Thiamin, Riboflavin, Niacin, Pyridoxine, Folic Acid, Cyanocobalamine.

7. Minerals [6 Hours]

- Individual minerals: calcium, phosphate, iron, magnesium, fluoride
- Digestion, absorption, transport, excretion, functions, Disorders

8. Hemoglobin, porphyrins and bile pigments [5 Hours]

- Overview
- Haem catabolism
- Clinical aspects: anemias, jaundice, porphyrias and thalassemias

9. Immunochemistry (in brief) [1 Hour]

- Immunoglobulins, Classification and functions

10. Homeostasis mechanism [6 Hours]

- General outline of fluid compartments of the body with their water and electrolyte content and osmolality, electrolyte and water balance
- Extra and intra cellular sodium, potassium, buffers, pH, buffer systems
- Acid – base balance (role of lungs and kidneys)
- Clinical aspects: dehydration, diabetes insipidus, acidosis and alkalosis

11. Muscle biochemistry [5 Hours]

- Muscle structure
- Molecular events in muscle contraction
- Connective tissue biochemistry - Collagen, elastin - Structure and associated disorders. Glycoproteins, Proteoglycans (classification & functions)

12. Molecular biology (In brief) [6 Hours]

- Nucleotide and Nucleic acid Chemistry
- Nucleotide composition, functions of free nucleotides in body.
- Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA
- Structure of DNA (Watson and Crick model), Functions of DNA.
- Structure and functions of tRNA, rRNA, mRNA.

13. Molecular endocrinology (In brief) [2 Hours]

- Definition, classification of Hormones (Thyroxine & Insulin)

14. Clinical biochemistry [8 Hours]

- Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate.
- Diagnostic and Therapeutic uses of enzymes
- Liver and renal function Tests

GOOD TO KNOW [15 Hours]

- Glycogen storage disorders (Name of diseases, enzyme deficient and organs involved)
- Fat metabolism in adipose tissue, fatty acid biosynthesis with its regulation and energetics.
- Common hyper lipo- proteinaemias
- Gout, hyperuricemia, peptic ulcers, nutritional disorders of nervous system and cardiovascular system
- Haem biosynthesis
- Determination of immunoglobulins
- Antigens, haptens
- Mechanism of hormone action
- Hormones acting at cell surface and inside the cell, Clinical aspects

NICE TO KNOW [5 Hours]

- Gene therapy
- Hormones & neurotransmitters
- Metabolism of bile pigments
- Molecular genetics

Suggested Readings

1. Murray RK, Garnner K, Mayes PA, Rodwell VW: Harper‟s Biochemistry. 26th Ed, Appleton & Lange, Connecticut, 1993.
2. Montgomery, Conway, Spector, Chappell: Biochemistry - A Case Oriented Approach. 6th Ed,Mosby Publishers, Missouri, 1996.
3. Devlin TM: Textbook of Biochemistry with clinical correlation. 5th Ed, Wiley-Liss, New York, 2002.
4. Nelson DL, Cox MM: Lehinger Principles of Biochemistry. 4th Ed, W.H.Freeman, New York, 2005.
5. Apps DK, Cohen BB, Steel CM: Biochemistry – A concise textbook for medical students, 5th Ed,ELBS with Bailliere Tindall, London, 1992.
6. Deb AC: Fundamentals of Biochemistry. 8th Ed, New Central Book Agency, Kolkata, 2004.
7. Satyanarayana U, Chakrapani U: Biochemistry. 3rd Ed, Arunabhasen Books & Allied (P) Ltd, Kolkata, 2006.
8. Dandekar SP: Prep manual for Under Graduate Medical Biochemistry. 2nd Ed, Urban & Schwarzenberg P Ltd, New Delhi, 2002.
9. Vasudevan DM, Sreekumari S: Textbook of Biochemistry for Medical Students. 5th Ed, Jaypee Brothers, New Delhi, 2007.
10. Chatterjee MN & Shinde R: Textbook of Biochemistry. 2nd Ed, Jaypee Brothers, New Delhi

HUMAN BIOMECHANICS (SUBJECT CODE: PT 1104)

Teaching Hours: 250 hours (Theory: 150 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical: 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks Practical
University Examination: 80 marks Theory, 80 marks Practical and viva – voce

Objectives: The objective is to enable the student to understand the basic principles of Biomechanics, application of kinetics and kinematics on human movements.

Course Outcome:
At the completion of the course, students will be able to:

1.4.1	Understand the principles & application of kinetics & kinematics to human joint movements
1.4.2	Develop an understanding of the mechanics of normal body movements with emphasis on posture, gait & activities of daily living including hand functions
1.4.3	Develop a basic understanding of the principles, working, application & identification of various tools & equipment used in exercise therapeutic management
1.4.4	Demonstrate skills of normal movement evaluation (goniometry) of all joints of the body
1.4.5	Demonstrate basic skills of posture, gait & ADL analysis including Starting positions

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. Bio - Mechanics and its principles – MUST KNOW

- Definition of mechanics and biomechanics
- Force - definition, diagrammatic representation, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces
- Momentum - principles, and practical application
- Motion, types of motion, theories of motion, Newton's laws of motion and their application.
- Torque and friction
- Gravity - definition, line of gravity, center of gravity, Determination of C.G. in human body
- Equilibrium - supporting base, types, and equilibrium in static and dynamic state.
- Energy, work and power: potential and kinetic energy, work and power, speed, velocity and inertia
- Elasticity: definition, stress, strain, Hook's law, stress strain curve, Young's modulus
- Anatomic pulleys with examples, Application of the principles to human body

2. Axis and planes – MUST KNOW

- Axes and planes of movement and gravity
- Application with reference to human body

3. Levers – MUST KNOW

- Definition
- Functions and classification of levers
- Application of levers in physiotherapy
- Order of levers with non- human & human examples & explanation of the same
- Levers at home and at work- **NICE TO KNOW**

4. Bio - Mechanics of muscles and soft tissues – MUST KNOW

- Muscle structure and function- **GOOD TO KNOW**
- Classification of muscles
- Types of muscle work
- Ranges of muscle work
- Angle of pull of muscles with importance of muscle work
- Application of the above concepts with reference to joints, muscle and movement
- Biomechanics of cartilage, tendon and ligament
- Effects of injury, immobilization and aging – **NICE TO KNOW**

5. Bio – mechanics of joints –MUST KNOW

- Joint structure and function
- Classification, designs and properties of connective tissues
- Motions and functions of joints
- Joint lubrication: theories and application
- Biomechanics of bone
- Visco-elastic properties and behavior of bone and soft tissues
- Open and closed kinematic chain movements
- Effects of injury, immobilization and aging – **NICE TO KNOW**

6. Bio-mechanics of all peripheral joints: **MUST KNOW**

Joint Structure and Function- **Must Know**
Kinetics Kinematics- **Must Know**
Muscles, ligaments- **Good to Know**
Effect of Age and injury- **Nice to Know**
(shoulder ,elbow, wrist [**GOOD TO KNOW**], hand, hip, knee, ankle, foot, and temporo-mandibular joints [**GOOD TO KNOW**]), vertebral column, thorax and rib cage

7. Posture & movement analysis

- **Gait - MUST KNOW**
  - Definition & description, alignments
  - Phases of gait cycle
  - Determinants of gait
  - Gait kinetics and kinematics, spatial & temporal parameters
  - GRF
  - Support, moment during gait cycle & energy consumption [**NICE TO KNOW**]
  - Gait analysis- Observational gait analysis **[MUST KNOW**], instrumentation/advanced gait analysis **[NICE TO KNOW]**

- **Posture – MUST KNOW**
  - Definition & description
  - Static and dynamic postures
  - Alignments of various joints
  - Center of gravity
  - Planes & muscular moments
  - Analysis of normal posture
  - Enumeration of abnormal postures- **NICE TO KNOW**

8. ADL analysis- MUST KNOW

- Supine to sit
- Prone to sit
- Sit to stand
- Kneel to stand
- Squat to stand
- Lifting analysis
- Hand functions (prehension and precisions)

9. Therapeutic gymnasium

Equipment and tools with their uses and therapeutic application

- Springs: properties, springs in series and parallel**[GOOD TO KNOW]**
- Pulleys: properties, types, mechanical advantage**[MUST KNOW]**
- Resistance devices: types, weights, different tools used to apply resistance **[MUST KNOW]**
- Elastic tools: elasticity, recoil, extensibility **[GOOD TO KNOW]**
- Explanation and mechanical principles of various equipment in an ideal gymnasium:
  MUST KNOW- parallel bars, CPM unit, cervical and lumbar traction, shoulder wheel, quadriceps table, weights, therabands, shoulder ladder, tilt table, equilibrium board, wobble board, treadmill, bicycle ergometer, medicine balls, gym ball, re-education board,
  GOOD TO KNOW- wall bars, overhead pulley systems, suspension unit, springs, pulleys, staircase, bolster, wedges
  NICE TO KNOW- DeLormes' shoe, plinth
- Walking aids and crutches: types and uses**- MUST KNOW**
- Hydrotherapy unit (in brief)**- NICE TO KNOW**

10. Starting positions- MUST KNOW

- Fundamental and derived positions
- Description and muscle work including base of support and equilibrium
- Effects and uses of individual positions in exercises

11. Goniometry: principles, types, application of goniometry **MUST KNOW**

Practical Contents

1. Goniometry measurement for all the peripheral and vertebral joints **MUST KNOW**
2. Identification & principles, working & uses of the various tools and equipment in therapeutic gymnasium **MUST KNOW**
3. **ONLY** identification of walking aids, crutches, parallel bars with their uses **MUST KNOW**
4. Identification of parts of suspension therapy unit and their uses **GOOD TO KNOW**
5. Analysis of activities of daily living **MUST KNOW**
6. Normal posture & analysis in anterior, posterior & lateral views **MUST KNOW**
7. Normal gait analysis & measurement of gait parameters **MUST KNOW**
8. Starting positions and their derived positions **MUST KNOW**

Suggested Readings

1. Levangie PK, Norkins CC: Joint Structure and Function: A Comprehensive Analysis. 3rd Ed, Jaypee Brothers Medical Publishers, New Delhi, 2001.
2. Smith, Weiss, Lehmkuhl: Brunnstrom's Clinical Kinesiology. 5th Ed, Jaypee Brothers, New Delhi, 1998. 3. Hollis M, Cook PF: Practical Exercise Therapy. 4th Ed, Blackwell, Oxford, 1999.
4. Gardiner DM: Principles of Exercise Therapy. 4th Ed, CBS Publishers, New Delhi, 1999.
5. Lippert LS: Clinical Kinesiology for Physical Therapy Assistants. 3rd Ed, Jaypee Brothers, New Delhi, 2002.
6. Jones and Barker: Human Movement Explained.3rd Ed, Butterworth- Heine, London, 2000.
7. Norkin C, White JD: Measurement of Joint Motion: A Guide to Goniometry. 2nd Ed, Jaypee Brothers, Daryaganj, 1995.
8. Kisner C, Kolby LA: Therapeutic Exercise Foundation and Technique. 3rd Ed, Jaypee Brothers, New Delhi, 1996.
9. Campion MR: Hydrotherapy: Principles and Practice, 1st Ed, Butterworth, Oxford 2000.
10. Palastanga N, Field D, Soames R: Anatomy and Human movement – Structure & Function. 5th Ed, Elsevier LTd, Philadelphia, USA, 2006.

PSYCHOLOGY & SOCIOLOGY (SUBJECT CODE: PT 1105)

Teaching Hours: 100 hours (Theory: 100 hours)
Maximum Marks: Theory: 100
Assessment: Written, Internal and University examinations
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Note: This course is to be taught by two teachers (Psychologist & Sociologist / Medical Sociologist).

Course Outcome:
At the completion of the course, students will be able to:

1.5.1	Develop an understanding of various components of psychology & their application to human learning & behavior
1.5.2	Develop an understanding of the various psychological processes & their evaluation
1.5.3	Develop an understanding of the basic psychological factors influencing an individual in health & sickness/illness
1.5.4	Understand the basic concepts & principles of sociology & their relation to individual, family and community
1.5.5	Understand the various social factors affecting the individual, family and community (rural and urban) in India.
1.5.6	Understand the role of social factors affecting health & illness

PSYCHOLOGY (Part-A)

Teaching Hours: 50 hours (Theory: 50 hours)
Maximum Marks: 50 (Theory: 50)
Assessment: Written, Internal and University examinations
Internal Examination: 10 marks Theory
University Examination: 40 marks Theory

Objectives: The objective is to enable the student understand the specific psychological factors and their effects in physical illness thus aid them to have a holistic approach in dealings with their patients during admission, treatment, rehabilitation and discharge.
Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. Introduction
- What is psychology?
- Fields of application of psychology
- Scope of psychology

2. Learning
- Theories of learning
- Principles of learning
- Factors affecting learning

3. Memory
- Forgetting

- Theories of memory and forgetting
- Methods to improve memory

4. Intelligence
- Theories of intelligence
- Influence of heredity and environment on the individual
- Tests of intelligence

5. Personality
- Theories of personality
- Factors influencing personality
- Assessments in personality
- Personality disorders

6. Behavior
- Normal and abnormal behavior
- Development and growth of behavior in infancy and childhood, adolescence, adulthood and old age

7. Thinking
- Definition
- Thinking process
- Problem solving
- Decision making
- Creative thinking

8. Motivation
- Theories
- Types of motivation

9. Emotions
- Theories of emotions
- Stress
- Conflicts
- Frustration

10. Attitudes
- Theories
- Attitudes and behavior
- Factors in attitude change

11. Emotional and behavioral disorders of childhood and adolescence (in brief)
- Disorders of under and over controlled behavior
- Eating disorders

12. Mental deficiency
- Mental retardation
- Learning disabilities
- Autistic behavior

13. Anxiety disorders
- Phobias, panic disorder
- Generalized anxiety disorder
- Obsessive compulsive disorder
- Post –traumatic stress disorder

14. Somatoform and dissociate disorders

- Conversion disorder
- Somatization disorder
- Dissociate amnesia & dissociate fugue

15. Patho-physiological disorders

- Stress and health

16. Severe psychological disorders

- Mood disorders
- Psychosis

17. Counseling

- Definition
- Aims and principles
- Quality of a good counselor

18. Psychotherapy

- Brief introduction to paradigms in psychopathology and therapy

19. Communication

- Effective and faulty
- Audiovisual aids and its effects on communication

20. Psychological need of pediatric and geriatric patients

SOCIOLOGY (Part–B)

Teaching Hours: 50 hours (Theory: 50 hours)
Maximum Marks: 50 (Theory: 50)
Assessment: Written, Internal and University examinations
Internal Examination: 10 marks Theory
University Examination: 40 marks Theory

Objectives: The objective is to enable the student understand the basic sociology concepts, principles and social process, social institutions (in relation to the individual, family and community) and the various social factors affecting the family in rural and urban communities in India will be studied.

Theory Contents

1. Introduction

- Meaning-definition and scope of sociology
- Its relation with anthropology, psychology, social psychology and ethics
- Methods of sociology-case study, social survey, questionnaire, interview and opinion poll methods
- Importance of its study with special reference to health care professionals

2. Socialization

- Meaning and nature of socialization
- Primary, secondary, and anticipatory socialization
- Agencies of socialization

3. Social groups

- Concepts of social groups
- Influence of formal and informal groups on health and sickness
- The role of primary groups and secondary groups in the hospital and rehabilitation settings

4. Community

- Rural community – meaning and features – health hazards of rural population
- Urban community – meaning and features – health hazards of urban population

5. Family

- The family - meaning and definition, functions
- Changing family patterns
- Influence of family on the individual health, family, and nutrition
- The effects of sickness on family and psychosomatic disease and their importance to physiotherapy

6. Culture and health

- Concept of culture
- Cultures and behavior
- Cultural meaning of sickness
- Culture and health disorders

7. Social change

- Meaning of social changes & factors of social change
- Human adaptation and social change
- Social change and stress
- Social and deviance
- Social change and health program
- The role of social planning in the improvement of health and in rehabilitation

8. Social security

- Social security and social legislation in relation to the disabled

9. Social worker

- Meaning of social work
- The role of a medical social worker

10. Social Factors in health and disease

- The meaning of social factors
- The role of social factors and illness

11. Social problems of disabled

- Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems
- Population explosion
- Poverty and unemployment
- Beggary
- Juvenile delinquency
- Prostitution
- Alcoholism
- Problems of women in employment

Suggested Readings

Psychology & Sociology

1. Morgan CT, King RA, Weisz JR, Schopler J: Introduction to Psychology.7th Ed, Tata McGraw Hill, New Delhi, 1993.
2. Munn NL, Farnald LD, Fernald PS: Introduction to Psychology. 3rd Ed, Houghton Mifftin Company, Boston or Oxford & IBH Publishers, New Delhi, 1972.
3. Worchle S, Shebilske W: Principles and Applications - Psychology. 5th Ed, Prentice Hall, Englewood Cliffs, New Jersy, 1994.
4. Nolen HS: Abnormal Psychology. 2nd Ed, McGraw Hill Higher Education, New York, 2001.
5. Cushman LA, Scherer MJ: Psychological Assessment in Medical Rehabilitation. 1st Ed, American Psychological Association, USA, 1995.
6. Bond.J. & Bond.S: Sociology & Health Care – An Introduction for Nurses & other Health Professions. 2nd Ed, Churchill Livingstone, Edinburgh, 1994.
7. Taylor S & Field D: Sociology for Health & Health Care. 4th Ed, Blackwell Publishing, USA, 2007.
8. Shankar Rao CN: Sociology Primary Principles. 3rd Ed, S. Chand & Company Ltd., New Delhi, 2001 (reprint).
9. Bhusan Vidya, Sachdeva.DR: Introduction to Sociology. 3rd Ed, Kitab Mahal, Patna, 2004.
10. Dibyendunarayan B: Sociology for Physiotherapists. 1st Ed, Jaypee Brothers, New Delhi, 2006.

BASIC NURSING AND FIRST AID (SUBJECT CODE: PT 1106)
(For college examination only)

Teaching Hours: 60 hours (Theory: 50hoursand 10 practical)
Maximum Marks: 50 (Theory: 50)
Assessment: Written examination
College Examination: 50 marks Theory

Objectives: The objective is to enable the student understand the basic nursing concepts and first aid for various ailments commonly seen by physiotherapists.

Theory Contents

1. Overview of nursing
- Definition
- Scope of nursing
- Principles
- Philosophy

2. Inter-personnel relationships
- Importance
- Characteristics
- Principles
- Phases
- Accelerating factors
- Barriers
- Therapeutic relationship

3. Environment safety
- Essential factors to well being
- Temperature, humidity, noise, light and other environmental factors
- Safety measures

4. Nursing position
- Positions and their uses
- Comfort measures
- Devices and their uses

5. Bed making
- Definition and types
- Purposes of bed making
- Principles of bed making
- General rules
- Open and closed beds
- Fowler bed
- Occupied bed
- Cardiac bed

6. Rest and sleep
- Beneficial effects of rest
- Effects of prolonged rest
- Physiology of sleep

- Factors affecting sleep
- Sleep disorders
- Nursing measures to ensure rest and sleep

7. Bandaging
- Overview
- General rules
- Types
- Applications

8. Surgical dressing
- Overview
- Types and dressing materials
- Purposes
- Principles
- Procedure
- Observation

9. Lifting and transporting patients
- Overview
- General instructions
- Lifting patient in bed
- Wheelchair transfer
- Stretcher transfers

10. Bedside procedures and management
- Temperature, recordings, sites, thermometers
- Peripheral pulses, recording, normal and abnormal pulses and their interpretations
- Respiration, observation and recording
- Blood pressure, measurement and recording
- Observation of stool, urine and sputum
- Types of catheters
- Uses and care of catheters
- Principles of catheterizations
- Enema overview and types
- Purpose of enema
- Procedure for enema

11. Nourishment
- Overview
- Methods of nourishments
- Feeding for helpless patient
- Tube feeding
- Drips
- Transfusion
- Parental administration of medicine
- Types of injections
- Purpose of injection
- Factors that favor absorption
- Complications of injection
- Drugs and fluid administered
- Size and safety measures while administering medications
- Selection of equipments for injections
- Principles involved in administration of injections

- General instructions for administration of medications
- Procedure of administration of medication
- Oral, subcutenoues, intradermal, intramuscular and intravenous injections

11. Care of rubber goods
- Types of rubber goods
- Uses and care

12. Aseptic technique
- Asepsis
- General precautions
- Medical aseptic practices
- Hand washing, gown technique, face masks and gloves
- Transferring forceps

13. Sterilization and disinfection
- Overview
- Uses, advantages and disadvantages
- Methods of sterilization
- Disinfection, types of disinfections
- Common antiseptics and disinfectants

14. First aid management
- Overview
- Basic and advanced life support
- Minor trauma and injuries
- Poisoning
- Snake and animal bites
- Electric shock
- Cardiopulmonary resuscitation

15. Clinical education and demonstration
- Nursing procedures
- First aid pertaining to musculoskeletal, neuromuscular and cardio respiratory ailments

Suggested Readings

1. Patricia A Potter, Anne G perry: Basic Nursing Theory and Practice,3 Ed,CV mosby, Missori,1995.
2. Elhart, Firsich, Rees: Scientific Principles in Nursing, 8Ed, CV Mosby, USA, NR Brothers India, 1978.
3. Sorensen & Luckmann's: Basic Nursing, A Psychophysiologic Approach: 3Ed, WB Saunders, Philadelphia, 1994.
4. Gardner AW, Royalnee PJ: New Advanced First Aid, 3Ed, John wirght and sons Ltd, Bristol, England, 1984.
5. Lilly P Telu: Manual of Nursing Arts Procedures, 3Ed, Vikas Publishing house Pvt Ltd, New Delhi, 1993.
6. Basavnthappa BT: Fundamentals of Nursing: Jaypee Brothers, New Delhi, 2004.
7. Gupta LC, Sahu VC: Practical Nursing Procedure: 2Ed, Jaypee Brothers, New Delhi, 1991.
8. Ahuja KK: Human Resource Management, Kalyani Publishers, Ludhiana, 1997.

‘

COMPUTER APPLICATION AND MANAGEMENT IN PHYSIOTHERAPY (SUBJECT CODE: PT 1107)

(For college examination only)

Teaching Hours: 50 hours (Theory)
Maximum Marks: 50 (Theory: 50)
Assessment: Written examination
College Examination: 50 marks Theory

Objectives: The objective is to enable the student to understand the basic concepts in computer and its practical application in physiotherapy. The student will also be able to understand and implement the basic management skills required for personal, hospital, department and financial aspects of physiotherapy.

Theory Contents

1. Introduction to computers

- Basic concept of computers
- Features of computers
- Advantages
- Role of computers

2. Hardware concepts

- Definition / Classification
- Architecture
- Storage device
- Characteristics of components of hardware
- Applications
- Concept of damage
- **Basic Troubleshooting**

3. Software concepts

- Definition
- Classification
- Different operating system
- Applications
- Precautions and management of virus
- Principles of programming

4. **Outlook**

- Configure outlook
- Backup & Restore of outlook
- Hyperlink

5. Data processing

- Definition
- Data entry
- Types
- Common activities in processing
- Characteristics of information
- Application areas

6. Network

- Types
- Classification
- Application
- WI-FI Security

7. Computer application in physical therapy

- Principles and practices in EMG
- Exercise testing equipment
- Laser
- Any computerized equipment

8. Computer application

- Research
- Libraries
- Museum
- Education
- Medicine
- Information system
- Physiotherapy

MANAGEMENT

1. Management

- Introduction
- Branches
- Nature and scope of management process
- Principles – General and Health sector including physiotherapy
- Theories

2 .Personnel Management

- Basic concepts
- Policies
- Procedures
- Performance Appraisal

3. Planning and Organization

- Planning Cycle
- Principles of Organizational Charts
- Planning Change
- Resource and quality management
- Planning of Physiotherapy Department/Center

4. Finance

- Budget
- Income generation in Physiotherapy

5. Hospital management

- Organization
- Staffing
- Information & communication

- Coordination with other services of hospital
- Cost of services
- Monitoring and evaluation
- Quality and patients safety
- Waste Management

6. Self Management

- Preparing for first job
- Resume writing
- Personality management
- Time management
- Career development
- Professionalism and values
- Soft skills

Suggested Readings

1.Kulkarni .G.K :Hospital Management, accounting, Planning and Control.

2. Srinivasan. R and Chunawalla. SA : Principles and practices of Management

3.Francis CM: Hospital administration 2nd edition

4. Liewlyn Devis. R and Maculay B.M.C : Hospital Planning and Administration

5. Welner EM : Human Services Management, Analysis and application 2nd edition

6. Rose Mary M.C.,Mohan, Elizabeth Barton and Maurice Piot: A guide for middle level management in primary health care: WHO, Geneva 1986.

Language a. English b. Kannada (SUBJECT CODE: PT 1108)

(For college examination only)

Teaching Hours: 50 hours (25+25)
Maximum Marks: 50 (Theory: 25+25)
Assessment: Written examination
College Examination: 50 marks Theory

Objectives: The objective is to enable the student to effectively communicate with patient, colleague and professional. The student will also be able to understand and implement the basic communication skills required for personal, hospital, and department management and interpersonal management.

English

Objective: It is designated to help the students to acquire a good command over English language for common and medical terminology used in clinical practice.

Content

- Spoken English and written English training
- Forming Paragraph
- Letter writing
- Note taking
- Description writing
- Essay writing
- Precise writing and abstracting
- Report writing
- Resume writing
- Article writing
- Public Speech, Presentation making

Suggested Readings

1. V. R. Naryana, Sharma Strengthen your writing, New Delhi, Orient Longman
2. Wrinen and Martin Grammer and composition, Delhi, Chand & Co.
3. Shashi kumar V. D'Souza P. V. Spoken English, New Delhi, Tata Mergraw Hill
4. Dorland's pocket Medical dictionary New Delhi, Oxford & IBH Publishing Co.

Kannada

The student should gain knowledge of the local language (kannada) so as to communicate and reciprocate with people in general and patients in particular to impart proper patient care during the course of their study and future.

At the end of the 1st BPT course the student is expected to know the basic of Kannada Language with patients and colleagues. Students must be able to identify and write small words and sentences, acquire communicative skills

Content

- Kannada literatures (letters, word sentences)
- Interaction
- Introducing each other
- Interaction with patients
- Spoken and written Kannada training
- Interacting at vegetable market, cloth shop, picnic and rout
- Conversation between doctor and patient
- Halebidu and Belur
- Lesson reading/newspaper reading

- Act playing in Kannada

Suggested Readings

1. Lingadevaru Halemane, Kannada Kali 2002 Kannada University.

NSS (SUBJECT CODE: PT 1109)
(For college examination only)

Teaching Hours: 100 hours (50+50)
Maximum Marks: 50 (Theory: 25+25)
Assessment: Written examination
College Examination: 50 marks Theory

Objectives: The objective is to enable the student to effectively communicate with patient, colleague and professional. The student will also be able to understand and implement the basic communication skills required for personal, hospital, and department management and interpersonal management**.**

Unit 01: Introduction and basic concepts to NSS

a. History, Philosophy, aims & objectives of NSS
b. Emblem, flag, motto, song, badged.
c. Organizational structure, roles and responsibilities of various NSS functionaries**.**

Unit 02 : NSS programs and activities

a. Concept of regular activities, special camping, day camps
b. Basis of adoption of village// slums, Methodology of conducting Survey
c. Financial pattern of the scheme
d. Other youth program/schemes of GOI
e. Coordination with different agencies
f. Maintenance of the Diary

Unit 03 : Understanding Youth

a. Definition, Profile of youth, categories of youth
b. Issues, Challenges and opportunities for youth
c. Youth as an agent of social change

Unit 04: Community Mobilization

a. Mapping of community stakeholders
b. Designing the message in the context of the problem and the culture of the community
c. Identifying methods of mobilization
d. Youth-adult partnership

Unit 05: Volunteerism and Shramdan

a. Indian tradition of volunteerism
b. Needs & importance of Volunteerism
c. Motivation and constraints of volunteerism
d. Shramdan as a part of volunteerism

Unit 6: Importance and role of youth leadership

a. Meaning and types of leadership
b. qualities of good leaders traits of leadership
c. Importance and role of youth leadership.

Unit 7: Life Competencies

a. Definition and importance of life competencies
b. Communication
c. Interpersonal
d. Problem solving and decision making

Unit 8: Social Harmony and National Integration

a. India history and culture

b. Role of youth in peace-building and conflict resolution
c. Role of youth in nation building

Unit 9: Youth development Programs in India

a. National Youth Policy
b. Youth development programs at the National Level, State Level and Voluntary Organizations

Unit 10: Citizenship

d. Basic features of Constitution of India
e. Fundamental Rights and Duties
f. Human rights
g. Consumer awareness and the legal rights of the consumer
h. RTI

Unit 11: Family and Society

a. Concept of family, community,(PRIs and other community-based organization) and society
b. Growing up in the family – dynamics and impact
c. Human Values
d. Gender justice

Unit 12: Health, Hygiene and sanitation

a. Definition, needs and scope of health education
b. Food and Nutrition
c. Safe drinking water, water borne diseases and sanitation (Swachh Bharat Abhiyan)
d. National health program
e. Reproductive health

Unit 13: Youth Health

a. Healthy Lifestyles
b. HIV AIDS, Drugs and Substance abuse
c. Home Nursing
d. First Aid

Unit 14 Youth and yoga

a. History, philosophy and concept of yoga
b. Myths and misconceptions about yoga
c. Different Yoga traditions and their Impacts
d. Yoga as a preventive promotive and curative method
e. Yoga as a tool for health life style.

Unit 15: Environment Issues

a. Environment conservation, enrichment and sustainability
b. Climate change
c. Waste management
d. Natural resource management (rain water harvesting, energy conservation, waste land development, soil conservation and afforestation)

Unit 16: Disaster management

a. Introduction to disaster management, classification of disasters
b. Role of youth in disaster management

Unit 17: Project cycle management

a. Project planning
b. Project implementation
c. Project monitoring
d. Project evaluation: impact assessment

Unit 18: Documentation and reporting

a. Collection and analysis of data
b. Preparation of documentation/report
c. Dissemination of document/reports

Unit 19: Vocational skill Development – Vocational training of at least 2 skills to be conducted.

Unit 20: Entrepreneurship Development

a. Definition & Meaning

b. Qualities of good entrepreneur
c. Steps / ways in opening an enterprise
d. Role of financial and support service institutions

Unit 21: Youth Crime

a. Sociological and Psychological factor influencing youth crime
b. Peer Mentoring in preventing crimes
c. Awareness about Anti Ragging
d. Cyber Crime and its prevention
e. Juvenile Justice

Unit 22: Civil / self Defense

a. Civil defense services, aims and objectives of civil defense
b. Needs for self-defense training

Unit 23:

a. Writing a project proposal
b. Establishment of SFUs

Unit 24: Additional Life skills

a. Positive thinking
b. Self-confidence and self esteem
c. Setting life goals and working to achieve them
d. Management of stress including time management.

Project work – workshop / seminars on personality development and improvement of communication.

Section-VIII- B

SECOND YEAR BPT (BPT II) SUBJECTS AND COURSE CONTENTS

EXERCISE THERAPY (SUBJECT CODE: PT 1111)

Teaching Hours: 300 hours (Theory: 100 hours and Practical: 200hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva-voce: 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 mark Practical
University Examination: 80 marks Theory and 80 marks Practical & Viva – voce

Objectives: To develop an understanding of theoretical knowledge and practical skills pertaining to various therapeutic movements used in the treatment of various diseases and disorders by physiotherapists.

Course Outcome:
At the completion of the course, students will be able to:

2.1.1	Develop an understanding of the basics of exercise, exercise prescription and its therapeutic methods
2.1.2	Develop an understanding of the basic principles of various assessment and treatment techniques related to exercise therapy
2.1.3	Demonstrate an understanding of the indications, contraindications and precautions to be taken during therapeutic movements and exercises
2.1.4	Demonstrate an understanding of the application of advanced therapeutic methods
2.1.5	Demonstrate an understanding of the applicability of therapeutic skills in the management of various conditions
2.1.6	Demonstrate practical skills of various exercises and treatment techniques used commonly

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

Fundamental concepts (MUST KNOW)

- Range of muscle work
- Types of muscle contraction and muscle work
- Strength of muscle contraction
- Voluntary/involuntary motion
- Mechanical principles **GOOD TO KNOW**
- Physiology of muscle performance **GOOD TO KNOW**
- Nervous control of movement **GOOD TO KNOW**
- Goals of therapeutic exercises **NICE TO KNOW**

Human movements (MUST KNOW)

- Classification – Passive (relaxed, forced & continuous/mechanical) & Active (Free, assisted, assisted resisted, Resisted movements/Exercises)
- Principles

- Effects & uses
- Techniques
- Indications, precautions & contraindications
- Muscle Re-education

Joint mobility (MUST KNOW)

- Causes of hypomobility & hypermobility
- Peripheral Joint mobilization
- Joint mobilization grading – Maitland and Kaltenborn grades
- Principles, Indications, contraindications & precautions
- Mobility grading **GOOD TO KNOW**
- Joint manipulation **NICE TO KNOW**

Soft tissue manipulations & therapeutic massage (MUST KNOW)

- Principles
- Classification
- Techniques
- Physiologic & Therapeutic Effects
- Indications
- Contraindications
- Clinical applications

Relaxation (MUST KNOW)

- Definition
- Types
- Techniques - Laura Mitchell, Contract relax method, Jacobson's Progressive Muscle Relaxation technique, Alexander's relaxation technique, Breathing technique
- Methods **GOOD TO KNOW**
- Advantages **NICE TO KNOW**

Aquatic therapy (MUST KNOW)

- Principles and properties of water
- Designing of a therapeutic pool
- Basic Equipment for aquatic pool
- Techniques
- Therapeutic Effects
- Indications, precautions and contraindications
- Whirlpool, Hubbard tank, Bad Ragaz techniques **NICE TO KNOW**

Suspension therapy MUST KNOW

- Principles
- Types
- Techniques
- Effects and uses
- Indications, precautions and contraindications
- Clinical applications
- Equipment **GOOD TO KNOW**

Body measurements MUST KNOW

- Manual muscle testing
- Limb length and girth
- Chest expansion

- Anthropometric measurements **GOOD TO KNOW**
- Vital parameters **GOOD TO KNOW**
- Angle of pelvic inclination **NICE TO KNOW**

Posture MUST KNOW

- Postural dysfunctions: Causes/affecting posture / Muscle imbalances
- Abnormal postures with their analysis
- Postural retraining
- Postural faults **GOOD TO KNOW**
- Clinical Implications **NICE TO KNOW**

Aerobic Exercise Training MUST KNOW

Definition, typesAdded

-
- Physiologic response
- Exercise program and its determinants
- Physiologic changes that occur with training
- Energy systems **GOOD TO KNOW**
- Energy expenditure & efficiency **NICE TO KNOW**
- Clinical applications **NICE TO KNOW**

Human gait MUST KNOW

- Pathological gaits with analysis
- Walking aids, measurements & crutch training
- Pre crutch training
- Gait training

Balance MUST KNOW

- Assessment
- Training
- Causes of impairment **GOOD TO KNOW**
- Clinical applications **GOOD TO KNOW**

Proprioceptive neuromuscular facilitation (PNF) MUST KNOW

- Physiological basis of balance control
- Principles
- Techniques
- Effects and uses
- Patterns
- Clinical applications

Coordination MUST KNOW

- Causes of in-coordination
- Tests for co-ordination
- Principles of reeducation
- Frenkel's exercises
- Nervous control **GOOD TO KNOW**
- Clinical applications **GOOD TO KNOW**

Yogasanas GOOD TO KNOW

- Classification
- Techniques

- Indications, precautions and contraindications
- Application of yogasanas and pranayamas **NICE TO KNOW**

Airway Clearance Techniques MUST KNOW
- Principles
- Techniques - postural drainage, chest manipulations
- Cough enhancement techniques – Coughing, Huffing
- Indications, precautions and contraindications
- Review of bronchial tree anatomy **GOOD TO KNOW**
- Techniques – Active Cycle of Breathing Techniques, Autogenic Drainage **GOOD TO KNOW**
- Postural Drainage for pediatric population and at home **GOOD TO KNOW**
- Techniques - PEP mask, Flutter therapy, High velocity chest compressions **NICE TO KNOW**

Stretching MUST KNOW
- Causes of soft tissue shortening
- Physiology of stretching – stretch reflex
- Assessment of tightness
- Types of stretching
- Techniques
- Indications, precautions and contraindications

Specific exercises MUST KNOW
- William's exercises
- Breathing exercises
- Facial exercises
- Proprioceptive exercises **NICE TO KNOW**
- Codman's Pendular exercises, Shoulder Wheel exercises
- Group exercises **GOOD TO KNOW**
- Kegel's exercises **GOOD TO KNOW**
- Burger's exercises **GOOD TO KNOW**
- Recreational exercises **NICE TO KNOW**
- Plyometric exercises **NICE TO KNOW**
- Isokinetic exercises **NICE TO KNOW**

Exercise Planning & Prescription MUST KNOW
- Principles
- Need for exercise prescription
- Physical fitness – components, assessment & testing
- Prescription highlights for patient (Hypertension/Diabetes/Obesity), competitive athlete and recreational athlete population **NICE TO KNOW**

Mechanical agents MUST KNOW
- Traction
- Effects and uses
- Indications, precautions and contraindications
- Compression Therapy **GOOD TO KNOW**
- Continuous Passive Motion **GOOD TO KNOW**

Functional reeducation & ADL training MUST KNOW
- Bed mobility - Supine to sit, supine to side to prone, sit to stand, sit to kneel sitting to kneeling, kneeling to standing

- ADL training - standing to walking to stair climbing
- Purpose and uses

Practical Contents

1. Demonstrate and assess- Limb Length(Lower Limb & Upper Limb) and anthropometric measurements (Girth, Height, Weight, BMI)
2. Demonstrate and assess - Manual Muscle Testing
3. Demonstrate assessment and training: Coordination (Frenkel's exercises) & Balance
4. Abnormal postures: assessment and retraining
5. Pathological gait: analysis and training
6. Walking aids – identification, measurements and crutch training
7. Demonstrate, perform and prescribe exercise with or without equipment: passive, free, active assisted, resisted, Progressive Resisted exercises
8. Demonstrate and perform: PNF – patterns & Technique (for Upper and Lower limb only)
9. Demonstrate and perform: Suspension therapy (Upper limb & Lower Limb)
10. Demonstrate and perform – Peripheral joint mobilization (Maitland)
11. Therapeutic massage: Upper limb, Lower limb, Back, Face, Neck
12. Demonstrate and perform – Assessment of muscle length and stretching (Passive & Active)
13. Specific exercises: Breathing exercises, William's exercises, Facial exercises, Proprioceptive exercises
14. Techniques to optimize oxygen transport and facilitate airway clearance (e.g., postural drainage, chest manipulations, forced expiratory techniques)
15. Demonstration of patient position for mechanical lumbar and cervical tractions, perform manual cervical and lumbar traction, continuous passive motion
16. Demonstrate functional reeducation: Bed mobility and ADL training activities
17. Aerobic Exercise program – Circuit training
18. Yogasanas and Pranayama **[demo only]**
19. Muscle Re-education- 14 hours

Suggested Readings

1. Carolyn Kisner, Lynn Allen Colby: Therapeutic Exercise. 3rd Ed, Jaypee brothers, New Delhi, 1996. 2. Gardiner DM: Principles of Exercise Therapy. 4th Ed,CBS publisher, Delhi, 1985.
3. Hollis.M & Fletcher Cook: Practical Exercise Therapy. 4th Ed, Wiley-Blackwell, Oxford, 1999.
4. Hislop HJ & Montgomery J: Daniel's & Worthinghams Muscle Testing.:Techniques of Manual Examination. 6th Ed, WB Saunders, Philadelphia, 2003
5. Basmajain JV & Wolf SL: Therapeutic Exercise. 5th Ed, Williams& Wilkins, USA, 1990
6. Payne RA: Relaxation Techniques.1st Ed, Churchill Livingstone, New York, 1995.
7. Holey EA, Cook EM: Evidence Based Therapeutic Massage – A practical guide for therapists. 2nd Ed, Elsevier, New York, 2003.
8. Campion.M.R: Hydrotherapy: Principles & Practice. 1st Ed, Butterworth – Heinmann, Woburn, MA, 1997
9. Hall CM & Brody LT: Therapeutic Exercise - moving toward function. Lippincott Williams & Wilkins, USA, 2004.
10. Skinner JS: Exercise testing & Exercise prescription for special cases: theoretical basis and clinical application. 3rd Ed, Lippincott Williams & Wilkins, New York, 2005.

ELECTROTHERAPY AND PHYSICAL AGENTS (SUBJECT CODE: 1109)

Teaching Hours: 250 hours (Theory: 100 hours and Practical: 150hours)
Maximum Marks: 200 (theory: 100 and practical & viva-voce: 100)
Assessment: Written, Oral & Practical, Internal and University examination
Internal Examination: 20 marks theory and 20 marks practical
University Examination: 80 marks Theory and 80 marks Practical & Viva – voce

Objectives: To develop an understanding of theoretical knowledge and practical skills pertaining to various electrotherapeutic modalities & physical agents.

Course Outcome:
At the completion of the course students will be able to:

2.2.1	Develop an understanding of the basic concept and principles of medical electronics and its relevance to the human body
2.2.2	Develop an understanding of the theoretical framework of electro-diagnosis and its applicability
2.2.3	Develop an understanding of the various principles & laws governing the functioning of electrotherapeutic modalities and physical agents & their effect on various body systems
2.2.4	Demonstrate an understanding of the indications, contraindications and precautions to be taken during application of electrotherapeutic modalities and physical agents in the treatment of various conditions
2.2.5	Demonstrate the methodology of application of electro-therapeutic modalities and physical agents
2.2.6	Demonstrate an understanding of the applicability of electrotherapeutic modalities and physical agents in the evaluation & management of various clinical conditions

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. Medical electronics (GOOD TO KNOW)

- Introduction to electrical physics
- Electricity definition, types & properties
- Electrical resistance, Ohm's law, resistance in series & parallel
- Fuse, amplifier and filter, condensers, valves and transformers
- Magnetism, properties of magnet and theories of magnetism
- Electromagnetic induction & electromagnetic spectrum, laws governing radiations – Law of reflection, rarefaction, Grothus law, cosine law, inverse square law.
- Electric shock, Electrical burns ,complications, prevention, safety measures and management

2. Electrotherapeutics (MUST KNOW)

- Muscle nerve physiology
- Propagation of action potential
- Pain – types of pain, pain pathway, theories of pain, Gate control theory of pain, pain modulation at various levels. Theories of Pain control
- Motor unit, motor point, topography of motor points

- Tissue impedance, measurement, lowering of skin resistance
- Electrodes, types of electrodes and sites for placement of electrodes
- Interrupted direct current: definition, production, physiological and therapeutic effects, methods and techniques of application, indications, contraindications, dangers and precautions
- Faradic current: definition, production, modifications, methods and techniques of application physiological and therapeutic effects of faradic current, indications, contraindications, dangers and precautions
- Galvanic current: definition, anodal galvanism, cathodal galvanism, medical galvanism, surgical galvanism, iontophoresis, physiological and therapeutic effects, indications, contraindications, dangers and precautions

- High voltage pulsed galvanism: definition, effects, indications and contraindications **(NICE TO KNOW)**
- Sinusoidal & didynamic current: definition, effects, indications and contraindications **(NICE TO KNOW)**
- Transcutaneous electrical nerve stimulation, definition, parameters, mechanisms of pain relief, indications, contraindication and precautions, Types of TENS
- Microamperage electrical nerve stimulation: definitions, effects, mechanism of action, indications and contraindications **(GOOD TO KNOW)**
- Interferential current: definition, principle of production, biological effects, indications, dosages contraindications and precautions
- Russian current: definition, effects, indications, dosages and contraindications **(GOOD TO KNOW)**
- Rebox current: definition, effects, indications, dosages and contraindications **(NICE TO KNOW)**

3. Electrodiagnosis (MUST KNOW)

- Overview of electrodiagnosis, merits and demerits
- Electrodiagnositic tests such as strength duration curve, rheobase, chronaxie, faradic galvanic test, neurotisation time, galvanic titanic ratio, nerve conduction test
- Electromyography and nerve conduction velocity studies
- Evoked potentials **(outline only) (NICE TO KNOW)**

4. Thermotherapy (MUST KNOW)

- Thermoregulation, effects of heat
- Short wave diathermy: definition, production, mode (Pulsed and continuous) , methods of application, technique of application, electrodes, physiological & therapeutic effects, indications, dosage, contraindications, dangers, precautions
- Pulsed short wave diathermy: definition, effects, uses and contraindications **(GOOD TO KNOW)**
- Long wave diathermy: definition, effects, indications and contraindications **(NICE TO KNOW)**
- Micro wave diathermy: definition, production, physiological &therapeutic effects, indications, techniques of application, dosage, contraindications dangers and precautions
- Therapeutic ultrasound: definition, frequency, production, continuous & pulsed mode ultrasound, physiological & therapeutic effects, indications, contraindications, methods and techniques of applications, dosages, phonophoresis, dangers and precautions
- Paraffin wax bath: principle of wax application, composition of wax bath therapy unit, methods of application, physiological & therapeutic effects, indication, contraindication and dosages
- Moist heat therapy: hydro collator packs, methods of applications, indications, contraindications and precaution
- Contrast bath: overview, methods of application, indications and contraindications
- Whirl pool bath: overview, methods of application, indications and contraindications **(GOOD TO KNOW)**
- Fluidotherapy: overview, methods of application, indications and contraindications (**GOOD TO KNOW)**

5. Phototherapy (MUST KNOW)

- Infra- red radiation: definition, production, generators, types, method of application, cosine law, law of inverse square, Grotthus' law and other laws pertaining to infra- red irradiation, indications and contraindications
- Ultraviolet rays: overview, types, production, generators like kromayer lamp, high pressure mercury vapor lamp, physiological and therapeutic effects, sensitizers, filters, test dosages, indications, contraindications, dangers and precautions

- Light amplification by stimulated emission of radiation (LASER): definition, types of laser, production, biological effects, indications, dosages, contraindications, precautions.

6. Cryotherapy (MUST KNOW)

- Overview of cryotherapy
- Physiological & therapeutic effects
- Methods of cryotherapy applications
- Indications, contraindications, dangers and precautions

7. Biofeedback (GOOD TO KNOW)

- Overview and types of biofeedback
- Indications, merits and demerits of biofeedback

8. Advanced electrotherapy (GOOD TO KNOW)

- Computerization in electrotherapy
- Programming of parameters for treatment of various conditions
- Combination therapy
- Shock wave therapy
- Functional Electrical Stimulation
- Matrix Rhythums Therapy
- Magnetic Therapy (PEMS)
- Recent advances as published in research articles in journals **(NICE TO KNOW)**

Practical Contents (MUST KNOW)

1. Preparation and testing of machines or modalities
2. Preparation of patient for application of physical agents
3. Screening of patients for contraindications prior to application of physical agents
4. Techniques of application of various physical agents
5. Technique of performing electrodiagnositc tests

Suggested Readings

1. Forster & Palastanga: Clayton's Electrotherapy Theory & Practice. 9th Ed, Bailliere Tindall, WB Saunders, New York, 2000.
2. Khan J: Principles & Practice of Electrotherapy. 3rd Ed, Churchill livingstone, Edinburgh, 1994.
3. Nelson RM, Hayes KW, Currier DP: Clinical Electrotherapy. 3rd Ed, Appleton & Lange, London, 1999.
4. Baxter DG: Therapeutic Laser, Theory & Practice. 1st Ed, Churchill Livingstone, New York, 1994.
5. Lehmann JF: Therapeutic heat & cold. 3rd Ed, Williams & Wilkins, Philadelphia, 1982.
6. WatsonT: Electrotherapy evidence based practice, 12th Ed, Churchill Livingstone, New York, 2008.
7. Khatri SM: Basics of Electrotherapy. Jaypee Brothers, New Delhi, 2003.
8. Sheila Kitchen: Electrotherapy Evidence based practice. 11th Ed, Elsevier, New York, 2006.
9. Behrens BJ, Mechlovitz SL: Physical agents-theory and practice for Physical therapists Assistant. 1st Ed, FA Davis, Philadelphia, 1996.
10. Robinson AJ, Lynn SM: Clinical Electrophysiology: Electrotherapy and Electrophysiologic Testing, 4th Ed, Williams & Wilkins Lippincott,, USA, 2008.

PROSTHETICS AND ORTHOTICS (SUBJECT CODE: PT1113)

Teaching Hours: 200 (Theory: 100 hours and Practical: 100hours)
Maximum Marks: Theory: 100 marks.
Assessment: Written, Internal and University examination.
Internal Examination: 20 marks Theory.
University Examination: 80 marks Theory.

Objectives: The objectives are to develop an understanding of basic orthotic and prosthetic devices, their uses, prescriptions, check outs and training for various musculoskeletal, neuromuscular disorders.

Course Outcome:
At the completion of the course, students will be able to:

2.3.1	Understand the historical aspects, materials and instrumentation of common prostheses and orthoses
2.3.2	Understand the classification and basic principles of working of common prosthetic and orthotic devices
2.3.3	Understand the role of a Physiotherapist in the process of prescribing and designing of prosthesis, orthosis & assistive devices
2.3.4	Understand the uses, assessment and prescription of common prosthesis, orthotics and assistive devices.
2.3.5	Demonstrate various methods of training a patient with prosthesis, orthosis or assistive devices to achieve functional independence
2.3.6	Demonstrate an understanding of the importance of counselling in patients using prosthetic or orthotic devices &/or assistive devices

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. **Overview**
   - Historical aspects
   - Uses of orthotics and prosthetics
   - Equipments
   - Materials

2. **Classification**
   - Overview
   - Classification of orthotics
   - Classification of prosthetics
   - Classification of adaptive devices

3. **Biomechanical principles**
   - Internal force system
   - External force system
   - Biomechanical analysis
   - Pathomechanical analysis
   - Biomechanics of orthosis and prosthesis

4. **Role of physiotherapist**
   - Prescription of orthotic and prosthetic devices
   - Check outs of orthotic and prosthetic devices
   - Training with orthotic and prosthetic devices
   - Ergonomic modifications

5. **Adaptive devices**
   - Overview
   - Adaptive devices for ADL
   - Sitting devices for multiple disabled
   - Adaptive devices for recreational activities
   - Adaptive devices for sports

6. **Foot wear modifications**
   - Types of footwear and their parts
   - Functions of foot wear
   - Foot wear modification for deformities
   - Foot wear modification for foot ulcers
   - Role of foot wear in enhancement of sports performance
   - Prevention of sports injuries by foot wear modifications

7. **Orthotics**
   - Overview
   - Upper limb
   - Lower limb
   - Spinal
   - Orthotics for neurological disorders
   - Orthotics for musculoskeletal disorders
   - Fitting and alignment techniques
   - Clinical applications
   - Maintenance of orthoses

8. **Prosthetics**
   - Upper limb
   - Lower limb
   - Aesthetic
   - Clinical applications
   - Fitting and alignment techniques
   - Complications of prosthetics
   - Prosthetic adaptation in competitive sports and recreation
   - Amputee gait
   - Non-prosthetic management of amputee
   - Energy expenditure in prosthetic gait
   - Maintenance of prosthesis & stump

9. **Wheel chairs**
   - Overview
   - Classification
   - Prescription
   - Maintenance
   - Modifications
   - Training

10. Psychological aspects

- Overview
- Psychological adaptations
- Counseling
- Patient clubs and self- help groups

Suggested Readings

1. Bella J M: Amputation and Prosthetics: A case study Approach, Jaypee Brothers, New Delhi, 2 Ed, 2002.
2. Kent K Wu Foot: Orthoses Principles and clinical application, Williams and Wilkins, London, 1990.
3. Ron Seymour: Prosthetics and Orthotics Lower limb and spinal, Lippincott Williams and Wilkins, New York, 2002.
4. Lunsardi MM, Nielsen CC: Orthotics and prosthetics in rehabilitation, Butterworth Heinemann, New Delhi, Oxford, 2000.
5. Edelstein J E and Bruckner J: Orthotics A comprehensive clinical approach Jaypee brothers, New Delhi, 2004.
6. Shurr D G, Michael J W, Cook TM: Prosthetics and Orthotics Prentice hall, Michigan, 2 Ed, 2001.
7. Bowker JH, Michael JW: Atlas of limb prosthetics: surgical, prosthetics, and rehabilitation principles, Mosby, Michigan, 2 Ed, 1992.
8. Gerhardt JJ, Philip SK, Zetti JH: Immediate and early prosthetics management: Rehabilitation aspects. Huber Michigan, 2 Ed, 1986.
9. Bussell MH: New advances in prosthetics and orthotics, an issue of Physical Medicine and Rehabilitation clinics, Elsevier Health Sciences Division, 2006.
10. Janardhanam K: Topics on prosthetics and Orthotics, Educom System, Chennai, 2003.

PATHOLOGY AND MICROBIOLOGY (SUBJECT CODE: PT1114)

Teaching Hours: Theory: 100 hours (40hours theory and 10 hours practical in both subjects)
Maximum Marks: 150 marks (100 marks for theory and 50 marks for practical & Viva-voce)
Assessment: Written, Oral & Practical, Internal and University examination
Internal Examination: 20 marks Theory, 10 marks Practical

University Examination: 80 marks Theory 40 marks practical

Course Outcome:
At the completion of the course, students will be able to:

2.4.1	Understand the basic theoretical aspects of pathology & microbiology as applied to the human body.
2.4.2	Understand the various disease causing agents and their manifestations in the human body
2.4.3	Understand the pathophysiology of common diseases in general affecting the human body (inflammation, cell injury, growth disturbances, neoplasia & circulatory disorders)
2.4.4	Understand the pathophysiology of common diseases on various body systems with emphasis on musculoskeletal, CNS and Cardiopulmonary system
2.4.5	Demonstrate an understanding of the common methods of sample collection, cultures and sensitivity tests for identification of microbiological agents
2.4.6	Demonstrate an understanding of various methods for prevention of transmission and contamination by infective agents

PATHOLOGY (Part-A)

Teaching Hours: Theory: 50 hours (40 hours theory and 10 hours practical)
Maximum Marks: 75 marks (50 marks theory and 25 marks practical)
Assessment: Written, Oral & Practical, Internal and University examination
Internal Examination: 10 marks Theory, 05 marks Practical
University Examination: 40 marks Theory 20 marks practical

Objectives: To develop an understanding of theoretical knowledge of basic pathology of diseases affecting various systems with an emphasis to cardiovascular, pulmonary, neuromuscular and musculo-skeletal systems.

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. Basics of general pathology

MUST KNOW

- Introduction to pathology (Common definitions & terms used in Pathology)
- Cell injuries: causes, mechanism, pathogenesis
- Reversible cell injury: types, morphological changes including cellular swellings, hyaline change, mucoid change
- Irreversible cell injury: apoptosis (Definition & classification) / autolysis, types of necrosis & gangrene, calcification (dystrophic & metastatic)

GOOD TO KNOW

- Intracellular accumulations - fatty changes

2. Inflammation and repair

MUST KNOW

- Acute inflammation: features, causes, vascular and cellular events

- Morphologic variations
- Inflammatory cells and mediators
- Chronic inflammation: causes, types, classification, non – specific & granulomatous with examples
- Wound healing: primary and secondary union, factors affecting the healing process
- Repair and regeneration
- Healing in specific site : Fracture bone

NICE TO KNOW

- Healing in specific site nerve and muscle healing

3. Growth disturbances and neoplasia

MUST KNOW

- Atrophy, hypertrophy, hyperplasia, aplasia, hypoplasia, metaplasia, malformation, agenesis, dysplasia
- Neoplasia: definition, classification, biological behavior
- Carcinoma and sarcoma, differences between benign and malignant
- Carcinogenesis: environmental carcinogens, chemical, viral, occupational, heredity
- Malignant neoplasia: grades and stages, local & distant spread
- Precancerous lesions

4. Hemodynamic disorders

MUST KNOW

- Hyperemia/Ischemia and hemorrhage
- Edema: pathogenesis and types
- Chronic venous congestion: lung, liver, spleen, systemic pathology
- Thrombosis and embolism: formation, fate and effects
- Infarction: types, common sites
- Shock: pathogenesis, types, morphologic changes

5. Cardio-pulmonary pathology

MUST KNOW

- Obstructive lung diseases (COPD)
- Restrictive lung diseases (Pneumonias)
- Ischemic heart disease & myocardial infarction
- Cardiac failure
- Rheumatic heart disease

GOOD TO KNOW

- Hypertension and hypertensive heart disease
- Peripheral vascular diseases (arterial and venous) with vasomotor diseases
- Congenital heart diseases

6. Nervous system

MUST KNOW

- Inflammations and infections (Meningitis, Encephalitis, Brain abscess)
- Neuromuscular junction disorders and myopathies

GOOD TO KNOW

- Congenital disorders
- Demyelinating disorders
- Sensory motor polyneuropathies

7. Musculoskeletal system

MUST KNOW

- Osteomyelitis
- Rickets / osteomalacia, osteoporosis
- Rheumatoid arthritis & osteoarthritis
- Fibromyalgia

Practical Content

Demonstration of specimen & slides – Anemia, Leukemia, Acute inflammation, Chronic inflammation, Tuberculosis of lymph node, Leprosy, Squamous cell carcinoma, Osteogenic sarcoma, Osteoclastoma etc.

MICROBIOLOGY (Part-B)

Teaching Hours: Theory: 50 hours (40 hours theory and 10 hours practical)
Maximum Marks: 75 marks (50 marks theory and 25 marks practical)
Assessment: Written, Oral & Practical, Internal and University examination
Internal Examination: 10 marks Theory, 05 marks Practical
University Examination: 40 marks Theory 20 marks practical

Objectives: To develop an understanding of theoretical knowledge of basic microbiology, the agents causing infections in humans with an emphasis on neuromuscular, musculo-skeletal, and cardiopulmonary systems.
Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. GENERAL MICROBIOLOGY. (7 hours)

Must know

- Brief history.
- Definitions: infection, parasite, host, vector, fomite, contagious diseases, infectious diseases, epidemic, endemic, pandemic, zoonosis, epizootic, attack rate.
- Normal flora of the human body.
- Routes of infection and spread: endogenous and exogenous infections: source and reservoir of infections.
- Bacterial cell. Morphology limited to recognizing bacteria in clinical sample-size, shape, motility and arrangement, structures which are associated with virulence (capsule, flagella & fimbriae), Physiology: Essentials of bacterial growth requirements.
- Sterilization, disinfection and universal precautions in relation to patient care and disease prevention. Definition of asepsis, sterilization, disinfection.
- Antimicrobials: Definition & Brief Introduction to Antibiotic Sensitivity testing (AST)
- Biomedical waste management

2. IMMUNOLOGY (7 hours)

- Basic principles of immunity: antibodies, antigen and antibody reactions (Agglutination, precipitation & ELISA) with relevance to pathogenesis and serological diagnosis.
- Basics of humoral immunity.
- Basics of cell mediated immunity.
- Immunology of hypersensitivity.
- Immunological basis of the autoimmune diseases.

- Immunodeficiency with relevance to opportunistic infections.
- Vaccines. (Nice to know)

SYSTEMIC MICROBIOLOGY

Must Know

3. BACTERIOLOGY (6 hours)

To be considered under the following headings - Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, collection and transport of samples.

- Staphylococci.
- Streptococci and Pneumococci.
- Corynebacterium diphtheria,
- Mycobacteria – M tuberculosis, M. leprae
- Clostridia

Good to know

- Enterobacteriaceae
- Neisseriae.
- Vibrio
- Campylobacter and Helicobacter species
- Pseudomonas Species
- Spirochaetes.
- Actinomycetes

Nice to know

7. Bacillius anthracis

4. GENERAL VIROLOGY (5 hours)

General properties: Basic structure and broad classification of viruses. Pathogenesis, laboratory diagnosis and treatment of viral infections.

5. SYSTEMIC VIROLOGY (3hours)

- Polio Virus
- Hepatitis virus: List of viruses, pathogenesis, mode of infection, list of diagnostic tests, Methods of prevention & control.
- Human immunodeficiency virus: Structure with relevance to laboratory diagnosis and type of infection, laboratory tests- Enumeration of screening and confirmatory tests, Universal precautions, prophylaxis.

6. MYCOLOGY (3 hours)

General properties of fungi. Classification based on diseases: superficial, subcutaneous, deep mycoses, opportunistic infections, systemic mycoses, General principles of fungal diagnosis. Method of collection of samples.

- Candida

Good to know

- Pathogenic fungi-Aspergillus, Penicillium

- **PARASITOLOGY (3 hours)**
  - General Aspects
  - Protozoans: Entamoeba
  - Nematodes: filariasis

Good to know

  - Sporozoans – Plasmodium

- **CLINICAL/ APPLIED MICROBIOLOGY (6hours)**

Must know

  - Pyrexia of unknown origin,
  - Acute-respiratory infections,
  - Central Nervous System infections,
  - Wound infection,

Good to know

  - Diarrhoeal diseases,
  - Urinary tract infections,
  - Pelvic inflammatory disease,

PRACTICAL CONTENT

- Demonstration of collection of clinical specimens and OVERVIEW OF CULTIVATION & Demonstration of cultures.
- Demonstration of Hanging drop preparation & simple, Gram and Ziehl Neelsen's staining
- Demonstration of sterilization technique
- Demonstration of serological tests
- Demonstration of diagnostic tests of AIDS, Hepatitis
- Demonstration of fungi.

SUGGESTED READINGS

1. Cotran RS, Vinay Kumar, Collins T, Robbins SL: Robbins Pathologic Basis of Disease. W.B. Saunders, Singapore, 1999
2. Goodman CC, Boissonnault WG: Pathology: Implications for the Physical Therapist. W.B.Saunders, Singapore, 1998
3. Cressee J, Underwood E: General and Systemic Pathology. 4th Ed, Churchill Livingstone, New York, 2008
4. Harsh Mohan: Textbook of Pathology. 5th Ed, Anshan Publications, New Delhi, 2005
5. Copstead LEC, Banasik JL: Pathophysiology. 3rd Ed, W.B.Saunders, Philadelphia, 2005.
6. Ananthanarayan, Paniker: Text Book of Microbiology.Edition 10th
7. Text Book of Microbiology C.P.Baveja Edition 5th
8. Essentials of Medical Microbiology by Rajesh Bathia & Ratan lal Ichhpujani Edition 4th
9. Essential of Medical Microbiology Apurba Sankar Sastry & Sandhya Bhat K Edition 2nd
10. Parasitology (Protozoology & Helminthology) By K.D.Chatterjee. Edition 13th
11. Panikers's Text book of Medical Parasitology BY Sougata Ghosh, Paniker , Edition 8th .
12. Medical Parasitology by Arora D.R Edition 4th

PHARMACOLOGY (SUBJECT CODE: PT1113)

Teaching Hours: Theory: 100 hours.
Maximum Marks: Theory: 100 Marks.
Assessment: Written, Internal and University examination.
Internal Examination: 20 marks Theory.
University Examination: 80 marks Theory.

Objectives : The objectives are to develop an understanding of basic pharmacology, usage of common drugs for the treatment of various diseases with emphasis on Musculo-Skeletal System, Central Nervous System, Cardio Vascular System, Respiratory System, Geriatric Pharmacology and Sports Pharmacology"

.

Course Outcome:
At the completion of the course, students will be able to:

2.5.1	Understand the various drug classifications and sources of drugs with emphasis on Musculo-Skeletal System, Central Nervous System, Cardio Vascular System, Respiratory System, Geriatric Pharmacology and Sports Pharmacology
2.5.2	Understand the usage, dosage, mechanism of action, adverse effects and drug interactions of common pharmacological agents on various systems with emphasis on Musculo-Skeletal System, Central Nervous System, Cardio Vascular System, Respiratory System, Geriatric Pharmacology and Sports Pharmacology
2.5.3	Understand the role of pharmacology in Physiotherapy and its management of common conditions

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".

80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

MUST KNOW

1 General Pharmacology

- Introduction, definitions & Sources of drugs
- Routes of drug administration
- Pharmaco-kinetics
- Pharmaco-dynamics
- Adverse drug reaction

2 Pharmacology in peripheral nervous system and autonomic nervous system

- Introduction to ANS Cholinergic System and drugs
- Anticholinergic drugs and drugs acting on autonomic ganglia
- Adrenergic system and drugs
- Antiadrenergic drugs
- Skeletal muscle relaxants

3 Pharmacology in central nervous system

- Introduction to CNS and alcohols
- Sedative hypnotic drugs
- Antiepileptic drugs
- Antiparkinsonian drugs
- Opioid analgesics & antagonists

4 Pharmacology in inflammatory / immune conditions

- NSAID
- Histamine & Antihistaminic drugs
- Drug therapy for RA & Gout
- Corticosteroids

5 Pharmacology in cardiovascular system

- Introduction to CVS and cardiac glycosides
- Anti anginal and other anti-ischemic drugs
- Drugs used in Hypertension
- Diuretics

6 Pharmacology in respiratory system

- Drugs for Cough
- Drugs for Bronchial asthma

7 Immunological agents NICE TO KNOW

- Vaccines
- Immuno-modulators

8 Antimicrobial agents

- Introduction to antimicrobial drugs
- Sulfonamides, Cotrimoxazaole
- Beta-lactam antibiotics
- Tetracycline and chloramphenicol
- Aminoglycoside antibiotics

- Macrolides and other antibacterial drugs
- Quinolones and treatment of urinary tract infection
- Antiviral drugs
- Antifungal drugs
- Anti-amoebic drugs and other antiprotozoal drugs
- Anthelmintic
- Anticancer drugs **(Good to know)**

9 Pharmacology in endocrine system

- Drugs for Diabetes Mellitus
- Thyroid and Antithyroid drugs
- Drugs affecting calcium balance

10 Pharmacology in Geriatrics , Sports and Environmental Toxicology, Principles of Prescription Writing and Over The Counter (OTC) Drugs

- Geriatrics Pharmacology
- Anabolic steroids
- Sports Pharmacology
- Drug abuse in sports
- Environmental Toxicology **(Good to know)**
- Principles of Prescription Writing **(Nice to know)**
- Over The Counter (OTC) Drugs **(Nice to know)**

Suggested Readings

1. Tripathi: Essentials of Medical Pharmacology. 5th Ed, Jaypee brothers, New Delhi,2004.
2. Satoskar R S & Bhandarkar: Pharmacology and Pharmacotherapeutics. Vol I & II, 14th Ed, Popular Prakashan, Mumbai, 1994.
3. Padmaja Udaykumar: Medical Pharmacology, 3RD Edition, CBS Publishers and Distributors Pvt Ltd
4. Pharmacology for Medical Graduates: 3RD Edition, Tara V Shanbag, Smita Shenoy and Veena Nayak, Elsevier.
5. Remington's Pharmaceuticals Sciences: 13th edition, 1965, Eric. W. Martin, Mack Publishing Company
6. Craig CR, Stitzel RE: Modern Pharmacology with Clinical Applications. 6th Ed, Lippincott Williams & Wilkins, USA, 2004.
7. Ciccone CD : Pharmacology in Rehabilitation. 2nd Ed, F. A. Davis Company, Philadelphia, 1996.
8. Bennett PN, Bronen MJ : Clinical Pharmacology. 9th Ed, Churchill Livingstone, UK, 2003.
9. Richard AH, Pamela CC. Mycek MJ, Gertner SB, Perper MM: Pharmacology, 2nd Ed, Lippincott, University of Michigan, 1992.
10. Gladson Barbara : Pharmacology for Physical therapists. Paperback, New York, 2005.
11. Seth SD: Textbook of Pharmacology. 2nd Ed, Churchill Livingstone Pvt Ltd., New Delhi, 2000.
12. Sengupta PR: Medical Pharmacology. 1st Ed, Modern Publication, New Delhi, 2004.
13. Bhattacharya SK, Sen P, Ray A: Pharmacology.2nd Ed, Publication, New Delhi, (reprinted) 2005.

CONSTITUTION OF INDIA (SUBJECT CODE: PT 1116)

(For college examination only)

Teaching Hours: 25 hours
Maximum Marks: 50 (College exam)
Assessment: Written examinations

Objectives: The objective is to enable the student understand the fundamental rights, directive principles and duties of citizens of India as per the constitution of India.

Theory Contents

1. Historical aspects

- Government of India act 1919
- Government of India act 1935
- The cabinet mission plan
- The constituent assembly
- Drafting structure of the constitution

2. Structure of the constitution

- Meaning
- Preamble and interpretation
- Sovereign
- Socialist
- Secular
- Democratic
- Republic
- Parts
- Schedules

3. Changing the constitution

- Amendments
- List of major amendments
- Restrictions on fundamental rights
- Territorial changes
- Transitional provisions
- Judicial review

4. Fundamental rights and duties

- Contents
- Significance

5. Directive principles of states policies

- Fundamental rights
- Need to balance

6. Special rights

- Dalits and backwards
- Women and children
- Religious and linguistic minorities

7. Election commission and public service commissions

- Overview
- Functioning

Suggested Readings

1. Baruah, Aparajita (2007). Preamble of the Constitution of India: An Insight & Comparison. Eastern Book Co. ISBN 9788176299960.
2. Basu, Durga Das (1984). Introduction to the Constitution of India (10th Ed.). South Asia Books. ISBN 0836410971.
3. Jayapalan, N. (1998). Constitutional History of India. Atlantic Publishers & Distributors. ISBN 8171567614.
4. Khanna, Hans Raj (1981). Making of India's Constitution. Eastern Book Co. ISBN 9788170121084.

5. Pylee, M.V. (2004). Constitutional Government in India. S. Chand & Co. ISBN 8121922038.
6. Sen, Sarbani (2007). The Constitution of India: Popular Sovereignty and Democratic Transformations. Oxford University Press. ISBN 9780195686494.
7. Sharma, Dinesh; Singh, Jaya; Maganathan, R.; et al. (2002). Indian Constitution at Work. Political Science, Class XI. NCERT.
8. J.C. Joharii: The Constitution of India—A Politico-Legal Study— Sterling Publication, Pvt.Ltd. New Delhi.
9. J.N Pandey: Constitution Law of India, Allahabad, Central Law Agency, 1998.
10. Granville Austin: The Indian Constitution—Corner Stone of a Nation— Oxford, New Delhi, 2000.

ENVIRONMENTAL STUDIES (PT1117)

(For college examination only)

Teaching Hours: 25 hours
Maximum Marks: 50 (College exam)
Assessment: Written examinations

Objectives: The objective is to enable the student understand the importance of environmental sanctity, ecosystem, biodiversity, pollution, population and environment.

Theory Contents

5. **Multidisciplinary nature of environmental studies**
   Definition, scope and importance, need for public awareness. (2 Lectures)
6. **Natural Resources: (8 Lectures)**
   Renewable and non-renewable resources:
   Natural resources and associated problems
   a. Forest resources: use and over – exploitation, deforestation, case studies. Timber extraction, Mining, dams, and their effects on forest and tribal people.
   b. Water resources: Use and over utilization of surface and ground water, floods, drought, conflict over water, dams-befits and problems
   c. Mineral resources- use and exploitation, environment effects of extracting and using mineral resources, case studies.
   d. Food resources: world food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizer and pesticides problem, water lodging, salinity, case studies
   e. Energy resources: growing energy needs renewable, and non- renewable energy resources, use of alternate energy sources. Case studies.
   f. Land resources: land as a resource, land degradation, man induced landslides, soil erosion and desertification.
   Role of an individual in conservation of natural resources
   Equitable use of resources for sustainable lifestyles.
7. **Ecosystems (6 Lectures)**
   - Concepts of ecosystem
   - Structure and function of ecosystem
   - Producers, consumers, and decomposers
   - Energy flow in ecosystem
   - Ecological succession
   - Food chains, food webs, ecological pyramids
   - Introduction, types, characteristic features, structures and function of following ecosystem:-
     a. Forest ecosystem

b. Grassland ecosystem
c. Dessert ecosystem
d. Aquatic ecosystem (ponds, streams, lacks, reveres, occasion, estuaries)

8. **Biodiversity and its conservation (8 lectures)**
   - Introduction – Definition: Genetic, species and ecosystem diversity
   - Biogeographical classification of India
   - Value of biodiversity: consummative use, productive use, social, ethical, aesthetic, and option values
   - Biodiversity at global national and local levels
   - India as mega diversity nation
   - Hot- sports of biodiversity
   - Threats to biodiversity: Habitat loss, poaching of wild life, man - wild life conflict.
   - Endangered and endemic species of India
   - Conservation of biodiversity: In situ and ex situ conservation of biodiversity

9. Environmental pollution (8 lectures)

Definition

- Cause, effects and control measures of :-
  a. Air pollution
  b. Water pollution
  c. Soil pollution
  d. Marine pollution
  e. Noise Pollution
  f. Thermal pollution
  g. Nuclear hazards
- Solid waste management: causes, effects and control measures of urban and industrial wastes.
- Role of individual in prevention of pollution
- Pollution case studies
- Disaster management: Floods, Earthquake, cyclone, and landslides.

10. **Social issues and environment (7 Lectures)**
    - **From unsustainable to sustainable development**
    - Urban problem related to energy
    - Water conservation, rain water harvesting, water shade management
    - Re-settlement and rehabilitation of people; its problems and concerns, case studies
    - Environmental ethics: issues and possible solution.
    - Climate change, global warming, acid rain, OZONE layer depletion, nuclear accidents and Holocaust. Case studies.
    - Waste land reclamation
    - Consumerism and waste products
    - Environment protection act
    - Air (Prevention and control of pollution) Act.
    - Water (Prevention and control of pollution) Act.
    - Wild life protection Act
    - forest conservation act
    - Issues involved in enforcement of environmental legislation.
    - Public awareness.

11. **Human population and environment (6 Lectures)**
    - Population growth, variation among nation.
    - Population explosion- family welfare program
    - Environment and human health.
    - Human rights
    - Value education
    - HIV/AIDS
    - Women and child welfare

- Role of information technology in environment and human health.
- Case studies

12. Field work (5 lectures)

- Visit to a local area document environmental assets - river, forest, grass land, hill mountain
- **Visit to a local polluted site- Urban/Rural/Industrial/Agricultural**
- Study of common plants insects and birds
- Study of simple ecosystem – pond, river, hill slopes etc.

(Classroom teaching – 45 hours and field work 5 hours)

Suggested Readings

2. Agarwal, K.C.2001 Environmental biology, Nidi Publication. ltd.Bikaner.
3. Bharucha Erach, The Biodiversity of India, MAPIN public Pvt. Ltd., Ahmedabad/380013, India email:mapin @icenet.net®
4. Brunner R.C.,1989, Hazardous waste incineration, McGraw hill inc.480P
5. Clark R. S. , Marine pollution, Clanderson press Oxford (TB)
6. Cunnighum W. P., Cooper, T.H. Gorhani, E N Hepworth, M T 2001, Environmental encyclopedia .Jaico Publ House Mumbai 1196P
7. De A.K., Environmental Chemistry WILEEY eastern Ltd.
8. Down to earth, Center for science and environment ®
9. Gleick, H . P. 1993. Water in crises, pacific institute for studies in Dev., environment and security Stockholm env. Institute Oxford university press 473p
10. Haekins R. E , Encyclopedia of India Natural history, Bombay Natural history society Bombay ®
11. Heywood, V.H and Waston, R. T. 1995. Global biodiversity assessment, Cambridge university press 1140p
12. Jadav, H and Bhosale, V M. 1995 environmental protection and laws. Himalaya Publication House 284p
13. Mckinney, M.L. and School, R. N. 1996 environmental science system and solution web enhances edition.639p
14. Mhaskar A.K ., Matter hazardous, Techno-science publication (TB)
15. Millar T.G JR. Environmental science wadsworth publishing Co. (TB)
16. Odum E.P 1971. Fundamentals of ecology. W.B Saunders co. USA, 574p
17. Rao M.N and Dutta, A.K 1987. Waste water treatment. Oxford and IBH Publ. Co. Pvt. Ltd 345p
18. Sharma B. K., 2001. Environmental chemistry. Geol, publ. house, Meerut.
19. Survey of environment, The Hindu (M)
20. Townsend C. , Harper J , And Michael Begon , Essentials of ecology, Blackwell science
21. Trivedi R.K., Handbook of environmental laws, compliances and standers voll and II, enviro media ®
22. Wanger K.D, 1998 environmental management. W.B Saunders Co. Philadelphia USA 499p

Section-VIII- C

THRID YEAR BPT (BPT III) SUBJECTS AND COURSE CONTENTS

GENERAL MEDICINE (SUBJECT CODE: 1120)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 150 marks (100 marks for theory and 50 marks for practical & Viva-voce)
Assessment: Written, Oral & Practical, Internal and University examination
Internal Examination: 20 marks Theory, 10 marks Practical
University Examination: 80 marks Theory 40 marks practical

Objective: The objectives are to develop an understanding about various medical diseases commonly referred for physiotherapy treatment.

Course Outcome:
At the completion of the course students will be able to:

3.1.1	Develop an understanding of the pathophysiology & clinical aspects of common medical conditions relating to all systems of the body seen in clinical practice
3.1.2	Develop an understanding of the importance & need for common investigations in diagnosing medical conditions
3.1.3	Develop an understanding of the interpretation of various investigations & integrate the results of common clinical investigations in the overall management of patients with medical conditions
3.1.4	Demonstrate common clinical examination skills relating to medical conditions
3.1.5	Demonstrate an understanding of the role/importance of Physiotherapy in the management of common medical conditions

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. Infective diseases (bacterial, Viral, Fungal, Protozoal infection with details on some of the common systemic infection and sepsis)

- Overview
- Principles & ethics of medicine
- Upper respiratory tract infection
- Urinary tract infection
- Sexually transmitted diseases
- Management
- Prevention

2. Deficiency diseases

- Overview
- Rickets
- Kwashiorkor

3. Diseases of the metabolism & endocrine system

- Overview
- Thyroid diseases
- Diabetes
- Osteoporosis
- Obesity
- Hyperlipidemia
- Pitutiary
- Adrenal
- Chronic fatigue syndrome, Mental disorders, Alcoholism and drug dependency, environmental and occupational hazards.
- Glycogen storage diseases, mucopolysaccharidoses, Gaucher's diseases, Niemannpick,s disease

4. Diseases of the respiratory system

- Common infectious diseases – Pulmonary tuberculosis, Pneumoniae, Suppurative lung diseases,
- Diseases of pleura, mediastinum, and diaphragm
- Occupational lung diseases
- Obstructive lung diseases - COPD
- Interstitial lung diseases
- Respiratory failure & ventilation, Pulmonary thromboembolism
- Lung Cancer
- Investigations
- Management

5. Cardio-vascular diseases

- Congenital heart disease
- Ischemic heart diseases
- Hypertension
- Arrhythmia
- Valvular heart disease
- Rheumatic fever
- Infective endocarditis
- Cardiac failure
- Syncope and pre-syncope
- Peripheral vascular diseases
- Investigations
- Management

6. Diseases of digestive system and hepatobiliary system, Peptic Ulcer, inflammatory bowel disease, Diseases of oesophagus, hepatitis, cirrhosis, acute and chronic pancreatitis, Liver failure

7. Diseases of the blood

- Overview
- Anemia
- Hemophilia
- Leukemia
- Investigations
- Management

8. Rheumatic diseases

- Overview
- Classification
- Types
- Management

9. Dermatology

- Acne, psoriasis& alopecia
- Pressure sores
- Hansen's disease
- Investigations
- Management
- Phototherapy

10. Psychiatry

- Introduction
- Neuroses
- Psychoses
- Somatoform disorder
- Mental retardation
- Dementia
- Communication & behavioral skills
- Childhood disorders
- Investigations
- Management

11. Poisoning:

- Overview
- Types
- Management

12. Geriatric medicine

- Aging process
- Diseases and disorders of aging
- Investigations
- Management

13. **Diseases of kidney and urinary tracts** – Acute and chronic renal failure and treatment, glomerulopathies, urinary tract infection, urinary tract obstruction, Acute and chronic renal failure.

14. **Diseases of immune system** – AIDS, Allergies, Anaphylaxis, Rheumatoid arthritis.

15. **Environmental and nutritional disease** – pollution, air pollution, chemical and drug industry, therapeutic drug injury, non-therapeutic toxic agent, injury by physical agents, nutrition disease, starvation, vitamins, trace elements deficiency.

16. **Body fluid and circulatory disturbance** – internal environment, disturbances of body fluids and electrolytes, dehydration, hemodynamic disturbances, hyperemia and congestion, shock, hemorrhage, circulatory disturbance of obstructive nature, thrombosis, ischemia, infraction.

17. **Genetic disorders** – developmental defects, cytogenetic abnormalities, Numerical abnormalities, structural abnormalities, single-gene defects, disorders, with multifactorial inheritance, coronary artery disease

Practical Contents

1. History taking

2. Physical examination of patient
3. Clinical demonstrations
4. Interpretation of investigations
5. Differential diagnosis and diagnosis
6. Observation of medical management

Suggested Readings

1. Boon NA, Colledge NR, Walker BR, Hunter JA: Davidson's Principles and Practice of Medicine. 20th Ed, Churchill Livingstone, Edinburgh, 2006.
2. Fauci, Braunwald, Kasper, Longo, Jameson, Loscalzo: Harrison's principles of internal medicine. Vol I & II, 17th Ed, McGraw Hill, New York, 2008.
3. McPhee, Papadakins, Tierncy: Current medical diagnosis and treatment. 46th Ed, McGraw Hill, New York, 2007.
4. Swash M: Hutchinson's clinical methods. 21st Ed, Saunders, Edinburgh, 2002.
5. Ogilvie & Evans: Chamberlain's symptoms and signs in clinical medicine – An introduction to medical diagnosis. 12th Ed, Butterworth Heinmann, oxford, 1997.
6. Douglas, Nicol & Robertson: Macleod's clinical examination. 11th Ed, Elsevier – Churchill Livingstone, Edinburgh, 2005
7. Shah SN: API text book of Medicine. Vol I & II, 8th Ed, The Association of Physicians of India, Mumbai, 2008.
8. Golwalla SA, Golwalla AF: Medicine for students. 21st Ed, National book depot, Mumbai, 2005.
9. Das PC: Textbook of medicine. 4th Ed, Current books international, Kolkata, 2000.
10. Mehta PJ, Joshi SR, Mehta NP: Practical Medicine. 17th Ed, National Book Depot, New Delhi, 2005.

GENERAL SURGERY (SUBJECT CODE: 1121)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 150 marks (100 marks for theory and 50 marks for practical & Viva-voce)
Assessment: Written, Oral & Practical, Internal and University examination

Internal Examination: 20 marks Theory, 10 marks Practical
University Examination: 80 marks Theory 40 marks practical

Objective: The objectives are to develop an understanding about various surgical conditions commonly referred for physiotherapy treatment.

Course Outcome:
At the completion of the course students will be able to:

3.2.1	Develop an understanding of the pathophysiology & clinical aspects of common surgical conditions relating to all systems of the body seen in clinical practice
3.2.2	Develop an understanding of the importance & need for common investigations in surgical conditions
3.2.3	Develop an understanding of the interpretation of various investigations & integrate the results of common clinical investigations in the overall management of patients with surgical conditions
3.2.4	Demonstrate common clinical examination skills relating to surgical conditions
3.2.5	Demonstrate an understanding of the role/importance of Physiotherapy in the management of common surgical conditions

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. General Surgery: [5 Hours]

Must Know

- Types of Incisions
- Clips, Ligatures and Sutures
- Drainage systems & Tubes used in Surgery

Good to know

- Types of anesthesia and its effects on the patient

8. Endoscopy – types

Nice to know

- General Thoracic Procedures – Radiologic Diagnostic procedures,
- Biopsy – uses and types.

2. Fluid, Electrolyte and Acid-Base disturbances – diagnosis and management [8 Hours]

Must Know

- Hemostasis – components, hemostatic disorders, factors affecting bleeding during surgery.

9. Hypovolemic Shock

- Surgical Infections
- General Post – Operative Complications and its management
- Nutrition in the surgical patient
- Wound healing – basic process involved in wound repair, basic phases in the healing process, clinical management of wounds, factors affecting wound healing, Scars types and treatment.

Good to know

- Transfusion therapy in surgery – blood components, complications of transfusion

3. Causes, Clinical Presentation, Diagnosis and treatment of the following Thoracic Trauma situations – [5 Hours]

Must Know

- Airway obstruction
- Pnuemothorax
- Hemothorax
- Cardiac, Pulmonary & Soft-tissue Contusions

Good to know

- Cardiac Tamponade
- Diaphragmatic disruption

Nice to know

- Tracheobronchial disruption
- Aortic disruption
- Esophageal disruption

4. Surgical Oncology – [6 Hours] Must Know

- Cancer – definition, types,
- Clinical manifestations, Staging, common surgical procedures involved in the management of common cancers of the following
    - Breast
    - Head & Neck
    - Lung
    - Oral Cavity
    - Bone

5. Disorders of the Heart – [8 Hours]

Definition, Clinical features, diagnosis and choice of management for the following disorders:

Must Know

- Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease:
    - Patent Ductus Arteriosus
    - Coarctation of Aorta
    - Atrial Septal Defect
    - Ventricular Septal Defect
    - Tetrology of Fallot
    - Transposition of Great Vessels

Good to know

- Acquired Heart Disease –
    - Ischemic Heart Disease – Coronary Artery Disease **(Must Know)**
    - Mitral Stenosis & Insufficiency
    - Aortic Stenosis and Insufficiency

Nice to know

- Cardiac tumors.

6. Diseases of the Arteries and Veins: [8 Hours]

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

Must Know

- Arteriosclerosis,
- Atherosclerosis
- Buerger's disease,
- Raynaud's Disease
- Deep Vein Thrombosis
- Varicose Veins

Good to know

- Aneurysm,
- Thrombophlebitis,
- , Pulmonary Embolism,

7. Burn: [6 Hours] Must Know

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

8.. Disorders of the Chest Wall, Lung and Mediastinum – [8 Hours]

- Definition, Clinical features, diagnosis and choice of management for the following disorders :

Must know

- Chest wall deformities
- Spontaneous Pneumothorax,
- Pleural Effusion,
- Empyema Thoracis,
- Lung abscess,
- Bronchiectasis,
- Tuberculosis,

Good to know

- Congenital tracheomalacia,
- Lesions of the Mediastinum.
- Tracheal Stenosis

Nice to know

- Chest wall tumors,
- Bronchogenic Carcinoma,
- Bronchial Adenomas,
- Neoplasms of the trachea,

9. Thoracic surgeries – [9 Hours]

- Definition, Types of Incisions with emphasis to the site of incision, muscles cut, Indications, Physiological changes and Complications of
  Must know
- Thoracotomy .
- Lung surgeries:
    - Pneumonectomy,
    - Lobectomy,
    - Thoracoplasty,
    - Pleurectomy,
    - Pleurodesis and Decortication of the Lung.

      Good to know
    - Segmentectomy

- Definition, Types of Incisions with emphasis to the site of incision, muscles cut, Indications, Physiological changes and Complications of Cardiac surgeries –

Must know

- Closed Heart surgery

- Open Heart surgery

Good to Know

- Indications, Physiological changes and Complications of Transplant Surgery – Heart, Lung and Kidney (Nice to know)

Nice to know

- Overview of the Cardio-Pulmonary Bypass Machine
- Extra -cardiac Operations

10. Definition, Indication, Incision, Physiological changes and Complications following Common surgeries like – [6Hours]

Must know

- Hernias – Types & Management

Good to know

- Cholecystectomy,
- Colostomy,
- Ileostomy,
- Gastrectomy,
- Appendicectomy
- Peptic ulcer

Nice to know

- Nephrectomy,
- Prostectomy.
- Circumcision
- Prolapse Rectum

11. Women's Health: [14 Hours]

- Menstrual cycle and its disorders.
- Maternal physiology in pregnancy
- Prenatal complications-investigations- management.
- Musculo skeletal disorders during pregnancy
- Child birth-
  - Stages
  - Surgical procedures involving child birth
  - Complications-investigations-management
  - Pain relief in labor
  - Puerperium
  - Post Natal care.

- Sterility-pathophysiology investigations- management.
- Menopause - its effects on emotions and musculoskeletal system.
- Hormonal disorders of females-obesity and female hormones.
- Malnutrition and deficiencies in females.
- Infections and sexually transmitted disease in female
- Incontinence – Types, Causes, Assessment and Management..
- Definition, Indications and Management of the following surgical procedures –
  - Hysterosalphyngography,
  - Dilatation and Curettage,
  - Laproscopy,
  - Colposopy,
  - Hysterectomy
- Cancer of the female reproductive organs-management

12. ENT: [7 Hours]

- Common problems of external ear
- Traumatic fractures of Temporal bone
- Acute Sinusitis & its management
- Otitis media
- Positional tests for vertigo
- Functional achonia & its management
- Facial palsy classification & medical management
- Surgical management of lower motor neuron type of facial palsy

13. Ophthalmology: [10 hours]

- Anatomy & Physiology of eye
- Anatomy, physiology, Pathology, of Lacrimal Excretory Apparatus
- Anatomy , Physiology & Diseases of conjunctiva
- Allergic, Bacterial & Viral
- Degenerative conditions of Conjunctiva
- Pingcula
- Pterygium
- Cornea – Anatomy & Physiology – Factors keeping cornea transparent
- Bacterial, Viral & fungal corneal ulcer
- Lens – Anatomy & Physiology
- Cataract
- Cataract surgeries
- Glaucoma – Chronic simple glaucoma, Angle closure glaucoma
- Anatomy & Physiology of Retina
- Refractive errors – contact lenses (Note on LASIK SURGERIES)
- Contusion injury – Penetrating Injuries, Sympathetic Opthalmititis
- LIDS – Blepharitis, Chalazion
- Fundoscopy
- Hypertensive Retinopathy – Diabetic Retinopathy – Anemia
- Optic Nerve Disc Examination a. Optic Neuritis, B. Optic Atrophy
- Retinal Detachment
- Intraocular Tumors – Retinoblastoma
- Endophthalmitis
- Amblyopia – concomitant squint, paralytic squint
- Proptosis – Orbital cellulitis
- Vasaculo-occlusive diseases
- Secondary Glaucoma – Buphthalmous
- Pupillary Pathway.

Practical Contents

1. History taking
2. Physical examination of patient
3. Clinical demonstrations
4. Diagnosis
5. Observation of surgeries

Suggested Readings

1. Russell RCG, Williams NS, Bulstrode CJK: Bailey & Love's short practice of surgery. 24th Ed, Arnold, London, 2004.
2. Mowschenson PM: Aids to undergraduate surgery. 3rd Ed, Churchill Livingstone, Edinburgh, 1989.
3. Farquharson M & Moran B: Farquharson's textbook of operative general surgery. 9th Ed, Hodder Arnold, London, 2005.
4. Lumley JSP: Hamilton Bailey's demonstrations of physical signs in clinical surgery. 18th Ed, Butterworth Heinman, Oxford, 1997.
5. Doherty MG: Current surgical diagnosis and treatment. 12th Ed, Lange medical books, New York, 2006.
6. S. Das: A concise textbook of surgery. 3rd Ed, Dr. S.Das, Calcutta, 2001.
7. S. Das: A manual on clinical surgery. 6th Ed, Dr. S. Das, Calcutta, 2004.
8. Dutta DC: Text book of obstetrics / Textbook of gynecology. 5th / 6th Ed, New central book agency (P) ltd, Kolkata, 2003/2004.
9. Basak KS: Essentials of ophthalmology. 3rd Ed, Current books international, Kolkata, 2004.
10. Bhargava KB, Bhargava SK & Shah TM: A short textbook of E.N.T diseases. 7th Ed, Usha publications, Mumbai, 2005.

PHYSIOTHERAPY IN GENERAL MEDICINE AND SURGERY INCLUDING OBG (SUBJECT CODE 1122)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks practical
University Examination: 80 marks Theory, 80 marks practical and Viva – voce

Objectives: The objectives are to develop an understanding about common medical conditions and diseases commonly seen by physiotherapists and their physiotherapeutic treatment including rehabilitation.

Course Outcome:
At the completion of the course students will be able to:

3.3.1	Develop an understanding of the pathophysiology & clinical aspects of common medical & surgical conditions relating to all systems of the body seen in clinical practice
3.3.2	Develop an understanding of the importance & need for common investigations in diagnosing medical & surgical conditions
3.3.3	Develop an understanding of the interpretation of various investigations & integrate the results in the overall management of patients with medical & surgical conditions
3.3.4	Demonstrate common Physiotherapy examination skills relating to medical & surgical conditions
3.3.5	Demonstrate an understanding of the role/importance of Physiotherapy in the management of common medical & surgical conditions including their rehabilitation
3.3.6	Develop an understanding of the pathophysiology & clinical aspects of common OBG conditions seen in clinical practice
3.3.7	Develop an understanding of the importance & need for common investigations in diagnosing OBG conditions
3.3.8	Develop an understanding of the interpretation of various investigations & integrate the results in the overall management of patients with OBG conditions
3.3.9	Demonstrate common Physiotherapy examination skills relating to OBG conditions
3.3.10	Demonstrate an understanding of the role/importance of Physiotherapy in the management of common OBG conditions including their rehabilitation

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. Abdominal Surgeries and Physiotherapy (MUST KNOW)

- Layers of abdominal wall
- Abdominal quadrants
- Types of Incisions and surgeries
- Indications **(GOOD TO KNOW)**
- Complications

2. Burns and Physiotherapy (MUST KNOW)

- Skin anatomy and physiology
- Types
- Classification
- Evaluation
- Hypertrophic scars and keloids
- Scar management
- Splints in burns **(GOOD TO KNOW)**

3. Wounds and Physiotherapy (MUST KNOW)

- Definition
- Types and classification
- Stages **(GOOD TO KNOW)**
- Types of dressings **(GOOD TO KNOW)**
- Evaluation

4. Ulcers and Physiotherapy (MUST KNOW)

- Definition
- Characteristics
- Types
- Evaluation
- Decubitus ulcers-stages and grades
- Diabetic foot and care
- Anesthetic hand and foot care **(GOOD TO KNOW)**

5. Reconstruction surgeries and Physiotherapy (MUST KNOW)

- Principles
- Indications
- Skin grafts and flaps
- Implants in reconstructive surgeries **(NICE TO KNOW)**

6. Surgeries in oncology and Physiotherapy (MUST KNOW)

- Introduction and common symptoms of cancer
- Breast Cancer
- Head and neck cancer
- Lung Cancer
- Oral cavity
- Bone Cancer
- Pre and post-surgical evaluation
- Lymphedema managements
- Palliative care
- Common Physiotherapy approaches

7. Intensive care unit and Physiotherapy (MUST KNOW)

- Evaluation
- Monitoring
- O^2 Therapy
- Basic life support **(GOOD TO KNOW)**
- Invasive and non-invasive ventilation **(GOOD TO KNOW)**
- Nebulization and humidification
- Medical gas therapy **(GOOD TO KNOW)**
- Neonatal **(NICE TO KNOW)** and pediatric intensive care **(GOOD TO KNOW)**

8. Obstetrics and gynecology and Physiotherapy (MUST KNOW)

- Anatomy and physiology of female reproductive system
- Pregnancy and stages of labor
- Musculoskeletal and cardio-respiratory problems in pregnancy **(GOOD TO KNOW)**
- Antenatal, perinatal and post-natal care **(GOOD TO KNOW)**
- Urinary and fecal incontinence **(GOOD TO KNOW)**
- Prolapse uterus and rectum **(NICE TO KNOW)**
- Evaluation in obstetrics and gynecology

9. **Miscellaneous (MUST KNOW)**
   - Physical rehabilitation in patient with edema & obesity
   - Physical rehabilitation in patient with renal dysfunction & diabetes **(GOOD TO KNOW)**
   - Physiotherapy in skin conditions - acne vulgaris, leprosy, psoriasis, vitiligo, alopecia, hyperhidrosis **(GOOD TO KNOW)**

10. **Rehabilitation principles & application in (MUST KNOW)**
    - Hand rehabilitation
    - Geriatric rehabilitation **(GOOD TO KNOW)**
    - Eye Rehabilitation **(NICE TO KNOW)**
    - Ergonomics, accessibility management

11. **Allied therapies**- Magneto therapy, Acupuncture, Naturopathy **(NICE TO KNOW)**

Practical Contents

1. Examination of abdomen **(MUST KNOW)**
2. Assessment of burns, **(MUST KNOW),** Interpretation of burn charts **(NICE TO KNOW)**
3. Examination of wound and ulcer **(MUST KNOW)**
4. Positioning and other physiotherapy techniques **(MUST KNOW)**
5. Exercise testing and prescription **(GOOD TO KNOW)**
6. Obstetric and gynecological assessment and exercise training **(GOOD TO KNOW)**

Suggested Readings

1. Frownfelter D & Dean E: Principles and practice of cardiopulmonary physiotherapy. 2nd Ed, Churchill Livingstone, New York, 1995.
2. Hillegass E & Sadowsky SH: Essentials of cardiopulmonary physical therapy. 2nd Ed, Saunders, Philadelphia, 2001.
3. Pryor JA & Ammani SP: Physiotherapy for respiratory and cardiac problem – Adults and Pediatrics. 4th Ed, Churchill Livingstone, London, 2008.
4. Malone DJ & Lindsay KLB: Physical therapy in acute care – as clinician's guide. 1st Ed, Slack Incorporated, USA, 2006.
5. Balado Donna: Acsm's guidelines for exercise testing and prescription. 6th Ed, Lea Febiger, USA, 1995.
6. Moffet M & Frownfelter D: Cardiovascular / Pulmonary Essentials – Applying the preferred physical therapist patterns. 1st Ed, Slack Incorporated, USA, 2007.
7. Cash JE & Downie P: Cash's text book of chest, heart and vascular disorders for physiotherapists. 1st Ed, Mosby pub, UK, 1987.
8. Cash JE & Downie P: Cash's textbook of general medical and surgical conditions for physiotherapists. Lippincott, Philadelphia, 1984.
9. Glenn Lrion: Comprehensive wound management. 2nd Ed, Slack Incorporated, USA, 2002.
10. Mantle J, Haslan J, Barton S: Physiotherapy in obstetrics and gynecology. 2nd Ed, Butterworth Heinmann, UK, 2004.

PHYSIOTHERAPY IN CARDIO-VASCULAR-THORACIC SURGERY (Subject Code – 1123) (PT in CVTS)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks practical
University Examination: 80 marks Theory, 80 marks practical and Viva – voce

Objectives: The objectives are to develop an understanding about common medical conditions and diseases commonly seen by Physiotherapists and their Physiotherapeutic treatment including rehabilitation.

Course Outcome:
At the completion of the course students will be able to:

3.4.1	Develop an understanding of the basics of exercise, exercise prescription and its therapeutic methods in Cardiovascular and respiratory physiotherapy
3.4.2	Demonstrate an understanding of the basic principles of various assessment and treatment techniques related to Cardiovascular and respiratory Physiotherapy
3.4.3	Demonstrate an understanding of the indications, contraindications and precautions to be taken during Cardiovascular and respiratory Physiotherapy
3.4.4	Demonstrate practical skills of assessment, various exercises and treatment techniques used commonly in Cardiovascular and respiratory Physiotherapy

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. Basics of cardiology (MUST KNOW)
- Common signs and symptoms
- Physical examination /patient evaluation
- ECG and other common laboratory investigations **(GOOD TO KNOW)**
- Exercise stress testing
- Holter monitoring and symptoms **(GOOD TO KNOW)**
- Echocardiography **(NICE TO KNOW)**
- Cardiac radiology **(NICE TO KNOW)**
- Cardiac catheterization **(GOOD TO KNOW)**

2. Basics of pulmonology (MUST KNOW)
- Common signs and symptoms
- Physical examination /patient evaluation
- PFTs and other laboratory investigations
- Bronchoscopy **(GOOD TO KNOW)**
- Pulmonary radiography **(GOOD TO KNOW)**
- Other diagnostic procedures **(NICE TO KNOW)**

3. Angiology (MUST KNOW)
- Common signs and symptoms
- Physical examination / patient evaluation

- Invasive and noninvasive investigations **(GOOD TO KNOW)**

4. Cardiac diseases and Physiotherapy (MUST KNOW)

- Rheumatic heart disease
- Heart failure
- Diseases of pericardium **(GOOD TO KNOW)**
- Ischemic heart disease
- Myocardial infarction
- Hypertension & hypotension
- Cardiac arrhythmias
- Cardiac emergencies **(NICE TO KNOW)**

5. Respiratory diseases and Physiotherapy (MUST KNOW)

- Diseases of nose, pharynx and larynx **(GOOD TO KNOW)**
- Bronchitis and bronchiolitis
- Bronchiectasis
- Bronchial asthma
- Chronic obstructive pulmonary disease
- Pneumonias
- Pulmonary tuberculosis
- Cystic fibrosis
- Atelectasis
- Occupational lung disorders **(GOOD TO KNOW)**
- Lung cancer
- Disorders of ventilation
- Disorders of pleura, mediastinum and diaphragm
- Respiratory failure **(GOOD TO KNOW)**
- Congenital anomalies **(NICE TO KNOW)**

6. Diseases of vascular system and Physiotherapy (MUST KNOW)

- Atherosclerosis
- Diseases of veins
- Diseases of arteries
- Diseases of aorta
- Pulmonary hypertension **(NICE TO KNOW)**
- Pulmonary embolism **(NICE TO KNOW)**

7. Exercise and cardio-vascular & respiratory System

- Effects of aerobic exercises on cardio-vascular and respiratory system **(MUST KNOW)**
- Age related changes in cardio- vascular and respiratory system **(GOOD TO KNOW)**
- Beneficial effects of aerobic exercises in patients with coronary artery disease **(MUST KNOW)**
- Oxygen debt **(GOOD TO KNOW)**
- Athlete heart **(GOOD TO KNOW)**

8. Pharmacology

- Drug therapy for common cardio- vascular disorders **(GOOD TO KNOW)**
- Drug therapy for common respiratory disorders **(NICE TO KNOW)**
- Drugs used in aerosol therapy **(MUST KNOW)**

9. Cardiac rehabilitation program (MUST KNOW)

- Definition
- Structure
- Introduction **(GOOD TO KNOW)**
- History **(NICE TO KNOW)**

- Stratification of risk factors **(NICE TO KNOW)**
- Program planning and implementation
- Exercise prescription

10. Pulmonary rehabilitation program (MUST KNOW)
- History **(NICE TO KNOW)**
- Definition
- Components program planning and implementation **(GOOD TO KNOW)**
- Exercise prescription
- Breathing re-education
- Principles of lung expansion therapy
- Principles of airway clearance therapy

11. Exercise testing protocols/ tests (MUST KNOW)
- Definition
- Indications
- Common protocols used in adults
- Common protocols used in pediatrics
- Anaerobic testing **(GOOD TO KNOW)**
- Bicycle ergometry **(NICE TO KNOW)**

12. Thoracic surgeries and Physiotherapy (MUST KNOW)
- Anatomy of thoracic cage **(GOOD TO KNOW)**
  - Incisions
  - Indications
  - Complications
  - Chest wall surgeries
  - Lung transplant
  - Types and care of drains
  - Pre and post-surgery evaluation
  - Pulmonary rehabilitation

13. Cardiac surgeries and Physiotherapy (MUST KNOW)
- Anatomy of heart and great vessels **(GOOD TO KNOW)**
  - Incisions
  - Surgeries in congenital heart diseases
- On pump and off pump surgeries **(GOOD TO KNOW)**
  - Pacemakers **(NICE TO KNOW)**
  - Valvular surgeries **(NICE TO KNOW)**
  - CABG
  - Heart transplantation
- Pre and post-surgical evaluation **(GOOD TO KNOW)**
  - Cardiac rehabilitation

14. Vascular surgeries and Physiotherapy (MUST KNOW)
- Anatomy of the vascular system **(GOOD TO KNOW)**
- Surgeries in arterial disorders
- Surgeries in lymphatic disorders
- Surgeries in venous disorders
- Pre and post-surgical evaluation

15. Miscellaneous (MUST KNOW)
- Physiotherapy for neonate and child with respiratory dysfunction
- Pulmonary rehabilitation of a patient with spinal cord injury

- Physiotherapy of a ventilator dependent patient

Practical Contents

MUST KNOW

- Pre and post-surgical evaluation of cardiac and pulmonary systems
- Investigations and their interpretation: Chest x-ray, ECG, PFTs, ABG
- AMBU
- Aerosol therapy
- Suctioning apparatus
- Positioning and other Chest Physiotherapy techniques
- Exercise testing and prescription

GOOD TO KNOW

- Equipment used in ICU: Artificial airways
- Mechanical ventilators
- CPAP, BiPAP, drains
- Catheters
- Lines, Pacemakers
- IABP

NICE TO KNOW

- Pulse oxymetry

Suggested Readings

1. Frownfelter D & Dean E: Principles and practice of cardiopulmonary physiotherapy. 2nd Ed, Churchill Livingstone, New York, 1995.
2. Hillegass E & Sadowsky SH: Essentials of cardiopulmonary physical therapy. 2nd Ed, Saunders, Philadelphia, 2001.
3. Pryor JA & Ammani SP: Physiotherapy for respiratory and cardiac problem – Adults and Pediatrics. 4th Ed, Churchill Livingstone, London, 2008.
4. Malone DJ & Lindsay KLB: Physical therapy in acute care – as clinician‘s guide. 1st Ed, Slack Incorporated, USA, 2006.
5. Balado Donna: Acsm‘s guidelines for exercise testing and prescription. 6th Ed, Lea Febiger, USA, 1995.
6. Moffet M & Frownfelter D: Cardiovascular / Pulmonary Essentials – Applying the preferred physical therapist patterns. 1st Ed, Slack Incorporated, USA, 2007.
7. Cash JE & Downie P: Cash‘s text book of chest, heart and vascular disorders for physiotherapists. 1st Ed, Mosby pub, UK, 1987.
8. Cash JE & Downie P: Cash‘s textbook of general medical and surgical conditions for physiotherapists. Lippincott, Philadelphia, 1984.
9. Glenn Lrion: Comprehensive wound management. 2nd Ed, Slack Incorporated, USA, 2002.
10. Mantle J, Haslan J, Barton S: Physiotherapy in obstetrics and gynecology. 2nd Ed, Butterworth Heinmann, UK, 2004.

RESEARCH METHODOLOGY AND ETHICS, EVIDENCE BASED PHYSIOTHERAPY (SUBJECT CODE: 1124)

Teaching Hours: 70 hours (Theory: 70 hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examination.
Internal Examination: 20 marks Theory University Examination: 80 marks Theory

Objectives: On successful completion of this unit, it is expected that students will be able to understand basic research methodology and ethics in physiotherapy. The objectives are to develop an understanding about evidence based physiotherapy and its applications.

Course Outcome:
At the completion of the course students will be able to:

3.5.1	Develop an understanding of the basic concepts of research methodology & basic biostatistics
3.5.2	Develop an understanding of the application of research methodology principles to Physiotherapy research
3.5.3	Develop an understanding of the historical aspects & basic concepts of research & Human ethics
3.5.4	Develop an understanding of the importance & application of ethical principles in Physiotherapy research & clinical practice
3.5.5	Develop an understanding of the basic concepts of evidence based practice & its role/importance in Physiotherapy research & clinical practice

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

I. RESEARCH METHODOLOGY

1. Basic concepts (MUST KNOW)

- Meaning and definition
- Research process **(GOOD TO KNOW)**
- Research types and approaches
- Objectives of research in physiotherapy
- Barriers for research in physiotherapy **(NICE TO KNOW)**
- Research problem or research question **(GOOD TO KNOW)**

2. Research ethics (MUST KNOW)

- Introduction
- Helsinki's declaration **(GOOD TO KNOW)**
- Plagiarism **(GOOD TO KNOW)**

3. Literature search (MUST KNOW)

- Steps in literature search
- Purpose
- Methods and techniques **(GOOD TO KNOW)**

4. Research designs (MUST KNOW)

- Meaning and definition
- Types of research designs
- Steps in preparation of research designs
- Factors affecting research designs

5. Sampling (GOOD TO KNOW)

- Principles
- Methods
- Designs
- Process

6. Research variables (GOOD TO KNOW)

- Introduction
- Types
- Reliability and validity
- Specificity and sensitivity

7. Pilot study and pre-testing (NICE TO KNOW)

- Need
- Advantages

8. Data collection (MUST KNOW)

- Introduction
- Sources
- Methods
- Types

9. Biostatistics (MUST KNOW)

- Introduction of biostatistics (tabulation, graphical presentation)
- Measures of central tendency, variation, location, association and correlation for qualitative and quantitative data, bivariate distribution.
- Probability theory, normal, binomial and Poisson distributions
- Sampling methods and sample size estimation
- Simple regression analysis, Multivariate analysis; concepts and interpretation, Logistic regression analysis; concepts and interpretation
- Concepts in generalization of statistics computed from a sample and their utilities in research, including tests for significance.

10. Research report (NICE TO KNOW)

- Introduction
- Types
- Publication

II. ETHICS

- Introduction, History & General Principles of ethics involving human participants **(NICE TO KNOW)**
- Ethical consideration in physiotherapy practice- State, National & international rules & regulations governing physiotherapy practice **(GOOD TO KNOW)**
- Informed consent process **(MUST KNOW)**
- Good clinical practices (GCP) **(MUST KNOW)**
- Ethical codes and conduct for physiotherapy profession**(GOOD TO KNOW)**
- Influence of values & valuing on patient care **(NICE TO KNOW)**
- Documentation skills- History, examination, treatment planning, organization & execution **(NICE TO KNOW)**

III. EVIDENCE BASED PHYSIOTHERAPY

1. Introduction to Evidence Based Practice: **(GOOD TO KNOW)**

- Definition
- Development of Evidence based knowledge **(NICE TO KNOW)**
- Evidence Based Physiotherapy Practice **(MUST KNOW)**

- Evidence Based Practitioner: The Reflective Practitioner, The E Model, Using the E Model **(GOOD TO KNOW)**
- Concepts of Evidence based Physiotherapy: Awareness, Consultation, Judgment, Creativity **(GOOD TO KNOW)**

2. Finding the Evidence (MUST KNOW)

- Measuring outcomes in Evidence Based Practice
- Measuring Health Outcomes
- Measuring clinical outcomes **(GOOD TO KNOW)**
- Inferential statistics and Causation **(NICE TO KNOW)**

3. Searching for the Evidence (MUST KNOW)

- Different sources of evidence ,Electronic **(GOOD TO KNOW)**
- Bibliographic databases **(NICE TO KNOW)**
- World Wide Web **(NICE TO KNOW)**
- Literature search**(MUST KNOW)**

3. Assessing the Evidence (MUST KNOW)

- Evaluating the evidence
- Levels of evidence in research using quantitative methods
- Levels of evidence classification system
- critical review of research using qualitative methods

4. Reviewing the evidence (GOOD TO KNOW)

- Stages of systematic reviews **(GOOD TO KNOW)**
- Meta-analysis **(NICE TO KNOW)**
- The Cochrane collaboration **(NICE TO KNOW)**

5. Economic evaluation of the evidence (GOOD TO KNOW)

Types of economic evaluation
Conducting economic evaluation

- Critically reviewing economic evaluation
- Locating economic evaluation in the literature

6. Practice guidelines: **(NICE TO KNOW)**

- Recent trends in health care
- Clinical Practice Guidelines (CPG)
- Communicating evidence to clients, managers and funders

7. Research dissemination and transfer of knowledge (NICE TO KNOW)

Suggested Readings

1. Jenkins, S., Price CJ, & Straker L. (1998). The researching therapist. A practical guide to planning, performing and communicating research. Edinburgh: Churchill Livingstone.
2. Domholdt, E. (2000) Physical therapy research: Principles and applications, 2nd ed. WB Saunders, Philadelphia, USA.
3. American physical therapy association: Guide to physical therapy practice, 2nd edition 2001.
4. Professionalism in physical therapy: History, practice and development by Laura Lee Swisher and Catherine G.Page,(Elsevier publication 2005)

5. Handbook of Research Method – Sproull, Screcrow Press, 1998.
6. Elements of Research in Physical Therapy, Currier D. P, Williams & Wilkins, Baltimore, 1990, Ed 3.
7. Effective documentation for physical therapy professionals by Eric shamus & Debra(McGraw Hill company 2004).
8. Carolyn Hicks: Research for physiotherapists: project design and analysis, 2 Ed, Churchill Livingstone, New York, 1995.
9. Thomas JR, Nelson JK: Research Methods in Physical Activity. 4th Ed, Human Kinetics, New Zealand, 2001.
10. Evidence-Based Practice in Nursing and Health Care: A Guide to Best Practice ,by Bernadette
11. Melnyk (Editor), Ellen Fineout-Overholt (Editor)
12. Evidence-Based Rehabilitation: A Guide to Practice,by Mary Law
13. Achieving Evidence-Based Practice, by Susan Hamer, BA, MA, RGN, FETC(DIST),
14. The Evidence-Based, Randy A Haye

COMMUNITY MEDICINE (SUBJECT CODE: 1125)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examinations
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

Objective: The objectives are to develop an understanding about various community health problems commonly referred for physiotherapy treatment.

Course Outcome:

At the completion of the course students will be able to:

3.6.1	Develop an understanding of the concepts of health & disease & factors influencing it at community level
3.6.2	Develop an understanding of the concepts of healthcare delivery systems , their levels & health education at community level
3.6.3	Develop an understanding of the importance, role & levels of disease prevention of in the community
3.6.4	Develop a basic understanding of the role of Physiotherapist/medical personnel in disaster management, hospital waste management & public-private partnership
3.6.5	Demonstrate an understanding of the role of Physiotherapist in the promotion of health, disease prevention & health education in the community
3.6.6	Develop a basic understanding of the common health conditions requiring rehabilitation in the community & the role of Physiotherapist in providing the same

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

MUST KNOW

1. Concept of health and disease

- Introduction
- Dimensions and indicators of health
- Concept of well-being
- Determinants of health
- Natural history of disease
- Disease control and prevention
- Modes of intervention

2. Principle of epidemiology and epidemiological methods

- Aims of epidemiology
- Measurement of mortality and morbidity
- Epidemiological methods
- Descriptive, analytical and Experimental studies
- Uses of Epidemiology
- Disease transmission
- Immunity and immunizing agents
- Disinfection

3. Epidemiology of communicable diseases

- Respiratory infections, intestinal infections
- Arthropod-borne infections, zoonoses, surface infections
- Hospital acquired infections
- Emerging and reemerging diseases

4. Screening for diseases

- Concept of screening
- Sensitivity and Specificity
- Uses of screening

5. Epidemiology of non-communicable diseases and conditions

- Principles, methods & uses
- Modes of disease transmission
- Host defenses and immunizing agents
- Hazards of immunization
- Disease prevention and control
- Disinfection
- Chronic non-communicable diseases **(CHD, DM, HTN, RTA, Cancers, Blindness)**

6. Health education

- Aims and objectives
- Approaches to health education
- Models of health education
- Contents of health education
- Principles of health education
- Practice of health education
- Principles & process of communication
- Methods & tools of health education, role of profession in health education

7. Nutrition and health

- Classification of foods
- Nutritional profiles of principal foods
- Nutritional problems in public health-PEM Nutritional Anaemia Vitamin A deficiency and Goitre
- Food fortification and food adulteration
- Nutritional assessment
- Community nutrition programs

8. Environment and health

- Concept of Environment and health
- Components of environment
- Water and air pollution and public health
- Noise Pollution, Radiation
- Disposal of waste – Refuse, Sewage, Sullage
- Medical entomology, Integrated Vector control

9. Occupational health

- Occupational environment
- Occupational hazards
- Occupational diseases – Pneumoconiosis, Lead poisoning, Cancers
- Prevention of occupational diseases–Medical, Engineering and Legislative measures(Nice to know)

10. Mental Health (Good to Know)

- Mentally healthy person
- Types of mental illness
- Causes of mental ill health
- Prevention
- Mental health services
- Alcohol and drug dependence

11. Preventive medicine in obstetrics, pediatrics & geriatrics

- Antenatal, intra natal and post natal care, IMR, MMR, Under five clinic
- Care of children
- Child health problems
- Social welfare programs for women and children (Good to know)
- Geriatric health problems

12. Public health administration (Nice to Know)

- National level health programs
- National leprosy eradication program
- **RNTCP**
- National AIDS control program
- Universal immunization program
- National cancer control program
- National mental health program
- National Programme For Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke(NPCDCS)

13. Disaster management

- Natural and man-made disasters
- Disaster Cycle
- Rehabilitation
- Agencies for disaster control & management

14. Public-private partnership (Good to Know)

- Introduction
- Agencies
- Need & importance

15. Hospital waste management

16. Demography and family planning

- Demography cycle
- Contraceptive methods
- Spacing and Terminal methods

Practical Contents

1. History taking
2. Field visit in community, PHC & SC
3. Surveys for diseases and disorders
4. Screening and examination
5. Observation of medical interventions in community

Suggested Readings

1. Park K: Park's textbook of preventive and social medicine. 24th Ed, M/s Banarasidas Bhanot, Jabalpur, 2017.
2. Rothman J, Levine R: Reventive practice – Strategies for physical therapy and occupational therapy. 1st Ed, W.B.Saunders Co, 1992.
3. Matzen RN, Lang RS: Clinical preventive medicine. 1st Ed, Mosby, Missouri, 1993.
4. Abramson JH, Abramson ZH: Survey methods in community medicine. 5th Ed, Churchill Livingstone, Edinburgh, 1999.

5. Jekel JF, Katz DL, Elmore JG: Epidemiology, Biostatistics and Preventive Medicine, 2nd Ed, Saunders, Philadelphia, 2001.
6. Rao SB: Principles of community medicine. 4th Ed, AITBS Publishers & distributors, New Delhi, 2005.
7. Rahim A: Principles and practice of community medicine. 1st Ed, Jaypee brothers, New Delhi. 2008.
8. Pruthvish S: Community based rehabilitation of persons with disabilities. 1st Ed, Jaypee brothers, New Delhi, 2006.
9. Gupta MC & Mahajan BK: Textbook of preventive and social medicine. 3rd Ed, Jaypee Brothers, New Delhi, 2003.
10. Gupta P &Ghai OP: Text book of preventive and social medicine. 2nd Ed, CBS Publishers and distributors, New Delhi, 2007.
11. *Textbook of Community Medicine*, 2nd Edition. Authors: *Dr Sunder Lal Dr Adarsh* and *Dr Pankaj*. Publisher: CBS Publishers and Distributors, New Delhi, 2017.

Section-VIII- D

FOURTH YEAR BPT (BPT IV) SUBJECTS AND COURSE CONTENTS

CLINICAL ORTHOPEDICS (SUBJECT CODE: 1128)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 150 marks (100 marks for theory and 50 marks for practical & Viva-voce)
Assessment: Written, Oral & Practical, Internal and University examination
Internal Examination: 20 marks Theory, 10 marks Practical
University Examination: 80 marks Theory 40 marks practical

Objective: The objectives are to develop an understanding about various orthopedic conditions commonly referred for physiotherapy treatment.

Course Outcome:
At the completion of the course students will be able to:

4.1.1	Develop an understanding of the pathophysiology & clinical aspects of common

	musculoskeletal conditions in clinical practice
4.1.2	Develop an understanding of the importance & need for common investigations in musculoskeletal conditions
4.1.3	Develop an understanding of the interpretation of various investigations & integrate the results in the overall management of patients with musculoskeletal disorders
4.1.4	Demonstrate common clinical examination skills relating to musculoskeletal conditions
4.1.5	Demonstrate an understanding of the role/importance of Physiotherapy in the management of various musculoskeletal conditions

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. Fundamental concepts

- History of orthopedics
- Causes of injuries
- Classification of injuries
- Fracture biomechanics
- Soft tissue healing
- Fracture healing

2. Soft tissue injuries

- Overview
- Types
- Soft tissue injuries of extremities
- Investigations
- Management

3. Fractures and dislocations

- Introduction
- Fractures & dislocations of upper extremity
- Fractures & dislocations of lower extremity
- Fractures & dislocations of spine
- Investigations
- Orthopedic management

4. Low back pain and neck pain

- Introduction
- Causes
- Types
- Disorders
- Investigations
- Management

5. Arthritic disorders

- Introduction
- Types
- Osteoarthritis & rheumatoid arthritis
- Spondyloarthropathies
- Hemophilic arthritis & charcot's joint

- Gout and psoriatic arthritis
- Investigations
- Management

6. Deformities

- Congenital & acquired deformities
- Congenital malformations
- Extremity deformities
- Spinal deformities
- Management

7. Infective diseases of bones and joints

- Introduction
- Causes
- Clinical features
- Types
- Investigations
- Management

8. Metabolic bone diseases

- Rickets & osteomalacia
- Osteopenia &. osteoporosis
- Investigations
- Management

9. Neuromuscular disorders

- Cerebral palsy
- Poliomyelitis
- Spinal dysraphism
- Leprosy
- Investigations
- Surgical management

10. Sports injuries

- Introduction
- Types
- Investigations
- Management

11. Bone Tumors

- Introduction
- Classification
- Types
- Clinical features
- Investigations
- Surgical management

12. Surgical procedures

- Amputations
- Illizarov
- Arthrodesis
- Arthroplaty

Practical Contents

1. History taking
2. Physical examination of patient
3. Clinical demonstrations
4. Diagnosis
5. Observation of surgeries

Suggested Readings

1. Terry SC: Campbell's operative orthopedics. Vol 1,2,3,4, 10th Ed, Mosby, Philadelphia, 2003.
2. Magee DJ: Orthopedic Physical Assessment. 4th Ed, W.B.Saunders & Co, Philadelphia, 2003.
3. Craig EV: Clinical Orthopedics. 1st Ed, Lippincott Williams & Wilkins, Philadelphia, 1999.
4. Weinstein SL, Buckwalter JA: Turek's orthopedics principles and their applications. 5th Ed, J.B.Lippincott Co, Philadelphia, 1994.
5. Hertling D & Kessler RM: Management of common musculoskeletal disorders. 3rd Ed, Lippincott Willams & Wilkins, Philadelphia, 1996.
6. Norris Christopher: Sports Injuries – Diagnosis and management. 3rd Ed, Butterworth Heinmann, Edinburgh, 2004.
7. Ebnazer John: Essentials of orthopedics for physiotherapists. 1st Ed, Jaypee brothers, New Delhi, 2003.
8. Maheshwari J: Essential Orthopedics. 3rd Ed, Mehta Publishers, New Delhi, 2005.
9. Natarajan M & Mayilrahanan N: Natarajan's textbook of orthopedics & traumatology. 4th Ed, M.N.Orthopedic hospital, Chennai, 1994.
10. Pandey S & Pandey AK: Clinical orthopedics Diagnosis. 2nd Ed, Jaypee brothers, New Delhi, 2000.

NEUROLOGY & NEUROSURGERY (SUBJECT CODE: 1129)

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)
Maximum Marks: 100 (Theory: 100)
Assessment: Written, Internal and University examination.
Internal Examination: 20 marks Theory
University Examination: 80 marks Theory

NEUROLOGY (PART – A)

Teaching Hours: 100 hours (Theory: 50 hours and Practical: 50hours)
Maximum Marks: 50 (Theory: 50)
Assessment: Written, Internal and University examination.
Internal Examination: 10 marks Theory
University Examination: 40 marks Theory

Objective: The objectives are to develop an understanding about various neurological and neurosurgical conditions commonly referred for physiotherapy treatment.

Course Outcome:
At the completion of the course students will be able to:

4.2.1	Develop an understanding of the pathophysiology & clinical aspects of common neurological & neurosurgical conditions in clinical practice
4.2.2	Develop an understanding of the importance & need for common investigations in neurological conditions
4.2.3	Develop an understanding of the interpretation of various investigations & integrate the results in the overall management of patients with neurological & neurosurgical conditions
4.2.4	Develop an understanding of & demonstrate common clinical examination skills relating

	to neurological conditions
4.2.5	Demonstrate an understanding of the role/importance of Physiotherapy in the management of various neurological & neurosurgical conditions

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

Theory Contents

1. Neurological disorders

- Evaluation **(MUST KNOW)**
- Electro diagnostic tests **(NICE TO KNOW)**

Defination, causes, clinical features, common investigations and medical management (Classification wherever applicable)

2. Peripheral nerve disorders (MUST KNOW)

- Peripheral nerve injuries
- Neuropathies
- Neuritis **(NICE TO KNOW)**
- Gullain Barrie Syndrome

3.CRANIAL NERVE DISORDERS

- Facial Palsy
- Trigeminal Neuralgia
- Hansen's disease **(GOOD TO KNOW)**

4.Autonomic disorders (MUST KNOW)

- Dysautonomia
- Reflex sympathetic dystrophy

5.Movement disorders (MUST KNOW)

- Parkinson's disease
- Ataxia
- Dystonia **(GOOD TO KNOW)**
- Hemiballismus
- Chorea
- Athetosis

6.Neuromuscular disorders

- Myopathies**(MUST KNOW)**
- Muscular dystrophy **(MUST KNOW)**
- Myasthenia gravis **(MUST KNOW)**
- Spinal muscular atrophy **(GOOD TO KNOW)**
- Myotonia **(GOOD TO KNOW)**
- Eaton-Lambert syndrome **(NICE TO KNOW)**
- Botulism **(NICE TO KNOW)**

7.Infective diseases of brain and spinal cord

- Meningitis,encephalitis **(MUST KNOW)**
- AIDS,brucellosis **(NICE TO KNOW)**

8.Specific conditions

- Cerebrovascular disorders **(MUST KNOW)**
- Motor neuron disorders **(MUST KNOW)**
- Vestibular conditions **(GOOD TO KNOW)**
- Transverse myelitis **(MUST KNOW)**
- Sub acute combined degeneration **(GOOD TO KNOW)**
- Multiple sclerosis **(MUST KNOW)**
- Dementia **(NICE TO KNOW)**

9.Pediatric Neurology (MUST KNOW)

- Congenital disorders
- High risk babies
- Developmental delays
- Cerebral palsy
- Learning disabilities **(GOOD TO KNOW)**
- Poliomyelitis
- Down's syndrome
- ADHD **(GOOD TO KNOW)**
- Autism **(GOOD TO KNOW)**

10.Metabolic disorders (MUST KNOW)

- Classification
- Screening
- West's syndrome
- Wilson's syndrome

NEUROSURGERY (PART–B)

- **Teaching Hours:** 100 hours(Theory: 50 hours and Practical:50 hours)
- **Maximum Marks:** 50 (Theory:50)
- **Assessment:** Written ,Internal and University examination.
- **Internal Examination:** 10 marks Theory
- **University Examination:** 40 marks Theory

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know.

Theory Contents

1. Pre and post surgical assessment and management in neurosurgical conditions.

- Traumatic brain injury
- Spinal cord injury
- Peripheral nerve injuries
- Spina bifida
- Aneurysms
- Syringomyelia
- Hydrocephalus
- Brain tumors andspinal tumors

2. Neurosurgical procedures

- Overview
- Nerve repair and grafting
- Neurovascular surgeries
- Rhizotomies
- Stereotactic surgeries
- Spinal decompression
- Surgeries for cerebral palsy
- Surgeries for poliomyelitis
- Complications

3.Spinal cord pathologies

- Syringomyelia
- Craniovertebral junction anomalies
- Tumours
- Intervertebral disc and nerve root pathologies.

Practical Contents

1. History taking
1. Physical examination of patient
2. Clinical demonstrations
3. Diagnosis
4. Observation of treatment procedures

Suggested Readings

1. Snell RS: Clinical neuroanatomy. 6th Ed, Lippincott Williams and Wilkins, Philadelphia, 2009.
2. Ropper AH & Brown RH: Adams & Victor's principles of neurology. 8th Ed, Mc Graw Hill professional, New York, 2005.
3. Lindsay KW & Bone I: Neurology & Neurosurgery Illustrated. 4th Ed, Churchill Livingstone, Edinburgh, 2004.
4. Fauci AS, Braunwald E, Kasper DL, et al: Harrison's Prinicples of internal medicine. 17th Ed, Mc Graw Hill Professional, Berkshire, UK, 2008.
5. Campbell WW: Dejong's the neurological examination. 6th Ed, Lippincott Williams & Wilkins, Philadelphia, 2005.
6. Shah SN: API textbook of medicine. 7th Ed, Mesh Publishing house pvt Ltd, New Delhi, 2003.
7. Mehta PJ & Golwalla AF: Mehta practical medicine. 16th Ed, The national book depot, Mumbai, 2003.
8. Ghai OP, Gupta P & Paul VK: Ghai essential pediatrics. 6th Ed, CBS Publishers & Distributors, New Delhi, 2005.
9. Patten J: Neurological differential diagnosis. 2nd Ed, Elsevier Science, Ireland, 1997.
10. Ahuja N: Ahuja's a short textbook of psychiatry. 6th Ed, Jaypee Brothers, New Delhi, 1996.

COMMUNITY PHYSIOTHERAPY & REHABILITATION (SUBJECT CODE: PT 1130)

Teaching Hours: 160 hours (Theory: 90 hours and Practical: 70hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examination
Internal Examination: 20 marks Theory and 20 mark practical.
University Examination: 80 marks Theory, 80 marks practical and Viva – voce

NOTE: Regular CBR clinical posting attendance is considered as Practical attendance

Objectives: The objectives are to develop an understanding of theoretical knowledge pertaining to community physiotherapy and rehabilitation.

Course Outcome:
At the completion of the course students will be able to:

4.3.1	Develop an understanding of the concepts of health, healthcare delivery systems & levels & health education at community level
4.3.2	Understand the principles of rehabilitation as applicable to common conditions encountered by Physiotherapists & their application at community level
4.3.3	Describe & demonstrate evaluation of disability at different levels in the community & its importance
4.3.4	Develop an understanding of the legal & ethical provisions for persons with disability & to disseminate the same in the community
4.3.5	Demonstrate an understanding of the government health related policies as applicable to the community
4.3.6	Develop an understanding of the role of Physiotherapist in a multidisciplinary rehabilitation team in the management of common conditions in the community
4.3.7	Develop an understanding of the importance of Physiotherapist in counselling & in achieving functional independence in patients & rehabilitating them back into community
4.3.8	Demonstrate the applicability of exercise & electrotherapeutic skills in the management of various conditions in the community with emphasis on musculoskeletal, neuromuscular, respiratory and cardiovascular system
4.3.9	Demonstrate conduct of health related programs in the community

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

COMMUNITY PHYSIOTHERAPY

1. **Basic concepts (MUST KNOW)**
   - ICF
   - Need for community physiotherapy
   - Holistic approach towards health and disease (GOOD TO KNOW)

2. **Health care delivery systems (MUST KNOW)**
   - Public and private sectors
   - Indigenous systems of medicine **(NICE TO KNOW)**
   - Voluntary health agencies
   - National health programs
   - Non-governmental and governmental organizations **(GOOD TO KNOW)**

3. **Patient evaluation in community (MUST KNOW)**

- Objectives
- Tools
- Screening tests **(GOOD TO KNOW)**
- Multiple system assessment
- Environmental barriers

4. Interventions in community (MUST KNOW)

- Responding in emergency situations **(GOOD TO KNOW)**
- Types of interventions **(GOOD TO KNOW)**
- Referral
- Aids and appliances, prescription, training, maintenance and their substitutes
- Transfers & positioning
- Self-care & skin care **(GOOD TO KNOW)**
- Community resources
- Utilization of assistants & care givers
- Therapeutic recreation **(NICE TO KNOW)**

5. Specific community Physiotherapy & Rehabilitation (MUST KNOW)
For all conditions:
CBR based Assessment & management—MUST KNOW
Environmental barriers—MUST KNOW
Self-care, aids & appliances & utilization of resources—GOOD TO KNOW
Recent advances in management—NICE TO KNOW

- Industrial rehabilitation
- Geriatric rehabilitation
- Pediatric rehabilitation (Cerebral palsy and mental retardation)
- Neuro-rehabilitation (Stroke, Spinal cord injury , Traumatic brain injury, Poliomyelitis)
- Orthopedic rehabilitation (Amputation, Degenerative joint diseases, Postural deformities)
- Cardiac rehabilitation
- Sports rehabilitation
- Cancer rehabilitation
- Obstetrics and gynecology conditions

6. Community Physiotherapy awareness (MUST KNOW)

- Need
- Critical issues **(NICE TO KNOW)**
- Patient and family education
- Models of disability
- Disability prevention
- Means

7. Community based rehabilitation (MUST KNOW)

- Principles
- IBR and CBR
- Funding and accountability **(GOOD TO KNOW)**
- CBR personnel **(GOOD TO KNOW)**
- Multi-professional collaboration **(GOOD TO KNOW)**

- Rural rehabilitation
- Extension services

8. Legislative and ethical issues for persons with disabilities (MUST KNOW)

- PWD Act (1995)and Revised PWD Act (2011 and 2019)
- Health issues
- Financial
- Disability certificate **(GOOD TO KNOW)**
- Provisions and rights
- Acts and policies
-

REHABILITATION

9. Fundamental concepts of rehabilitation (MUST KNOW)

- Objectives
- Team
- Role of professionals
- Approaches, systems, organizations & services
- CBR Matrix

10. Disability, impairment & handicap (MUST KNOW)

- Introduction
- Causes
- Types
- Evaluation
- Prevention

11. Environmental Evaluation(MUST KNOW)

- Introduction
- Environmental Barriers
- Access Audit
- Home modifications
- Work place modifications
- Transport **(GOOD TO KNOW)**
- Living attitudes **(GOOD TO KNOW)**

12. Vocational, social and psychological rehabilitation

Practical Contents

- **Use of ICF format for patient evaluation & management**
- **Field visits to villages/urban areas for conduct of health & disability surveys & awareness programs**
- **Industrial visits (ergonomic evaluation & work hardening) , school visits for screening/evaluation of health problems & conduct awareness programs**
- **Conduct of health awareness programs/camps for general public**
- **Short term health-education related project/s to be undertaken by students in the community (small group)**
- **Planning & designing of splints, assistive devices**
- **Report writing & journal preparation of the activities conducted (Compulsory)**
    - ***Students will be evaluated on the criteria of: Level of interest shown, Preparation & timely conduct of activity, Timely submission of journal, regularity, team work & leadership qualities.***

Marks will be allotted on the criteria of Regularity of work & timely submission (50%) & quality of work done (50%)

- **Points to be included in the journal (considered for evaluation)**
  - **Selection of topic**
  - **Planning the program**
  - **Implementation methods**
  - **Conduct of activity (Date, place, type of program, no. of beneficiaries)**
  - **Outcome of the program**
  - **Difficulties/Challenges faced by the students**
  - **Reflections of the students (total experience of the program)**

Suggested Reading:

1. Park K: Park's textbook of preventive & social medicine. 14th Ed, M/S Banarsidas Bhanot, Jabalpur, India, 1994.
2. Braddom RL: Physical Medicine and Rehabilitation. 3rd Ed, W.B.Saunders, Philadelphia, 2006.
3. Hoeman SP: Rehabilitation / restorative care in the community. 1st Ed, C.V.Mosby Company, St.Louis, 1990.
4. Piyush Gupta O.P.Ghai; T.B. of Preventive & social medicine 2nd edition CBS publishers & distributors 2007.
5. Karan OC, Greenspan S: Community rehabilitation services for people with disabilities. 1sr Ed, Butterworth Heinmann, USA, 1995.
6. Demeter SL, Andersson BJG, Smith GM: Disability evaluation. 1st Ed, Mosby publishers, Missouri, 1996.
7. Compton A, Ashwin H: Community care for health professional. 2nd Ed, Butterworth Heinmann, Cornwall, 2000.
8. Cooper Grant: Essential Physical medicine and rehabilitation. 1st Ed, Human Press Inc, New Jersy, 2000.
9. Curtis Kathleen: The physical therapist's guide to health care. 1st Ed, SLACK incorporated, USA, 1999.
10. Sunder S: Textbook of rehabilitation. 2nd Ed, Jaypee brothers, New Delhi, 2002.

PHYSIOTHERAPY IN ORTHOPEDICS (SUBJECT CODE: PT1131)

Teaching Hours: 180 hours (Theory: 90 hours and Practical: 90hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examinations

Internal Examination: 20 marks Theory and 20 marks practical
University Examination: 80 marks Theory, 80 marks practical and Viva – voce

Objectives: The objectives are to develop an understanding about various orthopedic ailments and sports injuries commonly seen by physiotherapists and their physiotherapeutic treatment including rehabilitation.

Course Outcome:
At the completion of the course students will be able to:

4.4.1	Develop an understanding of the pathophysiology & clinical aspects of various orthopedic/ musculoskeletal/sports conditions seen in clinical practice
4.4.2	Describe the role of Physiotherapy in the management of various orthopedic/ musculoskeletal/sports conditions
4.4.3	Demonstrate clinical examination skills relating to orthopedic/ musculoskeletal/sports conditions seen in clinical practice
4.4.4	Describe the principles of rehabilitation as applied to various orthopedic / musculoskeletal/sports conditions
4.4.5	Develop an understanding of & integrate the results of common investigations in the overall management of patients with orthopedic/ musculoskeletal/sports disorders
4.4.6	Demonstrate the assessment & management of various orthopedic/ musculoskeletal/sports conditions in clinical practice

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

1. Historical aspects NICE TO KNOW
- History of Orthopedics
- History of Orthopedic Physiotherapy
- History of Sports Physiotherapy

2. Fractures and Physiotherapy MUST KNOW
- Fracture healing
- Classifications of fractures
- Clinical assessment of fractures
- Investigations for diagnosis of fractures
- Complications of fractures
- Upper extremity fractures
- Lower extremity fractures
- Spinal fractures

3. Joint instability and Physiotherapy MUST KNOW

- Classification of joint instabilities
- Clinical assessment of instabilities **GOOD TO KNOW**
- Investigations for instabilities
- Instabilities of upper extremity joints
- Instabilities of lower extremity joints
- Spinal instabilities: spondylolisthesis

4. Arthritic disorders and Physiotherapy MUST KNOW

- Types of arthritic disorders
- Clinical assessment of arthritic disorders
- Investigations for arthritic disorders
- Complications of arthritic disorders **GOOD TO KNOW**
- Spondylo-arthropathies: ankylosing spondylosis, cervical and lumbar spondylosis
- Rheumatic disorders: Rheumatoid Arthritis, non-articular, rheumatism
- Degenerative joint disorders: Osteoarthritis, frozen shoulder

5. Soft tissue dysfunctions and Physiotherapy MUST KNOW

- Biomechanical properties of soft tissues **GOOD TO KNOW**
- Soft tissue healing **GOOD TO KNOW**
- Classification of soft tissues dysfunctions
- Clinical assessment of soft tissue dysfunctions
- Investigations for soft tissue dysfunctions
- Soft tissue dysfunctions of upper extremity joints
- Soft tissue dysfunctions of lower extremity joints

6. Manual therapy MUST KNOW

- History of manual therapy **NICE TO KNOW**
- Articular neurology **NICE TO KNOW**
- Principles of manual therapy approaches: Maitland, McKenzie and Mulligan
- Indication and contra indication for manual therapy

7. Sports Physiotherapy MUST KNOW

- Over view of sports including types **GOOD TO KNOW**
- Role of physiotherapist in sports **GOOD TO KNOW**
- Common sports injuries
- Classification of sports injuries
- Sports psychology **NICE TO KNOW**
- Evaluation of sports injuries
- Sports pharmacology **GOOD TO KNOW**
- Physiotherapy management including rehabilitation in sports

8. Surgical procedures and Physiotherapy MUST KNOW

- Amputation and management
- Prosthetic prescription
- Arthrodesis and osteotomy
- Arthroplasty
- Arthroscopy
- Tendon transfers
- Soft tissue release surgeries: tenotomy, myotomy and Z-plasty **GOOD TO KNOW**
- External fixators and internal fixators

9. Deformities and Physiotherapy MUST KNOW

- Torticollis
- Thoracic outlet syndrome
- Pes Cavus, pes planus
- Scoliosis, kyphosis, lordosis

10. Low back pain, neck pain and Physiotherapy MUST KNOW

- Classification of low back pain and neck pain
- Evaluation of low back pain and neck pain
- Prolapse intervertebral disc
- Lumbar cord compression
- Tubercolosis spine
- Sacralization and lumbarization **GOOD TO KNOW**
- Sacroiliac joint dysfunction **GOOD TO KNOW**
- Whiplash injuries
- Fibromyalgia

11. Miscellaneous conditions with Physiotherapy MUST KNOW

- Bone tumors
- Metabolic bone diseases
- Perthe's diseases
- Reflex Sympathetic Dystrophy
- Myositis ossificans

Practical Contents

1. Evaluate/assess status of musculoskeletal structures, soft tissue integrity, muscle **MUST KNOW**
2. Evaluate/assess pain, muscle performance, range of motion, length and girth of body parts, posture, functional mobility and gait with and without equipment **MUST KNOW**
3. Perform structure specific tests (E.g.: ligament, tendon, muscle) **MUST KNOW**
4. Determine client need for orthotic, prosthetic and assistive devices **NICE TO KNOW**
5. Position, move and drape client for effective, comfortable treatment and privacy **GOOD TO KNOW**
6. Identify appropriate outcome measures and barriers to client progress **GOOD TO KNOW**
7. Establish measurable short- and long-term goals for clients **MUST KNOW**
8. Identify precautions and contraindications to treatment **MUST KNOW**
9. Perform therapeutic exercises, taping, mobilization, soft tissue manipulations, neurodynamic release, gait training and prosthetic training **MUST KNOW**
10. Prioritize client's problems and associated treatments **MUST KNOW**

Suggested Readings

1. Hertling D & Kessler RM: Management of common musculoskeletal disorders – Physical therapy principles & methods. 3rd Ed, JB Lippincott JB, Philadelphia, 1996.
2. Magee DJ: Orthopaedic physical assessment. 4th Ed, W.B.Saunders, Philadelphia, 2002.
3. Reid DC: Sports injury assessment and rehabilitation. Churchill Livingstone, New York, 1992.
4. Butler DS: Mobilisation of the nervous system. Churchill Livingstone, Edinburgh, 1991.
5. Donatelli RA & Wooden MJ: Orthopaedic physical therapy. 3rd Ed, Churchill Livingstone, New York, 2001.
6. Downie PA: A Cash's textbook of orthopaedics and rheumatology. Jaypee brothers, New Delhi, 1993.

7. Walker J, Randy Jr: Grieve's Modern Manual Therapy: The vertebral column. 2nd Ed, Churchill Livingstone Inc, New York, 1995.
8. McKenzie R: 7 steps to pain free life: How to rapidly relieve back and neck pain using McKenzie method. 1st Ed, Penguin Group, New York, 2000.
9. Brotzman BS & Wilk K: Clinical orthopedic rehabilitation. 2nd Ed, Mosby, New York, 2003.
10. Hangaveld E & Bank K: Maitland's Peripheral Manipulation. 4th Ed, Elsevier Butterworth Heinmann, Philadelphia, Philadelphia, 2001.

PHYSIOTHERAPY IN PEDIATRICS (SUBJECT CODE-1132)

Teaching Hours: 150 hours (Theory: 80 hours and Practical: 700hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks practical
University Examination: 80 marks Theory, 80 marks practical and viva – voce

Course Outcome:

At the completion of the course students will be able to:

4.5.1	Understand the pathophysiology & clinical aspects of common pediatric conditions encountered by Physiotherapists during day to day practice
4.5.2	Describe the role of Physiotherapist in the management of common pediatric conditions
4.5.3	Demonstrate common clinical examination skills relating to pediatric conditions encountered in day to day practice
4.5.4	Describe the principles of rehabilitation as applied to common pediatric conditions
4.5.5	Integrate the results of common clinical investigations in the overall management of pediatric patients with various disorders
4.5.6	Demonstrate the assessment & management of common pediatric conditions encountered by Physiotherapists during day-to-day practice

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory contents

General Pediatric Physiotherapy MUST KNOW

- Normal growth and development, variations in normal development
- Pediatric Assessment for neurological, cardiac, respiratory and orthopedic conditions
- Developmental assessment scales (Motor, sensory, cognitive, neurological, functional scales used for neonates like Brazelton, TIMP, MAI, NBA, AIMS etc.)
- Developmental delay
- Gait assessment and deviations in children
- Motor control and motor learning

Neonatal Physiotherapy
High risk babies **MUST KNOW**
Equipments, instruments, common procedures in NICU **NICE KNOW**

Pediatric Neurological conditions and Physiotherapy MUST KNOW

- Cerebral palsy
- Spina bifida
- Hydrocephalus
- Learning disabilities
- Meningitis and encephalitis
-

GOOD TO KNOW

- Autism
- ADHD
- Polio **(GOOD TO KNOW)**
- Gullain Barre syndrome
- Brachial plexus injury
- Bell's palsy, congenital facial palsy

Pediatric Orthopedic conditions and Physiotherapy MUST KNOW

- CDH
- CTEV

- Pes Cavus, pes planus
- Scoliosis, kyphosis, lordosis
- Coxa vara, coxa valga
- Genu valgum, genu varum, genu recurvatum
- Torticollis
- Soft tissue injuries in children **(GOOD TO KNOW)**
- Perthe's diseases **(GOOD TO KNOW)**
- Arthrogyphosis multiplex congenita
- Rickets
- Osteogenesis imperfecta **(GOOD TO KNOW)**

Genetic disorders, Inherited muscle disorders and Physiotherapy MUST KNOW

- Spinal muscular atrophy
- Myopathies
- Down's syndrome

Neurosurgeries in children and Physiotherapy

- Surgeries for cerebral palsy (Rhizotomy, Tendon lengthening, osteotomies, arthrodesis) **(MUST KNOW)**
- Surgeries for polio **(NICE TO KNOW)**

Neurological therapies and Physiotherapy

MUST KNOW

- Neurodevelopmental therapy
- ROOD's approach

GOOD TO KNOW

- Phelps, Fay and Vojta approaches
- Modified Constraint induced movement therapy

NICE TO KNOW

- Sensory integration therapy
- Peto's conductive education

Pediatric rehabilitation and Physiotherapy NICE TO KNOW

- Therapeutic tools
- Equipment's
- Aids and appliances

Cardiac conditions in Pediatrics and Physiotherapy MUST KNOW

- Congenital heart diseases
- Rheumatic heart disease
- Valvular disease

Respiratory conditions in Pediatrics and Physiotherapy MUST KNOW

- Childhood asthma
- Respiratory distress syndrome
- Hyaline membrane disease / Bronchopulmonary dysplasia
- Bronchiolitis
- Bronchiectasis
- Meconium aspiration syndrome

- Pneumonia
- Cystic fibrosis
- Congenital diaphragmatic hernia **GOOD TO KNOW**

Metabolic disorders and physiotherapy NICE TO KNOW

- Phenyl ketonuria
- West's syndrome
- Wilson's syndrome
- Leigh's disease
- Angelman's syndrome

Practical Contents MUST KNOW

1. Developmental Assessment- Neurological examination in children & neonates (, Developmental milestones, growth measurements, Motor, sensory, cranial nerves, DTRs, bowel and bladder, balance and co-ordination , posture & gait & function)
2. Evaluation of Primitive reflexes
3. NDT treatment techniques
4. Vojta & Rood's assessment & treatment techniques.
5. Examination and management of various neuro-musculo-skeletal & cardio-respiratory diseases and disorders in children
6. Assessment and management of gait deviations in pediatric disorders
7. Determine the patient need for adaptive and assistive devices & aids and appliances.
8. Various facilitatory & inhibitory techniques used in pediatric disorders
10. Perform mat exercises, PNF, transfer techniques and application of various neurological therapy approaches.

Suggested Readings

1.Tecklin.J.S, Paediatric Physical Therapy, 2nd Edition, NewDelhi, 1994
2. Wilhelm.I.J, Handbook Of Paediatric Physical Therapy, 1st Edition, USA, 1995
3. Eckersley.P.M, Physical Therapy Assessment In Early Infancy. 1st Edition, USA,1993
4. Shepherd.R.B, Elements Of Paediatric Physiotherapy.5th Edition, USA,1993
5.Long.T.M. & Cintas.H.L, Physiotherapy In Paediatrics,3rd Edition, Philidelphia,1995
6. Illingworth.R.S, Physical Therapy For Children.2nd Edition, NewDelhi,2000
7. Jones.H.R. & Bolton.C.F, Paediatric Rehabilitation, 3rd Edition, NewDelhi, 1999
8. Wallace.H.M. & Biehl.R.F, Children With Disabilities, 3rd Edition, Mumbai, 1992
9. Finnie.N.R, Pediatric Physical Therapy, 3rd Edition, USA,1993
10. Tecklin.J.S, Clinical Pediatric Neurology.5th Edition, Philidelphia, 2005
11.Agarwal, Clinical Methods In Pediatric Diagnosis.1st Edition, New-Delhi, 1990
12.O. P Ghai, Ghai Essential Paediatrics.7th Edition, Bangalore, 2009
13.Campbell S K Palisano R J, Physical Therapy For Children, 4th Edition, USA, 2012
14.Agarwal Kn & Agarwal Dk, Pediatric And Neonatology, 1st Edition, New-Delhi, 2014
15.Ebnezar John, Pediatric Orthopedic Problems, 2nd Edition, Bangalore, 2013
16.Agarwal K N, Pediatric And Neonatology, 1st Edition, Bangalore, 2008
17.Campbell, Pediatric Orthopedic Problems, 1st Edition, Bangalore, 2013
18.R B Shepherd, Physiotherapy In Paediatrics.3rd Edition, Usa, 1995
19.Levitt Sophie, Treatment Of Cerebral Palsy And Motor Delay, 2nd Edition, UK, 2005

PHYSIOTHERAPY IN NEUROLOGY AND NEUROSURGERY (SUBJECT CODE: PT1133)

Teaching Hours: 180hours (Theory: 90 hours and Practical: 90hours)
Maximum Marks: 200 (Theory: 100 and Practical and viva 100)
Assessment: Written, Oral and Practical, Internal and University examinations
Internal Examination: 20 marks Theory and 20 marks practical
University Examination: 80 marks Theory, 80 marks practical and viva – voce

Objectives: The objectives are to develop an understanding about various neurological ailments and neuro-surgeries commonly seen by physiotherapists and their physiotherapeutic treatment including rehabilitation.

Course Outcome:
At the completion of the course students will be able to:

4.6.1	Develop an understanding of the pathophysiology and clinical aspects of various neurological and neurosurgical conditions seen in clinical practice
4.6.2	Develop an understanding of and demonstrate the common assessment and clinical examination skills related to neurological and neurosurgical conditions
4.6.3	Develop an understanding of and integrate the results of common clinical investigations in the management of various neurological and neurosurgical conditions
4.6.4	Describe the principles of rehabilitation as applied to various neurological and neurosurgical conditions
4.6.5	Demonstrate an understanding of the role of physiotherapist and demonstrate the management of neurological and neurosurgical conditions in clinical practice

Note: Long question and MCQs should be asked only from "Must Know" and Short Essay and Short Answers from "Must Know" and "Good to Know".
80% of Questions in the university exam will be included from must know content 15% from desirable to know and 5% from nice to know

Theory Contents

Theory Contents

1. **Neurological evaluation MUST KNOW**
   - CNS evaluation – Higher Mental Function, Cranial Nerve Examination, Motor, Sensory, Sensory Motor link, Perceptual, Hand function, Posture, Balance, Coordination, Bowel and bladder, gait, T/C/D, Functional
   - PNS evaluation – Motor, Sensory, Sensory Motor link, Posture, FG test, SD curve, Tinel's Sign, Special tests, Hand function and ADL (UL) , gait and balance (LL)
   - ANS evaluation
   - Neurological gaits–Circumductory, High Stepping, Ataxic, Scissoring, Parkinson's gait **MUST KNOW** ;Waddling, Gluteus Maximus, Trendlenberg, Hand to knee **GOODTOKNOW ;** Equinus, Calcaneal gait **NICE TO KNOW**
   - Electrodiagnostic tests – FG test and SD Curve **MUST KNOW**, EMG and NCV **GOOD TO KNOW,** EP, EEG, Late responses and blink reflex **NICE TO KNOW**
   - Various assessment scales–Cognitive –MMSE, MoCA ; Balance – Berg Balance Scale, POMA ;Functional – FIMS, Barthel Index, Hand Function – Sollerman Hand Function test, 9 Hole Peg test **GOOD TO KNOW**
2. **Acquired disorders and physiotherapy**
   - Meningitis and encephalitis **MUST KNOW**
   - Adult Hydrocephalus **GOOD TO KNOW**
3. **Inherited muscle disorders and physiotherapy MUST KNOW**
   - Muscular dystrophy except Duchenne Muscular Dystrophy
   - Myotonias **GOOD TO KNOW**
4. **Traumatic disorders and physiotherapy MUST KNOW**
   - Traumatic brain injury
   - Spinal cord injury, Spinal decompression
5. **Peripheral and cranial nerve disorders and Physiotherapy MUST KNOW**
   - Nerve injuries- Injury to Brachial Plexus (Erbs, Klumpkey), Sciatic, Tibial and Common Peroneal.
   - Facial palsy, Trigeminal neuralgia
   - Hansen'sdisease
   - Peripheral Neuropathies –Compressive (Carpel Tunnel Syndrome, Tarsal Tunnel Syndrome, Cervical

and Lumbar Radiculopathy), Metabolic, Infective;
Toxic, Chemotherapy Induced, Vascular Origin, Immune Mediated **NICE TO KNOW**

- Nerve Repair and grafting
  NICETOKNOW
- Neuralgia
- Neuritis

6. Hypokinetic disorders and Physiotherapy MUST KNOW

- Parkinson's disorder, Stereotactic surgeries
- Ataxia – Cerebellar, Sensory Ataxia ; Friedreich's Ataxia **GOOD TO KNOW**

7. Hyperkinetic disorders and Physiotherapy NICE TOKNOW

- Dystonia, Hemiballismus, Chorea ,Athetosis

8. Neurovascular disorders and Physiotherapy
MUST KNOW

- Cerebrovascular accidents(stroke), Neurovascular surgeries
  NICETOKNOW
- Hematomyelia
- Aneurysms – Carotid and Vertebral Artery disease, AV Malformation; Berry, Dissecting ,Fusiform **GOOD TO KNOW**

9. Neurodegenerative Disorders MUST KNOW

- Dementia
- Alzheimer's
- Huntington's disease
- Prion Diseases NICE TO KNOW

10. Neuro Oncology MUST KNOW

- Brain Tumors - Oligodendroglial Tumors, Astrocytic Tumors, ,Mixed Gliomas, Ependymal Tumors , Medulloblastomas, Meningeal Tumors **MUST KNOW** ; Pineal Parenchymal Tumors, Germ Cell Tumors **GOOD TO KNOW** ; Craniopharyngioma **NICE TO KNOW**
- Spinal Tumors
- Neurofibromatosis

11. Specific conditions and Physiotherapy MUST KNOW

- Post-polio syndrome
- Multiple sclerosis
- Perceptual disorders
- Neuromuscular junction disorders – Myasthenia Gravis; Eaton Lambert Syndrome **GOOD TO KNOW**
- Motor neuron disorders
- Transverse myelitis
- Syringomyelia
- Vestibular conditions- BPPV ;
  Labyrinthitis, Meniere's disease, Acoustic Neuroma, Ototoxicity **NICE TO KNOW**

- Sub-acute combined degeneration
- Dysphagia

12. Autonomic disorders and Physiotherapy MUST KNOW

- Dysreflexia
- Reflex sympathetic dystrophy
- Postural hypotension **GOOD TO KNOW**

13. Treatment Approaches for Neurological Conditions MUSTKNOW

- Proprioceptive neuromuscular facilitation
- Rood‘s approach
- Muscle re-education approach
- Constraint induced movement therapy
- Functional re-education

GOODTOKNOW

- Bobath approach for adult hemiplegia
- Sensory Rehabilitation

NICETOKNOW

- Brunnstrom‘s Approach

14. Neuro rehabilitation and Physiotherapy

MUST KNOW

- Transfer techniques

GOODTOKNOW

- Indications
- Therapeutic tools
- Equipment
- Aids and appliances

NICETOKNOW

- Objectives
- Team

Practical Contents

1. Examination of CNS, PNS , ANS– Higher Mental Function, Cranial Nerve Examination, Motor, Sensory, Sensory Motor link, Perceptual, Hand function, Posture, Balance, Coordination, Bowel and bladder, gait, T/C/D, Functional
2. PNS evaluation – Motor, Sensory, Sensory Motor link, Posture, FG test, SD curve, Tinel's Sign, Special tests, Hand function and ADL (UL) , gait and balance (LL)
3. ANS evaluation
4. Assessment and management of movement disorders- Parkinson's disease , cerebellar and sensory ataxia.
5. Demonstration of application of FG Test, SDC, Motor Point Stimulation
6. Assessment and management of common neuro-muscular conditions.
7. Assessment and Prescription for assistive devices & aids and appliances in common neurological conditions.
8. Assessment and management of neurological gaits Circumductory, High Stepping, Ataxic, Scissoring, Parkinson's gait ;Waddling, Gluteus Maximus, Trendlenberg, Hand to knee
9. Demonstrate mat exercises, PNF , Roods, functional Reeducation, Muscle Reeducation, Sensory Rehabilitation ,transfer techniques and application of various neurological therapy approaches.
10. Pt Mx of Following Neurological Conditions: Stroke, Spinal Cord Injury, TBI , PNI- Injury to Brachial Plexus (Erbs, Klumpkey), Sciatic, Tibial and Common Peroneal, Facial palsy, Trigeminal neuralgia

Suggested Readings

1. Stokes Maria: Physical management in Neurological rehabilitation–Physiotherapy essentials.2ndEd,Mosby,NewYork,2004.
2. Petty Nicola: Principles of neuromusculoskeletal treatment and management–A guide for therapists.1st Ed, Churchill Livingstone, 2004.
3. Nicola Petty :Neuromusculoskeletal examination and assessment–A handbook for therapists.3rdEd,Churchill Livingstone,2005.
4. O'SullivanSB, SchmitzJT: Physical Rehabilitation,5thEd,F.A.Davis Company,USA,2006.
5. Umphred DA: Neurological rehabilitation.5th Ed, Mosby,New York,2006.
6. CarrJH, Shepherd RB: Neurological Rehabilitation–optimizing motor performance.2ndrevised Ed, Butterworth-Heinemann, Oxford,1998.
7. Downie PA: Cash's Textbook of Neurology for Physiotherapists .Jaypee brothers,NewDelhi,1993.
8. Shepherd RB: Physiotherapy in Pediatrics.3rdEd, Butterworth-Heinemann,Oxford,1995.
9. Tecklin JS :Pediatric Physical Therapy.4threv Ed,Lippincott Williams and Wilkins,USA,2007.
10. BromleyIda: Tetraplegia and paraplegia–A guide for physiotherapists. 6th Ed , Churchill Livingstone, Philadelphia,2006.

STRUCTURED INTERNSHIP PROGRAM

Sl No	Posting		Duration	Skill to be learnt
1.	Neuro-Physiotherapy OPD, Neuro-medicine & Neurosurgery Wards	Neuro-Physiotherapy OPD	1 week	Documentation of therapy process. Practices PNF, Functional reeducation, Electrical stimulation, Motor relearning, CIMT, NDT, Vojta Home program, Counseling and education to patient family Interpretation of MRI, CT Scan, and electro- diagnostic investigations Uses all assessment tools and scales related to Neuro- physiotherapy. Prescription and training for aids and appliances needed by the patients.
		Neuro-medicine & Neurosurgery wards/ Trauma Care & Emergency Care	1 week	Practices Movement therapy, RIMP, RIP, MFR, Emergency care, Mental imagery, Mirror therapy, MIME therapy, Facilitation and inhabitation therapy
		ICU	1 week	Suctioning, AMBUing, Management of Ventilated patients, Interpretation of investigations such as ECG, ABG, ECHO, Chest radiograph, Arousal therapy, Facilitation therapy
		Day Care Center	1 week	Assessment & Physiotherapy management of Inmates as per need. Case wise management.
2.	Orthopedic Physiotherapy OPD, Wards	Orthopedic Physiotherapy Wards	10 days	Assessment, diagnosis & Physiotherapy management skills for various conditions, Initiation of rehabilitation protocol for different conditions, Mobilization techniques based on the grades, Prescribing home exercise program, Interpretation of investigations like Radiographs, MRI, CT scan
		Physiotherapy OPD	10 days	Use of different electrical & exercise therapy modalities, Use of different techniques of

				management, Differential diagnosis of various conditions, Home exercise program
		Fitness Room	10 days	Fitness testing & training
3.	Pediatric Physiotherapy OPD & Wards	Pediatric Physiotherapy OPD	1 week	Early intervention programs, Assessment & management of various Pediatric conditions, Use of common therapeutic approaches for management (NDT, SI, CIMT,PRE) Home exercise program prescription, Parent counseling
		Pediatric Physiotherapy Wards	1 week	Assessment & management of various Pediatric conditions, Use of common therapeutic approaches for management, Home exercise program prescription
		NICU/ PICU	1 week	Early intervention programs, Management of high risk babies, Management of critical infants
		Special Schools	1 week	Assessment & Physiotherapy management of children with special needs
4.	Chest Physiotherapy OPD & Wards including ICU/ICCU/MICU	ICU/ICCU/ ITU/MICU	1 week	Suctioning, AMBUing, Management of Ventilated patients, Interpretation of investigations such as ECG, ABG, ECHO, Chest radiograph
		Post -operative Cardiac wards/ Cardiac Rehabilitation Center	1 week	Initiation of Phase 1 Cardiac Rehabilitation, Performance of 6 minute Walk Test, Risk Stratification, Exercise Prescription
		Respiratory Medicine Wards	1 week	Use of Airway Clearance techniques & devices, Initiation of Pulmonary Rehabilitation Program, Interpretation of Investigations
		Oncology Wards	1 week	Initiation of Cancer Rehabilitation, Knowledge of various grafts, flaps & other surgical interventions
5.	Medicine, Surgery & OBG Wards, Artificial Limb Center(ALC)	Medicine Wards	1 week	Identification of clinical signs, symptoms of various medical conditions Physiotherapy management of medical conditions
		Surgery Wards	1 week	Identification of clinical signs, symptoms of various surgical conditions Identification of various incisions & Physiotherapy management of surgical conditions
		OBG Physiotherapy OPD &Wards	1 week	Antenatal& Postnatal Assessment & Physiotherapy management

		ALC	1 week	Materials, Indications, Types of orthosis & prosthesis, Negative cast, Check out of orthosis & prosthesis
6.	CBR/ Peripheral Centers	Geriatric Physiotherapy OPD/ Wards	1 week	Fall assessment & management, Assessment of common problems of Geriatric patients & their Physiotherapy management
		Satellite Center	1 week	Assessment & Physiotherapy management of common problems, Differential diagnosis of various conditions, Use of common electrotherapy & exercise therapy modalities for management, Home exercise program
		Primary Health Center	1 week	Assessment & Physiotherapy management of common problems Differential diagnosis of various conditions, Use of common electrotherapy & exercise therapy modalities for management, Home exercise program
		Old Age Home	1 week	Assessment & Physiotherapy management of common problems