KRISHNA VISHWA VIDYAPEETH, "DEEMED TO BE UNIVERSITY", KARAD

KRISHNA COLLEGE OF PHYSIOTHERAPY, KARAD

Syllabus

BACHELOR OF PHYSIOTHERAPY

(B. P. T) 3101

Year of revision: 2022-23

Year of implementation: 2023-24

COURSE STRUCTURE FOR BACHELOR OF PHYSIOTHERAPY

SEMESTER I

	Course code	Subject	Hours		Credits		Evaluation pattern					
							Written		Total	Practical		Total
			Theory	Practical	Theory	Practical	IA	Final exam	Final exam	IA	Final exam	Final exam
CGPA CORE COURSES												
CGPA	3101-11	Human Anatomy Part I	90	48	6	2	10	40	50	10	40	50
	3101-12	Human Physiology Part I	90	34	6	1	10	40	50	10	40	50
	3101-13	Biochemistry Part I	31	-	2	-	10	40	50	-	-	-
	3101-14	Fundamentals of Exercise Therapy Part I	53	76	4	3	10	40	50	10	40	50
	3101-15	Fundamentals of Electro Therapy Part I	50	70	3	2	10	40	50	10	40	50
		Total	**314**	**228**	**21**	**8**	**50**	**200**	**250**	**40**	**160**	**200**

NON CGPA ELECTIVE COURSES (any one)									
	Course code	**Subject**	**Hours**		**Credits**		**Evaluation pattern**		
			Theory	**Practical**	**Theory**	**Practical**	**Written**		
							Internal exam	**Total**	**Credit**
NON CGPA	3101-EL16	Yoga	15	30	1	1	25	25	2
	3101-EL17	Aquatic therapy	15	30	1	1	25	25	
	3101-EL18	Communication skills	15	30	1	1	25	25	
	3101-EL19	Leadership qualities	15	30	1	1	25	25	

SEMESTER II

	Course code	Subject	Hours		Credits		Evaluation pattern					
			Theory	Practical	Theory	Practical	Written		Total	Practical		Total
							IA	Final exam	Final exam	IA	Final exam	Final exam
	CGPA CORE COURSES											
CGPA	3102-11	Human Anatomy Part II	60	23	4	1	10	40	50	10	40	50
	3102-12	Human Physiology Part II	65	38	5	1	10	40	50	10	40	50
	3102-13	Biochemistry Part II	30	-	2	-	10	40	50	-	-	-
	3102-14	Fundamentals of Exercise Therapy Part II	47	78	3	3	10	40	50	10	40	50
	3102-15	Fundamentals of Electro Therapy Part II	45	45	3	2	10	40	50	10	40	50
		Total	**247**	**184**	**17**	**7**	**50**	**200**	**250**	**40**	**160**	**200**

NON CGPA ELECTIVE COURSES (any one)

	Course code	Subject	Hours		Credits		Evaluation pattern		
			Theory	Practical	Theory	Practical	Written		
							Internal exam	Total	Credit
NON CGPA	3102-EL16	Information technology and animation	15	30	1	1	25	25	2
	3102-EL17	Basics in artificial intelligence	15	30	1	1	25	25	
	3102-EL18	Diet & nutrition	15	30	1	1	25	25	
	3102-EL19	Copyright and patent design	15	30	1	1	25	25	

SEMESTER III

	Course code	Subject	Hours		Credits		Evaluation pattern					
			Theory	Practical	Theory	Practical	Written		Total	Practical		Total
							IA	Final exam	Final exam	IA	Final exam	Final exam
CGPA	**CGPA CORE COURSES**											
	3103-11	Pathology	45	-	3	-	10	40	50	-	-	-
	3103-12	Microbiology	30	-	2		10	40	50	-	-	-
	3103-13	Exercise therapy Part I	52	95	3	3	10	40	50	10	40	50
	3103-14	Electrotherapy therapy Part I	50	70	3	2	10	40	50	10	40	50
		Total	**177**	**165**	**11**	**5**	**40**	**160**	**200**	**20**	**80**	**100**

NON CGPA	**NON CGPA ELECTIVE COURSES** (any one)								
	Course code	**Subject**	**Hours**		**Credits**		**Evaluation pattern**		
			Theory	**Practical**	**Theory**	**Practical**	**Written**		
							Internal exam	**Total**	**Credit**
	3103-EL15	Biomedical engineering	15	30	1	1	25	25	2
	3103-EL16	E learning resources	15	30	1	1	25	25	
	3103-EL17	Mechatronics	15	30	1	1	25	25	
	3103-EL18	Exercise physiology	15	30	1	1	25	25	

SEMESTER IV

	Course code	Subject	Hours		Credits		Evaluation pattern					
			Theory	Practical	Theory	Practical	Written		Total	Practical		Total
							IA	Final exam	Final exam	IA	Final exam	Final exam
CGPA	CGPA CORE COURSES											
	3104-11	Pharmacology	50	-	3	-	10	40	50	-	-	-
	3104-12	Exercise therapy Part II	53	105	4	4	10	40	50	10	40	50
	3104-13	Electrotherapy therapy Part II	45	45	3	2	10	40	50	10	40	50
	3104-14	Psychology	50	-	3	-	10	40	50	-	-	-
		Total	**198**	**145**	**13**	**6**	**40**	**160**	**200**	**20**	**80**	**100**

NON CGPA	NON CGPA ELECTIVE COURSES (any one)								
	Course code	**Subject**	**Hours**		**Credits**		**Evaluation pattern**		
			Theory	**Practical**	**Theory**	**Practical**	**Written**		
							Internal exam	**Total**	**Credit**
	3104-EL15	3D printing and designing	15	30	1	1	25	25	2
	3104-EL16	Movement analysis	15	30	1	1	25	25	
	3104-EL17	Psychometric analysis	15	30	1	1	25	25	
	3104-EL18	Virtual reality	15	30	1	1	25	25	

SEMESTER V

	Course code	Subject	Hours		Credits		Evaluation pattern					
			Theory	Practical/ clinical	Theory	Practical/ clinical	Written		Total	Practical		Total
							IA	Final exam	Final exam	IA	Final exam	Final exam
CGPA	CGPA CORE COURSES											
	3105-11	Medicine part I	45	-	3	-	10	40	50	-	-	-
	3105-12	Orthopedics	80	-	5	-	10	40	50	-	-	-
	3105-13	Surgery	62	-	4	-	10	40	50	-	-	-
	3105-14	Pediatrics	60	-	4	-	10	40	50	-	-	-
	3105-15	PDMS Part I	34	115	2	4	10	40	50	10	40	50
		Total	**281**	**115**	**18**	**4**	**50**	**200**	**250**	**10**	**40**	**50**

NON CGPA	NON CGPA ELECTIVE COURSES (any one)								
	Course code	**Subject**	**Hours**		**Credits**		**Evaluation pattern**		
			Theory	**Practical**	**Theory**	**Practical**	**Written**		
							Internal exam	**Total**	**Credit**
	3105-EL16	Tele medicine	15	30	1	1	25	25	2
	3105-EL17	Robotic therapy	15	30	1	1	25	25	
	3105-EL18	Disaster management	15	30	1	1	25	25	
	3105-EL19	Mother & child health care	15	30	1	1	25	25	

SEMESTER VI

	Course code	Subject	Hours		Credits		Evaluation pattern					
			Theory	Practical/ Clinical	Theory	Practical/ Clinical	Written		Total	Practical		Total
							IA	Final exam	Final exam	IA	Final exam	Final exam
CGPA CORE COURSES												
CGPA	3106-11	Medicine part II	45	-	3	-	10	40	50	-	-	-
	3106-12	Psychiatry	50	-	3	-	10	40	50	-	-	-
	3106-13	OBG	30	-	2	-	10	40	50	-	-	-
	3106-14	PSM	70	-	5	-	20	80	100	-	-	-
	3106-15	PDMS Part II	15.5	75	1	2	10	40	50	10	40	50
		Total	**210.5**	**75**	**14**	**2**	**60**	**240**	**300**	**10**	**40**	**50**

	Course code	Subject	Hours		Credits		Evaluation pattern		
			Theory	Practical/ Clinical	Theory	Practical	Internal exam	Total	Credit
INTERNAL SUBJECT									
	3106-INT 16	Dermatology	12	-	1	-	40	40	1
NON CGPA	**NON CGPA ELECTIVE COURSES (any one)**								
	Course code	**Subject**	**Hours**		**Credits**		**Evaluation pattern**		
			Theory	**Practical**	**Theory**	**Practical**	**Written**		
							Internal exam	**Total**	**Credit**
	3106-EL17	Geriatric care	15	30	1	1	25	25	2
	3106-EL18	Critical care management	15	30	1	1	25	25	
	3106-EL19	Life style disorder	15	30	1	1	25	25	
	3106-EL20	Podiatric	15	30	1	1	25	25	

SEMESTER VII

	Course code	Subject	Hours		Credits		Evaluation pattern					
							Written		Total	Practical		Total
			Theory	Practical	Theory	Practical	IA	Final exam	Final exam	IA	Final exam	Final exam
CGPA	CGPA CORE COURSES											
	3107-11	Physiotherapy in Musculoskeletal conditions	60	140	4	5	20	80	100	20	80	100
	3107-12	Physiotherapy in Neurosciences	90	120	6	4	20	80	100	20	80	100
		Total	**150**	**260**	**10**	**9**	**40**	**160**	**200**	**40**	**160**	**200**

NON CGPA	NON CGPA ELECTIVE COURSES								
	Course code	**Subject**	**Hours**		**Credits**		**Evaluation pattern**		
			Theory	**Practical**	**Theory**	**Practical**	**Written**		
							Internal exam	**Total**	**Credit**
	3107-EL13	Hospital administration	15	30	1	1	25	25	2
	3107-EL14	By laws of health profession	15	30	1	1	25	25	
	3107-EL15	Palliative care	15	30	1	1	25	25	
	3107-EL16	Entrepreneurship	15	30	1	1	25	25	

SEMESTER VIII

	Course code	Subject	Hours		Credits		Evaluation pattern					
							Written		Total	Practical		Total
			Theory	Practical	Theory	Practical	IA	Final exam	Final exam	IA	Final exam	Final exam
CGPA	**CGPA CORE COURSES**											
	3108-11	Physiotherapy in General Medicine and Surgical conditions	60	150	4	5	20	80	100	20	80	100
	3108-12	Physiotherapy in Community Health	70	140	5	5	20	80	100	20	80	100
		Total	**130**	**290**	**9**	**10**	**40**	**160**	**200**	**40**	**160**	**200**
NON CGPA	**INTERNAL SUBJECT**											
	Course code	**Subject**	**Hours**		**Credits**		**Evaluation pattern**					
			Theory	**Practical**	**Theory**	**Practical**	**Internal exam**		**Total**		**Credit**	
	3108-INT 13	Ethics & Principles of physiotherapy practice	40	-	1	-	40		40		1	
	NON CGPA ELECTIVE COURSES (any one)											
	Course code	**Subject**	**Hours**		**Credits**		**Evaluation pattern**					
			Theory	**Practical**	**Theory**	**Practical**	**Written**					
							Internal exam		**Total**		**Credit**	
	3108-EL14	Basics in naturopathy	15	30	1	1	25		25		2	
	3108-EL15	Advances in prosthetic management	15	30	1	1	25		25			
	3108-EL16	Health patient counselling	15	30	1	1	25		25			
	3108-EL17	Preventive physiotherapy	15	30	1	1	25		25			

Name of regulatory council: Indian Association of Physiotherapist, OT PT Council, Maharashtra.

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PREAMBLE

The Department of Human Resource Development, Government of India, on the recommendation of the University Grants Commission (UGC) has accorded the status of a Deemed University to Krishna Vishva Vidyapeeth "Deemed to be University", Karad for Faculty of Medicine, Dentistry. Physiotherapy, Nursing, Allied Sciences and Pharmacy respectively.

The Degrees, Diplomas and the Fellowship courses of Krishna Vishva Vidyapeeth "Deemed to be University", Karad shall have the same status as of those given by any Statutory University duly recognized by the University Grants Commission. (UGC).

1. This shall apply to all the examinations leading to Bachelor of Physiotherapy

There shall be the following 8 semester examinations leading to the Degree of Bachelor of Physiotherapy, Namely: -

i. The (Bachelor of Physiotherapy) First B. P. Th. Examination: Semester I and Semester II

ii. The (Bachelor of Physiotherapy) Second B. P. Th. Examination: Semester III and Semester IV

iii. The(Bachelor of Physiotherapy) Third B. P. Th. Examination: Semester V and Semester VI

iv. The (Bachelor of Physiotherapy) Fourth B. P. Th. Examination: Semester VII and Semester VIII

The examinations specified in Paragraph 1 shall be held twice a year at such places andon such dates as may be fixed by the Academic Council.

2. Eligibility for the Admission:

Subject to its compliance with the provisions of this bye - law and of other bye - law which shall be in force from time to time, an applicant for securing admission to the First
B. P .Th. Course shall be governed by the provisions of bye - law as under:-

i) Shall be an Indian National and has completed $17_{1/2}$ years of age on or before 30^{th} June of the academic year of his / her admission to the College.

ii) has passed the (10+2) Higher Secondary Schools Certificate Examination or an examination recognized as equivalent thereto;

OR has passed an examination equivalent to the Higher Secondary School Certificate (HSC) of any recognized Board / University situated in India;

OR has passed Central Board of Secondary Education (CBSE)

Examination; OR has passed an Indian School Certificate (ISC)

Examination;

OR has passed examination from any School / College situated abroad, as equivalent thereto shall submit equivalence certificate from the Associationof Indian Universities, New Delhi/the Council of Boards of School Examinations.

iii) Applicants, seeking admission to the First B. P. Th. Course shall have passed the H.S.C. or an equivalent examination thereto, comprising of Physics, Chemistry, Biology with English and must have an aggregate of at least 45% marks for open category and 40% marks for reserved category.

And Provided that the candidate names are included in the Merit List, prepared onthe basis of total marks obtained by him/her in Physics, Chemistry and Biology in the CET, conducted by the University.

3. Eligibility to appear for the examinations and obtain Degree:

- Student shall have attended a regular course of study for four years which includes 8 semesters and 6 months of internship in Physiotherapy College and appears and passes in the examination from First B. P. Th. to Final B. P. Th. examination in the subjects given in the syllabus as prescribed by the IAP from time to time.
- The student, who fails in university examination or does not appear in that particular examination is required to secure minimum attendance of 80% in Theory and 80% in Practical / Clinical in the next academic term and also is required to improve knowledge and academic performance and work up to the satisfaction of the head of the concerned department in that academic term prior to his/her appearance in university examination.
- Provided further that the failures of First, Second, Third and Final B. P. Th. examinationsshall not be permitted to appear at the next higher examination unless he/she passes at the lower examination completely and one term before the respective examination.
- The criteria of attendance, performance in the internal assessment examination and the preliminary examination shall be prescribed for the repeaters student/s by annulling his/her previous eligibility for the same examination in which he/she failed. The fresh eligibility of attendance and performance at the preliminary examination shall be compulsory for his/her appearance in the same examination after one academic year.
- Notwithstanding anything to the contrary in this Bye - law no person shall be admitted to the examinations under this Bye - law, if he has already passed the same examination or an equivalent examination of any other Statutory University.
- The required attendance, progress and conduct in order to be eligible to appear in final university examinations are as under.
    - Minimum 80% attendance in theory and 80% in practical/clinical in each subject for each academic year.
    - The course of the subject shall be as indicated in the syllabus.
    - Prescribed provisions of the bye - law shall apply to every collegiate candidate from time to time.

4. Scheme of Examinations:

- Out of the maximum marks allotted to each subject the student should obtain 50% marks in theory papers (Max 20) and 50 % marks in Practical's and should get 50 % in the total of 50 of each subject i.e. Theory (Max 20)+ Internal Assessment (Max 5) and practical's (Max 20)) + Internal Assessment (Max 5) in order to pass the First B. P. Th. examination, Second B. P. Th. examination, Third B. P. Th. examination and Final B. P. Th. examination shall be as indicated in the syllabus as prescribed. **Appendix No. 1 stated at the end of the syllabus.**

  A successful examinee who passes an examination within the minimum prescribed period and obtains not less than 75% of the total marks prescribed in theory & practical of a subject, shall be declared to have passed the examination with distinction in that subject.

- Provisions of bye - law relating to Grace Marks for passing in the examination shall apply to the examinations.

- Grant of 'ATKT facility to failure students of UG courses of B. P. Th. faculty.

  - Any candidate who fails in one or two subjects in an examination is permitted to go to the next higher class and appear for the subject and complete it successfully before he can appear for the next higher examination.

  - A candidate failing in more than two subjects will not be promoted to the next higher semester.

  - The candidate shall be promoted to subsequent semester (from I semester to II semester, II semester to III semester, III semester to IV semester, from IV semester to V semester, V semester to VI semester, VI semester to VII semester, VII semester to VIII semester,) even if he/she fails in one or two course in the current semester of study. However, he/she must pass in these courses within six months.

  - To appear for subsequent examinations, he/she must pass in all courses of the previous semester (i.e. a candidate shall be promoted from semester I to semester II even if he/she has failed in two course or less, the candidate shall be permitted to appear for both semester I & II during his/her term of second semester. However, he/she shall not be permitted to appear for the III semester unless he/she completely clears the first semester, this continues for rest of the semesters). A candidate failing in more than two courses will not be permitted to proceed to next class. It is mandatory for the candidate to pass in all course of the previous odd semester to be eligible for the next odd semester, and to pass in all course of the previous even semester to be eligible for the next even semester.

  - The candidate shall be eligible for internship program only after successful completion of the VIII semester.

- **RULES FOR GRACE MARKS:** The grace marks up to a maximum of five may be awarded to a student who has failed only in one subject but has passed in all other course. These five marks shall be distributed in different heads of passing of that subject. Provided that these grace marks shall be awarded only if the student passes after awarding these marks

- **RULES FOR INTERNALS:**

  The student needs to obtain 50% of the internal assessment marks (if internal assessment is 10 marks student should obtain 50% that is 5 marks out of 10) after which the candidate is eligible for appearing the university examination of respective semester.

  The student shall be awarded with 5 marks extra in internal assessment if he/she has any outstanding merits in the extracurricular and co-curricular activities on submission of proper documents. The rights to awards marks will be the decision of higher authorities.

  An examinee who passes the I to VIII semesters of B. P. Th. examinations as a whole within the minimum prescribed period and obtains the highest number of marks shall be arranged and declared to have passed the B. P. Th. examination in order of merit among the students on prescribed number of places sequentially.

  The fees for the examination shall be as prescribed from time to time and whenever any change is made in the fees prescribed for any particular examination that shall be notifiedthrough a notification for information of the examinees concerned.

  A successful examinee at the VIII semester B. P. Th. examination on payment of the prescribed fees, shall receive a B. P. Th. passing certificate signed by the Controller of Examinationsand provisional certificate signed by Registrar.

  A student, successful at the VIII semester B. P. Th. Examination after successful completion of 6 months compulsory rotating internship as prescribed shall be entitled to receive a degree certificate signed by the Vice-Chancellor at convocation on payment of the prescribed fees.

- **GRADING OF PERFORMANCES**

  Letter grades and grade points allocations:

  Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each course. The letter grades and their corresponding grade points are given in Table

  Letter grades and grade points equivalent to Percentage of marks and performances

Percentage of Marks Obtained	Letter Grade	Grade Point	Performance

90.00-100	O	10	Outstanding
80.00-89.99	A	9	Excellent
70.00-79.99	B	8	Good
60.00-69.99	C	7	Fair
50.00-59.99	D	6	Average
Less than 50	F	0	Fail
Absent	AB	0	Fail

A learner who remains absent for any end semester examination shall be assigned a letter grade of AB and a corresponding grade point of zero. He/she should reappear for the said evaluation/examination in due course.

- The Semester grade point average (SGPA)

The performance of a student in a semester is indicated by a number called 'Semester Grade Point Average' (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester. For example, if a student takes five courses (Theory/Practical) in a semester with credits C1, C2, C3, C4 and C5 and the student's grade points in these courses are G1, G2, G3, G4 and G5, respectively, and then students' SGPA is equal to:

SGPA = (C1G1 + C2G2 + C3G3 + C4G4+ C5G5) / (C1 + C2 + C3 + C4+ C5)

- Cumulative Grade Point Average (CGPA)

The CGPA is calculated with the SGPA of all the VIII semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all VIII semesters and their courses. The CGPA shall reflect the failed status in case of F grade(s),till the course(s) is/are passed. When the course(s)is/are passedby obtaining a pass grade on subsequent examination(s) theCGPA shall only reflect the new grade and not the fail grades earned earlier. The CGPA is calculated as:

CGPA = (C1S1 + C2S2 + C3S3 + C4S4+ C5S5+ C6S6+ C7S7+ C8S8) / (C1 + C2 + C3 + C4+ C5+ C6+ C7+ C8)

where C1, C2, C3,... is the total number of credits for semester I,II,III,.... and S1,S2, S3,...is the SGPA of semester I,II,III,....

- **ELECTIVE STUBJECTS:**

4 elective subjects shall be kept open for the students in each semester. Out of the four electives students have to choose 1 elective and appear for an internal examination. Clearing the internal

examination of elective is mandatory to appear for the university examination. Each elective shall have 15 theory hours and 30 practical hours.

Program outcomes

B.P.Th (BACHELOR OF PHYSIOTHERAPY)

This course is of four and half years of duration and it proceeds in this format as follows:

First Year: It deals with basic foundation in medical as well as physiotherapy subjects. The application of physics to human body in understanding movements and Physiotherapeutic modalities are included.

Second Year: It deals with understanding of – altered physiology by studying Pathology and Microbiology; normal and altered human mind by studying Psychology; knowledge of Biomechanics and various Physiotherapeutic/ Electrotherapeutic application skills.

Third Year: It deals with clinical subjects, Physiotherapeutic evaluation skills including electrodiagnosis on patients and knowledge about Principles of International Classification of Functioning and its applicability.

Fourth Year: It deals with integrating knowledge of previous years to evaluate, diagnose, plan and manage Musculoskeletal, Neurological and Cardiorespiratory Dysfunctions in Hospital and Community Settings. In addition, students study Bioengineering, Professional Practice and Ethics inclusive of knowledge of Hospital administration and Management, Marketing, and Research Methodology and Biostatistics. A prevalence research work as a community level field project has to be submitted as a part of examination in Community Health Physiotherapy.

At the end of the programme, students should be able to understand the biological, physical, behavioural sciences underpinning physiotherapy and effective/ appropriate applicability on patients. The programme equips the students with 6 months of compulsory internship under supervision.

FIRST YEAR B.P.Th

1. It deals with basic foundation in medical as well as physiotherapy subjects. The application of physics to human body in understanding movements and Physiotherapeutic modalities are included.
2. To acquire necessary knowledge and skills to help them practice efficiently and accurately with relevance to Human Physiology and Human Anatomy inclusive of knowledge in Biochemistry that are required to be practiced in Community and at all levels of Healthcare System.
3. To understand and practice basics of Yoga as a subject at entry level.

SEMESTER I

HUMAN ANATOMY- Part 1 (3101-11):

Course objects-

a) The student should be able to identify & Describe Anatomical aspects ofMuscle, bones & joints, & to understand and Analyze movements
b) To understand the Anatomical basis of various clinical conditions e.g.Trauma, deformities, pertaining to limbs & spine.
c) To be able to localize various surface land-marks;
d) To understand & describe the mechanism of posture & gait & theAnatomical basis of abnormal gait.
e) To identify & describe various components of the contents of the Thorax- with special emphasis to tracheo-bronchial tree, & cardio- pulmonary system.

Course outcomes-

The student should be able to identify and describe anatomically all the structures of the human body for example muscles, bones, joints, viscera, CNS, PNS, etc.

HUMAN PHYSIOLOGY- Part 1 (3101-12):

Course objects-

a) Acquire the knowledge of the relative contribution of each organ system in maintenance of the milieu interior [Homeostasis]
b) Be able to describe physiological functions of various systems, with special reference to, Musculoskeletal, respiratory, digestive, endocrine and excretory system.
c) Analyze physiological responses & adaptation to environmental stresses-with special emphasis on physical activity, temperature.
d) Acquire the skill of basic clinical examination, with special emphasis to Exercise tolerance / Ergography.

Course outcomes-

The student shall acquire the knowledge of physiological functions of various systems with special reference to the musculoskeletal, neuromotor, cardiorespiratory, endocrine and urogenital system. Student should be able to analyse relative continuation of each organ system in homeostasis. The student should be able to analyse physiological response and adaptation to environmental stresses. Student shall acquire basic clinical examination of PNS and CNS, cardiorespiratory system and exercise tolerance

BIOCHEMISTRY- Part 1 (3101-13):

Course objects-

a) Be able to describe structures & functions of cell in brief.
b) Define Basal metabolic rate & factors affecting the same [in brief], with special reference to obesity.

c) Be able to discuss nutritional aspects of carbohydrates, lipids, proteins.
d) Define enzymes; discuss in brief, factors affecting enzyme activity.
e) Describe in details biochemical aspects of muscle contraction.

Course outcomes-

The student should be able to identify various biomolecules present in the body with their functions, formation and fate of these molecules, identify the normal- abnormal levels of these molecules in the body fluids to understand the disease process by the end of the course.

FUNDAMENTALS OF EXERCISE THERAPY- Part 1 (3101-14):

Course objects-

a) To define the various terms used in mechanics, biomechanics & kinesiology
b) Recall the basic principles of physics related to mechanics of movement / motion & will be able to understand the application of such principles to the simple equipment designs, & their efficacy in therapeutic gymnasium, & various starting position used in therapeutics.
c) To describe & also acquire the skill of use of various tools of the therapeutic gymnasium
d) To demonstrate passive movements in terms of various anatomical planes
e) Acquire the skill of application of various massage manipulations & describe the physiological effects, therapeutic use, merits / demerits of the same.
f) Acquire a skill of assessment of sensations, superficial & deep reflexes, pulse rate / blood pressure, chest expansion / respiratory rate, & limb length / girth measurement on models

Course outcomes-

The student should be able to define various exercises used in relation to mechanics, biomechanics and kinesiology. Student should be able to apply basic biophysics principles to mechanics of movement. The student should be able to describe, acquire and demonstrate all the assessment and treatment skills prescribed in the syllabus.

FUNDAMENTALS OF ELECTROTHERAPY- Part 1 (3101-15):

Course objects-

a) Recall the physics principles & Laws of Electricity, Electro – magnetic spectrum, & ultra sound

b) Describe effects of environmental & man made electromagnetic field at the cellular level & risk factors on prolonged exposure.

c) Describe the main electrical supply, Electric shock –precautions.

d) Enumerate types & production of various Therapeutic electrical currents describe the panel diagrams of the machines.

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

f) Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.

g) Acquire knowledge of low frequency currents, various superficial thermal agents such as Paraffin wax bath, homemade remedies, etc; their physiological & therapeutic effects, Merits / demerits; & also acquire the skill of application

Course outcomes-

The student should be able to describe the effects of various electromagnetic fields and therapeutic currents. The student should be able to gain knowledge of electrical supply, hazards and precautions. The student should be able to test the various electrotherapeutic equipment prescribed in their syllabus; describe and identify various electrical components in the circuits of the same. The student should be able to acquire and apply knowledge of various superficial thermal agents.

SEMESTER II

HUMAN ANATOMY- Part 2 (3102-11):

Course objects-

a) To identify & describe various parts of C.N.S.-fore- brain, Midbrain,Hind-brain, Brain stem, courses of cranial nerves; functional components,-course distribution-Anatomical bases of clinical lesions
b) To describe the source & course of spinal tracts
c) To describe blood circulation of C.N.S.& spine
d) Be able to identify the components of various Transections.
e) Be able to identify & describe the source & course of major arterial, venous & lymphatic system, with special emphasis to extremities, Spine & Thorax.
f) To be able to demonstrate the movements of various joints-
g) Distinguish cranial & peripheral nerves
h) Distinguish major arteries, veins & Lymphatic with special emphases to extremities, & spine

Course outcomes-

The student should be able to identify and describe anatomically all the structures of the human body for example muscles, bones, joints, viscera, CNS, PNS, etc.

HUMAN PHYSIOLOGY- Part 2 (3102-12):

Course objects-

a) Acquire the knowledge of the relative contribution of each organ system in maintenance of the milieu interior [Homeostasis]
b) Be able to describe physiological functions of various systems, with special reference to Musculo-skeletal, Neuro-motor, Cardio-respiratory, Female uro-genital function, & alterations in function with aging.

Course outcomes-

The student shall acquire the knowledge of physiological functions of various systems with special reference to the musculoskeletal, neuromotor, cardiorespiratory, endocrine and urogenital system. Student should be able to analyse relative continuation of each organ system in homeostasis. The student should be able to analyse physiological response and adaptation to environmental stresses. Student shall acquire basic clinical examination of PNS and CNS, cardiorespiratory system and exercise tolerance

BIOCHEMISTRY- Part 2 (3102-13):

Course objects-

a) Be able to describe structures & functions of cell in brief.
b) Be able to discuss nutritional aspects of Vitamins & their metabolism with special reference to obesity.
c) Acquire knowledge in brief about the Clinical biochemistry, with special reference to Liver & renal function test, Blood study for Lipid profile, metabolism of fat, Carbohydrates, proteins, bone minerals, & electrolyte balance.

Course outcomes-

The student should be able to identify various biomolecules present in the body with their functions, formation and fate of these molecules, identify the normal- abnormal levels of these molecules in the body fluids to understand the disease process by the end of the course.

FUNDAMENTALS OF EXERCISE THERAPY- Part 2 (3102-14):

Course objects-

a) To define the various terms used in mechanics, biomechanics & kinesiology

b) Recall the basic principles of physics related to mechanics of movement / motion & will be able to understand the application of such principles to the simple equipment designs, & their efficacy in therapeutic gymnasium, & various starting position used in therapeutics.
c) To describe & also acquire the skill of use of various tools of the therapeutic gymnasium
d) Acquire the skill of application of various massage manipulations & describe the physiological effects, therapeutic use, merits / demerits of the same.
e) To demonstrate & also acquire the skill of relaxation.
f) To describe the skill & usefulness of group & recreational activities & will be able to demonstrate general fitness exercises used in physical training.
g) Be able to define yoga & its types, its physiological & psycho-somatic effects & will be able to demonstrate standard yoga postures used by the beginners.
h) Be able to describe physiological principles of aerobic exercise conditioning related to general fitness & demonstrate skill of general fitness exercises & shall gain fitness forself.

Course outcomes-

The student should be able to define various exercises used in relation to mechanics, biomechanics and kinesiology. Student should be able to apply basic biophysics principles to mechanics of movement. The student should be able to describe, acquire and demonstrate all the assessment and treatment skills prescribed in the syllabus.

FUNDAMENTALS OF ELECTROTHERAPY- Part 2 (3102-15):

Course objects-

a) Recall the physics principles & Laws of Electricity, Electro – magnetic spectrum, & ultra sound

b) Describe effects of environmental & man made electromagnetic field at the cellular level & risk factors on prolonged exposure.

c) Describe the main electrical supply, Electric shock –precautions.

d) Enumerate types & production of various Therapeutic electrical currents describe the panel diagrams of the machines.

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

f) Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.

g) Acquire knowledge of medium and high frequency, various superficial thermal agents such as, Cryotherapy, homemade remedies, etc; their physiological & therapeutic effects, Merits / demerits;

& also acquire the skill of application

Course outcomes-

The student should be able to describe the effects of various electromagnetic fields and therapeutic currents. The student should be able to gain knowledge of electrical supply, hazards and precautions. The student should be able to test the various electrotherapeutic equipment prescribed in their syllabus; describe and identify various electrical components in the circuits of the same. The student should be able to acquire and apply knowledge of various superficial thermal agents.

SEMESTER III

COURSE OUTCOMES OF SECOND YEAR B.P.Th:

1. It deals with understanding of – altered physiology by studying Pathology & Microbiology; normal & altered human mind by studying Psychology; knowledge of Biomechanics & various Physiotherapeutic / Electrotherapeutic application skills.
2. To understand the process to detect & evaluate anatomical, patho-physiological and psychosomatic impairments resulting in physical dysfunction in various age groups, occupations & arrive at appropriate diagnosis.

PATHOLOGY **(3103-11)**:

The students should be able understand diseases involving major organ systems, their epidemiology, red flag signs and symptoms. This knowledge will enable the students to identify diseases that require referrals and/or alternate interventions.

MICROBIOLOGY **(3103-12)**:

The students should be able to develop a sound knowledge of prevalent infections which are communicable, with the agents/ pathogens (known & newly emerging) causing them. This will enable them to prevent causing an infection to the patients & themselves.

EXERCISE THERAPY PART I (3103-13):

The student develop an in depth knowledge about anatomy, physiology and biomechanical principles of normal human movements. Thus it enable them to understand the effect of common kinesiotherapeutic applications (exercises or positions) on the same.

ELECTROTHERAPY PART I (3103-14):

The student should develop a sound understanding of the application of various electrotherapeutic modalitites in the treatment of pain & would healing, taking into account their physiological effects, indications, contraindications & therapeutic application. This will thus, enable them to choose an appropriate modality and parameters according to the area/tissue.

SEMESTER IV

PHARMACOLOGY(3104-11)::

The students should be able to develop an understanding about administration, physiological effects, and adverse effects, drug interactions under normal & pathological conditions. They will thus, be able to apply the above knowledge while prescribing appropriate exercise protocols to patients with varied pathologies taking into account the influence the above drugs may have on the condition &/or rehabilitation.

EXERCISE THERAPY PART I (3014-12):

Students gain comprehensive insight into the structure of the human body, its functional processes, and the mechanical laws governing typical movement patterns. This deep understanding equips them to analyze the impact of various movement-based therapeutic techniques, including specific exercises and postural adjustments, on the body's natural motions.

The acquired knowledge allows students to draw connections between theoretical concepts and practical applications in kinesiotherapy, enhancing their ability to predict and interpret the outcomes of movement-oriented treatments on normal bodily functions.

ELECTROTHERAPY PART II (3104-13):

Learners are expected to gain a thorough grasp of how diverse electrical treatment methods can be utilized to manage pain and promote tissue repair. This knowledge encompasses the physiological impacts of these techniques, Suitable conditions for their use, Situations where they should be avoided, Proper therapeutic implementation. By mastering these concepts, students will be equipped to select the most effective electrical treatment approach and adjust its settings based on the specific body part or tissue type being treated. This comprehensive understanding enables practitioners to make informed decisions about electrotherapy applications, tailoring treatments to individual patient needs and optimizing therapeutic outcomes.

PSYCHOLOGY(3104-14):

The student is made aware of psychological issues faced by patients, and the influence they may have on the patient's condition, response to therapy & developing therapeutic relationships. The students can, thus, emphasis on communication skills to make interaction move effective and identify psychiatric illnesses for their referral.

COURSE OUTCOMES OF THIRD YEAR B.P.Th:

1. It deals with clinical subjects, physiotherapeutic evaluation skills including electrodiagnosis on a patient and knowledge about principles of international classification of functioning and its applicability.
2. To understand the rationale and basic investigative approach to medical diseases, surgical interventions and accordingly plan / implement specific physiotherapy measures effectively.
3. Evaluate and objectively assess all three components (as per ICF) of Movement Dysfunction or any opther dysfunction as per health condition and arrive at a functional diagnosis, with biomechanical and physiological reasoning.
4. To understand the use of appropriate tools of assessment, evaluation and reevaluation in musculoskeletal, neurological, cardiovascular conditions and all other health conditions pertaining to different ages and occupation, etc.

SEMESTER V

MEDICINE PART I (3105-11):

At the end of the course, the student enriches knowledge in various ailments and population like:

1. Be able to describe aetiology, pathophysiology, signs and symptoms and management of various Cardiovascular and Respiratory conditions.
2. Acquire skill of history taking and clinical examination of Cardiovascular and Respiratory conditions.
3. Acquire knowledge of various used for each condition to understand its effect and uses.
4. Acquire skill of clinical examination of Cardiovascular and Respiratory FUNCTIONS.
5. Be able to describe cardiovascular and respiratory conditions related to immunological conditions, nutritional deficiencies, infectious diseases and genetically transmitted conditions.

ORTHOPEDICS (3105-12): At the end of the course the student shall be able to:

1. Be able to discuss aetiology, pathophysiology, clinical manifestations and conservative/surgical management of various traumatic and cold cases of musculoskeletal conditions.
2. Gain the skills of clinical examination, apply special tests and interpretation of preoperative and postoperative cases.
3. Be able to read and interpret X-ray of spine and extremities and corelate radiological findings with clinical findings.
4. Be able to interpret pathological/ biochemical studies pertaining to orthopedic conditions

SURGERY (3105-13): At the end of course, the student shall be trained to establish:

1. Effect of surgical trauma and anaesthesia.
2. Surgical management in brief with relevance to general surgery, neurosurgery, cardiovascular and thoracic surgery, ENT and ophthalmic surgery, plastic and reconstructive surgery along with clinical evaluation.
3. Preoperative evaluation, surgical indications, management and post-operative care with possible complications in above mentioned domains.
4. Be able to read and interpret findings of relevant investigations.

PEDIATRICS (3015- 14):

Upon completion of the course, students will:

1. Gain a concise understanding of fetal growth and development within the womb.

2. Demonstrate knowledge of typical childhood growth and developmental milestones, the crucial role of vaccinations in child health, the benefits and importance of breastfeeding, the psychological factors influencing child development

3. Comprehend various pediatric conditions affecting Nerve and muscle systems, Bones and joints, Heart and blood vessels, Lungs and breathing. These conditions will be explored in relation to Immune system disorders, Lack of essential nutrients, Diseases caused by pathogens, Inherited disorders

4. Develop proficiency in performing clinical assessments on newborns and children, focusing on Neurological function, Musculoskeletal health, Respiratory capacity

FUNCTIONAL DIAGNOSIS AND PHYSIOTHERAPEUTIC SKILLS PART I (3105-15):

At the end of the course, the students will expertise in:

1. Understand use of ICF
2. Acquire knowledge of human growth and development from new life to birth and adulthood.
3. Understand structure and function of nerve, muscle as a basis for electrodiagnostics.
4. Understand theoretical basis and principles of manipulative skills, neuro-therapeutic skills and skills of cardiopulmonary care & resuscitation.
5. Document results of assessment to evaluate patient from time to time

SEMESTER VI

MEDICINE PART II (3106- 11):

Upon course completion, students will:

1. Demonstrate comprehensive understanding of Causes, Disease processes, Clinical manifestations, Treatment approaches for various conditions in Neurology, Rheumatology & Geriatrics

2. Develop proficiency in performing neurological system examinations.

3. Gain the ability to:

- Interpret findings from auscultation (listening to internal body sounds)
- Analyze diagnostic test results, with particular focus on:
  * Neurological investigations
  * General medical condition assessments

4. Comprehend and articulate the core principles of patient management in Medical Intensive Care Units.

PSYCHIATRY (3106-12):

The student should be able to describe common psychiatric disorders. Students should learn about pathological and etiological causes of common psychiatric conditions. The student should have basic knowledge of pharmacological and non-pharmacological management of common psychiatric disorders

GYNAECOLOGY & OBSTETRICS(3106-13):

At the end of the course, the student learns and differentiates normal and abnormal physiological events, complications during puberty, pregnancy, menopause, urogenital dysfunction. She/he should acquire cognate skills of clinical examination of pelvic floor.

COMMUNITY HEALTH AND SOCIOLOGY & BIOSTATISTIC (3106-14):

COMMUNITY HEALTH:
At the end the course, the student is well accomplished with knowledge of community health like:

1. Concepts and determinants of health and diseases.
2. National public health administration
3. Health care delivery system
4. Primary health care, etc.

SOCIOLOGY
At the end of the course the student is accomplished with sociology like:

1. Definition and relevance with physiotherapy
2. Socializations
3. Social groups
4. Family
5. Community role
6. Culture
7. Social change factor
8. Social control

9. Population groups, etc.

FUNCTIONAL DIAGNOSIS AND PHYSIOTHERAPEUTIC SKILLS (3106-15)::

At the end of the course, the students will expertise in:

1. Understand use of ICF
2. Acquire knowledge of human growth and development from new life to birth and adulthood.
3. Understand structure and function of nerve, muscle as a basis for electrodiagnostics.
4. Understand theoretical basis and principles of manipulative skills, neuro-therapeutic skills and skills of cardiopulmonary care & resuscitation.
5. Document results of assessment to evaluate patient from time to time

DERMATOLOGY(3106-16):

At the end of the course, the student will ber able to describe pathophysiology, signs and symptoms clinical features, examination and management of common skin conditions like leprosy, psoriasis, bacterial and fungal infections of the skin, connective tissue disorder, hand eczema, drug reaction, cutaneous manifestations of HIV and sexually transmitted diseases.

COURSE OUTCOMES OF FOURTH YEAR B.P.Th:

1. It deals with integrating knowledge of previous years to evaluate, diagnose, plan and manage musculoskeletal, neurological and cardiorespiratory dysfunctions in hospital and community settings.
2. In addition, students study bioengineering, professional practice and ethics inclusive of knowledge of hospital administration, management, marketing, research methodology and biostatistics.
3. Prevalence research work as a community level field project has to be submitted as a part of examination in community health physiotherapy.

SEMESTER VII

PHYSIOTHERAPY IN MUSCULOSKELETAL SCIENCES (3107-11):

At the end of the course, the student will be able to have knowledge about applied anatomy and physiology of musculoskeletal system along with pathological changes and patho-mechanics of the system. They will also discuss relevant tests and measures for determining impairment and differentiating the diagnosis based on the specificity and sensitivity of the assessment. The student should be able to use patient specific assessment, evidence-based intervention and significant patient education to promote a healthy, active lifestyle and community-based living as well as maximizing patient's functional independence.

PHYSIOTHERPAY IN NEUROLOGICAL SCIENCES (3107-12):

At the end of the course, the student should be able to describe anatomy, physiology and pathophysiology of various neuromuscular system along with various tests used to determine impairments and differentiating diagnosis. The students should be able to apply emphasis on various physiotherapy strategies for assessment & treatment addressing structural and functional impairments & activity limitations of individuals and population both adults & paediatrics in context of their personal goals including participation restrictions and environment they live in.

SEMESTER VIII

PHYSIOTHERAPY IN MEDICAL AND SURGICAL CONDITIONS (3108-11):

At the end of the course, the students will acquire knowledge about anatomy, physiology and pathophysiology of various cardiovascular and respiratory diseases. They will learn various tests to diagnose and identify the impairments, also the tests for differentiating diagnosis. Course focuses on maximizing functional independence and well-being. The student will have a sound understanding of theory, scientific evidence and best practices in the area of cardiovascular and respiratory system, including critical care, psychosocial sciences, movement sciences and PT.

PHYSIOTHERAPY IN COMMUNITY HEALTH (3108-12):

At the end of the course,the student should be able to know the roles and responsibilities of Physiotherapist as the efficient memeber of society.Student should be able to apply the acquired knowledge to practice oriented philosophy for optimization and betterment of health, which is done by better understanding the section and subsection of the societies, the national international health policies, role of govt and non govt organizations. The student should be apply skills for promotion of health and rehabilitation communities like elderly, women's health and occupational health etc.

ETHICS & PRINCIPLES OF PHYSIOTHERAPY PRACTICE (3108-13):

At the end of the course, the students will learn about knowledge, skills and behavior required by physiotherapist in a range of practice relationships and roles. Student will be able to understand the role, responsibilities, ethics and administration issues and accountability of physiotherapy and will be able to apply to professional and ethical reasoning and decision strategies and professional communication.

COURSE OUTCOMES OF COMPULSORY ROTATORY INTERNSHIP :

1. At the end of the programme, students will attain knowledge of consulting, diagnosing, providing appropriate treatment and management of all physical health disorders.
2. The students are also trained with additional community based rehabilitation camps such as being a part of multidisciplinary rural camps and special physiotherapy camps.
3. The programme equips the students with six months of compulsory internship under supervision, regular case presentation with clinical orientation training and compulsory scientific research project.

4. At the end of program the students should complete one research project as a part of internship completion.

COURSE OUTCOMES AT THE END OF THE PROGRAMME:

After the completion of UG (B.P.Th) programme, the above mentioned programme features in krishna college of physiotherapy enables the students to become a independent physiotherapist on successful completion of his/ her programme to practice collaboratively in a variety of healthcare setups from neonatal to geriatrics inclusive of specific personal training, sports fitness, critical care to community fitness and the whole responsive to the current future needs of healthcare systems.

SEMESTER I

3101-11: HUMAN ANATOMY PART 1

Course Credit for Human Anatomy -Part I		
	Hours	Credits
Theory	90	6
Practical	48	2

OBJECTIVES

TOPIC 1: MUSCULO - SKELETAL

a) The student should be able to identify & Describe Anatomical aspects ofMuscle, bones & joints, & to understand and Analyze movements
b) To understand the Anatomical basis of various clinical conditions e.g.Trauma, deformities, pertaining to limbs & spine.
c) To be able to localize various surface land-marks;
d) To understand & describe the mechanism of posture & gait & the Anatomical basis of abnormal gait.

TOPIC 2: THORAX

a) To identify & describe various components of the contents of the Thorax- with special emphasis to tracheo-bronchial tree, & cardio- pulmonary system.

SR.NO	CONTENT	TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic	Practical			
1.	**General Anatomy**					
	Topic 1: Histology	**7 hrs**	**7 hrs**	MK		
	a) Cell	1hrs	1hrs			
	b) Tissue Of The Body,	1hrs	1hrs			
	c) Epithelium	1hrs	1hrs			
	d) Connective Tissue,	1hrs	1hrs			
	e) Cartilage,	1hrs	1hrs			
	f) Bone,	1hrs	1hrs			
	g) Skin	1hrs	1hrs			
	Topic 2: Embryology	**4 hrs**	**4 hrs**	MK		
	a) Ovum, spermatozoa, Fertilization & formation of firm layers and their derivations.	1hrs	1hrs			
	b) Development of skin, fascia, blood vessels, lymphatics,	1hrs	1hrs			
	c) Development of bones, axial & appendicular skeleton & muscles	1hrs	1hrs			
	d) Development of cardiovascular and respiratory system	1 hrs	1hrs			
2.	**Respiratory system**	**12 hrs**	**9 hrs**	**MK**		
	a) Lungs,	2 hrs	2hrs			
	b) Pleura,	2 hrs	2hrs			
	c) Broncho-pulmonary segments (in detail)	2 hrs	2hrs			
	d) Diaphragm & respiratory muscles, muscles of breathing, mechanics of breathing	1hr	1hr			
	e) Trunk – Osteology – • All the bones of the vertebral column & ribs, • Intervertebral joints,	5hrs	2 hrs			

	• Inter vertebral disc, • Ligaments & muscles of the spine (all to be elaborated), • Thoracic cage					
3.	**<u>MUSCULOSKELETAL ANATOMY</u>** <u>Gross Anatomy</u> (All The Topics to be taught in detail)	**29 hrs**	**13 hrs**	MK		
	<u>Topic 1:</u> Anatomical positions of the body, axis, planes & common anatomical Terminologies related to musculoskeletal anatomy (groove, tuberosity, trochanters, Etc.)	5 hrs	2hrs			
	<u>Topic 2:</u> Skin and Fascia	1 hr	2hrs			
	<u>Topic 3:</u> Bones – • Compositions & functions, Classifications & types according to morphology & development of joints, blood supply & nerve supply. • Detailed anatomy covering all the joints of the major joint complexes in the body will be added.	10 hrs	3 hrs			
	a) Anatomy of all joints in detail • Shoulder, • Elbow, • Wrist, • Hip, • Knee and • Ankle.	10 hrs	3 hr	MK		
	b) Applied anatomy relevant to the course.	2hrs	2hrs		DK	
	c) Accessory joints and its clinical correlation	1hrs	1hrs			**NK**
	<u>Topic 5: Regional anatomy</u>	**28 hrs**	**11 hrs**	MK		
	a) Superior extremity- • Bones of upper limb • Hand & soft parts • Breast, • Pectoral region & muscles attachment fascia, • Axilla & scapular region	9 hrs	3 hrs			

	• Arm & cubital fossa • Forearm & hand • Upper limb surface marking • Blood vessels, • Nerves • Lymphatic drainage upper limb.					
	b) Inferior extremity – • Osteology Bones & Joints with extra articular structures of lower limb, blood vessels & nerves, • Lymphatic drainage of leg, • Front & medial side of thigh • Gluteal region & back of thigh • Anterior compartment of leg & dorsum of foot • Back of leg & sole • Arches of the foot, • Skin of the foot.	9 Hrs	4 Hrs			
	e) Radiological anatomy of musculoskeletal system. (UL/LL/ Thorax)	8 Hrs	2 Hrs			
	f) Surface Anatomy of relatedstructures.	2 Hrs	2 Hrs	**MK**		
	Cardiovascular System	**10 HRS**	**4Hrs**	**MK**		
	a) Heart	2Hrs	1Hrs			
	b) Arteries,	2Hrs	1Hrs			
	c) Veins,	2Hrs	-			
	d) Collateral circulation,	2Hrs	1Hrs			
	e) Nervous control of circulation (in Detail)	2Hrs	1Hrs			

PRACTICAL:

i) To be able to demonstrate the movements of various joints – (33 hrs)

ii) Distinguish cranial & peripheral nerves (30 hrs)

iii) Distinguish major arteries, veins & lymphatics with special emphases to extremities, & spine. (12 hrs)

- **TEXT BOOKS**

1. Human Anatomy – by Snell
2. Anatomy by Chaurasia all 3 volumes
3. Neuro anatomy by Inderbir Singh
4. Human Anatomy by Kadasne (All three volumes)

- **REFERENCE BOOKS**

1. Gray's Anatomy
2. Extremities by Quining Wasb
3. Atlas of Histology by Mariano De Fiore
4. Anatomy & Physiology by Smout and McDowell
5. Kinesiology by Katherine Wells
6. Neuroanatomy by Snell
7. Neuroanatomy by Vishram Singh

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	Content	Marks
1	Spots	20 Marks
3	Viva	15 Marks
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: **07**	LEVEL I: 03	LEVEL I: 02	**LEVEL I:** **01**
LEVEL II: **03**	**LEVEL II:** **02**	**LEVEL II:** **01**	**LEVEL II:** **01**

3101 - 12: HUMAN PHYSIOLOGY PART 1

Course Credit for Human Physiology-Part I		
	Hours	Credits
Theory	90	6
Practical	34	1

OBJECTIVES

At the end of the course, the candidate will -

f) Acquire the knowledge of the relative contribution of each organ system in maintenance of the milieu interior [Homeostasis]

g) Be able to describe physiological functions of various systems, with special reference to, Musculoskeletal, respiratory, digestive, endocrine and excretory system.

h) Analyze physiological responses & adaptation to environmental stresses-with special emphasis on physical activity, temperature.

i) Acquire the skill of basic clinical examination, with special emphasis to Exercise tolerance / Ergography.

Sr. No.	CONTENT	TEACHING HOURS (Didactic)	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
1.	General Physiology (Only short notes) GROSS studies (details not required)	(45 Hrs)			
	Topic 1: Physiology of Cell, Transportation across the cell membrane.	4 hrs	MK		
	Topic 2: Peripheral nervous system	15 hrs	MK		
	a) Structure, classification &properties				
	b) R.M.P.				
	c) Action potential;				
	d) Propagation of nerve impulse				
	e) Degeneration & regeneration				
	f) Reaction of degeneration [retrograde]				
	g) Neuromuscular transmission.				
	h) Myoneural junction				
	i) Motor unit action potential				
	j) Brief out line of eletrodiagnostic test.				
	Topic 3: Blood	5 hrs	MK		
	a) Composition and functions ofblood.				
	b) Blood groups				
	c) Erythropoietin, WBC &Platelets.				
	d) Coagulation				
	Topic 4: Digestive system	5 hrs			NK
	a) General introduction, organizational plan of digestive system				

	b) Composition, function and regulation of salivary, gastric,pancreatic, intestinal and biliary secretions.				
	c) Movements of GI tract				
	Topic 5: Excretory System General introduction, structure & functions of kidney in general, nervouscontrol of bladder and applied physiology of bladder, urine formation Micturition, neural control of bladder & bowel.	8 hrs	MK		
	Topic 6: Endocrine system Secretion, regulation and functionsofpituitary, thyroid, adrenal, pancreas, parathyroid, testis and ovaries, (details).	8 hrs		DK	
2.	Muscle Physiology	15 hrs	MK		
	Topic 1: Structure, properties and classification of muscles. Physiology of muscle contraction, excitation, and coupling				
	Topic 2: Motor unit-E.M.G.-factors affecting muscle transmission.				
	Topic 3: Physiology of Muscle Tone (muscle spindle)				
	Topic 4: Physiology of Voluntary movement.				
	Topic 5: Applied physiologyof muscles.				
3.	Exercise Physiology	10 hrs	MK		
	Topic 1: Effects of acute & chronic exercises on I) 0_2/$C0_2$ transport II) Muscle strength/ power/ endurance III) BMR/ RQ/ 0_2 dept IV) Hormonal & metabolic effects V) Cardiovascular system VI) Respiratory system				

	VII) Body fluids and electrolytes VIII) Consequence of over exercising the abnormal muscle.				
	Topic 2: Effect of gravity/altitude/acceleration/pressur e on physical parameters.				
	Topic 3: Physiology of aging.				
	Topic 4: Training-fatigue-& recovery.				
	Topic 5: Fitness-related to age, gender, & body type.				
4.	Respiratory System (in detail)	20 hrs			
	Topic 1: Introduction, general organization.				
	Topic 2: Mechanics of respiration.				
	Topic 3: Pulmonary Volumes & capacities.				
	Topic4: Ventilation/perfusion ratio, alveolar ventilation.				
	Topic5: Anatomical & physiological Dead space.		MK		
	Topic 6: Transport of respiratory gases				
	Topic7: Nervous & Chemical control of respiration.				
	Topic 8: Pulmonary function tests-Direct & indirect method of measurement.				
	Topic9: Physiological changes with altitude & acclimatization.				
	Topic 10: Brief out line about artificial ventilation.				

HUMAN PHYSIOLOGY - PRACTICAL:

SR. NO	TOIPC	HOURS
1.	Hematology-(demonstration only)	15 hrs
2.	**Graphs** Skeletal muscle-properties-pre/afterload-fatigue-Starling'slaw	7hrs.
3.	Stethography i. Effect of deglutination; ii. Voluntary hyperventilation	2hrs
4.	**Bicycle Ergography**	3hrs
5.	**Clinical Physiology on Respiration**	3hrs
6.	Perimetry	2hrs
7.	Spirometry	2hrs
TOTAL HOURS		34 hrs

TEXT BOOKS:

1. Course in Medical Physiology—Vol-I & II-by Dr Chandhani
2. Medical Physiology by Dr. Bijlani
3. Textbook on Medical Physiology-By Gyton
4. Textbook of Medical Physiology- By Shembulingam
5. Textbook of Medical Physiology- By A.K. Jain

REFERENCE BOOKS:

1. Review of medical physiology-Gavton.
2. Samson & Writes Applied physiology

SCHEME OF EXAMINATION

Theory	40	Practical	40
IA	10	IA	10
Total	50	Total	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	Content	Marks
1	Spots (2) 5 Minute per spot	10 Marks (2x 5 mks= 10 mks)
2	Demonstration on clinical Physiology	15
3	Viva	10 Marks
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	**LEVEL I: 01**
LEVEL II: 03	**LEVEL II: 02**	**LEVEL II: 01**	**LEVEL II: 01**

3101 - 13: BIOCHEMISTRY -PART 1

Course Credit for Biochemistry -Part I		
	Hours	Credits
Theory	31	2

OBJECTIVES

At the end of the course, the candidate will -

1) Be able to describe structures & functions of cell in brief.
2) Define Basal metabolic rate & factors affecting the same [in brief], with special reference to obesity.
3) Be able to discuss nutritional aspects of carbohydrates, lipids, proteins.
4) Define enzymes; discuss in brief, factors affecting enzyme activity.
5) Describe in details biochemical aspects of muscle contraction.

Sr. no	Topic	Teaching Hours	Must Know	Desirable to know	Nice to know
1	Cell biology I) Membrane structure & function II) Junction of intracellular organelle in brief- [nostructural details needed]	1 hr	MK		
2	Carbohydrates Chemistry I) Chemistry-definition, classification withexamples II) Functions of carbohydrates with mucco polysaccarhides [in details] III) Reducing properties of sugars of clinical & diagnostic importance [e.g. Benedict's test, Banfood's test etc	5 hrs	MK		
3	Proteins Chemistry a) Chemistry-definition-function-classification of Amino acids-protein structure-effect of temperature on proteins- denaturation- coagulation; isoelectric pH & its importance	2 hrs	MK		
4	Lipids Chemistry • Chemistry-definition-classification-[including fatty acids with examples]-function	2 hrs	MK		
5	Nucleic Acids D.N.A. /R.N.A.-definition-structure & function-types-Genetic code-catabolism of purine –gout	2 hrs		DK	
6	Enzymes a) Definition-Co-Enzymes-classification-factors affecting b) General metabolism of enzymes [in brief] c) Inhibition & types of inhibitors d) Iso - enzymes e) Clinical & therapeutic use of enzymes	3 hrs			NK

7	Muscle Contraction a) Contractile elements b) Biochemical events during contraction c) Energy metabolism in skeletal & cardiacmuscle	3 hrs	MK		
8	Connective Tissue Biochemistry of connective tissue-collagen –Glyco-protein –proteoglycans	2 hrs	MK		
9	Biological Oxidation Oxidative phosphorylation & ETC in brief	1 hrs		DK	
10	Alcohol metabolism alcohol abuse	**1HR**		**D K**	
11	**VITAMINS** a) Water & Fat soluble-definition-classification b) Individual vitamins-sources-Co-enzymeforms- function-reaction related to metabolism covered RDA, absorption-& transport-deficiency &toxicity.	5hrs	MK		
12	**NUTRITION** a) Importance of nutrition-Calorimetry-energy value-calorimeter-respiratory quotient & its significance b) Basal metabolic rate-definition-normal values-factors affecting BMR c) Energy requirement-with-age/sex/ thermogenesis/-specific dynamic action of food, -energy expenditure for various activities d) Composition of food, balanced Diet dietary recommendations nutritional supplementation-nutritional value of carbohydrates/proteins/fats & Fibers Nitrogen balance & its significance-Protein energy malnutrition-Kwashiorkor & Marasmus	4 hrs	MK		

TEXT- BOOKS

1] Biochemistry-by Dr. Deb Jyoti

Das,2] Biochemistry-by-Dr

Satyanarayan

3] Text book of Biochemistry for Medical students by-Dr Vasudevan/ Shri kumar

REFERENCE BOOKS

1] Review of Biochemistry [24th edition] by Harper.

SCHEME OF EXAMINATION

Theory	**40**
IA	10
Total	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**

LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	**LEVEL I: 01**
LEVEL II: 03	**LEVEL II: 02**	**LEVEL II: 01**	**LEVEL II: 01**

3101 - 14: FUNDAMENTAL OF EXERCISE THERAPY PART 1

Course Credit for Fundamental of Exercise Therapy-Part 2		
	Hours	Credits
Theory	53	4
Practical	76	3

OBJECTIVES

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

1] To define the various terms used in mechanics, biomechanics & kinesiology

2] Recall the basic principles of physics related to mechanics of movement / motion & will be able to understand the application of such principles to the simple equipment designs, & their efficacy in therapeutic gymnasium, & various starting position used in therapeutics.

3] To describe & also acquire the skill of use of various tools of the therapeutic gymnasium

4] To demonstrate passive movements in terms of various anatomical planes

6] Acquire the skill of application of various massage manipulations & describe the physiological effects, therapeutic use, merits / demerits of the same.

7] Acquire a skill of assessment of sensations, superficial & deep reflexes, pulse rate / blood pressure, chest expansion / respiratory rate, & limb length / girth measurement on models

Sr. No.	CONTENT	TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic	Practical			
1.	Biomechanics	23	22			
	A} Mechanical principles & its therapeutic applications	1 hrs				
	B} Forces	1 hrs	4 hrs	MK		

	a) Components b) Principles of force c) Classification of forces d) Sources of forces e) Application of forces in the therapeutic effect of traction forces	2 hrs 2 hrs 2 hrs 2 hrs				
	C] Physics Of Motion a) Newton's laws b) Analysis of a movement –kinetic & kinematics	1hrs		MK		
	D] Equilibrium a) Classification b) Relationship between thestability and base of support	1 hr	1 hrs	MK		
	E] Inertia: Definition and effect over a movement.	1hr	2hrs	MK		
	F] Levers in detail: a) Classification b) Effects and uses c) Levers in physiotherapy	4hrs	5 hrs	MK		
	G] Pulleys /springs a) classification b) mechanical advantages in each type c) therapeutic uses	1 hr	4 hrs	MK		
	H] Pendulum in detail	1hr	1hr		DK	
	I] Muscle as a source of kinetics: **a**) Introduction about muscles, muscle cell,muscle fibril, muscle fiber, muscle tissue b) Classification of muscle fibers, based on arrangement, energy expenditure, by physical nature and biomechanical efficiency. c) Muscle work- describe in detail- isometric, isotonic and isokinetic, angle ofpull, mechanical advantage, moment arm,torque, resolution of muscularforce, normal muscle action and reverse action. d) Muscle tone, factors maintains of normal muscle tone. e) Factors responsible muscle function. Applied myology in brief.	3 hrs	5hrs	MK		

2.	**OSTEOKINEMATICS:** a) Introduction about bone as a connective tissue, b) Types of bones related to stress applied in various circumstances functions of bone, c) Bone as a resource of force, d) Bony lever, e) Anatomical pulley	2hr	2hrs	MK		
3.	**ORTHOKINEMATICS:** a) Introduction about arthrology b) Describe about the joint motion, sources, c) Factors responsible for mobility and stability of joint. d) Characteristic feature of joint motion especially during combined movement as well as isolated movement. e) Describe the various positions attained byany joint when it is subject to function. f) Applied arthrokinematics in brief.	2hrs	2hrs	MK		
4.	**INTRODUCTION TO EXERCISE THERAPY** 1) Principles of exercise therapy, definition, aims and objectives of exercise therapy. 2) Branches of exercise therapy. 3) An orientation about various skills of manual therapy.	2 hrs	2 hrs	MK		
5.	**PASSIVE EXERCISES** a) Relaxed passive movements b) Passive manual mobilizationtechniques c) Passive stretching d) Manipulations	3 hrs 2 hrs 3 hrs 1 hr	14 hrs	MK MK	DK	NK
6.	**PHYSICAL PARAMETERS IN EXERCISE THERAPY:** **A. Goniometry for extremities and spine: principles, techniques, uses,types.** **B. Limb length: types, uses and**	15 hrs	27 hrs	MK		

	assessment **C. Limb girth:** D. **Measurement of chest expansion and vital signs.**					
7.	EXAMINATION OF PARAMETERS: **a) Vital examination (BP, Pulse, RR)** **b) Chest expansion** **c) Sensations** **d) Reflex testing (superficial & deep)**	**1 hr**	**6 hrs**			

PRACTICAL

Skills included in sr. no. 2 to 13 above to be practiced on self & models

TEXT BOOKS

1] Principles of Exercise Therapy – Dena Gardiner 2] Massage, manipulation & traction – Sydney Litch

3] Therapeutic Exercise ---------- do ----------

4] Massage – Holly

5] Suspension Therapy in Rehabilitation – Margaret Hollis6] Bio mechanics –Cynthia Norkin

7] Hydrotherapy – Duffield

8] Measurement of physical function – Cynthia Norkins.

REFERENCE BOOKS:

1] Therapeutic Exercise – Carolyn Kisner

2] Physiotherapy in Orthopaedic conditions – by Jayant Joshi [for the study of Basic Yogic postures]

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer	10 Marks (10x 1 mks= 10 mks)

	It must include MUST KNOW questions	
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	Content	Marks
1	Long case (Goiniometer)	15 Marks
2	Short case (Passive movements, limb girth and length, sensation, reflex testing, Vital assessment, chest expansion)	10 Marks
3	Spots	10 Marks (2x 5 Mks= 10 mks)
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	**LEVEL I: 01**
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3101 - 15: FUNDAMENTALS OF ELECTRO THERAPY PART 1

Course Credit for Fundamental of Electro Therapy-Part I		
	Hours	Credits
Theory	50	3
Practical	70	2

OBJECTIVES

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

1. Recall the physics principles & Laws of Electricity, Electro – magnetic spectrum, & ultra sound

2. Describe effects of environmental & man made electromagnetic field at the cellular level & risk factors on prolonged exposure.

3. Describe the main electrical supply, Electric shock –precautions.

4. Enumerate types & production of various Therapeutic electrical currents describe the panel diagrams of the machines.

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

6. Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.

7. Acquire knowledge of low frequency currents, various superficial thermal agents such as Paraffin wax bath, homemade remedies, etc; their physiological & therapeutic effects, Merits / demerits; & also acquire the skill of application

Sr. No.	CONTENT	TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic 95	Practical 105			
1.	MEDICAL ELECTRONICS					
	Electricity (8 Hrs)					
	1) AC	1 hr	3 hrs	MK		
	2) DC	1 hr		MK		
	3) Modified AC	1 hr		MK		
	4) Modified DC	1 hr		MK		
	5) Uses of electricity in general	2 hrs		MK		
	6) Therapeutic uses	2 hrs		MK		
	Components of electric circuits(5 Hrs)					
	1) Main supply	1 hr	4 hrs	MK MK		
	2) Types of cables	1 hr		MK MK		
	3) Fuse	1 hr		MK		
	4) Regulators	1 hr				
	5) Choke coil	1 hr				
	Devices used for rendering the current(6Hrs)					
	1) Condensers	1 hr	5 hrs	MK MK		
	2) Rheostats	1 hr		MK MK		
	3) Transformers	1 hr		MK		
	4) Transistors	1 hr				
	5) Semiconductors& Oscilloscope	2 hr				
	Setting up an electrotherapy department(2Hrs)	2 hrs	2 hrs		DK	
	Safety measures in electrotherapy department(2Hrs)	2 hrs	2 hrs	MK		
2	**Physics of Heat & Cold(8Hrs)**					
	a) Conduction of Heat	**2 hrs**	**12 hrs**	**MK**		
	b) Application of heat & cold& its physiological effects]	**2 hrs**		**MK**		

	Radiations a)Electromagnetic spectrum b)Laws governing radiations	2hrs 2 hrs		MKMK		
	Magnetism(2Hrs) a) Properties of magnets b) Electromagnetic induction	1 hr 1 hr	5 hrs		DK	
	Thermionic Emission(2Hrs) a) Diodes b) Triodes	1 hr 1 hr	2 hrs			NK
	Medical Physics (1Hr)	1 hr			DK	
3.	LOW FREQUENCY CURRENTS: (Production, Physical principles, indications, contraindications, Panel diagram, Testing ofapparatus)					
	a) Various types of low frequency currents, • Faradic Type Current, • Galvanic, • Sinusoidal, • Didynamic & • Strong Surged Faradism, • Russian Currents.	4 hrs	20 hrs	MK		
	b) TENS (Definition, Production, types, physiological & therapeutic effects, Testing of apparatus, ,Panel diagram Indications Contraindications and Therapeutic uses as a pain relieving modality	1 hr 1 hr 2 hr	10 hrs	MK MK MK		
4.	Paraffin wax bath (Therapeutic effects, uses, Merits, demerits, Indications/contraindications, Composition of wax bath, methods of application)	3 hrs	3 hrs	MK		
5.	**Hydro-collator hot packs (Therapeutic effects, uses, Merits, demerits, Indications/contraindications, Composition of hydrocollateral**	**3 hrs**	**2hrs**	**MK**		

	pack, methodsof application)					

- **PRACTICALS:**

1] Panel diagrams – Identification of components – Testing the mains supply & Machines

2] Skills of application of thermal agents

- **TEXT BOOKS:**

1. Clayton 1s Electro therapy – 3rd & 10th ed,
2. Electro therapy explained – by Low & Read
3. Electro Therapy – by Kahn
4. Basics of Electrotherapy – Dr. Subhash Khatri

- **REFERENCE BOOK:**

Clinical Electro Therapy – by Nelson & Currier.

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	**Content**	**Marks**
1	Long case (PWB, Hot Packs)	15 Marks
2	Short case (TENS, Faradic current, galvanic current)	10 Marks
3	Spots	10 Marks (2x 5 Mks= 10 mks)
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: **07**	LEVEL I: 03	LEVEL I: 02	**LEVEL I:** **01**
LEVEL II: **03**	**LEVEL II:** **02**	**LEVEL II:** **01**	**LEVEL II:** **01**

ELECTIVE COURSES SEMESTER 1

3101- EL16 BASICS IN YOGA

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES

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

Be able to define yoga and its types, its physiological & psycho-somatic effects &will be able to demonstrate standard yoga posture used by the beginners.

Category	THEORY	PRACTICAL
1. Introduction to Yoga and Physiotherapy Must to Know - History and Philosophy of Yoga - Introduction to Physiotherapy - Integration of Yoga into Physiotherapy Desirable to Know - Benefits of Yoga for Physiotherapy Patients	3 Hrs	5
2. Anatomy and Physiology Relevant to Yoga Must to Know - Musculoskeletal System Bones, Joints, and Muscles - Nervous System Structure and Function - Yoga Practices for Nervous System Health - Cardiovascular and Respiratory Systems	5 Hrs	11 Hrs

- Heart and Blood Vessels - Respiratory Mechanics **Desirable to Know** - Yoga Asanas and Their Impact on the Musculoskeletal System - Pranayama (Breathing Exercises) and Cardiovascular Health		
3. Yoga Asanas and Their Therapeutic Applications Must to Know • **Basic Asanas** - Tadasana (Mountain Pose) - Balasana (Child's Pose) - Savasana (Corpse Pose) Desirable to Know • **Intermediate Asanas** - Trikonasana (Triangle Pose) - Bhujangasana (Cobra Pose) - Virabhadrasana (Warrior Pose) - Advanced Asanas - Sarvangasana (Shoulder Stand) - Halasana (Plow Pose) - Bakasana (Crow Pose) - Pranayama and Meditation Techniques - Introduction to Pranayama - Basic Breathing Techniques - Kapalabhati (Skull Shining Breath) - Anulom Vilom (Alternate Nostril Breathing) Nice to know • **Other Asanas** - Padahastasana - Siddhasana - Sukhasana - Bhujangasana	7 Hrs	14 Hrs

- Ardha - Salabhasana - Paschimottanasana - Savasana - Dhanurasana - Ardha Halasana - Yogamudrasana - Uttanasana - Virasana - Vajrasana - Setu bandhasana - Gomukhasana - Pavan Muktasana - Halasana - Sarvangasana - Naukasana		

BOOKS FOR BASICS IN YOGA:

1. Introduction, nature, history of yoga: Dr. Punitha
2. Asanas, pranayama, bandhas, mudras & mediative relaxation – Eric Topol
3. Role of yoga therapy in different disorder – Patanjali
4. The Heart of Yoga: Developing a Personal Practice" by T.K.V. Desikachar
5. Yoga Anatomy" by Leslie Kaminoff and Amy Matthews
6. "Light on Yoga" by B.K.S. Iyengar
7. Journals: International Journal of Yoga, Journal of Bodywork and Movement Therapies

3101-EL17 AQUATIC THERAPY

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

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

1. Understand the principles of hydrodynamics and their application in aquatic therapy
2. Identify the physiological effects of immersion and their therapeutic benefits
3. Develop skills in assessing patients for suitability for aquatic therapy
4. Learn to design and implement aquatic therapy programs for various conditions and populations
5. Understand safety protocols and risk management in aquatic therapy settings
6. Develop proficiency in aquatic therapy techniques and exercises
7. Learn to use specialized aquatic therapy equipment effectively
8. Understand the application of aquatic therapy in neurological rehabilitation
9. Develop skills in aquatic therapy for orthopedic and musculoskeletal conditions

Category	THEORY	PRACTICAL
1. Introduction to Aquatic Therapy <u>Must to Know</u> - Definition and principles of aquatic therapy - Historical background - Benefits and limitations <u>Nice to know</u> - Current trends in aquatic therapy - Comparison with land-based therapy <u>Desirable to Know</u> - Future directions in aquatic therapy research	1 Hr	
2. Properties of Water <u>Must to Know</u>	1 Hr	

- Buoyancy - Hydrostatic pressure - Viscosity - Thermodynamics <u>Nice to know</u> - Specific gravity - Surface tension <u>Desirable to Know</u> - Advanced fluid dynamics in therapy settings		
3. Physiological Effects of Immersion <u>Must to Know</u> - Cardiovascular effects - Respiratory effects - Musculoskeletal effects <u>Nice to know</u> - Renal effects - Endocrine effects <u>Desirable to Know</u> - Neurological effects - Long-term adaptations to regular aquatic therapy	1 Hr	
4. Pool Design and Safety <u>Must to Know</u> - Basic pool requirements - Water temperature guidelines - Safety protocols and equipment <u>Nice to know</u> - Advanced pool designs for specific therapies - Water sanitation methods <u>Desirable to Know</u> - Innovative pool technologies - Eco-friendly pool management	1 Hr	

5. Assessment in Aquatic Environment Must to Know - Water-specific assessment tools - Contraindications for aquatic therapy Nice to know - Adaptation of land-based assessments for water - Underwater videography for assessment Desirable to Know - Development of new aquatic assessment tools	1 Hr	
6. Basic Aquatic Therapy Techniques Must to Know - Bad Ragaz Ring Method - Halliwick Concept - Ai Chi - Watsu Nice to know - Burdenko Method - Aqua Stretching Desirable to Know - Integration of multiple aquatic therapy approaches	1 Hr	5 Hrs
7. Therapeutic Exercises in Water Must to Know - Range of motion exercises - Strengthening exercises - Balance and coordination exercises Nice to know - Plyometric exercises in water - Aquatic Pilates Desirable to Know - Development of new aquatic exercise protocols	1 Hr	5 Hrs

8. Aquatic Therapy for Orthopedic Conditions Must to Know - Protocols for common orthopedic conditions (e.g., low back pain, knee osteoarthritis) - Post-surgical rehabilitation Nice to know - Aquatic therapy for sports injuries - Pre-habilitation protocols Desirable to Know - Customized aquatic therapy programs for elite athletes	1 Hr	5 Hrs
9. Aquatic Therapy for Neurological Conditions Must to Know - Protocols for stroke rehabilitation - Management of spasticity in water Nice to know - Aquatic therapy for Parkinson's disease - Multiple sclerosis management in water Desirable to Know - Innovative approaches for rare neurological conditions	1 Hr	5 Hrs
10. Aquatic Therapy for Cardiopulmonary Conditions Must to Know - Aquatic exercises for cardiac rehabilitation - Water-based pulmonary rehabilitation Nice to know - Hydrotherapy for lymphedema management - Aquatic therapy for obesity and metabolic disorders Desirable to Know - Integration of aquatic therapy in comprehensive lifestyle interventions	1 Hr	5 Hrs

11. Pediatric Aquatic Therapy Must to Know - Developmental aquatics - Aquatic therapy for cerebral palsy Nice to know - Aquatic interventions for autism spectrum disorders - Therapy for pediatric oncology patients Desirable to Know - Innovative play-based aquatic therapy approaches	1 Hr	2 Hrs
12. Geriatric Aquatic Therapy Must to Know - Fall prevention programs - Aquatic exercises for osteoporosis Nice to know - Aquatic therapy for dementia patients - Management of frailty in water Desirable to Know - Development of community-based aquatic programs for the elderly	1 Hr	2 Hrs
13. Equipment and Accessories Must to Know - Flotation devices - Resistance equipment - Measurement tools Nice to know - Specialized aquatic therapy equipment - Adaptive equipment for disabled individuals Desirable to Know - Development of new aquatic therapy tools and technologies	1 Hr	1 Hr

14. Documentation and Outcome Measures Must to Know - Basic aquatic therapy documentation - Common outcome measures for aquatic interventions Nice to know - Water-specific outcome measures - Electronic documentation systems for aquatic therapy Desirable to Know - Development of standardized aquatic therapy documentation protocols	1 Hr	
15. **Research Methods in Aquatic Therapy** Must to Know - Basic research designs for aquatic therapy studies - Interpretation of aquatic therapy research Nice to know - Advanced statistical methods for aquatic therapy research - Conducting systematic reviews in aquatic therapy Desirable to Know - Innovative research methodologies for complex aquatic interventions	1 Hr	

BOOKS FOR BASICS IN AQUATIC THERAPY

1. "Aquatic Exercise Therapy" by Andrea Bates and Norm Hanson
2. "Comprehensive Aquatic Therapy" by Bruce E. Becker and Andrew J. Cole
3. "The Bad Ragaz Ring Method" by Johan Lambeck and Urs Gamper
4. "Aquatic Rehabilitation" by Ruth Sova
5. "Water Exercise" by Martha D. White

3101-EL18 COMMUNICATION SKILLS

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understand the fundamental principles of effective communication in a healthcare setting.
2. Develop active listening skills to better understand patient needs and concerns.
3. Enhance verbal and non-verbal communication techniques.
4. Learn to communicate effectively with diverse patient populations.
5. Foster empathy and compassion in patient interactions.
6. Improve written communication skills for accurate documentation and reporting.
7. Develop strategies for communicating complex medical information in an understandable way.
8. Build skills for effective team communication and interdisciplinary collaboration.

Category	THEORY	PRACTICAL
1. Fundamentals of Communication Must to Know - Definition and importance of communication- Components of communication (sender, receiver, message, channel, feedback) - Verbal and non-verbal communication Desirable to Know - Communication models (e.g., Shannon-Weaver model) - Barriers to effective communication Nice to know - Historical development of communication theory - Cultural influences on communication styles	1 Hr	
2. Elements of Effective Communication Must to Know - Components of effective communication Desirable to Know	1 Hr	

- Non-verbal communication cues Nice to know - Communication barriers and how to overcome them		
3. Verbal Communication Must to Know - Basics of verbal communication Desirable to Know - Techniques for clear and concise communication Nice to know - Advanced verbal communication strategies	1 Hr	
4. Non-Verbal Communication Must to Know - Importance of body language, facial expressions, and gestures Desirable to Know - Role of non-verbal communication in physiotherapy Nice to know - Advanced non-verbal communication techniques	1 Hr	
5. Active Listening Must to Know - Techniques for active listening - Importance of eye contact and body language - Paraphrasing and summarizing Desirable to Know - Reflective listening - Empathetic listening techniques Nice to know - Advanced listening strategies for complex patient cases - Mindfulness techniques to enhance listening skills	1 Hr	
6. Patient Interview Skills Must to Know	1 Hr	

- Open-ended vs. closed-ended questions - SOAP note format- Gathering patient history <u>Desirable to Know</u> - Motivational interviewing techniques - Cultural sensitivity in interviewing <u>Nice to know</u> - Advanced interview techniques for special populations (e.g., pediatric, geriatric) - Use of standardized patient interviews		
7. Explaining Diagnosis and Treatment <u>Must to Know</u> - Using simple, clear language - Avoiding medical jargon - Checking patient understanding <u>Desirable to Know</u> - Visual aids and models for explanation - Tailoring explanations to patient's health literacy level <u>Nice to know</u> - Advanced techniques for explaining complex conditions - Using analogies and metaphors effectively	1 Hr	
8. Patient Education <u>Must to Know</u> - Principles of adult learning - Demonstrating exercises and techniques - Providing written instructions <u>Desirable to Know</u> - Motivational strategies for patient compliance - Using technology in patient education (e.g., apps, videos) <u>Nice to know</u> - - Creating custom educational materials - Peer-to-peer education techniques	1 Hr	
9. Interprofessional Communication	1 Hr	

Must to Know - Roles and responsibilities of healthcare team members- Clear and concise reporting - SBAR (Situation, Background, Assessment, Recommendation) technique Desirable to Know - Conflict resolution in healthcare teams - Effective referral writing Nice to know - Leadership communication in multidisciplinary teams - Telemedicine communication skills		
10. Empathy and Rapport Building Must to Know - Expressing empathy verbally and non-verbally- Building trust with patients - Professional boundaries Desirable to Know - Advanced empathy techniques - Dealing with difficult emotions and situations Nice to know - Mindfulness and self-awareness in patient interactions - Cultural competence in empathy	1 Hr	5 Hrs
11. Informed Consent and Shared Decision Making Must to Know - Elements of informed consent - Explaining risks and benefits - Involving patients in decision-making Desirable to Know - Techniques for presenting treatment options - Dealing with patient indecision Nice to know - Ethical considerations in shared decision making - Advanced techniques for complex decision-making scenarios	1 Hr	5 Hrs

12. Breaking Bad News Must to Know - SPIKES protocol for delivering bad news - Responding to patient emotions Desirable to Know - Cultural considerations in breaking bad news - Follow-up communication after delivering bad news Nice to know - - Advanced techniques for supporting patients and families - Self-care strategies for healthcare providers	1 Hr	5 Hrs
13. Documentation and Record Keeping Must to Know - Legal and ethical aspects of documentation - SOAP note writing - Electronic health record basics Desirable to Know - Advanced documentation techniques - Writing effective progress notes Nice to know - Narrative medicine techniques in documentation - Data analytics in patient records	1 Hr	5 Hrs
14. Conflict Resolution and Handling Complaints Must to Know - Basic conflict resolution techniques - Active listening in conflicts - Responding to patient complaints Desirable to Know - De-escalation techniques - Mediating conflicts between patients and other staff Nice to know - Advanced negotiation skills	1 Hr	5 Hrs

- Systemic approaches to reducing patient complaints		
15. Telehealth Communication <u>Must to Know</u> - Basics of telehealth etiquette - Ensuring patient privacy in virtual sessions - Adapting physical assessment for telehealth <u>Desirable to Know</u> - - Engaging patients in virtual environments - Troubleshooting technical issues <u>Nice to know</u> - Creating immersive telehealth experiences - Virtual reality applications in physiotherapy	1 Hr	5 Hrs

Books:

1. "Communication Skills for the Healthcare Professional" by Gwen van Servellen
2. "Communication and Interpersonal Skills in Physiotherapy" by Gillian Hardingham and Maureen Simmonds
3. "The Art of Communication in Nursing and Health Care: An Interdisciplinary Approach" by Theresa Raphael-Grimm
4. "Patient Practitioner Interaction: An Experiential Manual for Developing the Art of Health Care" by Carol M. Davis
5. "Interpersonal Relationships: Professional Communication Skills for Nurses" by Elizabeth Arnold and Kathleen Underman Boggs

3101-EL19 LEADERSHIP QUALITIES

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

Objectives:

- **Understanding Leadership Foundations**: Provide a comprehensive understanding of the fundamental theories, styles, and models of leadership.
- **Developing Self-awareness**: Help participants gain insights into their own strengths, weaknesses, and leadership potential through assessments and reflective exercises.
- **Building Communication Skills**: Enhance verbal and non-verbal communication skills necessary for effective leadership, including active listening, clarity in speech, and persuasive communication.
- **Fostering Team Building and Collaboration**: Equip participants with strategies to build and lead high-performing teams, emphasizing trust, motivation, and accountability.
- **Cultivating Emotional Intelligence**: Teach techniques to recognize and manage emotions in oneself and others, fostering empathy, resilience, and constructive conflict resolution.
- **Strategic Decision Making**: Provide frameworks and tools to make informed and ethical decisions under pressure, considering diverse perspectives and long-term implications.

Category	THEORY	PRACTICAL
1. **Introduction to Leadership** Must to Know - Definition of leadership - Importance of leadership in healthcare - Core leadership qualities for physiotherapists Desirable to Know - Historical perspectives on leadership - Different leadership styles (e.g., transformational, servant, situational) Nice to know - Emerging trends in healthcare leadership - Cultural influences on leadership styles	1	

2. SelfAwareness and Emotional Intelligence Must to Know - Understanding personal strengths and weaknesses - Basics of emotional intelligence - Selfreflection techniques Desirable to Know - Advanced emotional intelligence concepts - Tools for personality assessment (e.g., MBTI, DISC) Nice to know - Neuroscience of emotional intelligence - Mindfulness practices for leaders	2	5
3. **Communication Skills** Must to Know - Active listening techniques - Clear and concise verbal communication - Basics of nonverbal communication Desirable to Know - Advanced presentation skills - Conflict resolution communication Nice to know - Neurolinguistic programming basics - Crosscultural communication strategies	2	10
4. **Team Building and Management** Must to Know - Stages of team developmentRoles within a team - Strategies for effective team collaboration Desirable to Know - Team motivation techniques - Managing diverse teams Nice to know	2	

- Virtual team management - Advanced teambuilding exercises		
5. Decision Making and Problem Solving <u>Must to Know</u> - Steps in the decisionmaking process - Basic problemsolving techniques - Evidencebased decision making in physiotherapy <u>Desirable to Know</u> - Decisionmaking models (e.g., SWOT, PDCA) - Creative problemsolving techniques <u>Nice to know</u> - Decisionmaking under uncertainty - Ethical decisionmaking frameworks	2	5
6. Visionary Thinking and Strategic Planning <u>Must to Know</u> - Importance of vision in leadership - Basic strategic planning processGoal setting (SMART goals) <u>Desirable to Know</u> - Advanced strategic planning techniques - Scenario planning <u>Nice to know</u> - Futurism in healthcare leadership - Disruptive innovation in physiotherapy	2	
7. Change Management <u>Must to Know</u> - Basic principles of change management - Overcoming resistance to change - Implementing change in clinical settings <u>Desirable to Know</u> - Change management models (e.g., Kotter's 8Step) - Leading organizational culture change	1	

Nice to know - Psychology of change - Digital transformation in healthcare		
8. Conflict Management Must to Know - Common sources of conflict in healthcare - Basic conflict resolution strategies - Maintaining professionalism in conflicts Desirable to Know - Mediation techniques - Managing interprofessional conflicts Nice to know - Advanced negotiation skills - Conflict as an opportunity for growth	1	10
9. Ethical Leadership Must to Know - Ethical principles in healthcare leadership - Ethical decisionmaking framework - Professional code of ethics for physiotherapists Desirable to Know - Ethical dilemmas in physiotherapy leadership - Corporate social responsibility in healthcare Nice to know - Philosophy of ethics in leadership - Global ethics in healthcare leadership	1	
10. Mentoring and Coaching Must to Know - Differences between mentoring and coaching - Basic mentoring techniques - Importance of mentorship in professional development Desirable to Know	1	

- Advanced coaching techniques - Reverse mentoring concepts <u>Nice to know</u> - Neuroscience of learning and mentorship - AI in coaching and mentoring		

BOOKS FOR BASICS IN LEADERSHIP QUALITIES

- **Leadership and Management in Athletic Training: An Integrated Approach by Robert C. Schneider and Mary K. Vanderhoef**
- Leadership Roles and Management Functions in Nursing: Theory and Application by Bessie L. Marquis and Carol J. Huston
- Leadership and Management in Healthcare by Neil Gopee

SEMESTER II

3302-11: HUMAN ANATOMY PART 2

Course Credit for Human Anatomy-Part II		
	Hours	Credits
Theory	60	4
Practical	23	1

OBJECTIVES

TOPIC 1: NEURO-ANATOMY

i) To identify & describe various parts of C.N.S.-fore- brain, Midbrain, Hind-brain, Brain stem, courses of cranial nerves; functional components,-course distribution-Anatomical bases of clinical lesions
j) To describe the source & course of spinal tracts
k) To describe blood circulation of C.N.S.& spine
l) Be able to identify the components of various Trans sections.

TOPIC 2: CIRCULATORY

a) Be able to identify & describe the source & course of major arterial, venous & lymphatic system, with special emphasis to extremities, Spine &Thorax.

TOPIC 3: PSYCHOMOTOR

a) To be able to demonstrate the movements of various joints-
b) Distinguish cranial & peripheral nerves
c) Distinguish major arteries, veins & Lymphatic with special emphases to extremities, & spine

SR.NO	CONTENT	TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic	Practical			
1.	**General Anatomy**					
	Topic 1: Histology. (Special Instructions: Student Should Be Able To Identify The Above In Various Slides Under Microscope)	**4 Hrs**	**4Hrs**			
	a) Blood vessels	1Hrs	1Hrs			
	b) Lymphtic system	1Hrs	1Hrs			
	c) Muscles & Nerve	1 Hrs	1 Hrs			
	d) Endocrine system	1 Hrs	1 Hrs			
	Topic 2: Embryology	**2 Hrs**	**2 Hrs**	**MK**		
	a) Head & neck development Neural tube, brain vessels, spinal cord	1Hrs	1Hrs			
	b) Development of brain & its various parts - Spinal cord - Medulla oblongata - Pons - Midbrain - Cerebral hemisphere - cerebellum	1Hrs	1Hrs			
	Topic 3: Male reproductive system (Brief out line)	**1 HR**	**1Hrs**	MK		
	Topic 4: Female reproductive system) (in detail)	**2 HR**	**2Hrs**	MK		
	Topic 5: Lymphatic system(Briefout line)	**2 HRS**	**1Hrs**	MK		
	Topic 6: Radiological anatomy of HNF & abdomen	**2 HRS**	**2Hrs**	MK		
	Topic 7: Digestive system (Brief out Line)	**2 HRS**	**1Hrs**		DK	
	Topic 8: Urinary system (Briefout line)	**3 HRS**	**1Hrs**		DK	

2	**NEUROANATOMY** (All The Topics To Be Taught In Detail)	**30 HRS**	**5 HRS**	MK		
	Topic 1: Organization of CNS, spinal nerves & ANS mainly pertaining to cardiovascular, respiratory & uro-genital systems.	10 HRS	1Hrs			
	Topic 2: Cranial nerves. - A brief outline of all - V,VII, IX,XI,XII in detail	3HRS	1Hrs			
	Topic 3: PNS	3 HRS	2Hrs			
	a) Peripheral nerves,					
	b) Neuromuscular junction,					
	c) Myotomes & dermatomes,					
	Topic 4: CNS a) Cerebral cortex-Various functional areas,	14 HRS	1 Hrs	MK		
	b) Brain stem,					
	c) Pons,					
	d) Medulla oblongata					
	e) Cerebellum,					
	f) Basal ganglia,					
	g) Diencephalons,					
	h) Thalamus,					
	i) Sub thalamus,					
	j) Hypothalamus,					
	k) Corpus striatum,					
	l) Ventricles of the brain blood supply of the brain,					
	m) Internal capsule,					
	n) Visual radiations,					
	o) Thalamo-cortical radiations,					
	p) Auditory radiations,					
	q) Pyramidal system					
	r) Spinal cord segments andareas,					
	s) Different tracts of spinal cord-pyramidal & extra pyramidal system					
	t) Anatomic integration & intercortical integration of CNS,					
	u) Blood brain barrier					
	HEAD NECK FACE TOPICS:	**10 Hrs**	**3 Hrs**			
	a) Scalp					
	b) Salient points about the eyeball,internal ear, triangles					

	of the neck.					
	c) Face & parotid region					
	d) Triangles of neck					
	e) Cranial cavity					
	f) Temporo mandibular joint					
	g) Temporal and Infratemporal regions					
	h) Submandibular region					
	i) Deep structures in the neck					
	j) Mouth, Pharynx & Palate					
	k) Nose Cavity & para nasal sninus					
	l) Larynx					
	m) Tongue					
	n) Ear					
	o) Back Region					
	p) Head & neck Joints					
	q) Skull osteology					
	r) Cervical vertebrae					
	Osteology: a) Skull b) abdominal vertebras c) mandible	2 Hrs	1 Hr			

- **PRACTICAL :**
  - iv) To be able to demonstrate the movements of various joints – (33 hrs)
  - v) Distinguish cranial & peripheral nerves (30 hrs)
  - vi) Distinguish major arteries, veins & lymphatics with special emphases to extremities, & spine. (12 hrs)

- **TEXT BOOKS**

5. Human Anatomy – by Snell
6. Anatomy by Chaurasia all 3 volumes
7. Neuro anatomy by Inderbir Singh
8. Human Anatomy by Kadasne (All three volumes)

- **REFERENCE BOOKS**

8. Gray's Anatomy
9. Extremities by Quining Wasb
10. Atlas of Histology by Mariano De Fiore
11. Anatomy & Physiology by Smout and McDowell
12. Kinesiology by Katherine Wells
13. Neuroanatomy by Snell
14. Neuroanatomy by Vishram Singh

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	**Content**	**Marks**
1	Spots	20 Marks
3	Viva	15 Marks
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	**LEVEL I: 01**

LEVEL II: 03	**LEVEL II: 02**	**LEVEL II: 01**	**LEVEL II: 01**

3102-12: HUMAN PHYSIOLOGY PART 2

Course Credit for Human Physiology-Part 2		
	Hours	Credits
Theory	65	4
Practical	23	1

OBJECTIVES

At the end of the course, the candidate will -

c) Acquire the knowledge of the relative contribution of each organ system in maintenance of the milieu interior [Homeostasis]

d) Be able to describe physiological functions of various systems, with special reference to Musculo-skeletal, Neuro-motor, Cardio-respiratory, Female uro-genital function, & alterations in function with aging.

Sr. No.	CONTENT	TEACHING HOURS (Didactic)	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
1.	**NEUROPHYSIOLOGY: (30 hrs)**				
	Topic 1: CNS	20 hrs	MK		
	a) Physiology of synapse				
	b) Physiology of receptor organsfor general special sensation				
	c) Physiology of pain touch pressure temperature, stereognosis and kinesthetic sensation.				

	d) Physiology of reflex action, classification and properties of reflexes excluding conditioned reflexes.				
	e) Sensory and motor tracts of spinal cord and effects of complete and incomplete transaction of spinal cord at various levels.				
	f) Functions of cerebellum & basalganglia				
	g) Sensory and motor cortex				
	h) Physiology of labyrinthinesystem, Limbic system				
	i) Regulation of equilibriumandposture.				
	j) Learning and memory				
	k) Reticular activating system.				
	Topic 2: Autonomic NervousSystem Sympathetic / Parasympatheticsystem	10 hrs	MK		
	Adrenal medulla, functions				
	Neuro-Transmitters - role in the function of pelvic floor, micturation, defecation labor.				
2.	**CARDIO VASCULAR**	20 hrs	MK		
	Topic 1: Structure & properties ofcardiac muscle.				
	Topic 2: Cardiac cycle.				
	Topic 3: Heart rate regulation,factors affecting.				
	Topic 4: Blood pressure, definition,regulation, factors affecting.				
	Topic 5: Blood supply to heart.				
	Topic 6: Cardiac output, regulation & affecting factors.				
	Topic 7: Peripheral resistance, venous return.				
	Topic 8: Regional circulation, coronary, muscular & cerebral.				
	Topic 9: Conductive system ofheart.				
	Topic 10: Normal ECG				
3.	**REPRODUCTIVE SYSTEM**	5 hrs		DK	
	Topic 1: Functions of Estrogen,Progesterone & Testosterone.				
	Topic 2: Puberty & Menopause.				
	Topic 3: Childhood Obesity and itsPhysiological				

	Basis				
	Topic 4: Lymphatic System (briefoutline)				
4.	SPECIAL SENSES	5 hrs			NK
	Topic 1: Physiology of vision.				
	Topic 2: Physiology of hearing.				
	Topic 3: Physiology of taste.				
5.	Temperature Regulation (Desirable to know) • Topic 1:Circulation of the skin –body fluid – electrolyte balance	5 hrs		DK	
	• Topic 2: Childhood Obesity and its Physiological Basis				
	• Topic 3: Lymphatic System (briefout line)				

HUMAN PHYSIOLOGY - PRACTICAL:

SR. NO	TOIPC	HOURS
1.	ClinicalPhysiologyonCVS/Higherfunctions/Memorytime/Orientation/Reflexes/Motor&Sensory system.	20 hrs
2.	Physical fitness/Pulse/BP	9 hrs
3.	Ergography	3 hrs
4.	Cranial nerves	6 hrs
TOTAL HOURS		38 hrs

TEXT BOOKS:

1. Course in Medical Physiology—Vol-I & II-by Dr Chandhani
2. Medical Physiology by Dr. Bijlani
3. Textbook on Medical Physiology-By Gyton
4. Textbook of Medical Physiology- By Shembulingam
5. Textbook of Medical Physiology- By A.K. Jain

REFERENCE BOOKS:

1. Review of medical physiology-Gavton.
2. Samson & Writes Applied physiology.

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	**Content**	**Marks**
1	Spots (2) 5 Minute per spot	10 Marks (2x 5 mks= 10 mks)
2	Demonstration on clinical Physiology	15
3	Viva	10 Marks
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**

LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	**LEVEL I: 01**
LEVEL II: 03	**LEVEL II: 02**	**LEVEL II: 01**	**LEVEL II: 01**

3102-13: BIOCHEMISTRY PART 2

Course Credit for Biochemistry-Part 2		
	Hours	Credits
Theory	30	2

OBJECTIVES

At the end of the course, the candidate will -

d) Be able to describe structures & functions of cell in brief.

e) Be able to discuss nutritional aspects of Vitamins & their metabolism withspecial reference to obesity.

f) Acquire knowledge in brief about the Clinical biochemistry, with special reference to Liver & renal function test, Lipid profile, metabolism of lipid, Carbohydrates, proteins, bone minerals, & electrolytebalance.

Sr. no	Topic	Teaching Hours	Must Know	Desirable to know	Nice to know
1	Carbohydrates Metabolism: I) Metabolism-Digestion & absorption of carbohydrates –Glycolysis - aerobic, anaerobic, Energetics & regulation II) Kreb`s cycle-its energetics & regulation- role of T.C.A. cycle III) Glycogenesis, glycogenolysis & theirregulation-role of liver in muscle glycogen VI) Gluconeogenesis-significance of H.M.P. shunt • Hormonal regulation of blood sugar levels- • Lactoseintolerance, Diabetes mellitus.	3 Hrs	MK		
2	Proteins Metabolism: a) Metabolism-Digestion & absorption- b) transamination & De-amination theirimportance- c) Detoxification of ammonia includingurea cycle d) Special products of amino acid-e.g. phenylalnine glycine ,methionine[no biosynthesis] e) Neuro-transmitters no bio-synthesis]	3 Hrs	MK		
3	Lipids Metabolism: • Metabolism-Digestion & absorption oflipids-B-oxidation-of saturated fatty acids &its energetics Ketone bodies formation & utilization—cholesterol & its importance [no biosynthesis needed]-classification, sources & function of lipoproteins-hyperlipoproteinemia atherosclerosis	3 Hrs	MK		

2	**MINERALS** a) Phosphate, calcium, & iron [in details] b) Magnesium, fluoride, Zink, Copper, Selenium Molybdenum, Iodine-sources, RDA & function	3 Hrs	MK		
3	**ACID- BASE BALANCE, WATER & ELECTROLYTE** a) Body water, pH-osmolarity Extra & Intracellular fluid b) Buffers-pH, buffer system in blood c) Role of kidneys & lungs in acid-basebalance d) Water - electrolyte balance imbalance – dehydration	3 hrs		DK	
4	**HORMONES** a) Definition-classification-mechanism action b) Second messenger Ca^{+}, cAMP, inositol phosphate c) Metabolic effects of a]-Insulin, b]-Glucagon, c]-Catecholamines, d]-Thyroxine d) Mineralo-corticoids,f]-gluco corticoids &	3 hrs			**NK**
6	**CLINICAL BIOCHEMISTRY** a) Liver function test & Renal function test b) Relevance of blood levels of glucose, urea, creatinine Ca-Phosphate-& uric acid c) Enzymes-Amylase, CPK, LDH,isoenzymes d) Lipid profile-Tri -glyceride, cholesterol/HDL/LDL/ALDL etc normal value e) ABG analysis f) Liver and Renal Function tests	10 hrs	MK		
6	**OBESITY**	**1HR**			
7	Diabetes Biochemical changes in Diabetics.	**1 Hr**			**NK**

TEXT- BOOKS

1] Biochemistry-by Dr. Deb Jyoti Das,

2] Biochemistry-by-Dr Satyanarayan

3] Text book of Biochemistry for Medical students by-Dr Vasudevan/ Shri kumar

REFERENCE BOOKS

1] Review of Biochemistry [24th edition] by Harper.

SCHEME OF EXAMINATION

Theory	**40**
IA	10
Total	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	**LEVEL I: 01**
LEVEL II: 03	**LEVEL II: 02**	**LEVEL II: 01**	**LEVEL II: 01**

3102-14: FUNDAMENTAL OF EXERCISE THERAPY

Course Credit for Fundamental of Exercise Therapy-Part I			Course Credit for Fundamental of Exercise Therapy-Part II		
	Hours	Credits		Hours	Credits
Theory	53	4	Theory	47	3
Practical	76	3	Practical	78	3

3102-14: FUNDAMENTAL OF EXERCISE THERAPY- PART 2

Course Credit for Exercise Therapy-Part 2		
	Hours	Credits
Theory	47	3
Practical	78	3

OBJECTIVES

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

1] To define the various terms used in mechanics, biomechanics & kinesiology

2] Recall the basic principles of physics related to mechanics of movement / motion & will be able to understand the application of such principles to the simple equipment designs, & their efficacy in therapeutic gymnasium, & various starting position used in therapeutics.

3] To describe & also acquire the skill of use of various tools of the therapeutic gymnasium

4] Acquire the skill of application of various massage manipulations & describe the

physiological effects, therapeutic use, merits / demerits of the same.

5] To demonstrate & also acquire the skill of relaxation.

6] To describe the skill & usefulness of group & recreational activities & will be able to demonstrate general fitness exercises used in physical training.

7] Be able to define yoga & its types, its physiological & psycho-somatic effects & will be able to demonstrate standard yoga postures used by the beginners.

8] Be able to describe physiological principles of aerobic exercise conditioning related to general fitness & demonstrate skill of general fitnessexercises & shall gain fitness forself.

Sr. No.	CONTENT	TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic	Practical			
1.	**Principles Of Exercise Therapy Treatment**	1 hr	2 hrs	MK		
2.	**Relaxation-** a) All methods. b) Describe relaxation, muscle fatigue, muscle spasm and tension (mental & physical). c) Factors contributing to fatigue & tension. d) Techniques of relaxation (local and general). e) Effects, uses & clinical application. f) Indication & contraindication.	3hr	5hr	MK		
3.	**Active exercises** a) Definition & Classification b) Active assisted exercises c) Active resisted exercises d) Assisted resisted exercises e) Free exercises f) Exercises for endurance	2 hrs 1 hr 1 hr 1 hr 1 hr 1 hr	12 hrs	MK		
4.	**Therapeutic Gymnasium-** a) Setup of a gymnasium & itsimportance. b) Various equipment in the gymnasium. c) Operational skills, effects & uses of each equipment (shoulder wheel, finger ladder, therapeutic balls, parallel bars etc.)	2 hrs	2 hrs	MK		

4.	**Suspension therapy-** a) Introduction b) Materials c) Types d) Principles e) Indications f) Methods of application for each joint.	3 hrs	10 hrs	MK		
5.	**Hydrotherapy-** a) Physics-application-effects-merits /demerits - Basic principles offluid mechanics. b) Physiological & therapeutic effects of hydrotherapy, includingjoint mobility muscle Strengthening & wound care etc. c) Types of Hydrotherapy equipment, indications, contraindications, operation skills& patient preparation	3 hrs	5 hrs			NK
6.	**Walking Aids** – a) Introduction, b) Types c) Parts d) Measurements	2 hrs	5 hrs	MK		
7	Principles Of Group ExercisesMerits & Demerits.	2 hrs	3 hrs		DK	
8.	Fundamental Starting & DerivedPositions.	8 hrs	10 hrs	MK		
9.	Soft tissue manipulation **I.** Introduction Manipulative Technique a) History b) Definition and classification c) Principles of massage d) Techniques of massage indetail e) General effects and uses f) General indications &contraindications	5 hrs	1 hr	MK		

	II. Regional massage & its therapeutic uses a) Scalp massage b) Facial massage c) Back massage d) Abdominal massage e) Upper limb massage f) Lower limb massage	5 hrs	20 hrs	MK		
	III. The systemic effect of massage therapy a) Musculoskeletal system b) Nervous system c) Cardiovascular system d) Lymphatic system e) Integumentary system	2 hrs	1 hr	MK		
	IV. Clinical implementation of the massage for the following Conditions **a) Cardiac massage** **b) Massage for reducing thelimb oedema.** **c) Massage for chronic headache** **d) Massage for insomnia** **e) Massage for post traumaticstiffness** **f) Massage for muscle spasm** **g) Massage for neurogenic pain** **h) Massage for soft tissueContractures** **i) Massage for skin integrity**	**4 hrs**	**2 hrs**		**DK**	

TEXT BOOKS

1] Principles of Exercise Therapy – Dena Gardiner

2]Massage, manipulation & traction – Sydney Litch

3] Massage – Holly

4] Suspension Therapy in Rehabilitation – Margaret Hollis

5] Bio mechanics –Cynthia Norkin

6] Hydrotherapy – Duffield

7] Measurement of physical function – Cynthia Norkins.

REFERENCE BOOKS:

1] Therapeutic Exercise – Carolyn Kisner

2] Physiotherapy in Orthopaedic conditions – by Jayant Joshi [for thestudy of Basic Yogic postures]

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	**Content**	**Marks**
1	Long case (Suspension, Massage)	15 Marks
2	Short case (Relaxation, therapeutic gymnasium, walking aids, group exercises, starting & derived positions)	10 Marks
3	Spots	10 Marks (2x 5 Mks= 10 mks)
4	Journal	5 Marks

Total	40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: **07**	LEVEL I: 03	LEVEL I: 02	**LEVEL I:** **01**
LEVEL II: **03**	**LEVEL II:** **02**	**LEVEL II:** **01**	**LEVEL II:** **01**

3102-15: FUNDAMENTALS OF ELECTRO THERAPY PART 2

Course Credit for Electro Therapy-Part 2		
	Hours	Credits
Theory	45	3
Practical	45	2

OBJECTIVES

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

1) Recall the physics principles & Laws of Electricity, Electro – magnetic spectrum, & ultra sound
2) Describe effects of environmental & man made electromagnetic field at the cellular level & risk factors on prolonged exposure.
3) Describe the main electrical supply, Electric shock –precautions.
4) Enumerate types & production of various Therapeutic electrical currents describe the panel diagrams of the machines.
5) Describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers etc & the simple instruments used to test / calibrate these components [such as potentiometer, oscilloscope etc] of the circuitry, ; & will be able to identify such components.
6) Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.
7) Acquire knowledge of medium and high frequency, various superficial thermal agents such as, Cryotherapy, homemade remedies, etc; their physiological & therapeutic effects, Merits / demerits; & also acquire the skill of application

Sr. No.	CONTENT	TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic 95	Practical 105			
1.	MEDIUM FREQUENCY CURRENTS					
	a) IFT: (Production, Physical principles Testing of apparatus, ,Panel diagram, Beat frequency Indicationsand Contraindications Therapeutic uses as a pain relieving modality II) Pain & pain modulation	9hrs	10 hrs	MK		NK
2.	**HIGH FREQUENCY CURRENTS & OTHER THERAPEUTIC HEATING MODALITIES**	23hrs	25hrs			
	a) S.W.D (Definition, production, electrodes,physiological & therapeutic effects, indications, contraindications, dangers, precautions, physical principles)	5 hrs	5 hrs	MK		
	b) Therapeutic Ultra sound (Definition, production, physiological and therapeuticeffects, indications, contraindications, testing of apparatus, panel diagram)	5 hrs	5 hrs	MK		
	c) U.V.R.(Ultravoilet rays) (Production, generators, physiological and therapeutic effects, indications, contraindications, dangers, precautions, testing of apparatus,panel diagram)	5 hrs	5 hrs	MK		

	d) I.RR.(Infra red Radiation) (Production, types of generators,physiological and therapeutic effects, indications, contraindications, precautions, testing of apparatus, panel diagram, methods of application)	4 hrs	5 hrs	MK		
	e) LASER.(Light amplification bystimulated emission or radiation) Production, types of LASER, biological effects, indications, contraindications, precautions, testing of apparatus, panel diagram,)	4 hrs	5 hrs	MK		
3	Cold packs Cryotherapy (Therapeutic effects, uses, Merits, demerits, Indications/contraindications, dangers, precautions, methods ofapplication	3hrs	3hrs			
4	Whirl pool (Introduction, indications, contraindications)	2hrs	2hrs			
5	Contrast bath (Introduction, indications,contraindications)	4hrs	2hrs			
6	Traction (Physical principles, types of traction, physiological effects, indications & contraindications,panel diagram)	3hrs	2hrs			
7	Home remedies	1hr	1hr			

- **TEXT BOOKS:**

1. Clayton 1s Electro therapy – 3rd & 10th ed,

2. Electro therapy explained – by Low & Read
3. Electro Therapy – by Kahn
4. Basics of Electrotherapy – Dr. Subhash Khatri

- **REFERENCE BOOK:**

Clinical Electro Therapy – by Nelson & Currier.

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	**Content**	**Marks**
1	Long case (Cryotherapy, IRR)	15 Marks
2	Short case (SWD, US, IFT, UVR, Contrast bath)	10 Marks
3	Spots	10 Marks (2x 5 Mks= 10 mks)
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	**LEVEL I: 01**

LEVEL II: 03	**LEVEL II: 02**	**LEVEL II: 01**	**LEVEL II: 01**

ELECTIVE COURSES SEMESTER 2

3102- EL16 INFORMATION TECHNOLOGY AND ANIMATION

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understand the role of IT in modern physiotherapy practice and healthcare systems.
2. Learn to use electronic health record (EHR) systems effectively for patient management.
3. Explore telemedicine applications and their impact on physiotherapy service delivery.
4. Develop skills in using digital assessment tools and motion capture technology for patient evaluation.
5. Understand the principles of 3D modeling and animation for creating educational materials and visualizing biomechanics.
6. Learn to use data analysis software for research and evidence-based practice in physiotherapy.

Category	THEORY	PRACTICAL
1. Introduction to IT in Healthcare Must to Know - Basics of IT and its role in healthcare Nice to know - Historical development of healthcare IT Desirable to Know - Global perspectives on healthcare IT	1 Hr	
2. Electronic Health Records (EHR) Must to Know - Basics of EHR and its importance Nice to know - Benefits and challenges of EHR Desirable to Know	1 Hr	

- Future trends in EHR development		
3. Data Management and Security Must to Know - Principles of data management and security Nice to know - Data storage solutions Desirable to Know - Innovations in data security	2 Hr	5 Hrs
4. Tele Physiotherapy and health Must to Know - Basics of telemedicine and telehealth Nice to know - Benefits and challenges Desirable to Know - Future trends in telemedicine	1 Hr	
5. Mobile Health (mHealth) Must to Know - Basics of mHealth and its applications Nice to know - Popular mHealth apps for physiotherapy Desirable to Know - Developing custom mHealth solutions	1 Hr	5 Hrs
6. Digital Imaging and Diagnostics Must to Know - Basics of digital imaging and diagnostics Nice to know - Advanced imaging techniques Desirable to Know - Future trends in diagnostic technology	2 Hrs	5 Hrs

7. Wearable Technology Must to Know - Overview of wearable technology in healthcare Nice to know - Popular wearable devices for physiotherapy Desirable to Know - Innovations in wearable technology	1 Hr	
8. Health Informatics Must to Know - Principles of health informatics - Applications of health informatics Desirable to Know - Research and innovations in health informatics	1 Hr	
9. Patient Management Systems Must to Know - Basics of patient management systems Desirable to Know - Features of popular patient management systems Nice to know - Advanced patient management technologies	1 Hr	5 Hrs
10. Clinical Decision Support Systems Must to Know - Overview of clinical decision support systems (CDSS) Desirable to Know - Benefits and challenges of CDSS	1 Hr	
11. IT in Rehabilitation Must to Know - Role of IT in rehabilitation Desirable to Know - Applications of IT in physiotherapy Nice to know - Innovations in rehabilitation technology	2 Hrs	5 Hrs

12. E-Learning and Online Education Must to Know - Basics of e-learning and online education Desirable to Know - Popular e-learning platforms	1 Hr	
13. Health Data Analytics Must to Know - Principles of health data analytics Desirable to Know - Techniques for data analysis	1 Hr	5 Hrs

Suggested Reading and Resources:

- "Health Information Management: Concepts, Principles, and Practice" by Kathleen M. LaTour and Shirley Eichenwald Maki
- "Introduction to Healthcare Informatics" by Sue Biedermann and Donna Olson
- Journals: Journal of Medical Internet Research, International Journal of Medical Informatics

3102- EL17 BASICS IN ARTIFICIAL INTELLIGENCE

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. **Understand Fundamental AI Concepts:**

- Introduce basic concepts and terminologies in artificial intelligence.
- Explore the history and evolution of AI, emphasizing its significance in modern technology.

2. **AI Applications in Healthcare:**

- Highlight the role of AI in healthcare, with a focus on physiotherapy.
- Discuss case studies and real-world applications where AI has improved patient outcomes.

3. **Machine Learning Basics:**

- Explain the principles of machine learning and its various types (supervised, unsupervised, reinforcement learning).
- Illustrate how machine learning algorithms can be used for predictive analytics in physiotherapy.

4. **AI-Driven Diagnostics and Treatment Planning:**

- Demonstrate how AI can assist in diagnostics, patient assessment, and treatment planning.
- Explore AI tools that help in creating personalized rehabilitation programs.

Category	THEORY	PRACTICAL
1. Introduction to Artificial Intelligence (AI) Must to Know - Definition and basic concepts of AI Desirable to Know - Historical development of AI	1 Hr	

Nice to know - Overview of major AI research milestones		
2. Types of AI Must to Know - Difference between Narrow AI and General AI Desirable to Know - Overview of machine learning, deep learning, and neural networks Nice to know - AI subfields such as robotics, natural language processing (NLP), and computer vision	1 Hr	
3. AI in Healthcare Must to Know - Role and importance of AI in healthcare Desirable to Know - Case studies of AI applications in healthcare Nice to know - Future trends in AI for healthcare	1 Hr	5 Hrs
4. AI in Physiotherapy Must to Know - Current applications of AI in physiotherapy Desirable to Know - Benefits and challenges of AI in physiotherapy Nice to know - Innovations in AI for physiotherapy	1 Hr	5 Hrs
5. Machine Learning Basics Must to Know - Basic principles of machine learning (ML) Desirable to Know - Supervised vs. unsupervised learning Nice to know - Reinforcement learning	1 Hr	5 Hrs
6. AI Algorithms Must to Know - Common algorithms used in AI (e.g., regression, classification	1 Hr	

Desirable to Know - Advanced algorithms (e.g., decision trees, support vector machines) Nice to know - Deep learning algorithms (e.g., convolutional neural networks)		
7. Data Collection and Management Must to Know - Importance of data in AI Desirable to Know - Techniques for data collection Nice to know - Data management best practices	1 Hr	
8. Data Preprocessing Must to Know - Basics of data preprocessing Desirable to Know - Data cleaning and normalization techniques Nice to know - Feature engineering	1 Hr	
9. Training and Testing AI Models Must to Know - Steps in training and testing AI models Desirable to Know - Cross-validation techniques Nice to know - Hyperparameter tuning	1 Hr	5 Hrs
10. Evaluating AI Models Must to Know - Basics of model evaluation metrics Desirable to Know - Common evaluation metrics (e.g., accuracy, precision, recall) Nice to know - Advanced evaluation metrics (e.g., ROC-AUC, F1 score)	1 Hr	

11. Implementing AI in Physiotherapy Must to Know - Steps for implementing AI solutions in physiotherapy Desirable to Know - Integration of AI with existing physiotherapy systems	1 Hr	
12. Ethical Considerations in AI Must to Know - Importance of ethics in AI Desirable to Know - Common ethical issues (e.g., bias, privacy) - Guidelines and frameworks for ethical AI	1 Hr	3 Hrs
13. AI Tools and Platforms Must to Know - Introduction to popular AI tools and platforms (e.g., TensorFlow, PyTorch) Desirable to Know - Overview of cloud-based AI services (e.g., AWS, Google Cloud)	1 Hr	5 Hrs
14. Computer Vision in Physiotherapy Must to Know - Role of computer vision in physiotherapy Desirable to Know - Applications of computer vision (e.g., motion analysis)	1 Hr	5 Hrs
15. AI in Rehabilitation Must to Know - AI applications in rehabilitation Desirable to Know - Benefits and challenges of AI in rehabilitation	1 Hr	2 Hrs

Reference books:

1. "Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig
2. "Introduction to Artificial Intelligence" by Wolfgang Ertel

3. "Machine Learning Yearning" by Andrew Ng
4. "Artificial Intelligence: Foundations of Computational Agents" by David L. Poole and Alan K. Mackworth

3102-EL18 DIET & NUTRITION

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

Objectives:

- **Understanding Macronutrients and Micronutrients**: Students will learn about the essential nutrients required by the body, including carbohydrates, proteins, fats, vitamins, and minerals, and their roles in maintaining health.
- **Assessment of Nutritional Needs**: Students will be able to assess nutritional requirements based on factors such as age, sex, physical activity, and health status.
- **Healthy Eating Guidelines**: Teach students the principles of a balanced diet and the importance of consuming a variety of foods to meet nutritional needs.
- **Nutritional Biochemistry**: Provide an understanding of the biochemical processes involved in digestion, absorption, and metabolism of nutrients.
- **Impact of Nutrition on Health**: Explore how nutrition influences the prevention and management of chronic diseases such as obesity, diabetes, cardiovascular diseases, and certain cancers.
- **Food Safety and Hygiene**: Educate students on the principles of food safety, including proper storage, handling, and preparation techniques to prevent foodborne illnesses.

Category	THEORY	PRACTICAL
1. Introduction to Nutrition Must to Know - Basic definitions (nutrition, nutrients, diet) - Importance of nutrition in health and rehabilitation - Role of physiotherapists in nutrition counseling Desirable to Know - History of nutrition science - Current trends in nutrition research Nice to know - Future directions in nutritional therapy	1	

- Emerging technologies in nutrition assessment		
2. Macronutrients Must to Know - Carbohydrates: types, functions, requirements - Proteins: functions, requirements, quality - Fats: types, functions, essential fatty acids Desirable to Know - Glycemic index and load - Protein quality assessment methods - Advanced lipid metabolism Nice to know - Emerging research on macronutrient timing - Personalized macronutrient recommendations	1	
3. Micronutrients Must to Know - Vitamins: watersoluble and fatsoluble - Minerals: major and trace - Functions and deficiency symptoms Desirable to Know - Micronutrient interactions - Bioavailability of micronutrients Nice to know - Emerging micronutrients of interest - Genetic variations affecting micronutrient needs	1	
4. Energy Balance and Body Composition Must to Know - Energy balance equation - Methods of assessing energy expenditure - Body composition assessment techniques Desirable to Know - Advanced body composition analysis methods	1	10

- Metabolic adaptation to energy restriction Nice to know - Circadian rhythms and energy balance - Gut microbiome and energy harvest		
5. Nutrition for Exercise and Sports Must to Know - Nutrient needs for athletes - Pre, during, and postexercise nutrition - Hydration strategies Desirable to Know - Nutrient timing for performance - Ergogenic aids and supplements Nice to know - Genetic influences on sports nutrition needs - Altitude and nutrition considerations	1	
6. Nutrition in Weight Management Must to Know - Energy balance in weight loss/gain - Healthy weight loss strategies - Role of exercise in weight management Desirable to Know - Behavioral aspects of weight management - Pharmacological approaches to weight loss Nice to know - Gut hormones and appetite regulation - Epigenetics in weight management	1	
7. Nutrition in Cardiovascular Health Must to Know - Dietary approaches to hypertension (DASH diet) - Lipidlowering diets - Sodium and potassium balance	1	

Desirable to Know - Advanced lipid management through diet - Nutraceuticals for heart health Nice to know - Gut microbiome and cardiovascular health - Chronobiology of cardiovascular nutrition		
8. Nutrition in Diabetes Management Must to Know - Glycemic index and load in meal planning - Carbohydrate counting - Role of fiber in diabetes management Desirable to Know - Advanced insulin management and nutrition - Nutrition strategies for diabetes complications Nice to know - Artificial sweeteners and glucose metabolism - Gut microbiome in diabetes	1	
9. Nutrition in Musculoskeletal Health Must to Know - Calcium and Vitamin D for bone health - Protein requirements for muscle health - Antiinflammatory nutrition for joint health Desirable to Know - Nutrition for tendon and ligament health - Dietary strategies for osteoarthritis Nice to know - Emerging nutrients for musculoskeletal health - Chronobiology of bone metabolism	1	
10. Nutrition in Neurological Conditions Must to Know - Nutrition in stroke recovery	1	

- Dietary approaches for Parkinson's disease - Nutrition in spinal cord injury Desirable to Know - Ketogenic diet for epilepsy - Nutrition strategies for multiple sclerosis Nice to know - Gutbrain axis in neurological health - Emerging diets for neurodegenerative diseases		
11. Nutrition in Respiratory Conditions Must to Know - Nutrition in COPD Dietary considerations in asthma - Nutrition for cystic fibrosis Desirable to Know - Nutrition in pulmonary rehabilitation - Antioxidants and lung health Nice to know - Gut lung axis - Nutrition and sleep apnea	1	
12. Nutrition in Pediatric Physiotherapy Must to Know - Nutrition for growth and development - Nutrition in pediatric obesity - Feeding difficulties in children with disabilities Desirable to Know - Nutrition in pediatric sports - Dietary management of pediatric chronic diseases Nice to know - Earlylife nutrition and longterm health - Personalized nutrition in pediatrics	1	
13. Nutrition in Geriatric Physiotherapy Must to Know	1	10

- Nutritional needs of older adults - Malnutrition assessment and management - Nutrition for fall prevention <u>Desirable to Know</u> - Nutrition in cognitive decline - Dietary strategies for healthy aging <u>Nice to know</u> - Nutrition and frailty - Chronobiology of aging and nutrition		
14. Nutrition in Wound Healing <u>Must to Know</u> - Protein and energy needs for wound healing - Role of vitamins and minerals in wound healing - Nutrition for pressure ulcer prevention <u>Desirable to Know</u> - Immunonutrition in wound care - Nutrition for burn patients <u>Nice to know</u> - Emerging nutrients for wound healing - Gut microbiome and wound healing	1	
15. Nutritional Assessment in Physiotherapy <u>Must to Know</u> - Anthropometric measurements - Basic dietary assessment methods - Identifying nutrition red flags	1	10

BOOKS FOR DIET & NUTRITION

- "Advanced Nutrition and Human Metabolism" by Sareen S. Gropper and Jack L. Smith
- "ACSM's Body Composition Assessment" by Timothy G. Lohman et al
- "The Health Professional's Guide to Popular Dietary Supplements" by Allison Sarubin Fragakis
- "Handbook of Clinical Nutrition and Aging" by Connie W. Bales and Julie L. Locher
- "Geriatric Nutrition" by John E. Morley and David R. Thomas

3102-EL19 COPYRIGHT AND PATENT DESIGN IN PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Understand Intellectual Property (IP) Basics**: Define copyright and patent concepts within the context of physiotherapy practice.
- **Explore Copyright Law**: Examine the principles and application of copyright law as it pertains to physiotherapy, including the protection of original works, such as written materials, diagrams, and software.
- **Examine Patent Law**: Investigate the fundamentals of patent law relevant to physiotherapy, focusing on the requirements for patentability, disclosure, and infringement.
- **Discuss IP Strategies in Practice**: Analyze strategies for protecting intellectual property in physiotherapy practice, such as through copyright notices, licenses, and non-disclosure agreements.
- **Evaluate Case Studies**: Review relevant case studies and examples to understand real-world applications of copyright and patent law in physiotherapy.

Category	THEORY	PRACTICAL
1. Introduction to Intellectual Property Must to Know - Basic principles of copyright and patent laws Nice to know - Global variations in intellectual property laws Desirable to Know - Historical background of intellectual property	1	

2. Copyright in Physiotherapy Must to Know - Understanding copyright: scope and limitations Nice to know - Fair use and its relevance to physiotherapy Desirable to Know - Application of copyright to physiotherapy materials	2	
3. Patent Design in Physiotherapy Must to Know - Basics of patent law Nice to know - Differences between patents and copyrights Desirable to Know - Process of obtaining a patent in physiotherapy	2	
4. Importance of Intellectual Property Must to Know - Protecting original research and clinical protocols Nice to know - Ethical considerations in patenting physiotherapy techniques Desirable to Know - Economic impact of intellectual property in healthcare	2	10
5. Case Studies and Examples Must to Know - Recent legal cases in physiotherapy and IP Nice to know - Controversies in copyright infringement in physiotherapy Desirable to Know	2	10

- Successful patenting stories in healthcare		
6. Practical Applications <u>Must to Know</u> - Creating copyright notices for physiotherapy materials <u>Nice to know</u> - Licensing and monetizing intellectual property in physiotherapy <u>Desirable to Know</u> - Drafting patent applications for physiotherapy methods	3	10
7. Emerging Trends <u>Must to Know</u> - Digital rights management in physiotherapy <u>Nice to know</u> - Future technologies and their IP implications <u>Desirable to Know</u> - Open access movements and their impact	3	

BOOKS FOR BASICS IN COPYRIGHT AND PATENT DESIGN IN PHYSIOTHERAPY

- Copyright Law for Librarians and Educators by Kenneth D. Crews
- Understanding Copyright: Intellectual Property in the Digital Age by Bethany Klein, Giles Moss, and Lee Edwards
- Patent Law Essentials: A Concise Guide by Alan L. Durham
- Patent It Yourself by David Pressman and David E. Blau

SEMESTER III

3103-11 PATHOLOGY

Course Credit for Pathology		
	Hours	**Credits**
Theory	**45**	**3**

OBJECTIVES

At the end of the year, the student will be able to-

1. Acquire the knowledge of concepts of cell injury & changes produced thereby in different tissues & organs-; capacity of the body in healing process
2. Recall the Etiology-pathogenesis, the pathological effects & the clinical-pathological correlation of common infections & non-infectious diseases
3. Acquire the knowledge of concepts of neoplasia with reference to the Etiology, gross & microscopic features, diagnosis, & prognosis in different tissues, & organs of the body
4. Correlate normal & altered morphology of different organ systems in different diseasesneeded for understanding disease process & their clinical significance [with special emphasis to neuro, musculo-skeletal & cardio-respiratory systems]
5. Acquire knowledge of common immunological disorders & their resultant effects on the human body.
6. Understand in brief, about the Hematological diseases & investigations necessary to diagnose them & determine their prognosis

Sr.no	Subject	Hrs per week	Total hrs
01	Pathology	2 Hrs	45 hrs

Sr.no	Content	Teaching hrs. Didactic	Must know	Desirable to know	Nice to know
1.	**General Pathology-** ❖ Cell injury-causes, mechanism & toxic injuries with special reference to Physical, Chemical, & ionizing radiation • Reversible injury [degeneration]-types-morphology, swelling, hyaline, fatty changes, • Intra- cellular accumulation-hyalinemucin • Irreversible cell injury-types of necrosis-apoptosis –calcification - dystrophic & metastasis • Extracellular accumulation- amylidosis, calcification-Pathogenesis-morphology	5 Hrs	MK		
2	**Inflammation & Repair-**	2 Hrs	MK		
	• Acute inflammation-features, causes,vascular				
	& cellular events,				
	• Morphologic variations, • Inflammatory cells & mediators, • Chronic inflammation - causes, types, non-				
	specific & granulomatous with examples				
	• Wound healing by primary & secondary union				
	factors promoting & delaying healing process.				
	• Healing at various sites-including-bones, nerve,				
	& muscle				
	• Regeneration & repair				

3.	**Immuno-pathology- [basic concepts]-** • Immune system:- organization-cells-antibodies-regulation of immune responses, • Hyper-sensitivity, • Secondary immuno-deficiency including HIV,Organ transplantation	2 Hrs		NK	
4.	**Circulatory disturbances-** • Edema pathogenesis-types-translates/exudates • Chronic venous congestion-lung, liver, spleen, • Thrombosis-formation-fate-effects, • Embolism-types-clinical effects, • Infarction-types-common sites • Gangrenes-types-actiopathogenesis • Shock-pathogenesis, types, morphologic changes	3 Hrs	MK		
5.	**Deficiency disorders-** Vitamin A, B, C, D, E	2 Hrs		NK	
6.	**Growth Disturbance-** • Atrophy-malformation, agenesis,dysplasia, • Neoplasia calcification, histogenesis, biologic behaviour, difference between	3 Hrs	MK		

	benign & malignant tumour • Malignant neoplasm -grades-stages- local & distal spread, • Carcinogenesis-environmentalcarcinogens • Chemical, Occupational, heredity, vira, • Precancerous lesions & Ca in situ • Tumor & host interactions-systemic effects- metastatic or direct spread of tumors affecting bones, spinal cord, leading to paraplegia, etc.				
7.	**Medical Genetics- [In Brief]**	1 Hrs			**DK**
8.	**Specific Pathology-** **CVS** ▪ Arteriosclerosis-Ischaemic heart diseases-myocardial ▪ Infarction-Pathogenesis /Pathology ▪ Hypertension ▪ C.C.F. ▪ R H.D. ▪ Peripheral vascular diseases □ **Respiratory** ▪ COPD, ▪ Pneumonia [lobar, broncho, viral], ▪ T.B.-primary, secondary-morphologictypes, ▪ Pleuritis, complications, ▪ Lung collapse- atelectasis □ **Neuropathology** ▪ Reaction of nervous tissue to injury-	15 Hrs	MK		

	infection-& ischaemia ▪ Pyogenic meningitis, TBM, Viral, ▪ Cerebro-vascular diseases- arteriosclerosis-Thrombosis, embolism, aneurysm, hypoxia, infarction-&hemorrhage ▪ Effects of Hypotension on CNS. ▪ Coma ▪ Polio myelitis- Leprosy-Demyelinating diseases -Parkinsonism-Cerebral palsy- metachromatic leucodystrophy-Dementia-Hemiplegia /paraplegia—Pathogenesis &pathology of Wilson`s disease ▪ GBS ▪ SOL- [in brief] ▪ Peripheral nerve injury ▪ Applied pathology for stroke				
9.	Muscle diseases-Muscular dystrophy-hypertrophy-Psudo- hypertrophy-atrophy-Polio-myelitis Myositis ossificance, necrosis, regeneration-Myotonia	4 Hrs	MK		
10.	Neuro –muscular junction-Myasthenia gravis-Myasthenicsyndrome	2 Hrs	MK		
11.	Urinary –commonly encountered in paralytic bladder, Common urinary tract infections [brief]-urinarycalculi.	2 Hrs			**DK**
12	Endocrine-Hyperthyroidism-Diabetes	2 Hrs		NK	
13	***Clinical pathology- [including Demonstrations] basic bedsidelaboratory test and basic microscopic studies-**	**2 Hrs**	**MK**		

	• Anaemia- [deficiency]- T.C./D.C. / Eosinophilia, E.S.R., C.P.K. • Muscle/skin/nerve biopsy • Microscopic appearance of • Muscle necrosis-fatty infiltration Lab investigation in liver & renal failure				

BOOKS FOR PATHOLOGY

1. Text book of Pathology -by Harsh Mohan
2. Pathologic basis of disease by Cotran, Kumar, Robbins
3. A Hand book of medical laboratory technology – V. H. Talib General Pathology – by Bhende

SCHEME OF EXAMINATION

Theory	40
IA	10
Total	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10

MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: **07**	LEVEL I: 03	LEVEL I: 02	**LEVEL I:** **01**
LEVEL II: **03**	**LEVEL II:** **02**	**LEVEL II:** **01**	**LEVEL II:** **01**

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3103 - 12: MICROBIOLOGY

MICROBIOLOGY

Course Credit for Microbiology		
	Hours	Credits
Theory	30	2

OBJECTIVES

At the end of the course, the candidate will have sound knowledge of,

- The agent responsible for causing human infections, pertaining to C.N.S, C.V.S. musculoskeletal, & Respiratory system.

Sr. no	Content	Teaching hours	Must know	Desirable to know	Nice to know
1.	**General microbiology** i. Introduction **ii.** Scope	1 Hrs	MK		
2.	**Classification** of Micro-organisms & morphology of Bacteria	1 Hrs	MK		
3.	**Sterilization & disinfections –[basic concepts]** • Hospital acquired infection, universal safetyprecautions, waste disposal	4 Hrs		DK	

4.	**Immunology** • Antigen-antibody— reaction-& application fordiagnosis; • Immune response-normal/abnormal; • Innate immunity, &acquired immunity[vaccination] • Hyper-sensitivity & auto-immunity	5Hrs	MK		
5.	**Laboratory Diagnosis of Infection**	3 hrs			NK
6.	**Bacteriology** • Infection caused by gram +ve cocci; Gas gangrene-clostridium-Diptheria • Infection caused by gram –ve cocci-Septicemia-cholera-Shock-Typhoid-diarrhoea; • Mycobacterial infection-tuberculosis-Leprosy-Atypical Micobacterium; Syphillis-morphology &pathogenesis [VDRL]	7Hrs	MK		
7.	**Viruses** • Introduction & general properties, • HIV, • Hepatitis, • Polio, measles, congenitalviral infections, Rubella, CMV, Herpes	3 Hrs		DK	
8.	**Mycology** Mycetoma- Aspergilosis- candidiasis	1 Hrs			NK
9.	**Parasites affecting C.N.S.** • Malaria- Filaria- Toxoplasma - Cystisarcosis & echinococcus	2 Hrs	MK		
10.	**Applied Microbiology** As relevant to diseases involving Bones,Joints, Nerves, Muscles, skin &brain. Cardiopulmonary system & burns.	3 Hrs	MK		

BOOK FOR MICROBIOLOGY

1. Text books of Microbiology – by R. Ananthnarayan & C.K. Jayram Panikar. 10th edition.

SCHEME OF EXAMINATION

Theory	40
IA	10
Total	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: **07**	LEVEL I: 03	LEVEL I: 02	**LEVEL I:** **01**
LEVEL II: **03**	**LEVEL II:** **02**	**LEVEL II:** **01**	**LEVEL II:** **01**

3103 - 13: EXERCISE THERAPY PART I

Course Credit for Exercise Therapy -Part I		
	Hours	Credits
Theory	52	4
Practical	95	6

OBJECTIVES

At the end of the year, the candidate will be able to-

1. Understand biomechanical principles of joint. Analyze various Normal Musculoskeletal movements during activities of daily living.
2. Apply the biomechanical principles for the efficacy in the assessment methods for mobility, muscle strength.
3. Describe the Biophysical properties of connective tissue, & effect of mechanical loading, & factors which influence the Muscle strength, & mobility of articular & periarticular soft tissues.
4. Describe the physiological effects, Therapeutic uses, merits/demerits of various exercise modes.
5. Demonstrate various therapeutic exercises on self & also acquire the skill of application on Models
6. Acquire the skill of assessment of isolated & group muscle strength, & Range of motion of the joints subjectively & objectively

Sr. no	Content	Teaching hours		Must know	Desire to know	Nice to know
		Didactic	practical			
1.	Biomechanics of joints of the skeletal system [spine, extremities, T.M. joint& Thoracic cage	25 hrs	40 hrs	MK		
2.	Kinetics & Kinematics of various activities of daily living-e.g. Supine tositting, sitting to standing, squatting, climbing up & down, lifting, pulling, pushing, overhead activities, walking running, jogging	5 hrs	10 hrs		DK	
3.	Assessment of muscle strength, [group/individual]-subjective & objective methods-1/10 RM dynamometry	12 hrs	25 hrs	MK		
	-Factors that influence the strength of the normal muscle/ hypertrophy,- recruitment of motor units, change aftertraining / type of contraction Isometric /Isotonic / Isokinetic Eccentric					
	-General principles of strength training- :overload / intensity/Motivation /learning/ duration/ frequency /reversibility/specificity					
4.	Bio-physical properties of connective tissue,[contractile & non-contractile] elasticity /Plasticity-response to sudden /slow /sustained loading-strain curve-Creep-Hysteresis	7 hrs	20 hrs	MK		

	Mobilization-Methods-stretching /traction [cervical & lumber] /Hold – Relax method- rhythmic movements/oscillations					
	Mobilization of muscles & Fasciae-- around the shoulder/elbow/wrist /Hip/knee/ ankle/ Spine [dorso-lumber fascia]					
5.	Principles of P.N.F.[no practical]	3 hrs			DK	

TEXT BOOKS

1. Progressive resisted exercises-by Margaret Hollis,
2. Therapeutic Exercise by Carolyn Kisner
3. Kinesiology by Cynthia Norkins
4. PNF - Knott and Voss

REFERENCE BOOKS

1. Therapeutic exercise by Basmijjan & Wolf
2. Muscle testing by Daniel Kendall
3. Clinical evaluation - Lacote (for Isolated assessment of abdominal muscles)
4. Muscle Stretching & Auto-stretching- Olaf Evjenth
5. Orthopedic Evaluation - Magee (only for assessment of posture)

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	**10**	**IA**	**10**
Total	**50**	**Total**	**50**

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	Content	Marks
1	Long Case (Mobilization/Muscle training)	25 Marks
3	Short case (MMT/ ROM/ Assessment tools/ biomechanical movement analysis)	10 Marks
4	Journal	5 Marks
Total		40 Marks

3103 – 14: ELECTROTHERAPY- Part 1:

Course Credit for Electro Therapy-Part I		
	Hours	Credits
Theory	50	3
Practical	70	2

Course objectives-

a) Recall the basic principles of electrotherapy modalities

b) Describe effects of electrotherapy modalities at the cellular level & risk factors on prolonged exposure.

c) Describe the application of electrotherapy modalities with their physiological & therapeutic effects, Merits / demerits; & also acquire the skill of application

d) Acquire knowledge of application of Electrotherapy modalities with proper dosage application in various conditions

e) Acquire knowledge of pain modulation and application of various therapeutic modalities for pain management

f) Describe & identify various basics of electrotherapeutic assessment tools for various neuromuscular conditions

Course outcomes-

The student should be able to describe the effects of various electromagnetic fields and therapeutic currents. The student should be able to gain knowledge of electrical supply, hazards and precautions. The student should be able to test the various electrotherapeutic equipment prescribed in their syllabus; describe and identify various electrical components in the circuits of the same. The student should be able to acquire and apply knowledge of various superficial thermal agents.

Sr. No.		TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic 50	Practical 70			
1.	**Low Frequency Currents** 7) Cathodal/Anodal Galvanism 8) Iontophoresis-with various ions &Pharmaco-therapeutic drugs 9) Electric stimulation for re-education-short/long pulse-motor points Strong surged faradic current under pressure /elevation • T.N.S.-types • High voltage currents • Micro-currents • Diadynamic currents	20 hrs	20 hrs	MK		
2	**Medium frequency currents-** Beatfrequency-types-Endovac attachment- advantage of I.F.T. over low frequency currents	10 hrs	25 hrs	MK		
3	**Pain:** 1) Pain tolerance 2) Pain Modulation 3) Pain Gate Theory	5hrs	-	MK		
4	**Micro amperage Electrical nerve stimulation-** Definition, Effects, Mechanism of action, Indicationsand Contraindications.	10 hrs	15 hrs		DK	

5	**Electro-diagnostic tests:** 1) F-G test 2) SD curve	5 hrs	10 hrs			NK

Text Books:

- Clayton's Electro Therapy – IX th edition.
- Electro Therapy Explained – By Low & Read
- Electro Therapy – By Kahn,
- Therapeutic Electricity – By Sydeny Litch

- Reference Books:
- Clinical Electro Therapy – By Nelson & Currier

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	Content	Marks
1	Long case (Motor point Stimulation, IFT)	15 Marks
2	Short case (TENS,SD curve, FG Test, Iontophoresis)	10 Marks
3	Spots	10 Marks (2x 5 Mks= 10 mks)
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: **07**	LEVEL I: 03	LEVEL I: 02	**LEVEL I:** **01**
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ELECTIVE COURSES SEMESTER III

3103-EL15 BIOMEDICAL ENGINEERING

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understanding of human anatomy and biomechanics relevant to physiotherapy
2. Knowledge of biomedical sensors and instrumentation used in physiotherapy
3. Ability to analyze and interpret physiological data
4. Familiarity with rehabilitation engineering principles and assistive technologies
5. Skills in designing and evaluating physiotherapy devices and equipment
6. Understanding of signal processing techniques for movement analysis

Category	Theory	Practical
A] Introduction to Biomedical Engineering Must to know- - Biomedical engineering definition, scope, historical development, and milestones - Biomedical Engineering's Significance in Physiotherapy	1 Hr	
B] Anatomy and Physiology of Humans Must to know- - Skeletal Structure - Bone, Joint, and Muscle Structure and Function Common Musculoskeletal Disorders - Biomedical Tools for Maintaining Skeletal Health	1 Hr	
C] Nervous System Must to know- - Both the Peripheral and Central Nervous Systems Desirable to know- - Disorders of the nervous system Nice know- - Neuromodulation devices and neuroprosthetics	1 Hr	

D] Respiratory and Cardiovascular Systems Must to know- - Blood Vessels and the Heart - Inhalation Mechanics Desirable to know- - Cardiovascular Equipment, such as pacemakers - Devices for respiration (such as ventilators)	1 Hr	
E] The Mechanics of Body Motion Must to know- - Introduction to Biomechanics - Fundamentals of Mechanics Desirable to know- - Tissue Biomechanical Properties - Analysis of Movement and Gait	2 Hrs	
F] Physiotherapy's Use of Biomechanics Must to know- - Evaluation of Biomechanical Function and Rehabilitation Methods - Design of Prosthetics and Orthopedic Implants Nice know- - Devices and Instruments for Medicine	1 Hr	
G] An Overview of Medical Devices Must to know- - Fundamentals of Medical Devices Desirable to know- - Data Acquisition and Signal Processing		5 Hrs
H] Instruments for Diagnosis Must to know- - Imaging Methods (MRI, CT, X-ray) Desirable to know- - Devices for electrophysiology (ECG, EMG)	1 Hr	5 Hrs
I] Medical Equipment Must to know- - **Devices for Electrotherapy** - High frequency - Medium frequency - Low frequency		5 Hrs
J] Engineering Rehabilitation Must to know- - Rehabilitation Engineering Principles - Helpful Technology Desirable to know- - Robotics for Rehabilitation - Adjustable Tools and Equipment	1 Hr	5 Hrs
K] Rehabilitation Device Design and Development Must to know-		10 Hrs

- User-Centered Design - Needs Assessment - Prototyping - Testing Case Studies in Rehabilitation Device Development		
L] Biomaterial Must to know- - Biomaterials Overview - Biomaterial Types: Metals, Polymers, and Ceramics; Their Characteristics and Biocompatibility	1 Hr	
M] Biomaterial Applications in Physical Therapy Must to know- - Replacement of Joints - Tissue Engineering: Wound Healing and Medication Administration Methods	1 Hr	
N] Bioinformatics Fundamentals Must to know- - Analysis of Biological Data Desirable to know- - Proteomic and Genomic Data	1 Hr	
O] Physiotherapy Computational Modeling Must to know- - Physiological System Simulation Desirable to know- - Computational Resources for Planning Rehabilitation	1 Hr	
P] Regulatory and Ethical Considerations Must to know- - Biomedical Engineering Ethics - Ethics in the Development and Usage of Devices - Consent that is informed and patient safety	1 Hr	
Q] Innovation and Entrepreneurship Must to know- - Technology Transfer - Desirable to know- - Startups in Biomedical Engineering	1 Hr	

Books:

1. "Introduction to Biomedical Engineering" by John Enderle and Joseph Bronzino
2. "Biomechanics: Principles and Applications" by Susan J. Hall
3. "Medical Instrumentation: Application and Design" by John G. Webster
4. Journals: IEEE Transactions on Biomedical Engineering, Journal of Rehabilitation Research and Development

3103-EL16 E-Content Learning Resources for Physiotherapy Curriculum

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understand the principles of e-learning and its application in physiotherapy education
2. Identify and evaluate various e-learning platforms suitable for physiotherapy curriculum delivery
3. Design and develop effective e-content for different physiotherapy subjects
4. Create interactive multimedia resources (videos, animations, simulations) for teaching physiotherapy concepts
5. Implement strategies for adapting hands-on physiotherapy skills training to digital formats
6. Develop online assessment tools and methods appropriate for physiotherapy education
7. Understand the principles of instructional design for creating engaging e-learning materials
8. Integrate virtual reality and augmented reality technologies in physiotherapy e-learning resources

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Category	Theory	Practical
1. Introduction to E-Content Learning Must to know - Definition and Importance of E-Content Learning - Benefits and Challenges of E-Learning in Physiotherapy Desirable to know - Evolution of Digital Learning Resources	1 Hr	
2. Types of E-Content Learning Resources Must to know - Categories of E-Content - Core learning resources essential for understanding fundamental	1 Hr	

concepts Desirable to know - Supplementary resources that enhance and expand upon core knowledge Nice know - Advanced resources for specialized knowledge and skills		
3. Examples of E-Content Resources Must to know - Text-based Resources (E-books, Articles) Desirable to know - Multimedia Resources (Videos, Animations) Nice know - Interactive Resources (Simulations, Virtual Labs) - Assessment Tools (Quizzes, Tests)	1 Hr	
4. Creating and Curating E-Content Must to know - Principles of Effective E-Content Creation - Basic principles of instructional design - Curating Quality E-Content - Identifying credible sources Desirable to know - Techniques for engaging multimedia content - Aggregating and organizing content - Using LMS features for interactive learning Nice know - Advanced tools and software for content creation - Using content curation tools and platforms	1 Hr	5 Hrs
5. Learning Management Systems (LMS) Must to know - Introduction to LMS - Basics of LMS and their role in education - Implementing LMS in Physiotherapy Education - Setting up courses and managing content Desirable to know - Popular LMS platforms (Moodle, Canvas, Blackboard) - Analyzing data and reports for continuous improvement Nice know - Customizing and managing LMS for specific needs	1 Hr	5 Hrs
6. Multimedia Learning Resources Must to know - Basics of creating educational videos - Interactive Simulations and Virtual Labs - Benefits and applications in physiotherapy	2 Hrs	5 Hrs

Desirable to know - Editing and enhancing video quality - Creating simple interactive modules Nice know - Advanced video production techniques - Developing complex simulations and virtual environments		
7. E-Books and Digital Libraries Must to know - Utilizing E-Books - Accessing and using e-books effectively - Digital Libraries and Repositories - Overview of digital libraries Desirable to know - Integrating e-books into the curriculum - Navigating and searching digital repositories Nice know - Creating custom e-books for specific courses - Contributing to digital libraries	2 Hrs	
8. Online Assessments and Feedback Must to know - Designing Online Assessments - Principles of effective assessment design - Providing Feedback - Importance of timely and constructive feedback Desirable to know - Creating varied types of assessments (MCQs, short answers) Techniques for effective online feedback Nice know - Advanced assessment tools and analytics - Using feedback tools within LMS	1 Hr	5 Hrs
9. Mobile Learning and Apps Must to know - Mobile Learning - Basics of mobile learning and its benefits - App Integration in Curriculum - Effective use of educational apps Desirable to know - Popular mobile learning apps for physiotherapy - Integrating apps into classroom activities Nice know - Developing custom mobile learning apps - Evaluating and selecting the best apps for learning	1 Hr	5 Hrs
10. E-Learning Strategies and Best Practices Must to know - - Blended Learning - Basics of blended learning models	2 Hrs	5 Hrs

- Flipped Classroom - Concept and benefits of flipped classrooms Desirable to know - Designing blended learning courses - Implementing flipped classroom techniques Nice know - Advanced strategies for effective blended learning - Assessing the effectiveness of flipped classrooms		
11. Research and Innovation in E-Learning Must to know - - Research in E-Learning - Current research trends in e-learning - Innovations in E-Learning - Emerging technologies in e-learning Desirable to know - Conducting small-scale e-learning research - Innovative e-learning practices in physiotherapy Nice know - Publishing and presenting research findings - Developing and implementing innovative e-learning solutions	1 Hr	
12. Ethical and Legal Considerations Must to know - Ethical Issues in E-Learning - Understanding ethical principles - Legal Considerations - Basics of copyright and intellectual property Desirable to know - Addressing common ethical issues - Complying with legal standards in e-content Nice know - Ensuring ethical use of e-content - Navigating complex legal issues	1 Hr	

Suggested Reading and Resources:

- "E-Learning and the Science of Instruction" by Ruth C. Clark and Richard E. Mayer
- "The Online Learning Idea Book" by Patti Shank
- Journals: Journal of Online Learning and Teaching, International Journal of Educational Technology in Higher Education

3103-EL17 MECHANOTRONICS

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

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

1. Understand the basic principles of mechatronics and how they can be applied to physiotherapy equipment and treatments.
2. Explore the integration of mechanical, electrical, and computer systems in creating advanced physiotherapy devices.
3. Learn about sensor technologies and their applications in monitoring patient movement and progress.
4. Study actuator systems and their use in creating assistive devices or rehabilitation equipment.
5. Examine control systems and algorithms for precise movement control in physiotherapy applications.

Category	THEORY	PRACTICAL
1. Introduction to Mechatronics <u>Must to Know</u> - Definition and scope of mechatronics in physiotherapy - Basic principles of mechanical and electronic systems <u>Nice to know</u> - Historical development of mechatronics - Current trends in mechatronics for rehabilitation <u>Desirable to Know</u> - Future directions and potential innovations in mechatronics for physiotherapy	1 Hr	
2. Fundamentals of Biomechanics	1 Hr	

Must to Know - Kinematics and kinetics - Joint mechanics - Muscle mechanics Nice to know - Advanced biomechanical modeling - Gait analysis principles Desirable to Know - Computational biomechanics - Tissue mechanics at cellular level		
3. Sensors and Actuators Must to Know - Types of sensors (force, position, velocity) - Actuator types (motors, pneumatics) Nice to know - Advanced sensor technologies (IMUs, EMG) - Smart materials as actuators Desirable to Know - Development of novel biosensors - Nano-actuators in rehabilitation	1 Hr	
4. Control Systems Must to Know - Basic control theory - Feedback and feedforward control Nice to know - Adaptive control systems - Fuzzy logic control Desirable to Know - Machine learning in control systems - Neural network control	1 Hr	

5. Robotic Systems in Physiotherapy Must to Know - Types of rehabilitation robots - Basic robotic control for therapy Nice to know - Design principles of rehabilitation robots - Human-robot interaction Desirable to Know - Soft robotics in rehabilitation - Autonomous rehabilitation systems	1 Hr	
6. Exoskeletons and Orthoses Must to Know - Principles of exoskeleton design - Applications in neurological rehabilitation Nice to know - Powered vs. passive orthoses - Control strategies for exoskeletons Desirable to Know - Mind-controlled exoskeletons - Soft exosuits	1 Hr	
7. Prosthetics Must to Know - Basic prosthetic components - Biomechanics of prosthetic gait Nice to know - Myoelectric control of prostheses - Advanced prosthetic materials Desirable to Know - Neural interfaces for prosthetics - 3D-printed custom prosthetics	1 Hr	

8. Virtual Reality and Augmented Reality Must to Know - VR/AR applications in physiotherapy - Basic VR/AR systems for rehabilitation Nice to know - Design of VR environments for therapy - Gamification in VR rehabilitation Desirable to Know - Brain-computer interfaces with VR/AR - Telerehabilitation	1 Hr	5 Hrs
9. Wearable Technology Must to Know - Types of wearable sensors: Accelerometers, gyroscopes, magnetometers, heart rate monitors, EMG sensors, pressure sensors, and temperature sensors - Basic data interpretation: Understanding activity counts, step counting, heart rate variability, muscle activation patterns, and basic motion analysis Nice to know - Integration of wearables in therapy plans: Designing treatment protocols that incorporate data from wearables, using wearables for home exercise programs and remote monitoring - Wearable feedback systems: Haptic feedback devices, visual and auditory cues for gait and posture correction, real-time biofeedback systems Desirable to Know - Development of smart textiles: Fabric-embedded sensors, conductive yarns, shape-memory alloys in clothing for rehabilitation - AI-powered wearable health assistants: Advanced algorithms for health prediction, personalized exercise recommendations, and early detection of health issues	2 Hrs	5 Hrs
10. Mechanotronics in Gait Training Must to Know - Principles of body weight support systems: Harness design, dynamic unloading mechanisms, safety features - Treadmill-based gait training systems: Split-belt treadmills, force-sensing treadmills, visual feedback systems Nice to know - Overground gait training robots: End-effector based systems (e.g., Gait Trainer	2 Hrs	5 Hrs

GT I), exoskeleton-based systems (e.g., Lokomat) - Adaptive gait training algorithms: Real-time adjustment of assistance based on patient performance, challenge-based progression systems <u>Desirable to Know</u> - Brain-controlled gait training systems: EEG-based intention detection, brain-computer interfaces for gait initiation and control - Exoskeleton-assisted outdoor mobility: Terrain adaptation algorithms, energy-efficient designs for long-term use, integration with smart city infrastructure		
11. Upper Limb Rehabilitation Devices <u>Must to Know</u> - Principles of arm support systems: Gravity compensation mechanisms, workspace volume considerations, safety features - Robotic devices for hand rehabilitation: Exoskeleton gloves, end-effector based systems, finger individuation training devices <u>Nice to know</u> - Task-specific training robots: Reaching and grasping robots, fine motor skill training devices, ADL (Activities of Daily Living) simulation systems - Bilateral arm training systems: Mirror therapy robots, interlimb coordination training devices <u>Desirable to Know</u> - Brain-controlled arm rehabilitation systems: EEG and EMG hybrid control systems, adaptive brain-machine interfaces - Micro-manipulators for fine motor skills: Precision-engineered devices for hand and finger dexterity, haptic feedback systems for sensory retraining	1 Hr	5 Hrs
12. Force Plates and Motion Capture <u>Must to Know</u> - Basic force plate analysis: Center of pressure trajectories, ground reaction forces, balance assessment protocols - Principles of optical motion capture: Marker placement, camera setup, basic kinematic analysis <u>Nice to know</u> - Integration of force plates and motion capture: Inverse dynamics calculations, joint moment and power analysis - Markerless motion capture systems: Computer vision techniques, depth camera-based systems, limitations and advantages <u>Desirable to Know</u>	2 Hrs	5 Hrs

- Real-time biomechanical feedback systems: Instantaneous joint load estimation, gait retraining systems with audio-visual cues - AI in motion analysis: Automated movement pattern recognition, predictive modeling of injury risk based on movement data		
13. Mechanotronics in Sports Physiotherapy Must to Know - Isokinetic testing systems: Principles of isokinetic dynamometry, protocols for major joint testing, interpretation of torque-angle curves - Mechanotronic devices for strength training: Variable resistance systems, feedback-enhanced strength training devices Nice to know - Smart equipment for sports-specific training: Instrumented sports equipment (e.g., smart balls, intelligent rackets), VR-based sports simulators - Wearable impact sensors: Concussion detection systems, load monitoring devices for contact sports Desirable to Know - AI-powered injury prediction systems: Machine learning models for predicting injury risk based on training load, biomechanics, and physiological data - Robotic systems for sports performance enhancement: Robotic training partners, advanced simulation environments for skill acquisition	1 Hr	5 Hrs

BOOKS FOR BASICS IN MECHANOTRONICS

1. "Introduction to Mechatronics and Measurement Systems" by David G. Alciatore and Michael B. Histand
2. "Mechatronics: Electronic Control Systems in Mechanical and Electrical Engineering" by W. Bolton
3. "Mechatronics: Principles and Applications" by Godfrey C. Onwubolu
4. "Fundamentals of Mechatronics" by Musa Jouaneh
5. "Mechatronics: A Multidisciplinary Approach" by W. Bolton

3103-EL18 EXERCISE PHYSIOLOGY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

Objectives

- **Understanding Physiological Principles**: To comprehend the fundamental physiological mechanisms underlying human exercise, including cardiovascular, respiratory, metabolic, and neuromuscular responses.
- **Application of Exercise Testing**: To learn and apply various methods for assessing exercise capacity, including maximal oxygen consumption (VO2max) testing, lactate threshold determination, and cardiovascular function assessments.
- **Effects of Exercise on Health**: To explore the impact of exercise on health outcomes such as cardiovascular health, metabolic disorders, musculoskeletal health, and psychological well-being.
- **Exercise Prescription**: To develop skills in designing safe and effective exercise programs tailored to individuals with different fitness levels, health conditions, and goals.
- **Training Adaptations**: To analyze the physiological adaptations that occur in response to different types of exercise training, such as aerobic, resistance, and high-intensity interval training.
- **Environmental and Ergogenic Influences**: To examine how environmental factors (e.g., altitude, temperature) and ergogenic aids (e.g., supplements, equipment) influence exercise performance and physiological responses.

Category	THEORY	PRACTICAL
1. **Introduction to Exercise Physiology** Must to Know - Definition and scope of exercise physiology - Historical development of the field - Relevance to physiotherapy practice Desirable to Know - Current trends in exercise physiology research - Interdisciplinary applications Nice to know	1	

- Future directions in exercise physiology - Emerging technologies in the field		
2. **Cellular Energy Systems** <u>Must to Know</u> - ATPPC system - Glycolytic system - Oxidative system - Energy system contribution during exercise <u>Desirable to Know</u> - Molecular basis of energy production - Mitochondrial adaptations to exercise <u>Nice to know</u> - Genetics of energy metabolism - Emerging concepts in bioenergetics	1	
3. Cardiovascular Responses to Exercise <u>Must to Know</u> - Acute cardiovascular responses to exercise - Chronic cardiovascular adaptations - Cardiovascular drift VO2 max concept <u>Desirable to Know</u> - Advanced cardiovascular testing methods - Cardiovascular limitations to performance <u>Nice to know</u> - Molecular basis of cardiovascular adaptations - Emerging technologies in cardiovascular monitoring	1	10
4. **Respiratory Responses to Exercise** <u>Must to Know</u> - Pulmonary ventilation during exercise - Gas exchange and transport - Ventilatory thresholds - Exercise induced bronchospasm	1	10

Desirable to Know - Advanced pulmonary function testing - Respiratory limitations to performance Nice to know - High altitude physiology - Diving physiology		
5. **Skeletal Muscle Physiology** Must to Know - Muscle fiber types - Excitation contraction coupling - Force velocity relationship - Length tension relationship Desirable to Know - Molecular basis of muscle contraction - Advanced concepts in muscle fatigue Nice to know - Emerging theories in muscle physiology - Genetic influences on muscle performance	1	
6. **Thermoregulation and Exercise** Must to Know - Heat production during exercise - Heat loss mechanisms - Thermoregulatory adaptations - Heat stress and exercise performance Desirable to Know - Advanced concepts in thermoregulation - Cold stress and exercise Nice to know - Molecular basis of heat shock proteins - Climate change implications for exercise	1	
7. Endocrine Responses to Exercise	1	

Must to Know - Hormonal regulation during exercise - Acute vs. chronic endocrine adaptations - Effects of exercise on major endocrine glands Desirable to Know - Endocrine disorders and exercise - Advanced hormone testing in athletes Nice to know - Circadian rhythms and exercise performance - Gut hormones and exercise		
8. Substrate Metabolism During Exercise Must to Know - Carbohydrate metabolism - Fat metabolism - Protein metabolism - Fuel selection during exercise Desirable to Know - Metabolic flexibility - Metabolic adaptations to training Nice to know - Metabolomics in exercise physiology - Gut microbiome and exercise metabolism	1	
9. **AcidBase Balance in Exercise** Must to Know - Acidbase chemistry basics - Metabolic acidosis during exercise - Respiratory compensation - Buffering systems Desirable to Know - Advanced concepts in acidbase balance - Acidbase disturbances in athletes	1	

Nice to know - Molecular mechanisms of pH regulation - Emerging theories in metabolic acidosis		
10. **Exercise Testing and Prescription** Must to Know - Graded exercise testing protocols - Interpretation of exercise test results - FITTVP principle - Exercise prescription for healthy adults Desirable to Know - Advanced exercise testing techniques - Exercise prescription for special populations Nice to know - Emerging technologies in exercise testing - Personalized exercise prescription using genetics	1	10
11. **Training Principles and Adaptations** Must to Know - Overload principle Specificity principle - Reversibility principle - Periodization basics Desirable to Know - Advanced periodization models - Overtraining syndrome Nice to know - Molecular basis of training adaptations - AI in training program design	1	
12. **Environmental Physiology** Must to Know - Exercise in heat and humidity - Exercise in cold environments - Altitude training basics	1	

Desirable to Know - Hyperbaric and hypobaric exercise physiology - Underwater exercise physiology Nice to know - Space physiology - Exercise in extreme environments		
13. **Nutrition and Exercise Performance** Must to Know - Macronutrient requirements for athletes - Hydration strategies - Basic sports nutrition principles Desirable to Know - Nutrient timing - Ergogenic aids and supplements Nice to know - Nutrigenomics in sports nutrition - Gut microbiome and athletic performance	1	
14. Gender Differences in Exercise Physiology Must to Know - Cardiovascular differences - Thermoregulatory differences - Substrate utilization differences Desirable to Know - Hormonal influences on exercise performance - Gender specific training considerations Nice to know - Transgender athlete physiology - Pregnancy and exercise physiology	1	
15. **Exercise Immunology** Must to Know - Acute effects of exercise on immune function	1	

- Chronic effects of exercise on immune system - Exercise and upper respiratory tract infections <u>Desirable to Know</u> - Cytokine responses to exercise - Exercise in immunocompromised populations <u>Nice to know</u> - Gut microbiome, exercise, and immunity - Exercise as an immunotherapy		

BOOKS FOR EXERCISE PHYSIOLOGY

- "Gender Differences in Exercise Physiology" chapter in "ACSM's Advanced Exercise Physiology"
- "Women and Exercise Physiology" by Jaclyn Pennings
- "Clinical Sports Nutrition" by Louise Burke and Vicki Deakin
- "Exercise Physiology: Theory and Application to Fitness and Performance" by Scott Powers and Edward Howley

SEMESTER IV

3104–11: PHARMACOLOGY

Course Credit for 50 Hours		
	Hours	**Credits**
Theory	**50**	**3**

OBJECTIVES

At the end of the semester, the candidate will be able to –

1. Describe Pharmacological effects of commonly used drugs by patients referred for Physiotherapy; list their adverse reactions, precautions to be taken & contra-Indications, - formulation & route of administration
2. Identify whether the pharmacological effect of the drug interferes with the Therapeutic response of Physiotherapy & vis-a-versa
3. Indicate the use of analgesics & anti-inflammatory agents with movement disorders with consideration of cost, efficiency, & safety for individual needs.
4. Get the awareness of other essential & commonly used drugs by patients-The bases for their use & common as well as serious adverse reactions.

A] MUSTKNOW–

i] Drugs described into pics 2to9;

ii] Pharmacological effects & mechanism, Formulation, Route of administration, salient Parma-kinetic feature,

iii] Adverse Reactions;

iv] Precautions & contra-indications.

B] DESIRABLE

I] Major Group of drugs described into pics10,11&12

II] Bases of use in indicated conditions;

III] Common & serious Adverse

C) NICE TO KNOWN

I) Haematenics

II) Vaccinesand sera

Sr.no	Content	Didactic	Must know	Desirable to know	Nice to know
1.	**General pharmacology** Drug Pharmaco-kinetics–Pharmacology-adverse reaction-factors modifying drug effects	3Hrs	MK		
2	**Drug activity of CNS** 1. Introduction 2. Alcohols+Sedatives & hypnotics 3. Anti-convulsions 4. Analgesics & antipyretics-specially Gout &R.A. 5. Psycho Therapeutics 6. General anesthetic+ local anesthetic	9Hrs	MK		
3.	**Drugs acting on peripheral nervous system** Adrenergic Cholinergic (with special emphasis to dementia)Anticholinergicswithspecialemphasistopostural hypotensionandurinaryincontinence	5Hrs	MK		
4.	**Drug therapy in Parkinson's**	2Hrs	MK		
5.	**Skeletal muscle relaxants**	2Hrs	MK		
6.	**Drugs acting on CVS** 1. Hypertension 2. B-blockers 3. CachannelACEI 4. Blockers[prazosin] 5. Diuretics 6. CCF- 7. Angina 8. Antiarrythmia+shock 9. DrugsatisfyingHomeostasis	6Hrs	MK		

7.	**DrugsactingonRespiratorysystem** 1. Forupperrespiratorytractinfections-sinusitis-cough,laryngitis,pharyngitis 2. For Bronchialasthma 3. For COPD- effects of prolonged drugadministration	4Hrs	MK		

8.	**Insulin** Oralanti-diabeticdrugs	2Hrs	MK		
9.	**Chemo-therapy** 1. Generalprinciples 2. AntiTuberculosis- 3. Anti-leprosy	3Hrs	MK		
10.	**OtherChemoTherapeuticdrugs** 1. Sulfadrugsinurinarytract infection 2. Tetra/chloro 3. Penicillin 4. cephalosporin 5. aminoglycides 6. Microlytic	2Hrs		DK	
11.	**Endocrine-** 1. Introduction,Thyroid&Antithyroid 2. Estrogen+Progesterone 3. Steroids+anabolicsteroids	4Hrs		DK	
12	**DrugsinG.I.tract-** 1. Pepticulcer+antiemetic 2. Diarrhoea&constipation	3Hrs		DK	
13	Haematinics,VitaminB;Iron.	1Hrs			NK
14	Dermatological---Scabies-Psoriasis-Localantifungal	1Hrs		DK	
15	Vaccines&Sera	1Hrs			NK
16.	Vitamin–D,Calcium;Phosphorus,Magnesium	1Hrs	MK		
17.	DopingandDrugabuseinathelets	1Hrs	MK		

TEXTBOOKS:

1. Pharmacology by Gaddum
2. Medical Pharmacology by Drill
3. Pharmacology principle of Medical practice – by Krantx, & Carr
4. Pharmacological basis of Therapeutics–by Goodman, L.S. Gilman A

SCHEMEOFEXAMINATION

Theory	**40**
IA	**10**
Total	**50**

MODELQUESTIONPAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUSTKNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any1out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's: 10	BAQ's: 10	SAQ's:10	LAQ's:10
MK–06 DK–03 NK–01	MK–03 DK–01 NK–01	MK–01 DK–01 NK–01	MK–01 DK–01 NK–00
LEVELI:07	LEVEL I:03	LEVEL I:02	LEVEL I:01
LEVELII: 03	LEVEL II: 02	LEVEL II: 01	LEVEL II: 01

3104 - 12: EXERCISE THERAPY PART II

Course Credit for Exercise Therapy -Part II		
	Hours	**Credits**
Theory	**53**	**4**
Practical	**105**	**7**

OBJECTIVES

At the end of the year, the candidate will be able to-

1. Analyze Normal human posture [static & dynamic], activities of daily living.
2. Analyze various Normal Musculoskeletal movements during Gait, activities of daily living, & also the normal describe the movement of the Thorax during breathing; in terms of Biomechanical & Physiological Principles
3. Describe the physiological effects, Therapeutic uses, merits/demerits of various exercise modes.
4. Demonstrate various therapeutic exercises on self & also acquire the skill of application on Models
5. Acquire the skill of assessment of isolated & group muscle strength, & Range of motion of the joints subjectively & objectively

Sr.No	Content	Diadactic Hrs.	Practical hrs.	Must know	Desireto know	Nice to know
1.	Posture- Definition, types of posture, analysis of normal posture, abnormal posture. Methods of Assessment of the Posture-Sitting /standing/ Lying/Physiological deviations of the posture	5 hrs	10 hrs	MK		
2.	Gait- Definition, phases of gait, determinantsof gait, gait kinetics and	5 hrs	10 hrs			

	kinematics, spatial & temporal parameters. Methods of assessment of Gait: Measurements for walking aids- axillary /elbow crutches, walking sticks –Pre-crutch training, crutch gaits					
3.	Co-ordination & Balance-neural control-Methods of co-ordination exercises - Frenkels exercises	5 hrs	10 hrs	MK		
4.	Breathing exercises- Goals - Inspiratory- Expiratory/Segmental- Forced expiratory -coughing-huffing/ Modified Inspiratory / Active cycle of breathing	10 hrs	20 hrs	MK		
5.	Bronchial Hygiene- postural drainage positions/ humidification	10 hrs	20 hrs	MK		
6.	Principles of Home programme & Ergonomic advise	5 hrs	9 hrs			NK
7.	Functional Re-education.	5 hrs	10 hrs	MK		
	Functional motor skills, e-Motor skills to function independently in ADL					
	Mobility, Bed /Wheel chair mobility, ambulation.					
8.	Application of	6 hrs	12 hrs	MK		

	mat exercises [topractice on self & on models					
9.	6 Minute walk test - on models (only technique)	2hrs	4 hrs		DK	

TEXT BOOKS

1 Progressive resisted exercises-by Margaret Hollis,
2 Therapeutic Exercise by Carolyn Kisner
3 Kinesiology by Cynthia Norkins
4 PNF - Knott and Voss

REFERENCE BOOKS

i. Therapeutic exercise by Basmijjan & Wolf
ii. Muscle testing by Daniel Kendall
iii. Clinical evaluation - Lacote (for Isolated assessment of abdominal muscles)
iv. Muscle Stretching & Auto-stretching- Olaf Evjenth
v. Orthopedic Evaluation - Magee (only for assessment of posture)

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-	Q4. LAQ Answer any 1 out of 2	10 Marks

C		(1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	Content	Marks
1	Long Case (Pulmonary Functional training)	25 Marks
3	Short case (Posture/ Gait, Coordination, functional Re-education, Crutch walking)	10 Marks
4	Journal	5 Marks
Total		40 Marks

3104- 13: ELECTRO THERAPY PART 2

Course Credit for Electro Therapy-Part II		
	Hours	Credits
Theory	45	3
Practical	45	2

ELECTROTHERAPY- Part 2:

Course objects-

h) Recall the basic principles of electrotherapy modalities

i) Describe effects of electrotherapy modalities at the cellular level & risk factors on prolonged exposure.

j) Describe the application of electrotherapy modalities with their physiological & therapeutic effects, Merits / demerits; & also acquire the skill of application

k) Acquire knowledge of application of Electrotherapy modalities with proper dosage application in various conditions

l) Acquire knowledge of pain modulation and application of various therapeutic modalities for pain management

m) Describe & identify various basics of electrotherapeutic assessment tools for various neuromuscular conditions

Course outcomes-

The student should be able to describe the effects of various therapeutic modalities, its application, dosage for various conditions. Students should acquire knowledge about pain modulation, therapeutic application of various electrotherapy modalities for pain modulation. Students should be able to perform basic electro-diagnostic tests. Students should be able to describe physiological & therapeutic effects, Merits / demerits; & also acquire the skill of application of various electrotherapeutic modalities, included in the syllabus.

Sr. No.		TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic 50	Practical 70			
1.	**High frequency Thermal agents:** 1) Short Wave Diathermy: Types-continuous /Pulsed –types of electrodes, application, uses etc.	10 hrs	15 hrs	MK		
2	**Actino Therapy**: 1) Radiant heat [I.R.] 2) U.V.R.- A /B /C types-Testdose-, local & general application, PUVA 3) LASER -He/Ne, & I.R.-combination	20 hrs	30 hrs	MK		
3	**Cryotherapy** 1) Cold whirlpool, cryocuff, cold spray, cryokinetics in cryotherapy 2) Compression cryotherapy 3) Pneumatic compression	10 hrs	10 hrs		DK	
4	**Therapeutic Ultra sound:** 1) Types 2) Application	10 hrs	15 hrs	MK		

- Text Books:

1. Clayton's Electro Therapy – IX th edition.
2. Electro Therapy Explained – By Low & Read
3. Electro Therapy – By Kahn,
4. Therapeutic Electricity – By Sydeny Litch

- Reference Books:

Clinical Electro Therapy – By Nelson & Currier

SCHEME OF EXAMINATION

Theory	**40**	**Practical**	**40**
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	**Content**	**Marks**
1	Long case (UVR-Test dose and Application, IRR, SWD)	15 Marks
2	Short case (Ultrasound-testing and Application, Cryotherapy, LASER)	10 Marks
3	Spots	10 Marks (2x 5 Mks= 10 mks)
4	Journal	5 Marks
Total		40 Marks

3104-14 PSYCHOLOGY

Course Credit for Psychology		
	Hours	**Credits**
Theory	**50**	**3**

Course objectives-

a) Recall the scope and branches of psychology

b) Describe the psychological aspects during the development of human being.

c) Describe the psychology behind personality development

d) Describe memory and related issues

e) Acquire knowledge of learning and communication.

Course outcomes-

The student should be able to describe the psychological aspects of human beings.
Students should learn about psychological development of human being.
The thorough knowledge of memory development, personality and learning related aspects.

Sr. No.		TEACHING HOURS Didactic 50	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
1.	**Introduction to Psychology** 1) Definition 2) Scope 3) Branches of psychology	8 hrs	MK		
2	**Developmental Psychology:** 1) Factors influencing growth and development 2) Psychological development during Infancy, Childhood, Youth, Adulthood, Old Age	8hrs	MK		
3	**Personality** 1) Types 2) Theories 3) Factors influencing personality 4) Abnormal Personalities	8 hrs		DK	
4	**Memory:** 1) Types 2) Theories 3) Factors influencing memory 4) Forgetfulness 5) Communication and language	8 hrs	MK		
5	**Emotions** 1) Feelings and Emotions 2) Perception, sensory basis for perception	8 hrs	MK		
6	**Motivation, Conflict, Adjustment**	4 hrs			NK
7	**Stress and Pain**	6 hrs	MK		

- Text Books:
  1. Introduction to Psychology- by Clifford Morgan, Richard King, John Weisz, Tata McGraw-Hill Publishing Company Ltd, Seventh Edition
  2. Psychology for Physiotherapists- Thangamani Ramalingam A., Jaypee Brothers Medical Publishers (P) Ltd, Second Edition

- Reference Books:

1. Understanding Psychology- Robert S. Fieldman, The McGraw-Hill Companies, Tenth Edition

SCHEME OF EXAMINATION

Theory	**40**
IA	10
Total	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 **DK – 03** **NK – 01**	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	**MK – 01** **DK – 01** **NK – 00**
LEVEL I: **07**	LEVEL I: 03	LEVEL I: 02	**LEVEL I:** **01**
LEVEL II: **03**	**LEVEL II:** **02**	**LEVEL II:** **01**	**LEVEL II:** **01**

ELECTIVE COURSES SEMESTER IV

3104-EL15 3D PRINTING & DESIGING IN PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Introduction to 3D Printing Technology**: Understand the basics of 3D printing technology, including types of printers, materials used, and printing processes relevant to physiotherapy applications.
- **Application of 3D Printing in Physiotherapy**: Explore various applications of 3D printing in physiotherapy, such as designing customized splints, orthotics, prosthetics, and assistive devices.
- **Hands-on Experience with 3D Design Software**: Gain proficiency in using 3D design software to create and modify models for physiotherapy purposes, focusing on ergonomic and functional designs.
- **Patient-Specific Customization**: Learn how to utilize 3D printing to create personalized solutions tailored to individual patient needs and anatomical requirements.
- **Integration with Medical Imaging**: Understand the integration of 3D printing with medical imaging techniques (like MRI or CT scans) to develop accurate anatomical models and prototypes.
- **Ethical and Regulatory Considerations**: Discuss ethical considerations related to the use of 3D printing in healthcare, including patient privacy, consent, and regulatory requirements.

Category	THEORY	PRACTICAL
1. Introduction to 3D Printing Must to Know - Basics of 3D printing technology Nice to know - Historical evolution of 3D printing Desirable to Know	1	

- Different types of 3D printers		
2. Software for 3D Design Must to Know - CAD software basics (e.g., Tinkercad, Fusion 360) Nice to know - Open-source vs proprietary software Desirable to Know - Advanced CAD techniques for complex designs	2	2
3. Anatomy and Biomechanics for Design Must to Know - Understanding musculoskeletal anatomy Nice to know - Case studies of anatomical models Desirable to Know - Biomechanical principles in physiotherapy	2	2
4. Applications in Physiotherapy Must to Know - Custom orthotics and prosthetics Nice to know - Rehabilitation aids and assistive devices Desirable to Know - Patient-specific tools and equipment	2	1
5. Design Considerations Must to Know - Ergonomics and patient comfort Nice to know - Regulatory requirements and standards for medical devices Desirable to Know - Material selection for durability and flexibility	1	3

6. Case Studies and Prototyping Must to Know - Creating prototypes for therapy devices Nice to know - Real-world implementation challenges Desirable to Know - Iterative design process	2	5
7. Ethical and Legal Issues Must to Know - Patient confidentiality and data protection Nice to know - Medical device regulation and compliance Desirable to Know - Intellectual property considerations	2	5
8. Practical Hands-on Training Must to Know - Operating 3D printers Nice to know - Post-processing techniques for finished products Desirable to Know - Troubleshooting common issues	1	10
9. Future Trends and Innovations Must to Know - Emerging technologies in 3D printing Nice to know - Bioprinting and tissue engineering applications Desirable to Know - Integration with AI and machine learning	2	2

BOOKS FOR BASICS IN 3D PRINTING & DESIGING IN PHYSIOTHERAPY

- **Functional Design for 3D Printing by Clifford T. Smyth**
- **3D Printing and CNC Fabrication with SketchUp by Lydia Sloan Cline**
- **Additive Manufacturing Technologies: 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing by Ian Gibson, David W. Rosen, and Brent Stucker**
- **Introduction to Biomedical Engineering Technology by Laurence J. Street and Dawn M. Jonassen**

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3104-EL16 MOVEMENT ANALYSIS IN PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Introduction to Movement Analysis**
- Define movement analysis in the context of physiotherapy.
- Understand the importance of movement analysis in rehabilitation.
- **Biomechanical Principles**
- Explain basic biomechanical principles relevant to human movement.
- Identify common biomechanical terms and concepts used in movement analysis.
- **Techniques for Movement Assessment**
- Learn different techniques for observing and assessing human movement.
- Practice systematic observation and documentation of movement patterns.
- **Gait Analysis**
- Describe the components and phases of normal human gait.
- Identify common abnormalities in gait and their implications for rehabilitation.
- **Functional Movement Screening (FMS)**
- Understand the principles and purpose of FMS in physiotherapy.
- Perform and interpret FMS tests to evaluate movement patterns and identify asymmetries or dysfunctions.
- **Analysis of Specific Movement Patterns**
- Analyze specific movements relevant to various patient populations (e.g., athletes, elderly, orthopedic patients).
- Develop strategies for addressing movement deficiencies and optimizing performance
- **Case Studies and Practical Applications**
- Apply movement analysis principles to real-life case studies.
- Develop treatment plans based on movement assessment findings.

Category	THEORY	PRACTICAL
1. Basic Concepts Must to Know - Definition of movement analysis; importance in physiotherapy practice Nice to know - Cutting-edge technologies in movement analysis Desirable to Know - Historical development of movement analysis techniques	1	
2. Biomechanics Foundations Must to Know - Principles of biomechanics applied to human movement; joint mechanic Nice to know - Computational biomechanics and its applications Desirable to Know - Understanding muscle mechanics and their role in movement	1	
3. Kinematics Must to Know - Joint kinematics (degrees of freedom, axes of rotation); terminology Nice to know - Advanced kinematic modeling techniques for complex movements Desirable to Know - Gait analysis techniques and their clinical applications	1	10
4. Kinetics Must to Know - Forces acting on the body during movement; Newton's laws of motion Nice to know - Application of kinetics in specific patient populations (e.g., elderly, athletes) Desirable to Know - Muscular forces and their contribution to movement dynamics	2	

5. Movement Analysis Tools Must to Know - Observational analysis techniques; video recording and analysis methods Nice to know - Use of virtual reality and augmented reality in movement analysis Desirable to Know - Use of wearable sensors in movement assessment	2	10
6. Clinical Applications Must to Know - Movement assessment in various patient populations (orthopedic, neurological, pediatric) Nice to know - Movement analysis in occupational therapy contexts Desirable to Know - Role of movement analysis in sports rehabilitation	3	10
7. Functional Movement Testing Must to Know - Functional movement screening (e.g., FMS); assessment tools for functional movement Nice to know - Role of functional movement testing in injury prevention Desirable to Know - Identifying movement dysfunctions through functional movement testing	2	
8. Technological Advancements Must to Know - Use of motion capture systems (e.g., optical, inertial); data processing and interpretation Nice to know - Machine learning and AI applications in movement analysis Desirable to Know	3	

- Integration of movement analysis with EMG (Electromyography)		

BOOKS FOR BASICS IN MOVEMENT ANALYSIS IN PHYSIOTHERAPY

- "Neuromechanical Basis of Kinesiology" by Roger Enoka
- "Clinical Gait Analysis: Theory and Practice" by Christopher Kirtley
- "Muscles: Testing and Function, with Posture and Pain" by Florence Peterson Kendall
- "Biomechanical Basis of Human Movement" by Joseph Hamill, Kathleen M. Knutzen, and Timothy R. Derrick

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3104-EL17 PSYCHOMETRIC ANALYSIS PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Understanding Psychometric Principles**: Gain a comprehensive understanding of the fundamental principles of psychometrics as they apply to the field of physiotherapy.
- **Measurement Theory**: Explore various measurement theories and their relevance to assessing psychological factors in patients undergoing physiotherapy.
- **Assessment Tools**: Learn about different psychometric assessment tools used in physiotherapy practice, such as questionnaires, scales, and inventories.
- **Reliability and Validity**: Understand the concepts of reliability and validity in the context of psychometric assessments, and their importance in ensuring accurate measurement.
- **Interpretation of Results**: Develop skills in interpreting psychometric test results, considering factors like norms, standardization, and clinical significance.
- **Application in Patient Care**: Explore practical applications of psychometric analysis in physiotherapy settings, including patient evaluation, treatment planning, and monitoring progress.

Category	THEORY	PRACTICAL
1. Introduction to Psychometrics Must to Know - Basic concepts: reliability, validity, standardization Nice to know - History and development of psychometrics Desirable to Know - Advanced theories in psychometrics	1	
2. Measurement Scales Must to Know - Types of scales: nominal, ordinal, interval, ratio Nice to know - Application of different measurement scales Desirable to Know - Psychological scaling techniques (e.g., Likert scales)	1	
3. Reliability Must to Know - Types: test-retest, inter-rater, internal consistency Nice to know - Factors affecting reliability Desirable to Know - Advanced reliability indices (e.g., Cronbach's alpha)	1	
4. Validity Must to Know - Types: content, criterion-related, construct Nice to know - Methods to establish validity Desirable to Know - Threats to validity and how to minimize them	1	

5. Norms and Standardization Must to Know - Definition and importance Nice to know - Methods for establishing norms Desirable to Know - Cross-cultural considerations in norm development	1	
6. Psychometric Testing Must to Know - Selection and administration of tests Nice to know - Interpretation of test results Desirable to Know - Ethical considerations in testing	1	
7. Outcome Measures Must to Know - Selection criteria Nice to know - Application in clinical practice Desirable to Know - Trends and advances in outcome measure development	1	10

8. Assessment Tools in Physiotherapy Must to Know - Overview of commonly used tools (e.g., questionnaires, scales) Nice to know - Psychometric properties of specific assessment tools Desirable to Know - Critique and comparison of different assessment tools	2	10
9. Statistical Analysis in Psychometrics Must to Know - Basic statistical methods: mean, median, mode, standard deviation Nice to know - Parametric vs. non-parametric tests Desirable to Know - Multivariate statistical techniques (e.g., factor analysis) **10. Applications in Research** Must to Know - Designing studies involving psychometric analysis Nice to know - Integration of psychometric analysis in research projects Desirable to Know - Meta-analysis techniques	2 1	

11. Clinical Applications Must to Know - Incorporating psychometric principles into clinical decision-making Nice to know - Patient-reported outcomes (PROs) in physiotherapy Desirable to Know - Personalized medicine and psychometrics	2	10
12. Quality of Life Assessment Must to Know - Importance in chronic conditions Nice to know - Specific QoL measures in physiotherapy Desirable to Know - Trends in QoL assessment tools	1	

BOOKS FOR BASICS IN PREVENTIVE PHYSIOTHERAPY

- Clinical Sports Medicine by Peter Brukner and Karim Khan
- Therapeutic Exercise: Foundations and Techniques by Carolyn Kisner and Lynn Allen Colby
- Physical Rehabilitation by Susan B. O'Sullivan, Thomas J. Schmitz, and George Fulk
- Preventive Physical Therapy: A Comprehensive Guide for Physical Therapists by Nima Massoomi

3104-EL18 VIRTUAL REALITY IN PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Introduction to Virtual Reality (VR) in Physiotherapy**: Understand the fundamentals of VR technology and its applications in the field of physiotherapy.
- **Benefits of VR in Physiotherapy**: Explore and evaluate the specific benefits of VR technology in enhancing physiotherapy treatments and patient outcomes.
- **VR Hardware and Software**: Familiarize with different types of VR hardware (headsets, controllers) and software platforms used in physiotherapy settings.
- **Integration of VR into Treatment Protocols**: Learn how to integrate VR technology into existing physiotherapy treatment protocols effectively.
- **Patient Assessment and Customization**: Develop skills in assessing patients for VR suitability and customizing VR experiences to meet individual therapeutic needs.
- **Practical Application and Case Studies**: Apply theoretical knowledge through hands-on exercises, case studies, and simulations to gain practical experience in using VR for physiotherapy.

Category	THEORY	PRACTICAL
1. Introduction to Virtual Reality Must to Know - Definition of virtual reality in healthcare context Nice to know - Historical development of VR in physiotherapy Desirable to Know - Emerging trends in VR technology for physiotherapy	1	
2. Applications in Physiotherapy Must to Know	2	15

- VR applications for pain management and rehabilitation Nice to know - VR applications for mental health support Desirable to Know - VR applications for elderly care		
3. Benefits and Challenges Must to Know - Benefits of VR in enhancing patient engagement and compliance Nice to know - Challenges in implementing VR in clinical settings Desirable to Know - Ethical considerations in using VR in physiotherapy	2	
4. Technological Fundamentals Must to Know - Basics of VR hardware and software Nice to know - Comparison of different VR systems (e.g., Oculus, HTC Vive) Desirable to Know - Understanding motion tracking and haptic feedback in VR	2	
5. Evidence-Based Practice Must to Know - Review of clinical studies on effectiveness of VR in physiotherapy Nice to know - Conducting VR-based clinical trials Desirable to Know - Meta-analyses on VR outcomes in physiotherapy	1	

6. Patient Interaction and Safety Must to Know - Guidelines for patient preparation and support in VR sessions Nice to know - Managing adverse effects and cybersickness Desirable to Know - Strategies for ensuring patient safety in VR environments	1	
7. Integration into Treatment Plans Must to Know - Incorporating VR into physiotherapy treatment protocols Nice to know - Customizing VR programs for different patient demographics Desirable to Know - Collaborative care approaches integrating VR with other therapies	2	
8. Practical Implementation Must to Know - Hands-on training in setting up and operating VR equipment Nice to know - Troubleshooting common technical issues Desirable to Know - Developing personalized VR exercises for specific patient needs	2 1	15

9. Legal and Regulatory Issues Must to Know - Understanding regulations and standards for using VR in healthcare Nice to know - Legal implications of using VR in clinical practice Desirable to Know - Compliance with data protection and patient privacy laws		
10. Future Directions Must to Know - Future innovations in VR technology and their potential impact on physiotherapy Nice to know - Integration of AI and VR in rehabilitation Desirable to Know - Predictive modeling for optimizing VR-based treatment outcomes	1	

BOOKS FOR BASICS ON VIRTUAL REALITY IN PHYSIOTHERAPY

- Virtual Reality for Physical and Motor Rehabilitation **by Patrice L. (Tamar) Weiss and Emily A. Keshner**
- Virtual Reality and Augmented Reality in Physical Therapy **edited by Bryan Heidorn**
- Virtual Reality and Medicine **edited by Paul W. Wertheimer**

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SEMESTER V

3105-11: MEDICINE- PART 1

Course Credit for MEDICINE -Part I		
	Hours	**Credits**
Theory	**38**	**2**
Practical	**07**	

OBJECTIVES

At the end of the course ,the candidate will-

1. Be able to describe Etiology, Pathophysiology, Signs & Symptoms & Management of the various Cardiovascular and Respiratory conditions.
2. Acquire skill of clinical examination of Pulmonary and Cardio-vascular System.
3. Be able to interpret auscultation findings with special emphasis to pulmonary system, Chest X-ray, Blood gas analysis, P.F.T. findings, Blood studies done for Cardiovascular and respiratory conditions..
4. Be able to describe the principles of Management at the Medical Intensive CareUnit.

SR.NO	CONTENT	TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic	Practical			
1	**CARDIO-VASULAR &RESPIRATORYMEDICINE**					
	Cardio-vascular diseases (18Hrs)					
	Hypertension–systemic	2hrs		MK		
	I.H.D.–Myocardial infarction	2hrs		MK		
	Arrhythmia–classification	2hr				**NK**
	Valvular Heart Disease– i)Congenital ii)Acquired	3hrs		MK		
	Rheumatic Fever and Infective EndoCarditis	2hrs		MK		
	Congenital Heart Disease	2hrs		MK		
	Geriatric CardioVascularProblems&management	3hrs			DK	
	ECG–Normal & Variations due to ischemia & infarction	2hrs		MK		
	Diseases of the respiratory system(20Hrs)					
	Common Infectious diseases like Tuberculosis Pneumonia, Lung Abscess, Bronchiectasis	3hrs		**MK**		
	Diseases of Pleura like Pleural Effusion,Pneumothorax, Hydropneumothorax, Empyema	3hrs		MK		
	Occupational lung diseases and Interstitial Lung Diseases: Silicosis, Asbestosis, Pneumoconiosis, Brucellosis, Farmer's Lung, Interstitial diseases	4hrs		MK		
	Obstructive Lung Diseases like Bronchitis, Emphysema, Bronchial Asthma,CysticFibrosis	3hrs		MK		
	Geriatric respiratory problems & management	2hrs		MK		

	Intensive Medical Unit – Infrastructure & Treatment	2hrs		MK		
	Introduction of clinical examination– Breath sounds / X ray chest /Blood gas analysis/P.F.T.	3hrs		MK		
	2. Clinical aspects/Practical (Hrs)		7 hrs	MK		
	Evaluation, presentation and recording of two cases each in : • Respiratory Condition • CardioVascular Conditions • General Medicine Conditions like Obesity, Nutritional disorders, Diabetes Mellitus					

TEXTBOOKS

1. API-Textbook of Medicine – 5 th edition.
2. Golwalla– Medicine for students
3. Principles & practice of Medicine –16thedn.-byDavidson.

SCHEME OF EXAMINATION

Theory	40	Practical	40
IA	10	**IA**	10
Total	50	**Total**	50

MODELQUESTIONPAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. BasedonsingleBestanswer It mustinclude MUSTKNOWquestions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQAnswer5questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQAnswer any2outof3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any1outof2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's: 10	BAQ's: 10	SAQ's:10	LAQ's:10
MK–06 DK–03 NK–01	MK–03 DK–01 NK–01	MK–01 DK–01 NK–01	MK–01 DK–01 NK–00
LEVELI:07	LEVEL I:03	LEVEL I:02	LEVEL I:01
LEVELII: 03	LEVEL II: 02	LEVEL II: 01	LEVEL II: 01

3105-12 Orthopedics

CREDITS HOURS

Course Credit for Orthopedics		
	Hours	**Credits**
Theory	**55**	**4**
Practical	**25**	**2**

COURSE DESCRIPTION:

This course intends to familiarise students with principles of orthopedic surgery along with familiarisation with terminology and abbreviations for efficient and effective chart reviewing and documentation. It also explores various orthopedic conditions needing attention, focusing on epidemiology, pathology, primary and secondary clinical characteristics and their surgical and medical management. The purpose of this course is to make physiotherapy students aware of various orthopedic surgical conditions so these can be physically managed effectively both pre as well as postoperatively.

OBJECTIVES

a) Discuss the aetiology, Pathophysiology, clinical manifestations & conservative / Surgical management of various traumatic & cold cases of the Musculoskeletal Conditions.

b) Gain the skill of clinical examination; apply special tests & interpretation of the preoperative old cases & all the post-operative cases.

c) Be able to read & interpret salient features of the X-ray of the Spine & Extremities and correlate the radiological findings with the clinical findings.

d) Be able to interpret Pathological / Biochemical studies pertaining to Orthopedic conditions.

Sr. No	Content	Teaching hours	Must know	Desirable to know	Nice to Know
		Didactic			
1. 1.	Post trauma Pathology, clinical manifestations, healing process in bone & intra articular & extraarticular soft tissues.	2 hrs	MK		
2.	Fractures & dislocations of upperextremity & lower extremity i. Classification ii. Conservative treatment iii. Surgical intervention – • Surgical approach • Soft tissue section / repair • Internal / external fixation / arthroplasty • Post operative complications • Post operative management &management of complications.	12 hrs	MK		
3.	Fractures & dislocations of spine,thoracic cage, shoulder girdle& pelvis i. Conservative treatment ii. Surgical intervention Surgical approach • Soft tissue section / repair • Internal / external fixation /arthroplasty • Post operative complications • Post-operative management & management of complications.	**5 hrs**	**MK**		

4.	Management of Metabolic disorders. a. Osteoporosis b. Osteomalacia c. Osteopenia d. Rickets.	2hrs	MK		
5.	Degenerative disorders of spine and extremities: Cervical spondylosis, lumbar spondylosis, Osteoarthritis Brachial Plexus / Lumbosacral Plexus & Peripheral nerve injuries – sites, management.	3hrs	MK		
6.	Deformities and anomalies a. define and classify deformities and anomalies. State its causes b. Discuss the difference between congenital and acquired deformities. c. Describe its physical, clinical and radiological features and its complications d. Discuss the principles of medical and surgical management of the deformities e. Describe the following the deformities Deformities of the spine i. Scoliosis ii. Kyphosis iii. Lordosis iv. sway back v. flat back vi. Torticollis f. Congenital Malformation Spina Bifida, Meningocele, Myelomeningocele.	5hrs	MK		
7.	Deformities of extremities like Varus/Valgus, Torsion, Deformities of hands & feet, CTEV Reconstructive surgery Cerebral Palsy	2hrs	MK		
8.	Vascular Disorders like AvascularNecrosis, Necrosis, Perthe's Disease, Compartmental Syndrome.	2hrs	MK		

9.	Inflammatory / Infectious diseases of the bone & joints a) Pyogenic arthritis b) Rheumatoid arthritis c) Juvenile arthritis d) Tuberculous arthritis, Potts spine e) Gouty arthritis f) Haemophilic arthritis g) Neuropathic arthritis h) Psoriatic arthritis	2hrs		DK	
10.	Splint and traction	1hrs			NK
11.	Reconstructive surgery for bone lengthening	1hr			NK
12.	Tumors of bone & management. i. Discuss Classification, Principles of general management ii. Describe the general description of benign and malignant tumors of the musculoskeletal system	1 hrs			NK
13.	Degenerative disorders like osteoarthritis, lumbar spondylosis, cervical spondylosis	2hrs			
14.	Surgical intervention for Arthritis like O.A., RA, Ankylosing Spondylitis	2 hrs	MK		
15.	Reconstructive surgery in soft tissue lesions of Shoulder, elbow, wrist, hip, knee &ankle	2hrs		DK	
16.	Aetiology of Back Pain and Surgical management	2 hrs	MK		
17.	Common Sports injuries /overuse injuries & management.	2 hrs	MK		
18.	Traumatic Amputation & management	1 hrs	MK		
19.	Hand injury & management	1 hrs		DK	
20.	Soft tissue and traumatic injuries: a. Introduction, Anatomy & physiology general description, grade of injury and management ofinjuries of i. Ligaments, Bursae, Fascia ii. Muscles & Tendons iii. Muscles and tendons injuries ofupper and lower limb b. Cervicolumbar injuries, Whiplash of the cervical spine c. Crush injuries of hand & foot d. Deformities of the lower limb:	3 hrs	MK		

	C.D.H., coxa Vara, coxa valga, anteversion, Retroversion, Genu valgum, Genu varum, Genu recurvatum, C.D.K., Talipes calcaneus equinus, varus & valgus, Pes cavus, Pes planus, Hallux valgus & varus, Hallux rigidus and hammer toe e. Deformities of Shoulder & Upper limb Sprengel's shoulder, Cubitus varus, Cubitus valgus, Dupuytren's Contracture				
21.	Basic Principles of interpretation of a. X-rays of extremities & spine, b. MRI, CT scan and PET scan.	1 hrs	MK		
22.	Amputation	1hrs		DK	

CLINICAL: 25 Hrs

Independent clinical orthopedic evaluation presentation & recording of

Sr. no	Clinical Contents	Clinical Hrs
1	One acute soft tissue lesion [including nerve injury]	8 Hrs
2	2 cases of degenerative arthritis of extremity joint	2 Hrs
3	2 degenerative arthritis of spine.	2 Hrs
4	One case of acute P.I.D.	3 Hrs
5	2 chronic backaches	4 Hrs
6	1 postoperative case of fractures of extremities.	2 Hrs
7	One traumatic paraplegia / quadriplegia	4 Hrs

OBSERVATION:

At least 2 surgeries of # internal fixation, one knee/hip replacement & Reconstructive surgeryof the tendons.

Text Books:

1. Outline of Fractures –Adams 8th edition
2. Outline of Orthopedics -Adams 8th edition
3. Aple's systems of orthopedics and fractures by Louis Solomon, 9th edition
4. Essential Orthopedics - Maheshwari, J. 7th edition
5. Essentials of Orthopedics For Physiotherapists - Ebnezar, John 3rd edition
6. Essentials of Orthopedics And Applied Physiotherapy - Joshi, Jayant 4th edition

7. Textbook of orthopedics and trauma - G. S. Kulkarni 3rd edition

SCHEME OF EXAMINATION

Theory	40	Practical	40
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 DK – 03 NK – 01	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	MK – 01 DK – 01 NK – 00
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	LEVEL I: 01
LEVEL II: 03	LEVEL II: 02	LEVEL II: 01	LEVEL II: 01

3105-13: SURGERY

Course Credit for Surgery		
	Hours	Credits
Theory	32	2
Practical	30	1

OBJECTIVES

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

1. Describe the effects of surgical trauma & Anesthesia in general.
2. Classify, clinically evaluate & describe the surgical management in brief in
   a.Wound & ulcers b. Burns c. Head injuries
3. Describe pre-operative evaluation, surgical indications & various surgical approaches in various abdominal / thoracic / peripheral vascular conditions.
4. Recall the surgical approaches in the form of line diagram & will be able to describe the components of soft tissues cut to reach the target tissue & the possible post operative complications in movement.
5. Be able to read & interpret findings of the X ray-chest

Sr. No	Content	Teaching hours		Must know	Desirable to know	Nice to know
		Didactic	Practical			
1.	**General**	**11 hrs**		MK		
a)	Effect of Anesthesia & surgicaltrauma, Hemorrhage, Shock, Water & Electrolyte imbalance	1 hr				
b)	Inflammation – acute &chronic-signs, symptoms, complications & management	1 hr				

c)	Wounds / ulcers –classification, healing process, management	2 hrs				
d)	Common abdominal surgeries	2 hrs				

	for G.I. tract, Genito-urinary system Scar during surgical approach through abdominal wall. Scar management in brief					
e)	Radical mastectomy – complications & management	1 hr				
f)	Amputation – types, sites, complications & management	1 hr				
g)	Burns – causes, complications, classification & management	3 hrs				
2.	**<u>Neuro Surgery:</u>**	**4 hrs**		MK		
a)	Head Injury – management	1 hr				
b)	Intra cranial & Spinal tumors	1 hr				
c)	Surgeries of Head & neck in Neurosurgical conditions & postoperative care	2 hrs				
3.	**<u>Cardio vascular – thoracic surgery:</u>**	**6 hrs**		MK		
a)	Surgical approach					
b)	Post operative complications & management in Thoractomy, Thoracoplasty, Lobecotomy, pneumonectomy, Decortication, CABG, Valvular Surgery, Congenital Heart Disease Surgeries, and Surgery for Peripheral Vascular Disease.					
4.	**<u>E.N.T. Surgery:</u>**	**5 hrs**			DK	
a)	Upper respiratory track surgery & post operative care.	1 hr				
b)	Tracheostomy – indications, surgical approach & management.	1hr				
c)	Surgery for cancer –indications & postoperative care.	1hr				
d)	Surgical procedures in VII the nerve palsy.	1hr				

e)	Vertigo	1hr				
5.	**Ophthalmic Surgery:** Surgeries for III, IV & VI cranial nerve palsy.	**1 hr**				NK
6.	**Plastic Surgery:**	**5 hrs**		MK		
a)	Skin grafts & flaps – Types, indications with special emphasis to burns, wounds, ulcers.	2 hrs				
b)	Tendon transfers, with special emphasis to hand, foot & facial paralysis.	2 hrs				
c)	Keloid & Hypertrophied scar management.	1 hrs				

7.	**Clinical: (10Hrs)**	**Clinical Hrs**	**MK/DK/NK**
a)	Evaluation / presentation and recording of one case each in burns, wound & ulcer, Head Injurycase, peripheral vascular condition, post Radical mastectomy, post thoracic surgery, post abdominal surgery.	4 Hrs	MK
b)	Auscultation & its interpretation with special emphasis to Reading & interpretation of the X-ray chest. OBSERVATION – one abdominal & one thoracic surgery & one surgery of skin graft / flap.	3 Hrs	MK
c)	**Oncology surgery:** a) Mastectomy b) Lung cancer c) Head and neck cancer d) Cancer in female reproductive system e) Oral cancers f) Liver cancer	3 Hrs	MK MK MK MK DK NK

Text Books

1. Manipal's Manual of surgery. Rajagopal Shenoy.
2. Bailey & Love's short practice of Surgery – 21st Ed.
3. Under Graduate Surgery by Nan.

SCHEME OF EXAMINATION

Theory	40
IA	10
Total	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 out of 6 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 DK – 03 NK – 01	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	MK – 01 DK – 01 NK – 00
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	LEVEL I: 01
LEVEL II: 03	LEVEL II: 02	LEVEL II: 01	LEVEL II: 01

3105-14: PEDIATRICS

Course Credit for Pediatrics		
	Hours	**Credits**
Theory	**30**	**2**
Practical	**30**	**1**

OBJECTIVES:

At the end of the course, the candidate will

1. Acquire knowledge in brief about intra-uterine development of the foetus.
2. Be able to describe normal development & growth of a child, importance of Immunization, & breast-feeding & psychological aspect of development.
3. Be able to describe neuromuscular, musculoskeletal, cardio-vascular & pulmonary conditions related to immunological conditions, nutritional deficiencies, infectious diseases, & genetically transmitted conditions.
4. Acquire skill of clinical examination of a neonate / child with respect to neurological, musculoskeletal & respiratory function.

Sr.No	Content	Teaching hours	Must know	Desirabl eto know	Nice to know
1.	Normal intra-uterine development of foetus	1 hr		DK	
2.	Normal development & growth	1 hr	MK		
3.	Immunization, Handling of the child, Significance of breast-feeding	1 hrs	MK		
4.	Common causes for Developmental disorders like Sepsis, Prematurity, Asphyxia & Hyperbilirubinemia	1Hrs		DK	
5.	Brain damage-Cerebral Palsy-types & Medical Management	2 hrs	MK		

6.	Spinal Cord Disorders like Poliomyelities, Spinal Dysraphism, Spina Bifida, Meningocele, Myelomeningocele.	2 hrs	MK		
7.	Common infections C.N.S. & peripheral nervous system • Typhoid, rubella, mumps, measles, diphtheria, chicken pox, hepatitis.	2hrs	MK		
8.	Epilepsy	1 hr	MK		
9.	Mental Retardation	1 hr	MK		
10.	Genetically transmitted neuro-muscular conditions	2 hr	MK		
11.	Malnutrition related condition	1hr			NK
12.	Juvenile R.A & other immunological conditions of Musculoskeletal system.	2 hr	MK		
13.	Common diseases of the respiratory system like Asthma, Bronchitis, T.B. & Pneumonia & bronchiectasis	2 hrs	MK		
14.	Rheumatic & Congenital heart disease	3hr	MK		
15.	Polyneuropathy	2 hr	MK		
16.	Learning disabilities – Autism (ASD)	2 hr	MK		
17.	Pediatric Physiotherapy Assessment	4 hr	MK		

Clinical: 30 Hrs.

Sr. no	Clinical Contents	Clinical Hrs	MK/DK/NK
1	Normal & abnormal reflexes in neonate & child	4 Hrs	MK
2	Examination of the nervous system	2 Hrs	MK
3	Examination of respiratory system	2 Hrs	MK
4	Examination of cardiovascular system	2 Hrs	MK
5	One month compulsory clinical posting	20 Hrs	MK

Text Book:

1. Essentials of Paediatrics O.P. Ghai-Inter Print publications (10th Edition)
2. D.K. series in Paediatrics (4th Edition)
3. Nelson textbook of Pediatrics (22nd Edition)
4. Piyush Gupta UG Textbook of Pediatrics (1st Edition)

SCHEME OF EXAMINATION

Theory	40	Practical	40
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 DK – 03 NK – 01	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	MK – 01 DK – 01 NK – 00
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	LEVEL I: 01
LEVEL II: 03	LEVEL II: 02	LEVEL II: 01	LEVEL II: 01

3105 - 15: PHYSICAL DIAGNOSIS & MANIPULATIVE SKILLS – Part I

Course Credit for Surgery		
	Hours	**Credits**
Theory	**34**	**1**
Practical	**115.5**	**3**

COURSE DESCRIPTION:

1. Physical Diagnosis & Physiotherapeutic Skills is a stepping stone to introduce students to actual concepts of PT assessment and later to the treatment concepts
2. Physical Diagnosis focuses on the assessment of all the body systems i.e. Musculoskeletal, Neurological and Cardiovascular-Respiratory in order to study the various impairments and their impact on activity and participation of the individual taking into consideration the contextual factors as well. It also emphasizes on the clinical reasoning of the underlying components of a universal evaluation tool (ICF) for a better understanding of the patient in a holistic manner. The student is also subjected to learn basics of manipulative, cardiovascular- respiratory and neuro-therapeutic skills on models so that he/she will be able to apply these principles eventually on patients.
3. The student will also gain a sound knowledge of electro-diagnosis, which is an integral part of Functional Diagnosis.

SrNo	Topics	Didactic	Lab/Practical
1	Human Development, Growth & Aging Process		
2	Electro diagnosis		
3	Functional Analysis		
4	Manipulative Skills		
5	Neuro Therapeutic Skills		

OBJECTIVES:

Cognitive:

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

1. Understand the use of ICF.
2. Acquire the knowledge of human growth and development from new life tobirth and adulthood
3. Understand structure and function of nerve and muscle as a base for understanding the electro-diagnostic assessment.
4. Understand the use of appropriate tools or instruments of assessment in Musculoskeletal, Neurological and Cardio-vascular conditions.
5. Understand the theoretical basis and principles of manipulative skills, neurotherapeutic skills and skills of cardiopulmonary care and resuscitation
6. Document results of assessment to evaluate the patient from time to time.

Psychomotor:

Student will be able to:

1. Perform assessment of measures of body structures and functions related totissue mechanics.
2. Perform assessment of measures of body structures and functions related tomotorcontrol affecting activity and participation, quality of life and independence.
3. Perform the skill of electro-diagnosis (SD Curve) and observe skills of EMGand NCVstudies, to understand the documentation of finding of these studies.
4. Interpretation and analysis of assessment and findings.
5. Demonstrate skills of manual therapy musculoskeletal, neurotherapeutics and cardiovascular and respiratory skills on models (Laboratory work).

Affective:

Student will be able to:

1. Select appropriate assessment techniques to facilitate safety, sensitive practicesin patient comfort and effectiveness.

2. Demonstrate safe, respectful and effective performance of physical therapy handling techniques taking into account patient's clinical condition, need for privacy, resources available and the environment.
3. Follow the principles of appropriate handling technique that is draping, hand placement, bodypart positioning, manual techniques, lifting and transfer techniques.
4. Communicate with patients and their families/caregivers regarding the need and uses of various assessment techniques.

Sr no	Topic	Teaching hours		Mustto know	Desirable to know	Nice to Know
		Didactic	Practical's			
1.	Functional Diagnosis using International Classification of Function, Disability & Health (I.C.F.) (Applicable to all the sections mentioned bellow)	2. 5hrs		MK		
2	General principles of Human development & maturation a. Aspects – I. Physical ii. Motor iii. Sensory iv. Cognitive v. Emotional vi. Cultural vii. Social	2.5 hrs	2.5Hrs	MK		
	b. Factors influencing human development & growth i. Biological ii. Environmental iii. Inherited.	2.5 Hrs	2.5Hrs			NK

	C. Principles of maturation – i. In general ii. In anatomical directional pattern – 1. Cephalo – caudal 2. Proximo – distal 3. Centero – lateral 4. Mass to specific pattern 5. Gross to fine motor development 6. Reflex maturation tests iii. Development in specific fields 1. Oromotor development 2. Sensory development 3. Neuro development of hand function.	2.5Hrs	5Hrs	MK		

3	Electro diagnosis 1. Physiology of resting membrane potential & action potential, Propagation of Action Potential, Volume conduction. 2. Physiology of muscle contraction. 3. Motor unit & Recruitment pattern of motor unit – Size principle. Therapeutic current-As a tool for electro diagnosis. 1. Physiological principles 2. Faradic Galvanic Test, Strength Duration Curve, Test for Sensory & Pain, Threshold, Test for Pain Tolerance – tests should be carried out on relevant patients.	7.5Hrs	10Hrs	MK		
4	Basics in Manual Therapy & Applications with Clinical reasoning. a. Examination of joint integrity i. Contractile tissues ii. Non contractile tissues	1 hrs	5Hrs	MK		
	b. Mobility – assessment of accessory movement & End feel.	1Hrs	5Hrs	MK		
	c. Assessment of articular & extra-articular soft tissue status. i. Myofascial assessment ii. Acute & Chronic muscle hold iii. Tightness iv. Pain-original & referred	1Hrs	5Hrs	MK		

	d. Basic principles, Indications & Contra-Indications of mobilization skills for joints & soft tissues. i. Maitland ii. Kaltenborn iii. Mulligan iv. Mckenzie	2Hrs	22.5 Hrs		DK	
6	Assessment of Movement Dysfunction a. Higher functions b. Cranial nerves c. Sensations & sensory organisation d. Joint mobility e. Body image f. Tone g. Reflexes-Superficial & Deep h. Voluntary control i. Muscle Strength j. Co-ordination k. Balance l. Endurance m. Trick movements n. Limb Length o. Posture p. Gait	4 hrs	10Hrs	MK		

	q. Scales- Berg Balance, Modified Ashworth, F.I.M., Barthel Index, G.C.S., D.G.I., M.M.S., S.T.R.E.A.M. & A.S.I.A. r. Functional Diagnosis using ICF s. Interpretation of Electro diagnostic findings, routine Biochemical investigations.					
7	Assessment of Cardio Vascular & Pulmonary Dysfunction. a. Vital parameters b. Chest expansion c. Symmetry of chest movement d. Breath Holding Test e. Breath Sounds f. Rate of Perceived Exertion (RPE) g. Quality of life questionnaire h. Exercise Tolerance – six minutes walk test, Theoretical bases of Bruce's protocol i. Peak Flow Meter	2.5 hrs	13hrs	MK		
8	Assessment of Musculo skeletal Dysfunction i. Tightness ii. Joint Mobility iii. Muscle strength iv. Limb Length v. Trick Movement vi. Posture vii. Gait viii. Special Test • Cervical Spine: Foraminal compression, Distraction, Shoulder depression, vertebral artery, Dizziness tests. • Shoulder: Yergason‟s, Speed‟s, Drop- Arm,	2.5 hrs	25Hrs	MK		

	Supraspinatus, Impingement, Anterior & Posterior Apprehension, Allen, Adson. • Elbow: Cozen‟s, Miller‟s, Tinel‟s sign • Forearm, Wrist &Hand: Phalen‟s, Bunnel-Littler, Froment‟s sign					
9	Assessment of Hand i. Sensations ii. Mobility of joints iii. Strength iv. Special Tests like Froment's Sign, Bunnel – Litter's Test, Phalen's Test, Tinel's Sign, Wartenberg's Sign. v. Hand Function – Precision & Power Grips.	1.5 hrs	5Hrs			NK
11	Assessment of pain i. Types of pain: Somatic, Somatic referred, Neurogenic, Visceral ii. Subjective Assessment: a) Location, duration, progression, distribution,quality, diurnal variations, modifying factors. b) Severity, nature of pain, tissue irritability iii. Objective Measurement & Documentation- a) Visual Analogue Scale (V.A.S). b) Numerical Rating Scale(N.R.S.) c) McGill‟s modified questionnaire(including Body charts)	1 hrs	5hrs	MK		

Clinical:

1. Practice of Manual Therapy in Kaltenborn, Maitland, Mulligan & Cyriax onextremitiesonly & only on models
2. Electro-diagnostic assessment – S D Curve, Faradic Galvanic Test, Test for Sensory &Pain Threshold, Test for Pain Tolerance.
3. Identification of abnormal breath sounds, measurement of chest expansion, pattern of breathing, Vital parameters, Grades of Dyspnoea, Rate of Perceived exertion, Ankle Brachial Index.
4. Exercise tolerance testing – 6 minutes walk test & Bruce's protocol onmodelsonly

Term work in Clinical

A. Documentation & Interpretation of following investigations

1. Electro diagnosis –
    a. SDC
    b. Faradic Galvanic Test
    c. Test for Sensory / pain Threshold
    d. Test for Pain tolerance – Any 3

2. Neurological – Scales like Modified Ashworth, Berg's Balance, DGI, GlasgowComa, BarthelIndex, STREAM Format – Any 3 & EMG & NC Studies – 2 each.

B. Case presentation with Functional diagnosis – Three cases each in –

a. Musculoskeletal
b. Neurological
c. Cardiovascular & Pulmonary

To maintain the Record/Journal of the term work & to get each assignment dulysinged byHead.

RECOMMENDED TEXT BOOKS

1. Orthopaedic Physical Examination –Magee
2. Clinical Electro Therapy – Nelson – Currier --- Appleton & Lange publication
3. Clinical Electromyography – Mishra
4. Therapeutic Exercises - Colby & Kisner
5. Physical Rehabilitation, Assessment and treatment - Susan B O"s Sullivan
6. Neurological Examination - John Patten

RECOMMENDED REFERENCE BOOKS

1. Maitland"s book on Manual therapy,
2. Mobilisation of Extremities – Kaltenborn
3. Clinical Electromyography – Kimura
4. Orthopaedic Physical therapy – Donnatelli
5. NAGS, SNAGS and MWMS - Brian Mulligan
6. Exercise & Heart – Wenger
7. Exercise Physiology – William D Mc"Ardle
8. Facilitation techniques based on NDT principles - Lois Bly Allison Whiteside

9. Movement therapy in Hemiplegia - Brunnstrom
10. Cash textbook of Physiotherapy in neurological conditions - Patricia Downie
11. Physical Dysfunction - Trombly Scoot
12. Infant Motor Development- Jan Piek
13. Neurology & Neurosurgery Illustrated (3rd edition)-Bone & Callander
14. Neuro-developmental Therapy –Janett Howle

INTERNAL ASSESSMENT:

1. Two exams – Terminal and preliminary examination (Theory & Practical) of 40marks eachTOTAL - 80 marks
2. Internal Assessment to be calculated out of 10 marks
3. In Practicals of Terminal & Preliminary examinations Spots will be of 10 marks. No marks will be allotted for the journal in Terminal & Preliminary examinations
4. Internal assessment as per University pattern

SCHEME OF EXAMINATION

Theory	40	Practical	40
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	Content	Marks

1	Long Case A] Psychomotor &affective: • Skill of History taking • Skill ofclinical examination • Skill of objective diagnostic procedure B] Cognitive : • Ability to justify bases for functional diagnosis by I.C.F.	15 Marks
2	Short Case (Mobilization Technique: Kaltenborn, ,Maitland, Mulligan's)	10 Marks
3	Spots a) Electro diagnosis b) SD Curve c) FG test d) Assessment tools of Orthopedics, Neurology and cardiology	10 Marks
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 DK – 03 NK – 01	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	MK – 01 DK – 01 NK – 00
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	LEVEL I: 01
LEVEL II: 03	LEVEL II: 02	LEVEL II: 01	LEVEL II: 01

ELECTIVE COURSES SEMESTER V

3105-EL16 TELE PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understanding of telemedicine principles and applications in physiotherapy
2. Knowledge of digital health technologies used in remote physiotherapy
3. Proficiency in conducting virtual physiotherapy assessments and consultations
4. Familiarity with telehealth platforms and software for physiotherapy practice
5. Skills in designing and implementing home exercise programs for remote patients
6. Understanding of legal and ethical considerations in telehealth physiotherapy
7. Ability to adapt traditional physiotherapy techniques for virtual delivery

Category	Theory	Practical
1. Introduction to Telemedicine Must Know - Overview of Telemedicine - Definition and History of Telemedicine Desirable to Know - Importance and Benefits of Telemedicine in Healthcare Nice know - Telemedicine vs. Traditional Healthcare Delivery	1 Hr	
2. Technologies and Tools for Telemedicine Must Know - Telecommunication Technologies • Basics of Internet and Communication Technologies • Telemedicine Platforms - Overview of Popular Telemedicine Platforms • Features and Functionality • Remote Monitoring and Wearable Devices	2 Hrs	

• Types of Remote Monitoring Devices Desirable to Know - Video Conferencing Tools Nice know - Mobile Health Applications		
3. Implementation of Telemedicine in Physiotherapy Must Know - Setting Up Telemedicine Services Infrastructure Requirements - Conducting Teletherapy Sessions Preparing for a Teletherapy Session Techniques for Effective Communication - Remote Assessment and Diagnosis Techniques for Remote Physical Assessment Desirable to Know - Legal and Regulatory Considerations of infrastructure Nice know - Developing a Telemedicine Workflow in infrastructure	1 Hr	5 Hrs
4. Telemedicine Protocols and Best Practices Must Know - Establishing Protocols Developing Standard Operating Procedures (SOPs) - Best Practices for Telemedicine Ensuring Patient Privacy and Confidentiality Desirable to Know - Ensuring Consistency and Quality of Care Nice know - Documentation and Record-Keeping	2 Hrs	
5. Rehabilitation and Exercise Prescription via Telemedicine Must Know - Designing Rehabilitation Programs - Principles of Exercise Prescription - Monitoring Progress and Adjusting Programs - Tracking Patient Progress Remotely Desirable to Know - Tailoring Programs to Individual Needs Nice know - Using Telemedicine for Program Delivery	1 Hr	5 Hrs
6. Patient Education and Self-Management Must Know - Educating Patients via Telemedicine - Creating Educational Content - Self-Management Tools and Resources - Apps and Online Resources for Patients	1 Hr	5 Hrs

Desirable to Know - Delivering Information Effectively - Techniques for Promoting Self-Care Nice know - Encouraging Self-Management and Empowerment - Assessing Patient Engagement		
7. Tele Physiotherapy for Specific Conditions Must Know - Musculoskeletal Conditions - Common Musculoskeletal Issues and Telemedicine Solutions - Telemedicine in Neurological Rehabilitation - Telemedicine in Cardiovascular and Respiratory Rehabilitation	1 Hr	5 Hrs
8. Ethical and Legal Considerations Must Know - Ethical Issues in Telemedicine - Patient Consent and Autonomy - Legal Considerations - Telemedicine Laws and Regulations Desirable to Know - Maintaining Professional Boundaries - Licensing and Credentialing Nice know - Addressing Ethical Dilemmas - Compliance with Healthcare Standards	1 Hr	
9. Evaluation and Quality Improvement Must Know - Evaluating Telemedicine Services - - Measuring Outcomes and Effectiveness - Research in Telemedicine - Current Research and Trends Desirable to Know - Patient Satisfaction and Feedback - Designing and Conducting Telemedicine Studies Nice know - Continuous Quality Improvement - Analyzing and Interpreting Data	3 Hrs	5 Hrs
10. Future Trends in Telemedicine Must Know - Innovations in Telemedicine - Emerging Technologies and Future Directions - Global Perspectives - Telemedicine in Different Healthcare Systems Desirable to Know - Integrating Artificial Intelligence and Machine Learning Nice know	2 Hrs	5 Hrs

- The Future of Telemedicine in Physiotherapy		

Suggested Reading and Resources:

1. "Telemedicine: Principles and Practice" by Rashid Bashshur, Gary Shannon, and Brian E. Wootton
2. "Telehealth and Mobile Health" by Halit Eren and John G. Webster
3. Journals: Telemedicine and e-Health, Journal of Telemedicine and Telecare

3105-EL17 ROBOTIC THERAPY

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. **Introduction to Robotic Therapy:**

- Understand the basic concepts and terminologies related to robotic therapy.
- Explore the history and evolution of robotics in physiotherapy.

2. **Types of Robots in Physiotherapy:**

- Identify various types of robots used in physiotherapy, including exoskeletons, end-effector robots, and assistive robots.
- Discuss their functionalities and applications in patient rehabilitation.

3. **Mechanisms and Design Principles:**

- Learn about the mechanical design and control systems of therapeutic robots.
- Understand the principles of robot kinematics, dynamics, and control.

4. **Clinical Applications and Benefits:**

- Explore the clinical applications of robotic therapy in different conditions such as stroke, spinal cord injury, and musculoskeletal disorders.
- Discuss the benefits of using robotic therapy for enhancing patient outcomes.

5. **Patient Assessment and Customization:**

- Understand how to assess patients for suitability for robotic therapy.
- Learn to customize robotic therapy protocols based on individual patient needs and conditions.

6. **Integration with Traditional Physiotherapy:**

- Explore how robotic therapy can be integrated with traditional physiotherapy techniques.
- Discuss the role of physiotherapists in managing and supervising robotic therapy sessions.

Category	THEORY	PRACTICAL
1. Introduction to Robotic Therapy Must to Know - Definition and basic principles of robotic therapy Desirable to Know - History and evolution of robotic therapy Nice to know - Key milestones and breakthroughs in robotic therapy	1 Hr	
2. Types of Robots in Physiotherapy Must to Know - Classification of robots (e.g., exoskeletons, end-effector robots) Desirable to Know - Overview of commercially available robots Nice to know - Cutting-edge robotic technologies	1 Hr	
3. Mechanisms and Control Systems Must to Know - Basic mechanics and control systems of robots Desirable to Know - Differences between passive, active, and hybrid systems Nice to know - Advanced control strategies and algorithms	1 Hr	
4. Human-Robot Interaction Must to Know - Principles of human-robot interaction (HRI) Desirable to Know	1 Hr	

- User interface design and usability considerations Nice to know - Psychosocial aspects of HRI		
5. Applications in Rehabilitation Must to Know - Use of robots in neurological rehabilitation - Role of robots in musculoskeletal recovery - Benefits and challenges of using robots in pediatric therapy - Use of robots in elderly care and rehabilitation Desirable to Know - Case studies of robotic interventions for neurological conditions - Case studies of robotic interventions for musculoskeletal disorders - Case studies of pediatric robotic interventions - Case studies of geriatric robotic interventions Nice to know - Future trends in neurological robotic rehabilitation - Innovations in robotic musculoskeletal therapy - Future prospects in pediatric robotic therapy - Advances in geriatric robotic therapy	3 Hr	10 Hrs
6. Robotic Assessment Tools Must to Know - Common robotic assessment tools and techniques Desirable to Know - Standardization and validation of robotic assessments Nice to know - Emerging robotic assessment methodologies	2 Hr	5 Hrs
7. Safety and Ethical Considerations Must to Know - Safety protocols and ethical considerations in robotic therapy Desirable to Know - Regulatory frameworks and guidelines	2 Hr	5 Hrs

Nice to know - Ethical dilemmas and debates in robotic therapy		
8. Clinical Integration and Workflow Must to Know - Steps to integrate robotic therapy into clinical practice Desirable to Know - Best practices for workflow optimization Nice to know	1 Hr	5 Hrs
9. Training and Skill Development Must to Know - Essential skills for operating therapeutic robots Desirable to Know - Certification programs and training courses Nice to know - Advanced training techniques and methodologies	1 Hr	5 Hrs
10. Future Trends and Innovations Must to Know - Emerging trends and innovations in robotic therapy Desirable to Know - Integration of AI and machine learning in robotic therapy Nice to know - Vision for the future of robotic therapy	1 Hr	

BOOKS

1. Rehabilitation Robotics: Technology and Application" edited by Sashi S Kommu
2. "Wearable Robotics: Challenges and Trends" edited by José L. Pons, Diego Torricelli, and Marta Pajaro
3. "Neurorehabilitation Technology" edited by David J. Reinkensmeyer and Volker Dietz
4. "Rehabilitation Robotics: Principles and Practice" by Roberto Colombo and Vittorio Sanguineti
5. "Human-Robot Interaction: An Introduction" by Christoph Bartneck, Tony Belpaeme, Friederike Eyssel, Takayuki Kanda, Merel Keijsers, and Selma Šabanović
6. "Exoskeletons in Rehabilitation Robotics: Tremor Suppression and Beyond" edited by Eduardo Rocon and Jose L. Pons

3105-EL18 DIASTER MANAGEMENT

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understand the fundamental concepts of disaster management.
2. Recognize the role of physiotherapists in disaster preparedness, response, and recovery.
3. Develop skills to assess and manage injuries in disaster scenarios.
4. Learn to create and implement emergency action plans.
5. Enhance knowledge of triage and prioritization in mass casualty events.
6. Understand the psychological impact of disasters on patients and healthcare providers.
7. Develop strategies for effective communication and coordination during disasters.
8. Gain knowledge of the legal and ethical considerations in disaster management.
9. Learn to work effectively in interdisciplinary teams during disaster response.

Category	THEORY	PRACTICAL
1. Introduction to Disaster Management Must to Know - Definition of disasters and disaster management - Types of disasters (natural, manmade, complex) - Phases of disaster management cycle Desirable to Know - Global and local disaster trends - Impact of climate change on disasters	1 Hr	

Nice to know - Historical perspectives on disaster management - Future predictions in disaster occurrences		
2. Role of Physiotherapists in Disaster Management Must to Know - Primary responsibilities in disaster response - Integration with emergency medical services - Triage principles for physiotherapists Desirable to Know - Psychological first aid basics - Adapting treatments to disaster settings Nice to know - Leadership roles for physiotherapists in disaster teams - Research opportunities in disaster physiotherapy	1 Hr	
3. Disaster Preparedness Must to Know - Personal preparedness for disaster response - Essential equipment and supplies for physiotherapists - Basic disaster response protocols Desirable to Know - Creating and maintaining a disaster response kit - Participating in disaster drills and simulations Nice to know - Advanced disaster scenario planning - Developing communitybased preparedness programs	1 Hr	
4. Immediate Response and Triage Must to Know - START (Simple Triage and Rapid Treatment) method - Basic life support and CPR - Rapid musculoskeletal assessment in disasters	1 Hr	

Desirable to Know - Advanced triage techniques - Field assessment of spinal injuries Nice to know - Innovative triage technologies - Mass casualty incident management		
5. Trauma Management in Disasters Must to Know - Assessment and management of fractures, sprains, and strains Wound care basics - Pain management in disaster settings Desirable to Know - Advanced trauma life support principles - Management of crush injuries and compartment syndrome Nice to know - Rehabilitation protocols for complex trauma cases - Use of telemedicine in disaster trauma management	1 Hr	2 Hrs
6. Respiratory Care in Disasters Must to Know - Basic respiratory assessment - Airway management techniques - Chest physiotherapy in emergency situations Desirable to Know - Ventilator management basics - Dealing with smoke inhalation and chemical exposures Nice to know - Advanced respiratory care in makeshift facilities - Innovative airway clearance techniques	1 Hr	2 Hrs
7. Burn Management Must to Know - Assessment of burn severity and extent	1 Hr	2 Hrs

- Initial management of burn patients - Positioning and early mobilization of burn victims Desirable to Know - Advanced burn rehabilitation techniques - Psychological support for burn survivors Nice to know - Cuttingedge burn treatment technologies - Longterm burn rehabilitation strategies		
8. Amputee Care in Disaster Settings Must to Know - Emergency care for traumatic amputations - Basic principles of early prosthetic fitting - Stump care and management Desirable to Know - Intermediate prosthetic training - Phantom limb pain management Nice to know - Advanced prosthetic technologies - Community reintegration strategies for amputees	1 Hr	2 Hrs
9. Spinal Cord Injury Management Must to Know - Emergency handling of suspected spinal injuries - Basics of spinal cord injury assessment - Early intervention strategies Desirable to Know - Comprehensive spinal cord injury rehabilitation - Assistive technology for spinal cord injury patients Nice to know - Emerging therapies in spinal cord injury rehabilitation - Virtual reality applications in SCI rehab	1 Hr	2 Hrs
10. Pediatric Considerations in Disasters	1 Hr	5 Hrs

Must to Know - Developmental considerations in pediatric disaster victims Pediatric triage principles - Basic pediatric trauma assessment and management Desirable to Know - Psychological support for children in disasters - Pediatric burn management - Nice to know - Advanced pediatric rehabilitation techniques - School reintegration programs postdisaster		
11. Geriatric Care in Disasters Must to Know - Special considerations for elderly disaster victims - Managing preexisting conditions during disasters - Fall prevention in temporary shelters Desirable to Know - Cognitive assessment in disaster settings - Nutritional support for elderly victims Nice to know - Innovative mobility aids for disaster settings - Telerehabilitation for geriatric patients postdisaster	1 Hr	5 Hrs
12. Mental Health and Psychological Support Must to Know - Recognizing signs of acute stress and PTSD - Basic psychological first aid - Selfcare and stress management for responders Desirable to Know - Traumainformed physiotherapy practice - Group therapy techniques for disaster survivors Nice to know - Advanced PTSD management strategies	1 Hr	5 Hrs

- Mindbody interventions in disaster recovery		
13. Public Health in Disasters Must to Know - Basic principles of hygiene and sanitation - Prevention of communicable diseases - Health promotion in temporary shelters Desirable to Know - Environmental health assessment - Water and food safety in disaster zones Nice to know - Epidemiological surveillance techniques - Advanced public health interventions in protracted disasters	1 Hr	5 Hrs
14. Disaster Recovery and Rehabilitation Must to Know - Longterm rehabilitation planning - Communitybased rehabilitation principles - Returntowork strategies for disaster survivors Desirable to Know - Adaptive equipment provision in resourcelimited settings Disabilityinclusive disaster recovery Nice to know - Innovative community reintegration programs - Economic rehabilitation strategies	1 Hr	5 Hrs
15. Ethics and Legal Considerations Must to Know - Ethical decisionmaking in disaster response - Documentation in disaster settings - Understanding scope of practice in emergencies Desirable to Know - International humanitarian law basics - Cultural competence in international disaster response	1 Hr	

Nice to know - Advanced ethical dilemmas in disaster management - Policy development for disaster physiotherapy		

Books:

1. Disaster Medicine" by David E. Hogan and Jonathan L. Burstein
2. "Principles of Disaster Medicine: Comprehensive Aspects of Operational Healthcare" by Robert A. Jensen
3. "Emergency Management in Health Care: An All-Hazards Approach" by Gwen G. MacDonald
4. "Introduction to International Disaster Management" by Damon P. Coppola
5. "Manual of Disaster Medicine: Civilian and Military" by Robert A. Jensen and Daniel Kollek

3105-EL19 MOTHER & CHILD HEALTH CARE

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understand the fundamentals of maternal and child health care.
2. Recognize the importance of prenatal and postnatal care for mothers and children.
3. Identify common health issues and diseases affecting mothers and children.
4. Learn effective strategies for promoting maternal and child health.
5. Develop skills in assessing and managing the health of mothers and children.
6. Understand the nutritional needs of mothers and children at different stages.
7. Learn about the importance of immunizations and preventive care.

Category	THEORY	PRACTICAL
1: Introduction to Maternal Psychology **Must Know:** - Psychological changes during pregnancy and postpartum period. - Impact of maternal mental health on child development. - Role of physiotherapy in supporting maternal mental well-being. **Desirable to Know:** - Common psychological disorders during pregnancy and postpartum (e.g., depression, anxiety). - Counseling techniques and interventions for maternal mental health. - Strategies for promoting resilience and coping skills in new mothers. **Nice to Know:** - Cultural perspectives on maternal psychology and child-rearing practices.		

2: Child Growth and Development **Must Know:** - Milestones of normal child development (motor, cognitive, social-emotional). - Role of early intervention in optimizing child development outcomes. - Physiological changes in infants and children relevant to physiotherapy practice. **Desirable to Know:** - Factors influencing child growth and development (e.g., nutrition, environment). - Developmental screening tools and assessment techniques. - Parent education on promoting motor and cognitive development in children. **Nice to Know:** • Theoretical frameworks in child development (e.g., Piaget's stages of cognitive development**).**		
3: Physiotherapy Interventions for Mothers and Children **Must Know:** - Postnatal physiotherapy exercises and rehabilitation for mothers. - Techniques for managing musculoskeletal conditions during pregnancy and postpartum. - Pediatric physiotherapy principles and approaches for children of different ages. **Desirable to Know:** - Pediatric conditions commonly treated with physiotherapy (e.g., developmental delay, cerebral palsy). - Family-centered care and collaboration with parents in pediatric physiotherapy. - School-based physiotherapy services and educational support for children. **Nice to Know:** - Play-based therapy and its benefits in pediatric physiotherapy.		
4: Psychosocial Aspects of Parenting **Must Know:**		

- Parenting styles and their impact on child development. - Support systems and resources for parents of children with special needs. - Communication strategies for effective parent-physiotherapist collaboration. **Desirable to Know:** - Coping mechanisms and stress management for parents of children with chronic conditions. - Advocacy skills and navigating healthcare systems for parents. - Impact of social determinants on parenting and child health outcomes. **Nice to Know:** - Peer support groups and community resources for parents.		
5: Research and Evidence-Based Practices **Must Know:** - Evidence-based practices in maternal psychology and child development. - Outcome measures and assessment tools for evaluating maternal and child health interventions. - Continuous quality improvement in physiotherapy practices for mothers and children. **Desirable to Know:** - Current research trends and innovations in maternal and child health. - Ethical considerations in conducting research involving mothers and children. - Integration of research findings into clinical practice and policy development. **Nice to Know:** - Global perspectives on maternal and child health and best practices.		

Books:

1. "Maternal and Child Health: Programs, Problems, and Policy in Public Health" by Jonathan B. Kotch
2. WHO guidelines on maternal and child health
3. " Child Development: A Practical Introduction" by Kevin Crowley and Jacquelynne S. Eccles
4. " "Pediatric Physical Therapy" by Jan S. Tecklin
5. "Campbell's Physical Therapy for Children" by Robert J. Palisano et al.
6. "Physical Therapy for Children with Cerebral Palsy: An EvidenceBased Approach" by Mary Rahlin
7. "Maternal-Child Nursing" by Emily Slone McKinney

SEMESTER VI

3106-11: MEDICINE- PART 2

Course Credit for MEDICINE -Part I		
	Hours	Credits
Theory	37	2
Practical	08	

OBJECTIVES

At the end of the course ,the candidate will-

5. Be able to describe Etiology, Pathophysiology, Signs & Symptoms & Management of the various Neurological, Rheumatological and geriatric conditions.
6. Acquire skill of clinical examination of Neurological System.
7. Be able to interpret auscultation findings with special emphasis to investigations done foe neurological and general medical conditions.
8. Be able to describe the principles of Management at the Medical Intensive CareUnit.

SR. NO	CONTENT	TEACHING HOURS		MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Didactic	Practical			
1	**NEUROLOGY (24 hrs)**					
	Circulation of the brain & spinal cord	1 hr		MK		
	Cerebro–vascular accidents– Thrombosis, Embolism, Haemorrhage	1hr		MK		
	Stroke– LevelofLesion &Management	1hr		MK		
	Extra Pyramidal lesions–Basal Ganglia • Parkinsonism • Athetosis,Chorea,Dystonia &Spasmodic Torticollis	2hrs		MK		
	Polyneuropathy i. GBS syndrome. ii. Diabetic, Alcoholic & SACD Dysfunction of AutonomousNervous System in Spinal CordLesions	2hrs		MK		
	Disorders & Diseases of muscle • Myopathy–Types • Muscular Dystrophy–Types • Inflammatory Disorders – Polymyositis & Dermatomyositis • Myotonia	3hrs		MK		
	Disorders of Anterior Horn Cell. • MotorNeuroneDisease • SMA,Syringomyelia,PeronealMuscularAtrophy,Polio	2hrs		MK		
	Multiple Sclerosis	1hr		MK		
	Infections of the nervous system like Encephalitis, Neurosyphilis, HI V infection, Herpes, Meningitis, Transverse Myelitis, Tabes Dorsalis & T.B.Spine.	2hrs		MK		
	Epilepsy	1hr		MK		
	Tetanus	1hr				**NK**
	Alzheimer'sDisease	1hr		MK		
	Disorders of cerebellar function	1hr		MK		

	Disorders of cranial nerves & Special Senses	1hr			DK	
	Disorders of Myoneural Junction Myasthenia Gravis & Myasthenic Syndrome	1hr		MK		
	Neurogenic Bladder	1hr		MK		
	Cerebro Spinal Fluid • Formation &Absorption • StatusinVarious	1hr		MK		
	Sexually transmitted diseases	1hr		MK		
	2. GENERAL MEDICINE (13 hrs)					
	Disorders of Endocrine system i. Diabetes ii. Thyroid ,Pituitory & Adrenal conditions iii. Calcium Metabolism	2hrs			**DK**	
	Rheumatological Conditions. i. RheumatoidArthritis ii. SLE iii. SSA iv. Gout v. Polymyositis	4hrs		**MK**		
	Geriatric Conditions(Hrs) i. Aging Process ii. Osteoporosis iii. General Health Care, Wellness Clinic. iv. Hypertension	4hrs		**MK**		
	Nutrition Deficiency Disease	1hr		**MK**		
	Drug Abuse/Intoxication	1hr			**DK**	
	Sexually Transmitted Diseases PEP:HIV,HBV,HCV	1hr		**MK**		
	3. CLINICAL ASPECTS /PRACTICAL		8 hrs	**MK**		
	Evaluation, presentation and recording of two cases each in • U.M.N.lesion • L.M.N.lesion • Geriatric conditions					

TEXTBOOKS

4. API-Textbook of Medicine – 5 th edition.
5. Golwalla– Medicine for students
6. Principles & practice of Medicine –16thedn.-byDavidson.

SCHEMEOFEXAMINATION

Theory	40
IA	10
Total	50

MODELQUESTIONPAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUSTK NOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQAnswer5questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQAnswer any2outof3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any1outof2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's: 10	BAQ's: 10	SAQ's:10	LAQ's:10
MK–06 **DK–03** **NK–01**	MK–03 DK–01 NK–01	MK–01 DK–01 NK–01	**MK–01** **DK–01** **NK–00**
LEVELI:07	LEVEL I:03	LEVEL I:02	**LEVEL I:01**
LEVELII: 03	**LEVEL II: 02**	**LEVEL II: 01**	**LEVEL II: 01**

3106 - 12: PSYCHIATRY

Course Credit for Psychiatry		
	Hours	**Credits**
Theory	**50**	**3**

PSYCHIATRY

Course Credit for Psychiatry		
	Hours	**Credits**
Theory	**50**	**3**

Course objectives-

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

1. Enumerate various Psychiatric disorders with special emphasis to movement / Pain & ADL – describe the various causative factors & methods of assessment & management.

2. Acquire the knowledge in brief, about the pathological & etiological factors, signs /symptoms & management of various Psychiatric conditions.

3. Describe in brief the various treatments commonly used.

Course outcomes-

The student should be able to describe common psychiatric disorders. Students should learn about pathological and etiological causes of common psychiatric conditions. The student should have basic knowledge of pharmacological and non-pharmacological management of common psychiatric disorders

Sr. No.		TEACHING HOURS Didactic 50	MUST KNOW	DESIRABLE TO KNOW	NICE TO KNOW
1.	**Introduction to Psychiatry** 4) Definition, History 5) Examination of mental status 6) Classification of Mental status (DSM 5 in brief)	2 hrs	MK		
2	**Psychiatric Conditions:** 3) Schizophrenia and other Primary Psychotic Disorders 4) Anxiety and Fear related Disorders 5) Disorders specific related to Stress 6) Obsessive Compulsive and Related Disorders 7) Mood Disorders: Depressive Disorders, Bipolar Disorders 8) Substance related and addictive Disorders 9) Somatic symptoms and Related Disorders 10) Dissociative Disorders 11) Neurocognitive Disorders 12) Intellectual Disability 13) Child Psychiatry 14) Sleep Disorders	33 hrs	MK		
3	5) Psychological Treatments: ECT, Pharmacotherapy, Group therapy, Psychotherapy, Cognitive Behavioral therapy, Mindfulness, Relaxation Techniques and other Somatic	10 hrs		DK	

	Therapies				
4	6) **Emergency Psychiatry** 7) **Community Psychiatry**	**5 hrs**			**NK**

Text Books:

- Textbook of Psychiatry – Pravin Tripathi, -- Jaypee bros – medical publishers
- A short book of Psychiatry – 7th Edition-by Ahuja – Jaypee bros – medical publishers

SCHEMEOFEXAMINATION

Theory	40
IA	10
Total	50

MODELQUESTIONPAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUSTK NOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQAnswer5questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQAnswer any2outof3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any1outof2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's: 10	BAQ's: 10	SAQ's:10	LAQ's:10
MK–06 **DK–03** **NK–01**	MK–03 DK–01 NK–01	MK–01 DK–01 NK–01	**MK–01** **DK–01** **NK–00**
LEVELI:07	LEVEL I:03	LEVEL I:02	**LEVEL I:01**

LEVELII: 03	**LEVEL II: 02**	**LEVEL II: 01**	**LEVEL II: 01**

3106 - 13: OBSTETRICS & GYNAECOLOGY

SUBJECT	THEORY (Hrs)	PRACTICAL (Hrs)	TOTAL(Hrs)	Credit hours
OBSTETRCS & GYNAECOLOGY	20	-	20	1
		10		1
Total Credits				2

- **DIDACTIC THEORY HOURS - 20 HOURS**
- **CLINICAL - 10 HOURS**
- **TOTAL - 30 HOURS**

OBJECTIVES

Theory:

At the end of the course, the candidate will

1. Be able to describe the normal & abnormal physiological events during the Puberty,Pregnancy,

Labour, Puerperium, & Pre, Peri & Post Menopause.

2. Be able to discuss common complications during Pregnancy, Labour, Purerperium & PrePeri & Post Menopausal stage & various aspects of Urogenital Dysfunction & the management in brief.

3. Acquire the cognitive skill of the clinical examination of Pelvic Floor.

Sr. No	CONTENTS	Teaching Hours	Must Know	Desirable to know	Nice to Know
1	Physiology of Puberty & Menstruation, Abnormalities & common problems of Menstruation	1 Hr	MK		
2	Pregnancy – Fertilization, Development of the foetus, Normal gestations, Abnormal /Multiple gestations, Common Complications during pregnancy like P I H, Eclampsia Diabetes, Hepatitis, German Measels, TORCH infection.	2 Hrs	MK		

3	**Labour** 1. Normal – Events of Ist IInd & III rdStages of labour 2. Complications during labour &management 3. Caesarian section	3 Hrs	MK		
4	Post Natal – Puerperium, lactation,Methods of Contraception complications of repeated child bearingwith small gaps	2 Hrs		DK	
5	Sterility - management	1 Hr			NK
6	Methods of family planning	1 Hr		DK	
7	**Uro-genital dysfunction** 1.Uterine prolapse – classification & management (Conservative / Surgical)	2 Hrs	MK		
	2.Cystocoele, Rectocoele, Enterocoele				
	3.Neoplasm of Female reproductive organs – surgical management	1Hr			NK
8	Pre, Peri & Post Menopause – Physiology, Complications & management	2 Hrs	MK		
9	Pelvic Inflammatory Diseases with special emphasis to backache due to Gynaec / Obsconditions	1 Hr	MK		
10	Recent advances in pelvic floor anatomy.	1 Hr	MK		
11	Adolescent gynecological problems.	1 Hr	MK		
12	Recent innovations in treatment of stress urinary incontinence.	1 Hr		DK	
13	Nutrition and exercise for women'shealth.	1 Hr			NK

CLINICAL:

Evaluation & presentation of two cases each in:

Sr.No	Contents	Clinical Hours
1	Uro-genital dysfunction	1 Hrs
2	Antenatal care	1 Hrs

3	Postnatal care i. Following normal labour ii.Following Caeserean section	2 Hrs
4	Pelvic Inflammatory Diseases	1 Hrs
5	**OBSERVATION** – One Normal & One Caesarian delivery, One case of Tubectomy & One Hysterectomy /Repair of the Uro-genital Prolapse.	5 Hrs

Text Book:

1. Text book of Gynaecology – by Dutta – New Central Book Agency
2. Text book of Obstetrics by Dutta – New Central Book Agency

SCHEMEOFEXAMINATION

Theory	40
IA	10
Total	50

MODELQUESTIONPAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUSTK NOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQAnswer5questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQAnswer any2outof3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any1outof2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's: 10	BAQ's: 10	SAQ's:10	LAQ's:10
MK–06 **DK–03** **NK–01**	MK–03 DK–01 NK–01	MK–01 DK–01 NK–01	**MK–01** **DK–01** **NK–00**
LEVELI:07	LEVEL I:03	LEVEL I:02	**LEVEL I:01**

LEVELII: 03	**LEVEL II: 02**	**LEVEL II: 01**	**LEVEL II: 01**

3106 - 14: COMMUNITY HEALTH / SOCIOLOGY & BIO-STATISTICS

SUBJECT	THEORY(Hrs)	PRACTICAL(Hrs)	TOTAL (Hrs)	Credit Hours
Community health	**10**	**10**	**20**	**1 + 1 = 2**
Sociology	**20**	**-**	**20**	**1**
Biostatistics	**30**	**-**	**30**	**2**
Total credits	**60**	**10**	**70**	**5**

A.COMMUNITY HEALTH

OBJECTIVES:

At the end of the course, the candidate shall be able to understand the contents given in the syllabus.

Sr.No	Contents	Teaching Hours		Must Know	Desirable to Know	Nice to know
		Theory 10 Hrs	**Practical 10 Hrs**			
1	General concepts & Determinants of Health & Diseases – National & International Definition of Health, Role of Socio-Economic & Cultural Environment in Health & Disease a)Epidemiology – Definition & Scope b) Environmental Hygiene including man & his surrounding, Occupational & Industrial hygiene, Village & Town Sanitation, Bacteriology of Water, Milk, & Food Hygiene [Overview]	1 Hr	1 Hr	MK		
2	Overview of Public Health Administration at Central & State levels – Strategies of Health Delivery System for "The Health for All" National health programme [brief Role of WHO]	1 Hr	1 Hr		DK	
	Socio-Economical & Cultural Issues					

3	related to Morbidity owing to the Physical Disability & Handicaps of Structural / Neuro-motor & Psycho-somatic origin-	4 Hrs	4 Hrs	MK		
	A} Health problem vulnerable groups i. Preventive medicine in obstetrics- ANC, intra natal & PNC; geriatric care ii. Pre-term babies with high risk infants & health problems of Pre-School Children, Brain Damage during birth injury, Congenital & Acquired disorders, Spinal Dysraphysm, T.B. Meningitis, Polio, Cerebral palsy, Other Hereditary neuro-motor Conditions, such as Myopathies & Muscular Dystrophies, Malnutrition – Rickets. iii. Occupational Diseases & Hazards – Definition, Scope, Accident prevention minor& major accidents, injury prevention- UE, LE, spine, Hand Injuries, Disc Lesions, CTD, Backaches, Respiratory Illnesses due to exposure to asbestoses, tobacco, fumes, COPD, Asthma, Sarcoidosis; Stress.					
	B. Traumatic / Paralytic morbidity, Head Injury, Quadri /paraplegia, Urinary/Bowel Incontinence, Amputation, Skeletal Deformities due to multiple Fractures & Prolonged Bed Rest & Mental Retardation, adolescents and road traffic accidents.					

	C. Nutritional – Osteomalacia, Rickets, Neuropathies due to Vitamin- deficiency, Skeletal Deformities, food intoxicants.					
	D. Auto-immune & Hereditary diseases - overview- Rheumatoid arthritis, S.L.E. Sero-vearthtritis, Ankylosing Spondylitis, Multiple Sclerosis, Spinal Muscular Atrophies & Myopathies, Dystrophies in adults.					
	E. Geriatric-Osteoporosis, Malnutrition, Alzheimer's Disease, Parkinsons, Ataxia, CHD, Hypertension.					
	F. Addiction – Alcoholic – Neromotor & Psychosomatic disorders, Smoking – asthma, COPD, drug abuse.					
4	**Family planning** – objectives of National Family Planning Programmes & Family Methods General Idea of Advantage & Disadvantage of the Methods.	1 Hr	1 Hr			NK

5	Mental health –socio-economical & cultural aspect and assessment of mental health.	1 Hr	1 Hr	MK		

6	**Communicable diseases-an over-view [including prevention & control]** TB, HIV Leprosy, Brucillosis, & Other conditions leading to Paralysis & Arthritis, Respiratory diseases causing Bronchiactesis COPD. **Non communicable diseases-** cardiovascular, HTN, stroke	1 Hr	1 Hr	MK		
7	**National Immunization programmes** – children & hospital staff.	1 Hr	1 Hr		DK	

Text Book

1. K. Park – Park's Textbook of Preventive & Social Medicine
2. P.K. Mahajan & M.C. Gupta – Textbook of Preventive & Social Medicine

SOCIOLOGY: 20 HOURS

Sr.No	Contents	Teaching Hours 20 Hrs	Must Know	Desirable to Know	Nice to know
1	Introduction – Definition & Relevance with Physiotherapy.	**1Hrs**	**MK**		
2	Sociology & Health – Social factors affecting Health Status, Social Consciousness & Perception of Illness, and Decision Making in taking Treatment.	**2Hrs**	**MK**		
3	Socialization – Definition, Influence, of Social Factors, on Personality, Socialization in the Hospital & Rehabilitation of the patients.	**1Hrs**		**DK**	
4	Social groups-Concepts, Influence of formal & informal groups of Health & Diseases, Role of Primary & Secondary Groups in the Hospital & Rehabilitation Setting.	**2Hrs**	**MK**		
5	Family-Influence on human personality, Individual Health, Family & Nutrition, Effects of Sickness on Family Psychosomatic Diseases & Family.	**2Hrs**	**MK**		
6	Community Role of Rural & Urban communities in Public Health, Role of community in determining Beliefs, Practices & Home Remedies in	**2Hrs**	**MK**		

	Treatment.				
7	Culture-Components Impact on Human Behavior Cultural Meaning of Sickness Response to Sickness & Choice of Treatment, [Role of Culture as Social Consciousness in moulding the Perception of Reality] Culture induced Symptoms & Diseases, Sub-Culture of Medical Workers.	**1Hrs**		**DK**	
8	Culture, religion & gender influence in rehabilitation practice Caste system	**1Hrs**			**NK**
9	Social change factors– Human Adaptation, Stress, Deviance, Health Programme Role of Social Planning in the improvement of Health & in Rehabilitation.	**1Hrs**	**MK**		
10	Social Control – Definition, Role of norms, Folkways, Customs, Morals, Religion, Law & other means of social controls in the regulation of Human Behavior, Social Deviance & Disease.	**1Hrs**	**MK**		
11	Social problems of the Disabled-Consequences of the following social problems in relation to sickness disability, remedies to prevent these problems. A. Population Explosion b. Poverty & Unemployment c. Beggary & Juvenile Delinquency d. Prostitution & Alcoholism e. Problems of Women in Employment	**3Hrs**	**MK**		
12	Social Security & Social Legislation in relation to the Disabled.	**1Hr**			**NK**
13	Role of a Social Worker in diversified areas of rehabilitation	**1Hr**	**MK**		
14	Social pathology	**1Hr**		**DK**	

Text Books

1. Sachdeva, & Bhusahn- An introduction to sociology – Allahabad; kitab mahal ltd. 1974.
2. Madan – Indian social problems, Vol-I-Madras – Allied publications 1973.

A. BIOSTATISTICS: 30 HRS.

OBJECTIVES:

At the end of the course, the candidate shall –

1. Gain knowledge of the basic concepts of Biostatistics & its need for professional practice & Research
2. Be able to describe an Over-view-a

   a] Ethnography & Anthropology

   b] Design & Methodology of an Experiment or Survey

   c] Demography & vital statistics

   d] Sampling & interpretation of Data.

Sr. No	Contents	Theory Hours 30 Hrs	Must Know	Desirable to Know	Nice to know
1	Introduction – Uses of statistical methods in Physiotherapy – Measurement Scales, variables, & their Measurements, Symbolic Data, Operations.	8	MK		
2	Statistical data – Tabulation, Calculation of Central Tendency, & Dispersion, Linear Regression & Correlation – Presentation of Data in Diagrammatic & Graphic Form.	10			NK
3	Probability & Sampling as a Mathematical System, Population & Samples, Sampling Distribution, Sampling Methods.	7		DK	
4	Practice sessions for simple data- graphs/ compiling data	4	MK		
5	Statistical Fallacies	1			NK

TEXT BOOK

1. B.K. Mahajan – Methods in Biostatistics.

SCHEMEOFEXAMINATION

Theory	80
IA	20
Total	100

MODELQUESTIONPAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUSTK NOW questions ▪ Community health- 10 ▪ Sociology- 5 ▪ Biostatic- 5	20 Marks (20x 1 mks= 20 mks)
Section B	Q2. BAQ Answer 10 questions ▪ Community health- 5 ▪ Sociology & Biostatic- 5	20 Marks (10x 2 mks= 20 mks)
	Q3. SAQ Answer any4 out of 5 ▪ Community health- 2 ▪ Sociology – 2 ▪ Biostatic - 1	20 Marks (4x 5 mks= 20 mks)
Section-C	Q4. LAQ Answer any 2 out of 3 ▪ Community health- 1 ▪ Sociology-1 ▪ Biostatic - 1	20 Marks (2x 10mks= 20 mks)
TOTAL		80 Marks

BLUE PRINT

MCQ's : 20	BAQ's: 20	SAQ's: 20	LAQ's: 20
MK – 12 **DK – 06** **NK – 02**	MK – 06 DK – 03 NK – 01	MK – 02 DK – 02 NK – 01	**MK – 02** **DK – 01** **NK – 00**
LEVEL I: **14**	**LEVEL I:** **06**	**LEVEL I:** **03**	**LEVEL I:** **02**
LEVEL II: **06**	**LEVEL II:** **04**	**LEVEL II:** **02**	**LEVEL II:** **01**

3106 - 15: PHYSICAL DIAGNOSIS & MANIPULATIVE SKILLS- Part II

Course Credit for Surgery		
	Hours	Credits
Theory	15.5	1
Practical	75	2

COURSE DESCRIPTION:

4. Physical Diagnosis & Physiotherapeutic Skills is a stepping stone to introduce students to actual concepts of PT assessment and later to the treatment concepts
5. Physical Diagnosis focuses on the assessment of all the body systems i.e. Musculoskeletal, Neurological and Cardiovascular-Respiratory in order to study the various impairments and their impact on activity and participation of the individual taking into consideration the contextual factors as well. It also emphasizes on the clinical reasoning of the underlying components of a universal evaluation tool (ICF) for a better understanding of the patient in a holistic manner. The student is also subjected to learn basics of manipulative, cardiovascular- respiratory and neuro-therapeutic skills on models so that he/she will be able to apply these principles eventually on patients.
6. The student will also gain a sound knowledge of electro-diagnosis, which is an integral part of Functional Diagnosis.

Sr No	**Topics**	**Didactic**	**Lab/Practical**
1	Human Development, Growth & Aging Process		
2	Electro diagnosis		
3	Functional Analysis		
4	Manipulative Skills		
5	Neuro Therapeutic Skills		

OBJECTIVES:

Cognitive:

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

7. Understand the use of ICF.
8. Acquire the knowledge of human growth and development from new life tobirth and adulthood
9. Understand structure and function of nerve and muscle as a base for understanding the electro-diagnostic assessment.
10. Understand the use of appropriate tools or instruments of assessment in Musculoskeletal, Neurological and Cardio-vascular conditions.
11. Understand the theoretical basis and principles of manipulative skills, neurotherapeutic skills and skills of cardiopulmonary care and resuscitation
12. Document results of assessment to evaluate the patient from time to time.

Psychomotor:

Student will be able to:

6. Perform assessment of measures of body structures and functions related totissue mechanics.
7. Perform assessment of measures of body structures and functions related tomotorcontrol affecting activity and participation, quality of life and independence.
8. Perform the skill of electro-diagnosis (SD Curve) and observe skills of EMGand NCV studies, to understand the documentation of finding of these studies.
9. Interpretation and analysis of assessment and findings.
10. Demonstrate skills of manual therapy musculoskeletal, neurotherapeutics and cardiovascular and respiratory skills on models (Laboratory work).

Affective:

Student will be able to:

5. Select appropriate assessment techniques to facilitate safety, sensitive practicesin patient comfort and effectiveness.

6. Demonstrate safe, respectful and effective performance of physical therapy handling techniques taking into account patient's clinical condition, need for privacy, resources available and the environment.
7. Follow the principles of appropriate handling technique that is draping, hand placement, body part positioning, manual techniques, lifting and transfer techniques.
8. Communicate with patients and their families/caregivers regarding the need and uses of various assessment techniques.

Sr no	Topic	Teaching hours		Mustto know	Desirable to know	Nice to Know
		Didactic	Practical's			
1.	Electro-myography i. Principles ii. Instrumentation – Basic components like CRO, Filter, iii. Amplifier & Premplifier, Types of Electrodes, and Panel diagram. iv. Normal & Abnormal EMG pattern • At rest • On minimal contraction • On maximal contraction	1.5 Hrs	10Hrs	MK		
	Nerve Conduction Studies i. Principles & Technique ii. F wave iii. H reflex	1Hrs	5Hrs	MK		
	iv. Muscle Energy Technique v. Myofascial stretching vi. Cyriax vii. Neuro Dynamic Testing	2Hrs	22.5 Hrs		DK	
2	Basics in Neuro Therapeutics Skills & Applications with Clinical reasoning. Principles of Neuro Developmental Technique, Rood's Technique, PNF, Brunnstrom Technique Indications for Application	2.5 hrs 2Hrs	17.5Hrs	MK		

3	• Interpretation of reports – ABG, PFT, ECG- (Normal & Variationsdue to Ischaemia & Infarction) • X-ray Chest • Ankle Brachial Index • Tests for Peripheral Arterial & Venous circulation. • Functional Diagnosis using I.C.F.	2.5 hrs	13hrs	MK		
4	• Lumbar Spine: Schober‟s, SLR, Prone Knee Bending,Slump. • Sacro Iliac joint: Faber- Patrick‟s, Gaenslen, Gillet, March • Hip: Nelaton‟s line, Bryant‟s triangle, Thomas, Ober‟s, Tripod sign, Trendlenburg sign, • Knee: Tests for collateral & cruciate ligaments (valgus, varus, Lachman, Sag, Drawer‟s, McMurray‟s, Fluctuation, Patellar tap, Q- angle, Clarke) • Ankle & Foot: Anterior Drawer, Talar Tilt, Homan‟s & Moses (for D.V.T.) ix. Functional Diagnosis using ICF x. Interpretation of X-ray of extremities & spine, routine, bio-chemical investigations.					
5	Response of soft tissues to trauma : i. Trigger points ii. Spasm iii. Ligament Sprains iv. iv. Muscle Strains	1hrs			DK	
6	Assessment of Fitness & Health i. Screening for risk factors ii. Body composition-B.M.I., use of skin fold calipers, Girth measurement iii. Physical fitness: Flexibility, Strength, Endurance, Agility i. Physical Activity Readiness Questionnaire ii. Screening for health and fitness in childhood, adulthood and geriatric group iii. Quality of life iv. Principles & components of exercise prescription for healthy	1.5 hrs	2.5 hrs	MK		

7	Introduction to Quality of Life Questionnaire.	0.5 hrs	0.5 hrs		DK	
8	Clinical decision making and reasoning in various disorders		2.5 Hrs	MK		
9	Advanced physical diagnostic tools	0.5 Hr	1 Hrs			NK
10	Basic Principles of CT & MRI Interpretation for common Physiotherapy related diseases.	0.5 Hrs	0.5 Hrs			

Clinical:

1. Practice to Neuro Therapeutic Skills of NDT, PNF, Rood's Technique &Brunnstromon models only.

2. Interpretation of reports – EMG, NC Studies, ABG, PFT, X-ray of Chest,Extremities& Spine & ECG.

Term work in Clinical
Documentation & Interpretation of following investigations

1. Cardio Vascular & Pulmonary – ABG, PFT, ECG, X-ray Chest, ExerciseToleranceTest-1each.
2. STREAM Format

B. Case presentation with Functional diagnosis – Three cases each in –

a. Musculoskeletal
b. Neurological
c. Cardiovascular & Pulmonary

To maintain the Record/Journal of the term work & to get each assignment dulysinged byHead.

RECOMMENDED TEXT BOOKS

1. Orthopaedic Physical Examination –Magee
2. Clinical Electro Therapy – Nelson – Currier --- Appleton & Lange publication
3. Clinical Electromyography – Mishra
4. Therapeutic Exercises - Colby & Kisner
5. Physical Rehabilitation, Assessment and treatment - Susan B O"s Sullivan
6. Neurological Examination - John Patten

RECOMMENDED REFERENCE BOOKS

15. Maitland"s book on Manual therapy,
16. Mobilisation of Extremities – Kaltenborn
17. Clinical Electromyography – Kimura
18. Orthopaedic Physical therapy – Donnatelli
19. NAGS, SNAGS and MWMS - Brian Mulligan
20. Exercise & Heart – Wenger
21. Exercise Physiology – William D Mc"Ardle
22. Facilitation techniques based on NDT principles - Lois Bly Allison Whiteside

23. Movement therapy in Hemiplegia - Brunnstrom
24. Cash textbook of Physiotherapy in neurological conditions - Patricia Downie
25. Physical Dysfunction - Trombly Scoot
26. Infant Motor Development- Jan Piek
27. Neurology & Neurosurgery Illustrated (3rd edition)-Bone & Callander
28. Neuro-developmental Therapy –Janett Howle

5. Internal assessment as per University pattern

SCHEME OF EXAMINATION

Theory	40	Practical	40
IA	10	**IA**	10
Total	50	**Total**	50

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

PRACTICAL LAYOUT

Sr. No	Content	Marks
1	Long Case A] Psychomotor &affective: • Skill of History taking • Skill ofclinical examination • Skill of objective diagnostic procedure	15 Marks

	B] Cognitive : • Ability to justify bases for functional diagnosis by I.C.F.	
2	Short Case (MFR, PRT, M.E.T. or Neural Tissue Mobilization)	10 Marks
3	Spots e) X ray (on section2/3/4) f) Pulmonary Function Test g) Blood gas analysis h) E.C.G. / E.M.G. / N.C.V studies	10 Marks
4	Journal	5 Marks
Total		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 DK – 03 NK – 01	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	MK – 01 DK – 01 NK – 00
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	LEVEL I: 01
LEVEL II: 03	LEVEL II: 02	LEVEL II: 01	LEVEL II: 01

3106-16: DERMATOLOGY

(INTERNAL EXAM ONLY)

Total Didactic Hours: 12

Hours.OBJECTIVES:

At the end of the course, the student will-

Be able to describe the Pathophysiology, Signs & Symptoms, Clinical Features, Examination & Management of Common Skin Conditions like Leprosy, Psoriasis, Vitiligo, Acne, Bacterial & Fungal Infections of the skin, Auto-Immune Disorders, H.I.V. & Sexually Transmitted Diseases.

Sr.No	Content	No. of hours	Must know	Desirable to know	Nice to know
		Didactic			
1.	Introduction to Dermatology, basic skin lesions & History taking.	1 Hr	MK		
2.	Skin infections (Part I) – Scabies / Pediculosis / Bacterial infections.	1 Hr		DK	
3.	Skin infection (Part II) viral / Fungal / Cutaneous T.B. Skin infections secondary to prolong stay in hospital.	1 Hr	MK	DK	
4.	Psoriasis / Sebaceous Dermatitis / Atopic Dermatitis / Hand eczemas (Psoriasis & Eczema)	1 Hr	MK		
5.	Pigmentary Disorders (Vitiligo, Melasma) & Drug Reactions (Urticaria, Fixed Drug Eruption, Maculo Papular Drug Rash, Erythema Multiform minor, Steven Johnson Syndrome, Toxic Epidermal Necrolysis).	1 Hr		DK	

6.	Leprosy & Deformity.	1 Hr	MK		
7.	Autoimmune Disorders (Scleroderma, Systemic Lupus Erythematosus, Dermatomyositis)	1 Hr	MK		
8.	Acne & treatment of Acne(Including cosmetic & Dermatosurgical procedures) (Chemical peels, MDA etc.)	1 Hr		DK	
9.	Disorders of Scalp (Dandruff, Chronic Hair loss, Alopecia)	1 Hr		DK	
10.	Sexually Transmitted skin lesions.	1 Hr			NK
11.	HIV & Cutaneous manifestations.	1 Hr	MK		
12.	Topical therapy in Dermatology & Physiotherapy for various skin dysfunctions.	1 Hr	MK		

TEXT BOOKS:

1. Text book on Dermatological diseases for Medical graduates - Elseiver
2. Text book on Dermatology

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 DK – 03 NK – 01	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	MK – 01 DK – 01 NK – 00
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	LEVEL I: 01
LEVEL II: 03	LEVEL II: 02	LEVEL II: 01	LEVEL II: 01

One Theory examination of 40 marks to be conducted at the end of the term &Passing in the I.A. is mandatory.

ELECTIVE COURSES SEMESTER VI

3106-EL17 GERIATRIC CARE

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understand the principles of safe patient handling and mobility techniques for elderly patients.
2. Assess and modify home and healthcare facility environments to enhance safety and accessibility for geriatric patients.
3. Develop effective communication strategies for interacting with elderly patients during handling procedures.
4. Implement ergonomic principles and use of assistive devices to optimize patient handling and mobility.
5. Address psychological, emotional, and cultural considerations in geriatric handling practices.
6. Educate caregivers on safe handling techniques and provide ongoing training and support.
7. Utilize evidence-based practices and research findings to improve geriatric handling and environmental modification.

Category	THEORY	PRACTICAL
1. Introduction to Geriatric Handling Must Know: - Principles of safe patient handling and mobility techniques for elderly patients. - Risk assessment for falls and injury prevention strategies. - Importance of maintaining dignity and autonomy during handling procedures. Desirable to Know: - Ergonomic principles for healthcare professionals in geriatric settings. - Use of assistive devices and equipment for safe patient handling. - Techniques for transferring patients between surfaces (e.g., bed to chair).	2 Hrs	

Nice to Know: - Advanced techniques for handling patients with specific mobility challenges (e.g., hemiplegia, quadriplegia).		
2: Environmental Modification for Geriatric Care Must Know: - Assessment of home and healthcare facility environments for safety and accessibility. - Modifications to improve accessibility and reduce fall risks (e.g., grab bars, non-slip flooring). - Regulatory guidelines and standards for environmental modifications. Desirable to Know: - Design principles for creating age-friendly environments. - Assistive technology and devices for enhancing independence at home. - Collaboration with architects and designers for optimal environmental modifications. Nice to Know: - Innovative technologies for home automation and remote monitoring in geriatric care.	2 Hrs	5 Hrs
3: Special Considerations in Geriatric Handling Must Know: - Communication strategies for effective interaction with elderly patients during handling procedures. - Psychological and emotional considerations in geriatric handling. - Legal and ethical issues related to patient handling and consent. Desirable to Know: - Cultural competence in geriatric care and handling practices. - Strategies for managing behavioral challenges during handling (e.g., dementia, anxiety). - Importance of teamwork and interdisciplinary collaboration in patient handling.	3 Hrs	5 Hrs

Nice to Know: - Integrative therapies (e.g., music therapy, aromatherapy) for enhancing patient comfort during handling.		
4: Geriatric Handling Techniques Must Know: - Positioning techniques for preventing pressure ulcers and maintaining joint integrity. - Adaptive strategies for patients with mobility limitations (e.g., wheelchair positioning, bed positioning). - Assessment and management of skin integrity in elderly patients. Desirable to Know: - Exercises and stretches to promote flexibility and joint mobility in elderly patients. - Pain management strategies during handling procedures. - Use of sensory techniques (e.g., proprioceptive input) in geriatric handling. Nice to Know: - Role of nutrition and hydration in maintaining skin health and resilience.	3 Hrs	10 Hrs
5: Education and Training for Caregivers Must Know: - Training programs for caregivers on safe handling techniques. - Importance of ongoing education and skills development for caregivers. - Resources and support networks for caregivers of elderly patients. Desirable to Know: - Strategies for promoting caregiver well-being and preventing burnout. - Role of technology in training caregivers and monitoring patient handling practices. - Techniques for providing emotional support to caregivers. Nice to Know: - Community-based initiatives and volunteer programs supporting elderly	3 Hrs	5 Hrs

caregivers.		
6: Research and Evidence-Based Practices Must Know: - Current research and evidence supporting best practices in geriatric handling. - Outcome measures and assessment tools for evaluating handling techniques. - Continuous quality improvement in geriatric handling practices. Desirable to Know: - Emerging trends and innovations in geriatric handling and environmental modification. - Ethical considerations in conducting research involving elderly patients. - Integration of research findings into clinical practice and policy development. Nice to Know: - Global perspectives on geriatric handling and environmental modification.	2 Hrs	5 Hrs

Books:

1. "Geriatric Physical Therapy" by Andrew A. Guccione, Rita Wong, and Dale Avers
2. "Handbook of Geriatric Care Management" edited by Cathy Jo Cress
3. "Environmental Gerontology: Making Meaningful Places in Old Age" by Graham D. Rowles and Habib Chaudhury
4. "Gerontology for the Health Care Professional" by Regula H. Robnett and Walter C. Chop
5. "Patient Care in Imaging Technology" by Lillian S. Torres and Andrea Dutton

3106-EL18 CRITICAL CARE MANAGEMENT IN PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Understand Critical Illnesses:** Gain a comprehensive understanding of common critical illnesses encountered in intensive care units (ICUs) and their impact on physiological systems.
- **Assessment Skills:** Develop advanced assessment skills specific to critically ill patients, including respiratory, cardiovascular, neurological, and musculoskeletal systems.
- **Ventilator Management:** Learn principles and techniques of ventilator management, including modes of ventilation, weaning protocols, and troubleshooting common ventilator issues.
- **Patient Positioning and Mobilization:** Understand the importance of patient positioning and early mobilization in critical care settings, and learn appropriate techniques for safe mobilization of critically ill patients.
- **Respiratory Physiotherapy:** Acquire knowledge and skills in respiratory physiotherapy techniques such as chest physiotherapy, airway clearance techniques, and lung expansion maneuvers.
- **Cardiovascular Support:** Learn strategies for cardiovascular support in critically ill patients, including hemodynamic monitoring, assessment of cardiac output, and implications for physiotherapy interventions.
- **Multidisciplinary Collaboration:** Appreciate the role of physiotherapy within the multidisciplinary critical care team and develop effective communication skills to collaborate with other healthcare professionals.

Category	THEORY	PRACTICAL
1. **Introduction to Critical Care** Must to Know - Role of physiotherapy in critical care - Ethical considerations Nice to know	2	

- Advanced monitoring techniques - Pharmacology relevant to critical care - Psychological support for patients and families - Research trends in critical care physiotherapy <u>Desirable to Know</u> - Principles of mechanical ventilation - Hemodynamic monitoring - Neurological assessment - Nutritional support		
2. Respiratory Management <u>Must to Know</u> - Assessment and treatment of respiratory failure - Airway clearance techniques - Ventilator weaning strategies <u>Nice to know</u> - Cardiovascular management - Renal function and management - Sepsis management - Trauma and polytrauma management - Endocrine dysfunction	2	6
3. Cardiovascular Management <u>Must to Know</u> - Mobilization and exercise tolerance - Positioning techniques - Cardiopulmonary rehabilitation <u>Nice to know</u> - Gastrointestinal complications - Infectious diseases - Rehabilitation in critical care - Palliative care	3	6

4. Neurological Management Must to Know - Assessment and interventions for neurological - Conditions - Brain injury rehabilitation - Stroke rehabilitation	2	6
5. Musculoskeletal Management Must to Know - Prevention of contractures - Early mobilization strategies - Functional independence	3	6
6. Interdisciplinary Team Collaboration Must to Know - Communication skills - Role in patient-centered care - Collaborative decision-making	3	6

BOOKS FOR CRITICAL CARE MANAGEMENT IN PHYSIOTHERAPY

- Physiotherapy in Respiratory and Cardiac Care: An Evidence-Based Approach **by Alexandra Hough**
- Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics **by Jennifer A. Pryor and Ammani S. Prasad**
- Intensive Care: A Concise Textbook **edited by Gary Smith, Neil Soni, and Andrew Rhodes**
- Physiotherapy in Intensive Care: A Practical Approach **edited by Michelle E. Kho and Julia M. A. Walters**

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3106-EL19 LIFE STYLE DISORDER IN PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Understanding Epidemiology and Pathophysiology**:
- Explain the prevalence, incidence, and risk factors associated with lifestyle disorders such as obesity, diabetes, hypertension, and cardiovascular diseases.
- **Assessment Skills**:
- Develop proficiency in conducting comprehensive assessments of lifestyle-related health issues, including physical examinations, functional assessments, and lifestyle assessments.
- **Evidence-Based Practice**:
- Critically appraise and apply current evidence-based practices in physiotherapy interventions for lifestyle disorders.
- **Behavioral and Lifestyle Interventions**:
- Design and implement therapeutic strategies that address lifestyle factors contributing to disorders (e.g., diet, exercise, stress management).
- **Interdisciplinary Collaboration**:
- Collaborate effectively with other healthcare professionals (e.g., nutritionists, psychologists) to provide holistic care for patients with lifestyle disorders.

Category	THEORY	PRACTICAL
1. Introduction to Lifestyle Disorders <u>Must to Know</u> - Definition, prevalence, and impact on health <u>Nice to know</u> - Global trends and socio-economic factors <u>Desirable to Know</u> - Emerging lifestyle disorders and their implications	1	
2. Risk Factors and Etiology <u>Must to Know</u> - Major risk factors (e.g., sedentary lifestyle, poor diet, smoking) <u>Nice to know</u> - Genetic predisposition and epigenetic factors <u>Desirable to Know</u> - Psychosocial factors influencing lifestyle disorders	1	
3. Physiological Basis <u>Must to Know</u> - Metabolic syndrome and its components <u>Nice to know</u> - Pathophysiology of insulin resistance <u>Desirable to Know</u> - Impact of inflammation on lifestyle diseases	1	
4. Common Lifestyle Disorders <u>Must to Know</u> - Obesity, diabetes mellitus type 2, cardiovascular diseases <u>Nice to know</u> - Hypertension and its correlation with lifestyle <u>Desirable to Know</u> - Osteoporosis and musculoskeletal disorders associated with lifestyle	1	

5. Assessment and Screening Must to Know - Screening tools (e.g., BMI, waist circumference) Nice to know - Physical fitness assessments Desirable to Know - Nutritional assessments and dietary counseling	1	10
6. Management Strategies Must to Know - Exercise prescription and physical activity guidelines Nice to know - Behavioral interventions and motivational interviewing Desirable to Know - Pharmacological interventions and their role	2	
7. Role of Physiotherapy Must to Know - Exercise therapy in management of lifestyle disorders Nice to know - Manual therapy techniques for pain management Desirable to Know - Integrative approaches (e.g., yoga, mindfulness)	2	10
8. Patient Education Must to Know	1	

- Importance of lifestyle modifications Nice to know - Goal setting and self-management techniques Desirable to Know - Community-based programs and support systems		
9. Prevention Strategies Must to Know - Public health initiatives and policies Nice to know - Workplace wellness programs Desirable to Know - Role of technology in promoting healthy behaviors	1	
10. Research and Evidence Must to Know - Current evidence on lifestyle interventions Nice to know - Innovative approaches in physiotherapy research Desirable to Know - Long-term outcomes of lifestyle interventions	2	
11. Case Studies and Practical Applications Must to Know - Real-life examples of successful lifestyle modifications Nice to know - Case-based learning scenarios Desirable to Know - Simulation exercises in patient management	2	10

BOOKS FOR BASICS IN LIFE STYLE DISORDER IN PHYSIOTHERAPY

- **Physical Activity and Health: An Interactive Approach by Jerome E. Kotecki**
- **Exercise Physiology: Nutrition, Energy, and Human Performance by William D. McArdle, Frank I. Katch, and Victor L. Katch**
- **Therapeutic Exercise: Foundations and Techniques by Carolyn Kisner and Lynn Allen Colby**

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3106-EL20 PODIATRIC IN PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Understanding Podiatric Conditions**: Gain comprehensive knowledge of common podiatric conditions such as plantar fasciitis, Achilles tendonitis, and bunions, including their causes, symptoms, and pathophysiology.
- **Assessment Skills**: Develop proficiency in conducting thorough podiatric assessments, including gait analysis, biomechanical assessment, and functional movement testing.
- **Treatment Techniques**: Learn evidence-based physiotherapy interventions specific to podiatric conditions, including manual therapy, therapeutic exercises, orthotic prescription, and footwear advice.
- **Interdisciplinary Collaboration**: Understand the importance of interdisciplinary collaboration with podiatrists, orthopedic surgeons, and other healthcare professionals in managing complex podiatric cases.
- **Patient Education**: Acquire skills in educating patients about their podiatric conditions, treatment options, self-management strategies, and preventive measures to promote long-term recovery and optimal foot health.

Category	THEORY	PRACTICAL
1. Anatomy and Biomechanics Must to Know - Anatomy of the foot and ankle joints - Muscles and tendons involved in foot movement - Neurovascular supply to the foot Nice to know - Biomechanics of gait and foot mechanics - Normal vs. abnormal foot biomechanics - Foot types and their implications	1	

Desirable to Know - Patho mechanics in specific foot conditions - Biomechanical assessments in sport-specific activities - Advanced gait analysis techniques		
2. Common Foot Conditions Must to Know - Plantar fasciitis - Morton's neuroma - Metatarsalgia - Stress fractures Nice to know - Achilles tendonitis - Tarsal tunnel syndrome - Bunions and hammertoes - Ankle sprains Desirable to Know - Peripheral neuropathy - Diabetic foot care - Charcot-Marie-Tooth disease - Rheumatoid arthritis of the foot	2	1
3. Assessment and Diagnosis Must to Know - History taking and physical examination - Biomechanical assessment of gait - Neurological screening of the lower limb Nice to know - Special tests for foot and ankle conditions - Dynamic foot pressure mapping - Footwear assessment Desirable to Know - Imaging modalities (X-ray, MRI) for foot pathology	2	5

- Ultrasound for soft tissue assessment - Video analysis techniques for gait		
4. Treatment Modalities <u>Must to Know</u> - Foot and ankle mobilization techniques - Strengthening and stretching exercises - Taping and bracing techniques - Patient education on foot care <u>Nice to know</u> - Therapeutic ultrasound - Instrument-assisted soft tissue mobilization (IASTM) - Manual therapy techniques - Dry needling techniques <u>Desirable to Know</u> - Shockwave therapy for plantar fasciitis - Orthotic prescription and fabrication - Injection therapy for Morton's neuroma - Laser therapy for wound healing	2	5
5. Physical Examination of the Foot <u>Must to Know</u> - Assessment techniques for foot and ankle (inspection, palpation, range of motion) <u>Nice to know</u> - Special tests for foot and ankle conditions <u>Desirable to Know</u>	1	5

- Clinical reasoning in foot examination (integration of findings into treatment planning)		
6. Therapeutic Interventions <u>Must to Know</u> - Manual therapy techniques for the foot and ankle <u>Nice to know</u> - Exercise prescription for foot rehabilitation <u>Desirable to Know</u> - Advanced therapeutic modalities (e.g., ultrasound therapy, shockwave therapy)	1	5
7. Sports Podiatry <u>Must to Know</u> - Common sports-related foot injuries <u>Nice to know</u> - Return-to-sport criteria and protocols <u>Desirable to Know</u> - Biomechanical assessment for sports performance enhancement	1	5

8. Pediatric Podiatry Must to Know - Developmental milestones related to foot anatomy and function in children Nice to know - Pediatric foot conditions (e.g., flat feet, intoeing) Desirable to Know - Special considerations in orthotic management for children	1	2
9. Geriatric Podiatry Must to Know - Age-related changes in foot structure and function Nice to know - Foot care strategies for older adults Desirable to Know - Management of foot complications in elderly patients (e.g., ulcer prevention, vascular assessment)	1	2
10. Evidence-Based Practice Must to Know - Research methodologies relevant to podiatric physiotherapy Nice to know - Critical appraisal of literature on foot and ankle interventions Desirable to Know - Conducting clinical audits and outcome measures in podiatric practice	1	

11. Interdisciplinary Collaboration Must to Know - Role of podiatric physiotherapist in a multidisciplinary team Nice to know - Effective communication strategies with other healthcare professionals Desirable to Know - Case studies demonstrating collaborative care in complex foot and ankle cases	1	
12. Ethics and Professionalism Must to Know - Ethical considerations in podiatric practice Nice to know - Legal frameworks governing podiatric physiotherapy Desirable to Know - Professional development opportunities in podiatric physiotherapy	1	

BOOKS FOR BASICS ON PODIATRIC IN PHYSIOTHERAPY

- Clinical Mechanics and Kinesiology by Janice K. Loudon and Robert C. Manske
- Lower Extremity Biomechanics: Theory and Practice by Donatelli R.
- Gait Analysis: Normal and Pathological Function by Jacquelin Perry
- Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach by S. Brent Brotzman and Kevin E. Wilk

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SEMESTER VII

3107 - 11: PHYSIOTHERAPY IN MUSCULOSKELETAL CONDITIONS

- **DIDACTIC THEORY HOURS - 60 HOURS**
- CLINICAL - 140 HOURS
- **TOTAL - 200 HOURS**

Credit For Physiotherapy In Musculoskeletal Conditions		
	Hours	**Credits**
Theory	**60**	**4**
Practical	**140**	**5**

OBJECTIVES:

This course is formulated on the "Problem based" method. At the end of the course, the candidate will –

1. Be able to identify, discuss & analyze, the Musculo Skeletal Dysfunction in terms of Biomechanical, Kinesiology & Biophysical bases & correlate the same with the provisionaldiagnosis, routine radiological & Electrophysiological investigations & arrive at appropriate Functional diagnosis with clinical reasoning.
2. Be able to plan & Prescribe as well as acquire the skill of executing short & long term Physiotherapy treatment by selecting appropriate modes of Mobilization /manipulations, Electro Therapy, Therapeutic exercise & appropriate ergonomic advise for the relief of pain, restoration/Maintenance of function, &/ or rehabilitation for maximum functional independence in A.D.L. at home & work place:

SYLLABUS

Sr no	Topic	Hours		Must Know	Desirable to know	Nice to know
		Th: 60 Hrs	Cl: 140 Hrs			
	SECTION I:	(30 Hrs)	(70 Hrs)			
1.	Principles of Evaluation, interpretation of investigations & functional diagnosis (ICF) with appropriate clinical reasoning for planning & implementation of management techniques.	3Hrs	6 Hrs	MK		
2.	Planning, Prescription & Implementation ofshort term & long-term goals with clinical reasoning.	3 Hrs	3Hrs	MK		
3.	Principles of management which includes clinical reasoning schools of manipulative therapy and techniques and Documentation.	2 Hrs.	6 Hrs	MK		
4.	Application of appropriate electro therapeutic modes for relief of acute & chronic pain & swelling; wound healing, re-education etc with clinical reasoning.	3 Hrs	3Hrs	MK		
5.	Application of simple therapeutic modes for muscle strength / joint mobility.	3 Hrs	6 Hrs	MK		
6.	Application of Advanced therapeutic modes of mobility like Mobilization Techniques (Techniques covered in IIIrd BPTh.) (to be applied only on extremities), Friction Massage, Myofacial Release, Muscle Energy Techniques & Neuro Dynamic Techniques on patients. (Non-thrust mobilization methods only).	3 Hrs	12 Hrs			
7.	Application of various taping methods for support & relief of pain.	2 Hrs	3Hrs	MK		
8.	Basic principles and application –Aquatic therapy for Musculoskeletal conditions	2Hrs	3Hrs	MK		
9.	Posture Correction & Gait Training.	2Hrs	6 Hrs	MK		
10	Application of appropriate Therapeutic exercise using therapeutic gymnastic tool as and when necessary, for the relief of pain, structural stability, strength/endurance: & Functional restoration including gait training/maintenance of functions & / or forthe preventive measures.	2 Hrs	4 Hrs	MK		

11	Appropriate Home Program & Ergonomic advise for preventive measures & Functional efficiency at home & work place, Advice to Parents & Care Givers.	1 Hr	2 Hrs		DK	
12	Introduction to Evidence based Physiotherapy practice in Musculoskeletal conditions.	1 Hr	3 Hrs		NK	
	SECTION II: PHYSIOTHERAPY MANAGEMENT FOR THE FOLLOWINGCONDITIONS:	(30 Hrs)	(70 Hrs)			
1.	Manifestations of trauma & diseases of the bones & soft tissues of the musculo skeletaltissue.	2Hrs	3Hrs	MK		
2	Fractures of the spine, extremities – classification/ management & complications.	3 Hrs	6 Hrs	MK		
3	Metabolic & hormonal disorders of the bone tissue – Osteoporosis.	3 Hrs	6 Hrs	MK		
4	Peripheral nerve injuries, management/ complications – V.I.C. & Plexus Injuries-	3 Hrs	6 Hrs			
5	Deformities of the spine, extremities – congenital malformation – Spina Bifida, meningocele / meningomyelocele, CTEV (Foot Deformities) CDH	3 Hrs	6 Hrs	MK		
6	Management for musculoskeletal conditionsof extremities and spine	3 Hrs	6 Hrs	MK		
7	Re- constructive surgeries in Polio & cerebral palsy.	1Hrs	1Hrs	MK		
8	Inflammatory/ Infectious disease of the bone& joints T.B. / Osteomyelitis.	2 Hrs	4 Hrs			NK
9	Tumors of the bone.	2 Hrs	4 Hrs	MK		
10	Degenerative / Rheumatoid arthritis.	4Hrs	9 Hrs	MK		
11	Soft tissue injuries/common soft tissue injuries encountered during sports/Over – use. Outline of sport physiotherapy and rehabilitation, Athletic fitness.	2Hrs	5Hrs	MK		
12	Amputation – classification – prosthetic management.	1 Hrs	2 Hrs	MK		
13	Hand injury – management.	1 Hrs	2 Hrs		DK	
14	Miscellaneous Conditions- Text Neck Syndrome, Failed Back Syndrome, Post Viral Arthralgia, Avascular Necrosis, Common Paediatric Orthopedic Conditions	3 Hrs	3 Hrs		DK	

15	Assistive Device technology, Digital and pervasive technologies for musculoskeletal conditions					
	1. Prescription of appropriate orthotic & prosthetic devices & fabrication of simple temporary splints.	2Hrs		MK		
	2.Classification of Assistive Devices , basic principles of digital and pervasive technologies for musculoskeletal conditions.	3 Hrs				
	3. Biomechanical principles in designing of appliances, Aids /Splints& assessment Procedures for static & dynamic alignment of the upper limb, lower limb and spine.	5Hrs			DK	
	4. (A)Orthosis :-spine-upper & lower limb,	5Hrs		MK		
	5. (B)Prosthesis- for Lower limbs , Upper limbs	5Hrs		MK		
	6. Project-Temporary splints –to fabricate ONE splint each - [to use P.O.P, aluminum strips /sheets /wires rubber bands, rexin, Orfitetc]	3 Hrs				NK
	7. Basic procedure of application of Cock up (dorsal/volar) Outrigger Opponens splint Anterior and posterior guard, Foot drop splint Facial splint Mallet Finger Splint C- bar for1st web space of hand	2Hrs				NK

Clinical

Evaluation & treatment planning: its presentation & documentation of Minimum two cases each in –

1) # upper Limb (Including hand injury),
2) # lower limb,
3) Soft tissue lesion (any),
4) # spine with/without Neurological condition
5) Degenerative arthritis of skeletal joint
6) Musculo – skeletal condition of Hand & foot.

Text Books

1. Cash's Textbook of Orthopedics & Rheumatology for Physio Therapists- Jaypee
2. Manual mobilization of extremity joints – by Freddy Kaltenborn, Maitland
3. Therapeutic exercise – by Kolby&Kisner
4. Therapeutic exercise – by O' Sullivan
5. Taping Techniques – by Rose Mac Donald

Reference Book

1. Orthopedic Physical therapy – by Donatelli
2. Manual Therapy – by Maitland
3. Neural tissue mobilization – Butler

SCHEME OF EXAMINATION

Theory	**80**	**Practical**	**80**
IA	20	IA	20
Total	100	Total	100

MODEL QUESTION PAPER

Sr. No	**Contents**	**Marks**
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	20 Marks (20x 1 mks= 20 mks)
Section B	Q2. BAQ Answer 5 questions	20 Marks (10x 2 mks= 20 mks)
	Q3. SAQ Answer any 2 out of 3	20 Marks (4x 5 mks= 20 mks)
Section-C	Q4. LAQ Answer 2questions Should be compulsory Should have one Optional question (i.e.	20 Marks

	OR)	(2x 10mks= 20 mks)
TOTAL		**80 Marks**

BLUE PRINT

MCQ's : 20	BAQ's: 20	SAQ's: 20	LAQ's: 20
MK – 12 **DK – 06** **NK – 02**	MK – 06 DK – 03 NK – 01	MK – 02 DK – 02 NK – 01	**MK – 02** **DK – 01** **NK – 00**
LEVEL I: 14	**LEVEL I: 06**	**LEVEL I: 03**	**LEVEL I: 02**
LEVEL II:06	**LEVEL II:04**	**LEVEL II:02**	**LEVEL II:01**

3107 - 12: PHYSIOTHERAPY IN NEUROSCIENCES

HOURS DISTRIBUTION	
DIDACTIC THEORY HOURS: • Adult / Psycho - Somatic & Psychiatric Conditions • Paediatric Conditions	**90 HOURS** 70 HOURS 20 HOURS
CLINICAL • Adult / Psycho - Somatic & Psychiatric Conditions • Paediatric Conditions	**120 HOURS** 100 HOURS 20 HOURS
TOTAL	**210 HOURS**

Course **Credit For Physiotherapy In Neurosciences**		
	Hours	Credits
Theory	90	6
Practical	120	4

OBJECTIVES:

At the end of the course, the candidate will –

1. Acquire the knowledge of normal neurodevelopment, with specific reference to locomotion
2. Be able to assess, identify & analyze neuro-motor & psychosomatic dysfunction in terms of alteration in the muscle tone, power, coordination, involuntary movements sensations/perception etc, E.M.G. / N.C. Studies & arrive at functional diagnosis with clinical reasoning.
3. Acquire the skill of application of P.N.F. technique on patients.
4. Be able to plan, prescribe & execute short term & long term treatment, with special

reference to relief of Neuropathic & psycho-somatic pain, mat exercises, functional re-education, gait training, postural & functional training for A.D.L., ergonomic advise, & parents education in neuro- pediatric care.

5. Be able to prescribe appropriate Orthosis / splints & will be able to fabricate temporary protective & functional splints.

Sr no.	Topic	Teaching hours		Must to know	Desire to know	Nice to know
		Theory 70 Hrs	Practical 120 Hrs			
	SECTION A					
1.	Principles of Evaluation in Adult andPediatrics	2 Hrs		MK		
2.	Understanding principles of theoriesof motor control & motor learning • Principles of neural recoveryincluding motor learning. • Types of movement disordersand physiotherapy treatment	2 Hrs		MK		
3.	Assessment of development, Tone, Co-ordination, Psyco-somatic& Locomotors function.	3 Hrs		MK		
4.	Applied Neuro-Anatomy	1 Hrs			DK	
5.	Functional Diagnosis of neuromuscular dysfunction • Functional evaluation of neurological conditions that includes ICF and Scales.	2 Hrs				**NK**
6.	Understanding sensory system & organization of sensory strategies for efficient motor output.	1 Hrs			DK	
7.	Principles of neural recovery including motor learning Skill of sensory-motor learning & neuro-muscular skeletal training	2 Hrs		MK		

8.	Basic principles and application – Advanced neuro-physiotherapy techniques. Understanding principlesof Application of neurotherapeautic skills like: • PNF • NDT • Carr & Shepherd • Brunnstorm& • Rood's	5 Hrs	10 Hrs	MK		
9.	**Planning short term & Long termGoals**	**2 Hrs**		**MK**		
10.	Treatment Programme • Application of appropriate Electro-therapeutic modes for relief of pain & functional re-education with clinical reasoning. Introduction to Evidence based Physiotherapy practice in neurological conditions.	10 Hrs	10 Hrs	MK		
	• Application of skills as P.N.F., Co-ordination & balancing exercise by using techniques based on neuro physiological principles. • Tools used for neuro rehabilitation like vestibular balls, tilt board etc. • Application of transfer & functional re-education exercise, postural exercise & gait training. • Bladder training.			MK		
	• Developing a philosophy for caring.			MK		
	• Prescription for appropriate orthotic devices & fabrication of temporary splints.			MK		
	• Lifting techniques, wheel chair modifications, adaptive devices			MK		

	• Ergonomic advice for prevention / rehabilitation & parents / care giverseducation about handling of a patient.			MK		
	Section II:					
11.	Physiotherapy management for the following conditions: 1.Stroke/Hemiplegia	40Hrs	20 Hrs	MK		

	2. **Space occupying lesion**: • Disorders of cerebral circulation & spaceoccupying lesions such as cortical, thalamic & Brain- stem lesions • Brain and spinal Tumors- Classification, Clinical features, Investigations and management.			MK		
	3. Movement disorders: • Parkinson's Diseases • Ataxia • Athetosis • Chorea • Dystonia • Hemibalismus			MK		
	4. Peripheral and Cranial nerve Disorders: • Introduction • Nuropathies • Cranial nerves- Emphasis on 7^{th} and 8^{th} Nerves • Neuritis • Gullian Barre Syndrome • Hansence Diseases			MK		
	5. Infective Diseases of Brain andSpinal Cord • Introduction, Etiology, Classification • Meningitis • Encephalitis • AIDS • Infective Lesions ofNerves			MK		

6. Principles, M a n ag e m e n t of pre and post-surgical Conditions • Traumatic Brain Injury • Spinal Cord injury, Paraplegia • Peripheral Nerve Injury • Hydrocephalus • Anomalies • Myelomelingocele • Parkinsonism- Deep brain stimulations		20 Hrs	MK		
7.Specific Conditions • Motor Neuron Diseases • Vestibular Condi tones • Multiple Sclerosis • Muscular Dystrophy • Tabes Dorsalis • Neurosyphilis • Peroneal Muscle Atrophy			MK		
8.Disorders of Autonomic nervous system • Psycho-somatic Pain & Paralysis				DK	
9. Assistive Device technology, Digital and pervasive technologies forneurological conditions.					NK
10. a. Orthosis :-spine, upper & lower limb			MK		
b) Orthosis Planning & Prescriptionfor Adult and Pediatric Neurorehabilitation					
12.Perceptual Disorders in Neurology			MK		
13.Electrotherapy modalities in Neuro-Rehabilitation			MK		

	14.Assessment and management of neurological Gaits.			MK		
	15.Lab sessions for evaluation onstudents models and treatment technique.			MK		
	16. Neurosurgery- Craniotomy, Cranioplasty, shunting, laminectomy, Avaluative surgery and neural implantation- Role and functions of Physiotherapist			MK		
	5. Pediatric Neurology • Introduction • Conginatal Disorderes • Developmental Delayes • Cerebral Palsy.-Neurological Rehabilitation in Pediatrics, skills such Rood's approach, vojta techniques etc. • Learning Disabilities • Spina Bifida • Downs Syndrome • Autism • Birth injuries, • Hydrocephalus • Polio Mylitis • Syringomylia • Spinal Dysraphysm	20 hrs		MK		
12.	**Clinical:** • Evaluation & Treatment planning, it's presentation & documentation of minimum two cases each in • 1) U.M.N. lesion, • 2) L.M.N. lesion, • 3) Pediatric neuro case.		60 Hrs	MK		

CLINICAL:

Evaluation & Treatment planning, it's presentation & documentation ofminimum two case

each in

1) U.M.N. lesion,
2) L.M.N. lesion,
3) Pediatric neuro case

TEXT BOOKS

1) Cash's Text book for physiotherapy in Neurological disorders-Jaypee bros.
2) Proprioceptive Neuro muscular Facilitation – by Herman Kabat
3) Practical Physical Therapy – Margaret Hollis
4) Therapeutic exercise – by O'Sullivan
5) "Right in the middle" – by Patricia Davis 6) Stroke rehabilitation – by Margaret Johnson

REFERENCE BOOKS

1. Therapeutic exercise – by Basmajiian – 5 th edn.
2. Physical Rehabilitation – by Krusen
3. Brain's disorders of Nervous system

SCHEME OF EXAMINATION

Theory	**80**	**Practical**	**80**
IA	20	IA	20
Total	100	Total	100

MODEL QUESTION PAPER

Sr. No	**Contents**	**Marks**
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	20 Marks (20x 1 mks= 20 mks)
Section B	Q2. BAQ Answer 5 questions	20 Marks (10x 2 mks= 20 mks)

	Q3. SAQ Answer any 2 out of 3	20 Marks (4x 5 mks= 20 mks)
Section-C	Q4. LAQ Answer 2questions Should be compulsory Should have one Optional question (i.e. OR)	20 Marks (2x 10mks= 20 mks)
TOTAL		80 Marks

BLUE PRINT

MCQ's : 20	BAQ's: 20	SAQ's: 20	LAQ's: 20
MK – 12 **DK – 06** **NK – 02**	MK – 06 DK – 03 NK – 01	MK – 02 DK – 02 NK – 01	**MK – 02** **DK – 01** **NK – 00**
LEVEL I: 14	**LEVEL I: 06**	**LEVEL I: 03**	**LEVEL I: 02**
LEVEL II:06	**LEVEL II:04**	**LEVEL II:02**	**LEVEL II:01**

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ELECTIVE COURSES SEMESTER VII

3107-EL13 HOSPITAL ADMINISTRATION

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understanding of healthcare management principles in physiotherapy departments
2. Knowledge of healthcare policies and regulations affecting physiotherapy services
3. Ability to develop and implement quality improvement initiatives in physiotherapy units
4. Proficiency in resource management and budgeting for physiotherapy departments
5. Understanding of patient flow management and appointment scheduling systems
6. Knowledge of healthcare information systems and electronic health records in physiotherapy practice
7. Skills in staff management, leadership, and team building within physiotherapy departments

Category	Theory	Practical
1. Introduction to Hospital Management Must to know - Overview of Hospital Management - Definition and Importance of Hospital Management - Role of Hospital Management in Healthcare Desirable to know Evolution and History of Hospital Management	1 Hr	
2. Hospital Management in Physiotherapy Must to know - Importance of Hospital Management for Physiotherapists - Integration of Physiotherapy Services in Hospitals	1 Hr	
3. Organizational Structure and Governance Must to know - Hospital Organizational Structure - Hierarchical Structure and Functional Units - Roles and Responsibilities within a Hospital Desirable to know - Interdepartmental Coordination - Hospital Governance Models	1 Hr	

- Leadership in Hospital Management Nice know - Decision-Making Processes		
4. Strategic Planning and Management Must to know - Strategic Planning in Healthcare - Importance of Strategic Planning - Steps in the Strategic Planning Process Desirable to know - SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats) Nice know - Continuous Quality Improvement	2 Hr	5 Hrs
5. Implementation and Evaluation Must to know - Implementing Strategic Plans - Monitoring and Evaluation	1 Hr	
6. Human Resource Management Must to know - Workforce Planning - Recruitment and Selection - Staff Training and Development - Performance Management Desirable to know - Employee Relations and Labor Laws - Staff Welfare Programs - Managing Conflicts and Grievances	1 Hr	
7. Financial Management Must to know - Healthcare Economics - Basics of Healthcare Economics - Funding and Financial Models in Healthcare Desirable to know - Budgeting and Financial Planning - Financial Statements and Reports - Cost Control and Management Nice know - Financial Decision-Making	1 Hr	
8. Quality Management Must to know - Quality Assurance and Improvement - Accreditation and Standards - Patient Safety and Risk Management	1 Hr	5 Hrs
9. Information Management and Technology Must to know - Healthcare Information Systems - Electronic Health Records (EHR)	1 Hr	5 Hrs

- Health Information Systems (HIS) Desirable to know - Data Management and Analytics - Role of Technology in Hospital Management - Emerging Technologies in Healthcare Nice know - Telemedicine and Remote Monitoring		
10. Patient Care Management Must to know - Patient Admission and Discharge Processes - Managing Patient Flow - Admission and Discharge Protocols - Patient Transfer and Referral Systems Desirable to know - Enhancing Patient Experience - Measuring Patient Satisfaction - Addressing Patient Complaints and Feedback	2 Hrs	5 Hrs
11. Legal and Ethical Issues in Hospital Management Must to know - Healthcare Laws and Regulations - Overview of Healthcare Legislation - Compliance with Legal Standards Desirable to know - Handling Legal Issues in Hospitals - Ethical Principles in Hospital Management - Ethical Decision-Making Nice know - Managing Ethical Dilemmas	1 Hr	
12. Marketing and Public Relations Must to know - Healthcare Marketing - Basics of Marketing in Healthcare - Developing Marketing Strategies Desirable to know - Digital Marketing and Social Media - Building Public Relations - Crisis Communication Nice know - Community Engagement and Outreach	1 Hr	5 Hrs
13. Research and Innovation in Hospital Management Must to know - Research Methods in Healthcare Management - Designing Research Studies - Data Collection and Analysis Desirable to know - Publishing and Presenting Research - Identifying Opportunities for Innovation	1 Hr	5 Hrs

- Implementing Innovative Solutions Nice know - Case Studies of Successful Innovations		

Suggested Reading and Resources:

1. "Hospital Management" by K. V. Ramani and Dileep V. Mavalankar
2. "Essentials of Management for Healthcare Professionals" by Seth B. Goldsmith
3. Journals: Journal of Healthcare Management, Journal of Hospital Administration

3107-EL14 By-Laws of Health Profession for Physiotherapy

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understand the legal framework governing physiotherapy practice in the relevant jurisdiction
2. Analyze and interpret the specific by-laws and regulations applicable to physiotherapy professionals
3. Identify the scope of practice for physiotherapists as defined by professional by-laws
4. Comprehend the ethical standards and code of conduct outlined in physiotherapy by-laws
5. Understand the licensing and registration requirements for physiotherapists
6. Examine the continuing education and professional development requirements stipulated in the by-laws
7. Analyze the disciplinary procedures and processes outlined in the professional by-laws

Category	Theory	Practical
1. Introduction to Health Profession By-Laws Must to know - Definition and Importance of By-Laws in Health Professions - Role of By-Laws in Ensuring Quality Care Desirable to know - Historical Development of Health Profession Regulations	1 Hr	
2. By-Laws Specific to Physiotherapy Must to know - Importance for Physiotherapists - Key Elements of Physiotherapy By-Laws	1 Hr	
3. Legal Framework and Regulation Must to know - Legal Foundations of Health Profession By-Laws - Understanding Legal Terminology - Sources of Law: Statutes, Regulations, and Case Law	1 Hr	

- The Legal Hierarchy and its Impact on Health Professions Desirable to know - Overview of Regulatory Bodies in Physiotherapy (e.g., WCPT, National Boards) - Functions and Powers of Regulatory Bodies Nice know - Registration and Licensing Requirements		
4. Professional Standards and Ethics Must to know - Establishing and Maintaining Professional Standards - Codes of Conduct and Professional Practice Guidelines - Core Ethical Principles (Autonomy, Beneficence, Non-maleficence, Justice) Desirable to know - Importance of Continuing Professional Development (CPD) - Ethical Decision-Making Models - Handling Ethical Dilemmas	1 Hr	
5. Scope of Practice and Competence Must to know - Defining Scope of Practice - Components of Scope of Practice - Factors Influencing Scope of Practice - Competency Standards and Assessment - Role of Education and Training in Competence Desirable to know - Expanding and Limiting Scope of Practice - Recertification and Revalidation Processes	1 Hr	
6. Patient Rights and Consent Must to know - Understanding Patient Rights and Responsibilities - Patient Advocacy and Empowerment - Principles of Informed Consent - Legal and Ethical Considerations - Documenting and Obtaining Consent Desirable to know - Handling Patient Complaints and Grievances	2 Hr	5 Hrs
7. Confidentiality and Privacy Must to know - Importance of Confidentiality in Healthcare - Legal Requirements for Confidentiality - Managing Breaches of Confidentiality Desirable to know - Principles of Data Protection - Legal Framework for Data Privacy (e.g., GDPR, HIPAA) Nice know - Implementing Privacy Policies and Procedures	1 Hr	

8. Record Keeping and Documentation Must to know - Importance of Accurate Record Keeping - Legal and Professional Requirements for Documentation - Best Practices for Clinical Documentation - Managing and Storing Health Records Desirable to know - Benefits and Challenges of Electronic Health Records (EHR) - Legal Considerations for EHR Nice know - Ensuring Data Security and Integrity	2 Hr	10 Hrs
9. Legal Liability and Malpractice Must to know - Understanding Legal Liability - Types of Legal Liability (Civil, Criminal, Administrative) - Common Causes of Legal Action Against Physiotherapists - Risk Management Strategies Desirable to know - Definition and Examples of Malpractice - Legal Consequences of Negligence Nice know - - Preventing Malpractice Claims	1 Hr	
10. Employment and Contract Law Must to know - Employment Law in Healthcare - Key Employment Laws Affecting Healthcare Professionals - Rights and Responsibilities of Employers and Employees Desirable to know - Elements of a Valid Contract - Common Contractual Issues in Physiotherapy Practice Nice know - Handling Workplace Disputes and Grievances - Negotiating and Drafting Contracts	1 Hr	5 Hrs
11. Health and Safety Regulations Must to know - Legal Requirements for Health and Safety in Healthcare - Creating a Safe Work Environment - Legal Standards for Infection Control - Best Practices for Preventing Infections Desirable to know - Handling Occupational Health Issues - Managing Infection Control Breaches	1 Hr	5 Hrs
12. Research and Innovation Ethics Must to know - Principles of Ethical Research - Obtaining Ethical Approval for Research - Informed Consent in Research Desirable to know	1 Hr	5 Hrs

- Ethical Considerations in Using New Technologies - Balancing Innovation with Patient Safety Nice know - - Case Studies on Innovation in Physiotherapy		
13. Global Perspectives and Comparative By-Laws **Must to know** - Overview of International Health Profession By-Laws - Comparative Analysis of By-Laws in Different Countries - Adapting Global Standards to Local Contexts **Desirable to know** - Legal Issues in Cross-Border Practice - International Collaboration in Physiotherapy Nice know - Addressing Legal and Ethical Challenges	1 Hr	

Suggested Reading and Resources:

- "Health Law: Cases, Materials and Problems" by Barry R. Furrow
- "Law and Ethics in Nursing and Healthcare: An Introduction" by Graham Avery
- Journals: Journal of Medical Ethics, Health Care Analysis

3107-EL15 PALLIATIVE CARE FOR PHYSIOTHERAPY CURRICULUM

	HOURS	CREDIT
THEORY	15	1
PRACTICAL	30	1

OBJECTIVES:

1. Understand the principles and philosophy of palliative care in the context of physiotherapy
2. Identify the role of physiotherapists in interdisciplinary palliative care teams
3. Develop skills in assessing and managing pain and other symptoms in palliative care patients
4. Understand the physiological changes associated with terminal illnesses and their implications for physiotherapy interventions
5. Develop strategies for maintaining and improving quality of life for patients in palliative care
6. Learn techniques for supporting patients' functional independence and mobility in end-of-life care
7. Understand the psychological and emotional aspects of working with patients and families in palliative care settings

Category	THEORY	PRACTICAL
1. Introduction to Palliative Care <u>Must to Know</u> - Definition - Goals - Principles of palliative care <u>Desirable to Know</u> - Global perspectives and variations in palliative care practices	1 Hr	

Nice to know - Historical development of palliative care		
2. Palliative Care in Physiotherapy Must to Know - Role and importance of physiotherapy in palliative care Desirable to Know - Innovations and research in palliative physiotherapy Nice to know - Case studies highlighting physiotherapy interventions	1 Hr	
3. Patient Assessment and Management Must to Know - Key components of patient assessment in palliative care Desirable to Know - Research on new assessment methodologies Nice to know - Advanced assessment tools and techniques	2 Hrs	
4. Communication Skills Must to Know - Basic communication strategies with patients and families Desirable to Know - Training programs for advanced communication skills Nice to know - Techniques for handling difficult conversations	1 Hr	5 Hrs

5. Psychological and Emotional Support Must to Know - Recognizing psychological needs of patients Desirable to Know - Role of psychotherapy and counseling in palliative care Nice to know - Techniques for providing emotional support	1 Hr	5 Hrs
6. Ethical and Legal Issues Must to Know - Core ethical principles in palliative care Desirable to Know - Case studies on ethical dilemmas Nice to know - Ethical decision-making models	1 Hr	
7. Cultural and Spiritual Considerations Must to Know - Importance of cultural sensitivity in palliative care Desirable to Know - Research on cultural impacts on palliative care Nice to know - Strategies for culturally competent care	1 Hr	5 Hrs

8. Physical Therapy Interventions Must to Know - Benefits of exercise and mobility in palliative care Desirable to Know - Innovations in exercise therapy Nice to know - Designing individualized exercise programs	2 Hrs	5 Hrs
9. Nutrition and Hydration Must to Know - Importance of nutrition in palliative care Desirable to Know - Research on nutritional interventions Nice to know - Nutritional assessment and planning	1 Hr	
10. End-of-Life Care Must to Know - Principles of end-of-life care Desirable to Know - Case studies on end-of-life care Nice to know - Techniques for end-of-life planning	1 Hr	

11. Palliative Care in Different Settings Must to Know - Basics of providing home-based care Desirable to Know - Innovations in home-based palliative care Nice to know - Advanced techniques for home-based interventions	1 Hr	5 Hrs
12. Research and Innovation Must to Know - Basics of research in palliative care Desirable to Know - Innovations and future directions Nice to know - Key areas of current research	1 Hr	
13. Evaluation and Continuous Improvement Must to Know - Importance of evaluation in palliative care Desirable to Know - Using data for continuous improvement Nice to know - Techniques for evaluating care interventions	1 Hr	5 Hrs

BOOKS FOR BASICS IN PALLIATIVE CARE:

- "Oxford Textbook of Palliative Care" by Nathan I. Cherny, Marie Fallon, Stein Kaasa, Russell K. Portenoy, and David C. Currow
- "Palliative Care Perspectives" by James L. Hallenbeck
- Journals: Journal of Palliative Medicine, Palliative Care: Research and Treatment

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3107-EL16 ENTREPRENEURSHIP

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

Objectives:

- **Understanding Entrepreneurship**: Develop a comprehensive understanding of what entrepreneurship entails, including its definitions, theories, and historical context.
- **Identifying Opportunities**: Learn to recognize and evaluate entrepreneurial opportunities by assessing market needs, trends, and gaps.
- **Business Planning**: Develop skills in creating a business plan, including market analysis, financial projections, and operational strategies.
- **Legal and Ethical Considerations**: Understand the legal and ethical aspects of entrepreneurship, including intellectual property rights, contracts, and responsibilities to stakeholders.
- **Financial Management**: Gain knowledge of financial management techniques relevant to startups, including budgeting, fundraising, and financial risk management.
- **Marketing and Sales Strategies**: Learn how to develop effective marketing and sales strategies tailored to entrepreneurial ventures, including digital marketing techniques.
- **Risk Assessment and Management**: Develop skills in identifying and mitigating risks associated with entrepreneurship, including financial, operational, and strategic risks.

Category	THEORY	PRACTICAL
1. **Introduction to Entrepreneurship** <u>Must to Know</u> - Definition of entrepreneurship - Importance of entrepreneurship in healthcare - Characteristics of successful entrepreneurs <u>Desirable to Know</u> - History of healthcare entrepreneurship	1	

- Current trends in physiotherapy business Nice to know - Future of healthcare entrepreneurship - Global perspectives on physiotherapy businesses		
2. Business Models in Physiotherapy Must to Know - Types of physiotherapy practices (solo, group, multidisciplinary) - Basic business model canvas - Value proposition in physiotherapy Desirable to Know - Innovative business models in healthcare - Franchise models in physiotherapy Nice to know - Telemedicine business models - International physiotherapy business models	1	
3. Market Research and Analysis Must to Know - Basics of market research - Understanding target demographics - Analyzing competition in physiotherapy Desirable to Know - Advanced market research techniques - Identifying niche markets in physiotherapy Nice to know - Predictive analytics in healthcare markets - Global market trends in physiotherapy	1	
4. Business Planning Must to Know - Components of a business plan - Writing a mission and vision statement - Basic financial projections Desirable to Know	1	

- Advanced business plan writing - Pitching to investors Nice to know - Scenario planning in business - Sustainability planning		
5. Financial Management Must to Know - Basic accounting principles - Understanding cash flow - Pricing strategies in physiotherapy Desirable to Know - Financial ratio analysis - Investment strategies for clinic growth Nice to know - Venture capital in healthcare - Cryptocurrency and block chain in healthcare finance	1	
6. Legal and Regulatory Aspects Must to Know - Business registration process - Basic healthcare laws and regulations - Licensing requirements for physiotherapy practice Desirable to Know - Advanced healthcare compliance - Intellectual property in physiotherapy Nice to know - International regulations for telemedicine - Future regulatory trends in healthcare	1	
7. Marketing and Branding Must to Know - Basics of healthcare marketing - Creating a brand for physiotherapy practice - Patient acquisition strategies	1	5

Desirable to Know - Digital marketing for healthcare - Content marketing in physiotherapy Nice to know - Neuromarketing in healthcare - Virtual reality in physiotherapy marketing		
8. Operations Management Must to Know - Clinic workflow optimization - Appointment scheduling systems - Inventory management for physiotherapy supplies Desirable to Know - Lean management in healthcare - Quality management systems Nice to know - AI in healthcare operations - Robotics in physiotherapy operations	1	5
9. Human Resources Management Must to Know - Hiring and retention strategies - Team management in a clinic setting - Basic employment laws Desirable to Know - Performance management systems - Developing a clinic culture Nice to know - Remote work policies in healthcare - AI in HR for healthcare	1	
10. Technology in Physiotherapy Business Must to Know - Electronic Health Records (EHR) systems - Basic clinic management software	1	10

- Telehealth platforms for physiotherapy Desirable to Know - Advanced practice management software - Wearable technology in physiotherapy Nice to know - AI and machine learning in physiotherapy - Blockchain in healthcare records		
11. Customer Service and Patient Experience Must to Know - Principles of excellent patient care - Managing patient feedback - Basic patient satisfaction surveys Desirable to Know - Advanced patient experience design - Service recovery strategies Nice to know - AI chatbots for patient service - Virtual reality in patient experience	1	10
12. Networking and Professional Relationships Must to Know - Building referral networks - Interprofessional collaboration - Basic networking skills Desirable to Know - Advanced networking strategies - Building strategic partnerships Nice to know - Global networking in physiotherapy - AIpowered networking platforms	1	
13. Innovation and Research in Practice Must to Know - Implementing evidencebased practice	1	

- Basic research methods for clinic improvement - Innovation mindset in physiotherapy Desirable to Know - Conducting clinical research in private practice - Developing new treatment protocols Nice to know - Patenting innovations in physiotherapy - Commercializing research findings		
14. Ethics and Social Responsibility Must to Know - Ethical considerations in private practice - Corporate social responsibility basics - Sustainable practice management Desirable to Know - Developing an ethics committee - Social entrepreneurship in healthcare Nice to know - Global ethics in physiotherapy business - Environmental sustainability in healthcare	1	
15. Growth Strategies and Scaling Must to Know - Strategies for clinic expansion - Diversifying services in physiotherapy - Basic principles of scaling a healthcare business Desirable to Know - Mergers and acquisitions in healthcare - Franchising a physiotherapy business Nice to know - International expansion of physiotherapy practices - Disruptive growth strategies in healthcare	1	

BOOKS FOR BASICS IN ENTREPRENEURSHIP

- "Marketing Research Kit For Dummies" by Michael Hyman
- "Business Model Generation" by Alexander Osterwalder
- "Anatomy of a Business Plan" by Linda Pinson
- "Legal Aspects of Health Care Administration" by George D. Pozgar
- "Operations Management in Healthcare: Strategy and Practice" by Corinne M. Karuppan
- "Digital Health: Understanding the BenefitRisk PatientProvider Framework" by Megan Renfrew

SEMESTER VIII

3108 - 11: PHYSIOTHERAPY IN GENERAL MEDICINE AND SURGICAL CONDITIONS

HOURS DISTRIBUTION	
DIDACTIC THEORY HOURS:	**60 HOURS**
CLINICAL	150 HOURS
TOTAL	210 HOURS

Course Credit For Physiotherapy In General Medicine And Surgical Conditions		
	Hours	Credits
Theory	60	4
Practical	150	5

OBJECTIVES:

1. Acquire the skill of evaluation & interpretation of functional capacity, using simple exercise tolerance tests,such as 6 minutes walk test, symptom limited test.
2. Be able to select strategies for cure care & prevention; adopt restorative & rehabilitative measures formaximum possible functional independence of a patient at home, work place & in community.
3. Be able to execute the effective Physio Therapeutic measures (with appropriate clinical reasoning) withspecial emphases to Breathing retraining, nebulization humidification, bronchial hygiene, General Mobilization& Exercise conditioning.
4. Acquire Knowledge of the overview of patients care at the Intensive care area, artificial ventilation suctioning, positioning for bronchial hygiene & continuous monitoring of the patient at the Intensive care area.

5. Acquire the skill of basic Cardio-pulmonary resuscitation.
6. Be able to execute the effective physiotherapeutic measures with appropriate clinical reasoning to improvegeneral surgical and medical condition.

The following topics are applicable to all the adult & pediatric conditionsrelated to Cardio-respiratory conditions & Peripheral vascular diseases

SR.NO	CONTENT	NO. OF HOURS		MUST TO KNOW	DESIRABLE TO KNOW	NICE TO KNOW
		Th: 60 Hrs	Pr:150 Hrs			
1	1.Anatomy Review the regional anatomy of thorax; upper respiratory tract trachea and bronchialtree; lungs and bronchopulmonary segments,muscles of respiration; heart and great vessels; movements of the chest wall and surface anatomy of lung and heart. 2. Physiology Review the mechanics of respiration, lungvolumes, respiratory muscles, complianceof lung and chest wall, work of breathing,dead space, gas exchange in lung and pulmonary circulation.	2	5	MK		

2	Describe physical assessment in cardiorespiratory dysfunction, inspection posture (recumbent, erect, orthogenic), breathing pattern (rate, rhythm, use of accessory muscles) chest movement (symmetry intercostal and diaphragmatic components), chest deformity (Barrel chest,pigeon chest), Spinal deformity (scoliosis, kyphosis, kyphoscoliosis) sputum (colour type volume, consistency),cough (types, productive / non productive, presence of a normal coughreflex). Palpation, tactile and vocal fremitus, mobility of thoracic spine and ribcage. Percussion, dullness and hyperresonance. Auscultation, Normal andabnormal breath sounds.	5	5	MK		
3	1. Describe indications, goals and procedureof breathing exercise. Describe diaphragmatic breathing, localised basal expansion apical expansion, specific segmental exercise, raising the resting respiratory level. 2. Describe chest mobilisation exercises. 3. Describe relaxation positions for thebreathless patient high side lying, forward lean sitting, relaxed sitting, forwardlean standing, relaxed standing. 4. Describe controlled breathing duringwalking and during functional activity. 5. Describe exercise for the breathless patient;exercise tolerance testing and exercise programme.	2	10	MK		

4	1. Describe the technique of huffing andcoughing, forced expiratory technique, vibratory chest shaking and percussion. 2. Describe techniques of postual drainageincluding indications, general precautions and contraindications, preparationfor drainage of individual bronchopulmonary segments, modifiedpostural drainage and continuing postural drainage as home programme.	2	10	MK		
5	Physiotherapy after Cardiac Surgeryand ICCU Pre - operative : Assess patient's medical history, normal breathing pattern of patient, pulse, respiratoryrate, BP, thoracic mobility, posture and patients exercise tolerance. Identify Problems: Excess secretions,decreased mobility of thorax, defective posture, decreased exercisetolerance. Demonstrate treatment techniques. Explain to the patients - Endotrachealtube, central lines, nasogastric tube, catheter, ECG leads, drains, peripheral lines, temperature probe etc. Teach breathing exercises, splinting of incision, huffing and coughing, correct posture, range of motion exercises to trunk and shoulders, active exercises to ankle and foot. Post-operative : Assess special instructions pertaining to	3	13	MK		

	operative procedure performed, type of incision, blood pressure, pulse rate, respiration colour, time of last analgesic dose, drains, temperature,ECG, chest X-rays and blood gases. Identify problems : Pain, decreased air entry, retained secretions, reducedarm and leg movements, decreased mobility. Demonstrate treatment techniques : Deep breathing exercises, suctioning,active / assisted exercises to arm and leg, graduated exercise programme					
6	Cardiac rehabilitation - objectives , phases of cardiac rehabilitation, FITT principle , management	4	12	MK		

7	Physiotherapy after Pulmonary Surgery Pre-operative: Demonstrate treatment techniques explanation to patient, care of incision, mechanical ventilation, breathingexercise, huffing and coughing, mobilization exercise, posture correction, graduated exercise programme. Post-operative : Assess : Special instructionspertaining to operative procedure performed, breath sounds, cyanosis, respiratory rate, temperature and pulse, bloodpressure, drainage from pleural drain (bubbling or swinging), sputum expectorated,analgesia, movements of chest wall (symmetry) position of patient and effort of breathing, chest radiograph and blood gases. Identify Problems: Pain, intercostal drains insitu, decreased air entry, retained secretions, decreased movement of the shoulder of affected side, decreased mobilityand poor posture. Demonstrate treatment techniques: deepbreathing and segmental breathing exercises, vibrations, percussion, huffing andcoughing, full range active assisted arm exercises, ankle foot exercises, trunk exercises, posture correction, positioning of patient, IPPB and inhalation. .	3	13	MK		
8	Pulmonary rehabilitation : objectives , phases of cardiac rehabilitation, FITT principle , management	4	12	MK		

9	Physiotherapy in Obstructive LungDiseases Assess: Effort of breathing, extent of wheeze, pattern of breathing, sputum production, chest deformity, exercise tolerance (Patient's Effort Tolerance). Identify Problems: Decreased outflow dueto bronchospasm, anxiety due to difficulty in ventilation, exhaustion due toincreased work of disturbed breathing.	3	5	MK		
	Increased secretions which are difficult toremove, decreased exercise tolerance. Demonstrate treatment techniques - Relaxation postures and techniques, reassurance and education about disease,controlled breathing, breathing exercise, postural drainage, vibration, shaking, huffing and coughing, graduated exerciseprogramme and posture correction.					
10	Physiotherapy in Restrictive LungDisorders Assess: Chest expansion at differentlevels, mobility of thorax and spine, posture (Kyphosis or scoliosis) and tests forexercise tolerance.	3	5	MK		
11	Physiotherapy in Chest Infection Assess: Sputum, cough, fever anddyspnoea Identify problems: Productive cough withrisk haemoptysis, exhaustion due to increased work of breathing, chest infections, chest deformity, decreased exercise tolerance.	3	5	MK		

	Demonstrate treatment techniques: Postural drainage with use of adjuncts, percussion, vibration, huffing and coughing to expectorate, mobilizing exercises to thorax and graded exercises.					
12	Principles of Intensive Care Physiotherapy Describe the principles of intensive care therapy. Demonstrate knowledge of the following equipment s: Endotraceal tubes,tracheostomy tubes, humidifier, ventilator,high frequency ventilators, different ventilators, CPAP masks, suction pump, electrocardiogram, pressure monitor arterial, central venous pressure, pulmonary artery and pulmonary wedge, intracranial and temperature monitors. Assess: Special instructions pertaining toany operation performed, level of consciousness, colour, blood pressure, pulse, temperature, sputum expectorated (colour and quality) drugs (time last doseof analgesia given), ECG and blood gas results. Describe chest radiograph with respect to expansion of lungs, size of heart, presenceof secretions and placement of chest tubes.	6	20	MK		
13	Cardio pulmonary resuscitation Management of Covid 19 - ICU & itscomplications	2	3		D K	
14	Importance of life style modification inprevention of IHD.	2	3		D K	

15	Use, application of electro therapeuticmodalities for relief of pain, swelling and wound healing.	2	2		D K	
16	Cardio respiratory changes associated withageing and fitness Programme.	2	-		D K	
17	Familiarization with concept of quality of life.	2	-			**NK**
18	Planning short / long terms goals with clinical reasoning – documentation of theconditions given.	1	5	MK		
19	Occupational Lung Disorders - physiotherapymanagement .	1	5			**NK**
20	Diabetes (Wound, Ulcer, Glycemic controlwith exercise)	2	3		D K	
21	Obesity	2	3		D K	
22	Burns	2	3	MK		
23	**General Surgery (Mastectomy &Abdominal surgery)**	**2**	**10**	**MK**		

Text Books

1. Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists- Jaypee.
2. Cash's Textbook of Medical & Surgical Conditions for Physiotherapists- Jaypee.
3. Tidy's Physiotherapy- Ann Thomson Alison Skinner Joan Piercy.
4. Therapeutic exercise–byO' Sullivan.
5. Physiotherapy for Respiratory And Cardiac Problems-Jennifer A Pryor,Ammani Prasad.
6. Cardio Pulmonary Physical Therapy-Donna Frownfelter,Elizabeth Dean.

Reference Book

1. Chest X-Ray Made easy– Jonathan Mary Carroll Ivan Brown.
2. Cardio-Pulmonary– Scott Irwin.
3. Clinical Cardio-Respiratory- P.J. Mehta.
4. Managing COPD- Richard E K Russell, Paul A Ford.

SCHEME OF EXAMINATION

Theory	80	Practical	80
IA	20	IA	20
Total	100	Total	100

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	20 Marks (20x 1 mks= 20 mks)
Section B	Q2. BAQ Answer 5 questions	20 Marks (10x 2 mks= 20 mks)
	Q3. SAQ Answer any 2 out of 3	20 Marks (4x 5 mks= 20 mks)
Section-C	Q4. LAQ Answer 2questions Should be compulsory Should have one Optional question (i.e. OR)	20 Marks (2x 10mks= 20 mks)
TOTAL		80 Marks

PRACTICAL EXAMINATION

	SECTIONS	MARKS
	Long Case: based on the History 10 marks, Evaluation 10 marks, Treatment Plan on Patient 20 marks	40 Marks
2.	Short Case: Simulated	20 Marks
3.	Spots: 5 based on, X – ray (Chest), ICU Equipments, Nebulizers, ABG Analysis, Pulmonary Function Testing, ECG etc 3 minutes each spot and 3 marks per spot	5x3 marks = 15 Marks
4.	Journal	5 Marks
TOTAL		80 Marks

BLUE PRINT

MCQ's : 20	BAQ's: 20	SAQ's: 20	LAQ's: 20
MK – 12 **DK – 06** **NK – 02**	MK – 06 DK – 03 NK – 01	MK – 02 DK – 02 NK – 01	**MK – 02** **DK – 01** **NK – 00**
LEVEL I: 14	**LEVEL I: 06**	**LEVEL I: 03**	**LEVEL I: 02**
LEVEL II:06	**LEVEL II:04**	**LEVEL II:02**	**LEVEL II:01**

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3108 - 12: PHYSIOTHERAPY IN COMMUNITY HEALTH SCIENCES

HOURS DISTRIBUTION	
DIDACTIC THEORY HOURS: **A.** Health promotion & CBR **B.** Women's health **C.** Geriatrics health **D.** Occupational health(ergonomics)	**70 HOURS** 20 HOURS 20 HOURS 20 HOURS 10 HOURS
CLINICAL **A.** Health promotion & CBR **B.** Women's health **C.** Geriatrics health **D.** Occupational health(ergonomics)	100 HOURS 25 HOURS 25 HOURS 25 HOURS 25 HOURS
PROJECT	40 HOURS
TOTAL	210 HOURS

Course Credit For Physiotherapy Community Health Sciences		
	Hours	Credits
Theory	70	5
Practical	140	5

Objectives:

At the end of the course the candidate will:

A. Be able to describe:

i. The general concepts about health, disease and physical fitness.

ii. Physiology of aging process and its influence on physical fitness.

iii. National policies for the rehabilitation of disabled – role of PT.

iv. The strategies to access prevalence and incidence of various conditions responsible for increasing morbidity in the specific community – role of PT in improving morbidity, expected clinical and functional recovery, reasons for non-compliance in specific community environment solution for the same.

v. The evaluation of disability and planning for prevention and rehabilitation.

vi. CBR in urban and rural set up.

B. Be able to identify with clinical reasoning the prevailing contextual {e.g. environmental and psycho-social cultural} factors, causing high risk responsible for various dysfunctions and morbidity related to sedentary life style and specific community like women, children, aged as well as industrial workers and describe planning strategies of interventional policiesto combat such problems.

C. Be able to conduct as small project {cross sectional study / survey} to access to the prevalence of specific physical health problem and / or morbidity in specific community – which may be based at the institutional level or in field.

A. **HEALTH PROMOTION**

Sr.No	Contents	No of Hrs		Must Know	Desirable to Know	Nice to Know
		Didactic 10 Hrs	Clinical 10 Hrs			
1	W.H.O definition of health and disease.	3 Hrs	3 Hrs	MK		
2	Health delivery system – 3 tier.	3 Hrs	3 Hrs		DK	
3	Physical fitness definition and evaluation, Introduction to Evidence based Physiotherapy practice in community based rehabilitation	4 Hrs	4 Hrs	MK		
	i. Effect of growth					
	ii. Physical fitness in women-pregnancy, menopause.					
	iii. Physiology of aging neuromuskuloskeletal, CVS, metabolic and degenerative.					
	iv. Physiological effects of aerobic exercise – clinical reasoning for advocating aerobic exercise as preventive measure in obesity & its related conditions / in cardio-respiratory conditions / Aging/deconditioning effect after prolonged bed rest / Diabetes.					

B. CBR

Sr. No	Contents	No of Hours		Must Know	Desirable to Know	Nice to Know
		Didactic 10 Hrs	Clinical 15 Hrs			
1	Definition of international classification of Disability.	2 Hrs	3 Hrs	MK		
2	Disability- evaluation, types, prevention.	2 Hrs	3 Hrs	MK		
3	Rehabilitation- definition, types (institutional, reach out and CBR)	2 Hrs	3 Hrs	MK		
4	Team work of medical practitioner, PT/OT, AST, P&O, Clinical psychologist, and vocational counsellors and social	2 Hrs	3 Hrs			NK

	workers. CBR – Role of PT. National policies for rehabilitation of disabled – Role of PT.					
5	*CBR strategies in	2 Hrs	3 Hrs	MK		
	A. Urban area e.g. i. UHC, community centre, clubs, mahilamandals, Social centers. Ii. Schools, industries, sports centers. **B. Rural** area- by using PHC / rural hospital, district hospital / in infrastructure					

C. WOMEN'S HEALTH

Sr. No	Contents	No of Hrs		Must Know	Desirable to Know	Nice to Know
		Didactic 20 Hrs	Clinical 25 Hrs			
1	Women's Health – Women in India, Social issue having impact on physical Function, Legal rights and benefits.	2 Hrs	1 Hr			NK
2	Anatomical & Physiological variations associated with pregnancy & menopause.	2 Hrs	1 Hr	MK		
3	Antenatal & Postnatal care	3 Hrs	6 Hrs	MK		
4	incontinence and therapeutic interventions	3 Hrs				
5	Advice on labor positions,	2 Hrs	3 Hrs		DK	
6	Pain relief	3 Hrs	10 Hrs	MK		
7	Urogenital Dysfunction	3 Hrs	2 Hrs	MK		
8	Uterine Prolapse	2 Hrs	2 Hrs	MK		

D. GERIATRIC HEALTH

Sr. No	Contents	No of Hrs		Must Know	Desirable to Know	Nice to Know
		Didactic 20 Hrs	Clinical 25 Hrs			
1	Geriatrics – Senior citizens in India & NGOS, Differential diagnosis in Geriatric illness	3 Hrs	1 Hr		DK	
2	Legal rights, benefits	3 Hrs	1 Hr			NK
3	Institutionalized & Community dwelling elders	3 Hrs	3 Hrs	MK		
4	Physiology of ageing	3 Hrs	5 Hrs	MK		

5	Musculoskeletal & neuro / Cardio respiratory, metabolic changes	5 Hrs	5 Hrs	MK		
6	scheme of evaluation & role of PT in Geriatrics.	3 Hrs	10 Hrs	MK		

E. INDUSTRIAL HEALTH(ERGONOMICS)

Sr. No	Contents	No of Hrs		Must Know	Desirable to Know	Nice to Know
		Didactic 10 Hrs	Clinical 25 Hrs			
1	Principles of ergonomics in detail	2Hrs	5Hrs	MK		
2	Ability Management – Job analysis:- Job description, Job demand Analysis, Task Analysis, Ergonomics Evaluation, Injury Prevention, Employee Fitness Programme.	2 Hrs	5Hrs	MK		
3	Disability Management:- Acute care, Concept of Functional Capacity Assessment, Work Conditioning, Work Hardening.	2Hrs	10 Hrs	MK		
4	Environmental stress in the industrial area – accidents due to A. Physical agents e.g. heat/cold, light, noise, vibration, UV radiation, ionizing radiation. B. Chemical agents- inhalation, local action and ingestion. C. Mechanical hazards-overuse/fatigue injuries due to ergonomic alternation and ergonomic evaluation of work place. Mechanical stresses per hierarchy. D. Psychological hazards e.g Monotonicity and Dissatisfaction in job, Anxiety of work completion with quality, Role of PT. In industrial set up and stress management relaxation modes.	3Hr	11Hr			DK

5	Mechanical stresses per hierarchy I. Sedentary table work-executive's clerk. ii. Inappropriate seating arrangement-vehicle drivers. iii. Constant standing- watchman, defence forces, surgeons. Iv. Over execution in labourers-stress management. v. Conditioning training and Group Therapy Exercises for specific occupational stressors:	1 Hr	4 Hrs			NK

Text Books:

1) Physiotherapy in Gynaecological & Obstetrical conditions – by Poldon – Jaypee

2) Astrand P A Rodahe K-Text book of Work Physiology

3) Therapeutic Exercise – By Kisner

4) Text book of Community Medicine & Community Health – by BhaskarRao

5) Geriatrics Physiotherapy – By Andrew Guccione

6) Industrial Therapy – by Glenda Key

Reference Books:

1. Mural K F –Ergonomics: Man in his working environment

2. Exercise Physiology-by Mc'Ardle

3. Musculoskeletal Disorders in work place: Principle & Practice-by Nordin Andersons Pope

4. Indian Social Problem Vol 2 –by G R Madan

5. Disability 2000-RCI

6. Legal Rights of disabled in India-by GautamBannerjee

7. ICF –WHO Health Organisation 2001 publication

8. Preventive &Social Medicine –by Park

9. Training in the Community for the people with disability –by HallenderPadmini Mendes

10. Disabled Village Children-by David Werner

11. Chorin C& M Desai, C Gonsalves, 1999, Women & the Law, Vol. I & II Socio - legal Information Centre Mumbai

SCHEME OF EXAMINATION

Theory	80	Practical	80
IA	20	IA	20
Total	100	Total	100

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	20 Marks (20x 1 mks= 20 mks)
Section B	Q2. BAQ Answer 5 questions	20 Marks (10x 2 mks= 20 mks)
	Q3. SAQ Answer any 2 out of 3	20 Marks (4x 5 mks= 20 mks)
Section-C	Q4. LAQ Answer 2questions Should be compulsory Should have one Optional question (i.e. OR)	20 Marks (2x 10mks= 20 mks)
TOTAL		80 Marks

PRACTICAL EXAMINATION

SR. NO	SECTIONS	MARKS
1.	Long Case: based on the Women's Health /Geriatric/Industrial Health /Health Promotion	40 Marks
2.	Short Case: simulated based on community health problem	Marks
3.	Project Presentations and Viva	15 Marks

4.	Journal	**5 Marks**
TOTAL		**80 Marks**

BLUE PRINT

MCQ's : 20	BAQ's: 20	SAQ's: 20	LAQ's: 20
MK – 12 **DK – 06** **NK – 02**	MK – 06 DK – 03 NK – 01	MK – 02 DK – 02 NK – 01	**MK – 02** **DK – 01** **NK – 00**
LEVEL I: 14	**LEVEL I: 06**	**LEVEL I: 03**	**LEVEL I: 02**
LEVEL II:06	**LEVEL II:04**	**LEVEL II:02**	**LEVEL II:01**

3108-13: ETHICS & PRINCIPLES OF PHYSIOTHERAPY PRACTICE

(INTERNAL EXAM)

(Didactic 40 hrs)

OBJECTIVES:-

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

1. Describe Management and its principles, branches, theories of management and management in health sector and its application in Physiotherapy.

2. Plan to organize a physiotherapy department

3. Acquire the knowledge of ethical code of professional practice,as well as its moraland legal aspects; & role of IAP, WHO & WCPT

4. Acquire the knowledge about evidence based physiotherapy and its applications.

I. ETHICS

(Didactic 15 hrs)

Sr No	Topic	Teaching hours Didactic 15 hours	Must know	Desirable to know	Nice to know
1.	**Ethical Principles in health care:**	1 Hrs	MK		

2.	**Ethical principles related to physiotherapy**: Rules of professional conduct- a. Physiotherapy as a profession b. Relationship with patients c. Relationship at health care institution i.e. hospital, clinic	4Hrs	MK		
	etc. d. Relationship with colleagues and peers e. Relationship with medical and other professionals				
3.	**Scope of practice**: Introduction, History & General Principles of ethics involving human participants. a. Ethical consideration in physiotherapy practice- State, National & international rules & regulations governing physiotherapy practice. b.Informed consent process c. Good clinical practices (GCP) d. Ethical codes and conduct for physiotherapy profession. e. Influence of values & valuing on patient care f. Bioethics	6 Hrs	MK	DK DK	
4.	Confidentiality and responsibility	1 Hrs		DK	
5.	Malpractice and negligence	1 Hrs	MK		
6.	Provision of services and advertising	1Hrs			NK

7.	**Legal aspects:** a. Legal responsibility of physiotherapists for their action in the professional context understanding liability and obligations incase of medico legal action b. Consumer protection act	1 Hrs			NK

RECOMMENDED BOOKS:-

1. Medical ethics - CM Francis
2. Professionalism in physical therapy: History, practice and development by Laura Lee Swisher and Catherine G.Page,(Elsevier publication 2005)
3. Current problems in medical ethics - M George, V Lobo
4. The Cambridge Textbook of Bioethics-Peter A. Singer

II. PRINCIPLES OF PHYSIOTHERAPY PRACTICE

(Didactic 25 hrs)

Sr No	Topic	Teaching hours Didactic 15 hours	Must know	Desirable to know	Nice to know
	A) GENERAL PRINCIPLES OF PHYSIOTHERAPY PRACTICE: 5Hrs				
1.	**Organization of Physiotherapy department**: Planning, Space, manpower, innovative concepts and other basic resources.	2Hrs	MK		

2.	**a. Documentation skills-** History, examination, treatment planning, organization & execution. **b. Theories of management, principles of health sector management, its application to physiotherapy** **c. Personal management-** Policies, procedures, basic concepts including performance appraisal **d. Financial issues-** Including budget and income generation **e. Hospital management:** Hospital organization, staffing, information, communication and coordinator with other services of hospital, cost of services, monitoring and evaluation	3 Hrs		DK	NK
	B). Evidence based Physiotherapy practice: 20 Hrs				
1.	**Introduction to Evidence Based Practice**: ▪ Definition ▪ Development of Evidence based knowledge ▪ Evidence Based Physiotherapy Practice ▪ Evidence Based Practitioner: The Reflective Practitioner, The E Model, Using the E Model ▪ Concepts of Evidence based Physiotherapy: Awareness, Consultation, Judgement, Creativity	2 Hrs	MK	DK	NK
2	**Finding the Evidence** ▪ Measuring outcomes in Evidence Based Practice ▪ Measuring Health Outcomes ▪ Measuring clinical outcomes ▪ Inferential statistics and Causation	2 Hrs	MK	DK	NK

3	**Searching for the Evidence** ▪ Different sources of evidence ,Electronic ▪ Bibliographic databases ▪ World Wide Web ▪ Literature search	2 Hrs	MK		
4	**Assessing the Evidence** ▪ Evaluating the evidence ▪ Levels of evidence in research using quantitative methods ▪ Levels of evidence classification system ▪ critical review of research using qualitative methods	2 Hrs	MK		
5	**Reviewing the evidence** ▪ Stages of systematic reviews	2 Hrs		DK	
	▪ Meta-analysis ▪ The Cochrane collaboration				NK
6	**Economic evaluation of the evidence** ▪ Types of economic evaluation ▪ Conducting economic evaluation ▪ Critically reviewing economic evaluation ▪ Locating economic evaluation in the literature	3 Hrs		DK	NK
7	**Practice guidelines**: ▪ Recent trends in health care, ▪ Clinical Practice Guidelines (CPG), ▪ Communicating evidence to clients, managers and funders:	3Hrs	DK		NK
8	Research dissemination and transfer of knowledge:	2 Hrs	DK		

RECOMMENDED BOOKS:

1. American physical therapy association: Guide to physical therapy practice, 2nd edition 2001.

2. Evidence-Based Practice in Nursing and Health Care: A Guide to Best Practice ,by Bernadette

3. Evidence-Based Rehabilitation: A Guide to Practice,by Mary Law

4. Achieving Evidence-Based Practice, by Susan Hamer, BA, MA, RGN, FETC(DIST),

5. Carolyn Hicks: Research for physiotherapists: project design and analysis, 2 Ed, Churchill Livingstone, New York, 1995.

6. Thomas JR, Nelson JK: Research Methods in Physical Activity. 4th Ed, Human Kinetics, New Zealand, 2001.

7. Hospital management, accounting, planning and control - Kulkarni GK8.Principles and practice of management - Srinivasan R &Chunawalla SA

MODEL QUESTION PAPER

Sr. No	Contents	Marks
Section A	Q1. MCQ. Based on single Best answer It must include MUST KNOW questions	10 Marks (10x 1 mks= 10 mks)
Section B	Q2. BAQ Answer 5 questions	10 Marks (5x 2 mks= 10 mks)
	Q3. SAQ Answer any 2 out of 3	10 Marks (2x 5 mks= 10 mks)
Section-C	Q4. LAQ Answer any 1 out of 2	10 Marks (1x 10mks= 10 mks)
TOTAL		40 Marks

BLUE PRINT

MCQ's : 10	BAQ's: 10	SAQ's: 10	LAQ's: 10
MK – 06 DK – 03 NK – 01	MK – 03 DK – 01 NK – 01	MK – 01 DK – 01 NK – 01	MK – 01 DK – 01 NK – 00
LEVEL I: 07	LEVEL I: 03	LEVEL I: 02	LEVEL I: 01
LEVEL II: 03	LEVEL II: 02	LEVEL II: 01	LEVEL II: 01

One Theory examination of 40 marks to be conducted at the end of the term &Passing in the I.A. is mandatory.

ELECTIVE COURSES SEMESTER VIII

3108-EL14 BASICS IN NATUROPATHY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

Objectives:

- **Introduction to Naturopathic Principles**: Understand the fundamental principles of naturopathic medicine, including the healing power of nature, treating the whole person, prevention, and identifying the root cause of illness.
- **Herbal Medicine**: Gain knowledge of commonly used herbs in naturopathic practice, their therapeutic uses, and basic principles of herbal formulation.
- **Nutrition and Dietetics**: Learn about the role of nutrition in health and disease, principles of naturopathic nutrition, and dietary recommendations for various health conditions.
- **Hydrotherapy**: Understand the principles and techniques of hydrotherapy (water therapy) used in naturopathic treatments for therapeutic purposes.
- **Lifestyle Counseling**: Develop skills in providing lifestyle counseling, including stress management techniques, sleep hygiene, exercise recommendations, and healthy lifestyle choices.
- **Detoxification and Cleansing**: Explore naturopathic approaches to detoxification and cleansing, including methods such as fasting, dietary changes, and supporting organ function.

Category	THEORY	PRACTICAL
1. Introduction to Naturopathy Must to Know - Definition and principles of naturopathy - History and development of naturopathy - The concept of holistic health	1	

Desirable to Know - Differences between naturopathy and conventional medicine - Legal and regulatory status of naturopathy Nice to know - Famous naturopaths and their contributions - Global trends in naturopathic medicine		
2.Fundamental Principles of Naturopathy Must to Know - The healing power of nature (Vis Medicatrix Naturae) - Identify and treat the cause (Tolle Causam) - First, do no harm (Primum Non Nocere) Desirable to Know - Treat the whole personDoctor as teacher (Docere) - Prevention is the best cure Nice to know - Application of naturopathic principles in physiotherapy - Integration of naturopathy with evidence based practice	1	
3.Naturopathic Assessment Must to Know - Basic naturopathic physical examination - Health history taking from a naturopathic perspective - Understanding the concept of "terrain" in naturopathy Desirable to Know - Iridology basicsPulse and tongue diagnosis Nice to know - Advanced naturopathic diagnostic techniques - Use of technology in naturopathic assessment	1	
4.Nutrition in Naturopathy Must to Know	1	

- Basics of naturopathic nutrition - Understanding macro and micronutrients - Therapeutic use of whole foods Desirable to Know - Detoxification diets - Food combining principles Nice to know - Nutrigenomics in naturopathic practice - Advanced nutritional therapies		
5.Hydrotherapy Must to Know - Principles of hydrotherapyBasic hydrotherapy techniques (e.g., contrast baths, compresses) - Indications and contraindications of hydrotherapy Desirable to Know - Advanced hydrotherapy techniques - Combining hydrotherapy with physiotherapy treatments Nice to know - Hydrotherapy equipment and facilities - Research on hydrotherapy effectiveness	1	10
6.Herbal Medicine Basics Must to Know - Introduction to common medicinal herbs - Basic principles of herbal medicine - Safety and contraindications in herbal medicine Desirable to Know - Herbal preparations and dosage forms - Herb drug interactions Nice to know - Advanced herbal formulations - Ethnobotany and traditional herbal systems	1	

7.MindBody Medicine Must to Know - Stress management techniques - Introduction to meditation and mindfulness - The role of emotions in health and disease Desirable to Know - Guided imagery techniques - Basic principles of yoga therapy Nice to know - Advanced mindbody interventions - Psychoneuroimmunology basics	1	10
8.Physical Modalities in Naturopathy Must to Know - Basics of naturopathic manipulative therapies - Introduction to therapeutic massage - Use of heat and cold therapies Desirable to Know - Naturopathic approaches to exercise therapy - Basics of acupressure Nice to know - Advanced manual therapy techniques - Integration of naturopathic modalities with physiotherapy	1	10
9.Detoxification and Cleansing Must to Know - Basic concepts of detoxification in naturopathy - Safe detoxification practices - Understanding the organs of elimination Desirable to Know - Fasting protocols and safety - Colon hydrotherapy basics	1	

Nice to know - Advanced detoxification therapies - Environmental medicine concepts		
10. Naturopathic Approach to Common Conditions Must to Know - Naturopathic management of musculoskeletal conditions - Naturopathic approaches to digestive disorders - Natural support for the immune system Desirable to Know - Naturopathic care for cardiovascular health - Natural approaches to stress and anxiety Nice to know - Naturopathic oncology support - Naturopathic management of autoimmune conditions	1	
11. Homeopathy Basics Must to Know - Principles of homeopathy - Understanding potentization and dilution - Basic homeopathic remedies for first aid Desirable to Know - Constitutional homeopathy concepts - Homeopathic case taking Nice to know - Complex homeopathy - Research in homeopathy	1	
12. Lifestyle Counseling Must to Know - Basics of naturopathic lifestyle counseling - Sleep hygiene and circadian rhythm support - Naturopathic approaches to exercise	1	

Desirable to Know - Motivational interviewing techniques - Environmental health counseling Nice to know - Advanced behavior change models - Naturopathic approaches to addiction		
13. Energy Medicine Concepts Must to Know - Introduction to vitalism in naturopathy - Basic concepts of energy fields in the body - Introduction to meridians and chakras Desirable to Know - Basics of Reiki and therapeutic touch - Introduction to biofield therapies Nice to know - Advanced energy medicine techniques - Scientific studies on energy medicine	1	
14. Natural Fertility and Women's Health Must to Know - Naturopathic approach to menstrual health - Basic natural fertility support - Naturopathic care during pregnancy and postpartum Desirable to Know - Natural approaches to menopause - Naturopathic management of PCOS Nice to know - Advanced natural fertility treatments - Naturopathic pediatrics basics	1	
15. Environmental Medicine Must to Know	1	

- Basics of environmental influences on health - Reducing toxic exposure in daily life - Understanding electromagnetic sensitivity <u>Desirable to Know</u> - Naturopathic approaches to chemical sensitivities - Basics of building biology <u>Nice to know</u> - Advanced environmental medicine diagnostics - Ecological medicine concepts		

BOOKS FOR BASICS IN BASICS IN NATUROPATHY

- Textbook of Natural Medicine by Joseph E. Pizzorno and Michael T. Murray
- The Complete Textbook of Naturopathic Medicine by Robert Schmid
- Physiotherapy for Respiratory and Cardiac Problems: Adults and Paediatrics by Jennifer A. Pryor and Ammani S. Prasad
- Musculoskeletal Essentials: Applying the Preferred Physical Therapist Practice Patterns by Marilyn Moffat and Carol S. Stemmons

3108-EL15 ADVANCES IN PROSTHETIC MANAGEMENT IN PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

1. **Understanding Prosthetic Components**: To comprehensively understand the various types of prosthetic components available, their materials, and their functionalities.
2. **Assessment Skills**: Develop advanced assessment skills to evaluate the functional needs and abilities of individuals requiring prosthetic devices.
3. **Customization and Fitting Techniques**: Learn advanced techniques for the customization, fitting, and alignment of prosthetic devices to optimize comfort, function, and biomechanical efficiency.
4. **Gait Analysis and Training**: Gain proficiency in conducting gait analysis for individuals with prosthetic limbs and designing tailored rehabilitation programs to improve gait patterns and stability.
5. **Management of Complications**: Develop strategies for identifying and managing complications associated with prosthetic use, such as skin breakdown, pain, and alignment issues.
6. **Interdisciplinary Collaboration**: Foster skills in collaborating with interdisciplinary teams including prosthetists, orthotists, physicians, and occupational therapists to ensure holistic patient care.
7. **Patient Education and Counselling**: Equip with the knowledge and skills to educate patients and their families about prosthetic devices, their care, and usage expectations, promoting independence and compliance.
8. **Research and Evidence-Based Practice**: Integrate current research and evidence-based practice into the management of prosthetic rehabilitation to enhance clinical decision-making and outcomes.

Category	THEORY	PRACTICAL
1. Introduction to Prosthetics Must to Know - Basic principles of prosthetic devices, types of amputations, and common prosthetic materials. Nice to know - Historical evolution of prosthetics and key milestones in prosthetic technology. Desirable to Know - Cutting-edge prosthetic technologies under development and their potential impact.	2	
2. Physiological and Psychological Aspects Must to Know - Impact of amputation on biomechanics, physiology, and psychological well-being of patients. Nice to know - Rehabilitation protocols specific to different levels of amputations and patient demographics. Desirable to Know - Role of virtual reality and sensory feedback in improving prosthetic adaptation and function.	2	1
3. Assessment and Prescription Must to Know - Assessment techniques for residual limb health, functional assessment, and gait analysis. Nice to know - Advances in prosthetic socket design and fitting techniques.	2	5

Desirable to Know - Customization of prosthetic devices based on patient-specific biomechanical and lifestyle factors.		
4. Prosthetic Components Must to Know - Components of a prosthetic limb: socket, suspension system, prosthetic foot, knee, and terminal device. Nice to know - Emerging trends in lightweight materials, modular components, and energy-storing prosthetic systems. Desirable to Know - Integration of neural interfaces and brain-controlled prosthetic devices.	2	3
5. Gait Training and Rehabilitation Must to Know - Gait training strategies for new amputees, advanced gait patterns, and functional mobility training. Nice to know - Innovative rehabilitation approaches using robotics and advanced prosthetic simulators. Desirable to Know - Prosthetic rehabilitation in extreme conditions (e.g., sports, underwater, high-altitude environments).	2	8

6. Complications and Management Must to Know - Common complications (e.g., skin breakdown, overuse injuries) and their prevention strategies. Nice to know - Role of physiotherapy in managing phantom limb pain and neuromas. Desirable to Know - Research on regenerative medicine and tissue engineering for prosthetic integration.	2	8
7. Patient Education and Support Must to Know - Patient education on prosthetic use, care, and maintenance. Nice to know - Psychological support strategies for coping with limb loss and adjusting to prosthetic use. Desirable to Know - Community-based rehabilitation programs and advocacy for amputee rights and accessibility.	2	5

8. Ethical and Societal Implications <u>Must to Know</u> - Ethical considerations in prosthetic provision and enhancement technologies. <u>Nice to know</u> - Societal impact of advanced prosthetic technologies on disability rights and healthcare equity. <u>Desirable to Know</u> - Future trends in prosthetic design and ethical dilemmas posed by human augmentation technologies.	1	

<u>BOOKS FOR BASICS IN PHYSIOTHERAPY ADVANCES IN PROSTHETIC MANAGEMENT</u>

- Physiotherapy in Orthopaedics: A Problem-Solving Approach **by Christopher Norris**
- Essentials of Orthopedic Surgery **by Sam W. Wiesel**
- Physical Rehabilitation **by Susan B. O'Sullivan, Thomas J. Schmitz, and George Fulk**
- Prosthetics and Orthotics: Lower Limb and Spine **edited by S. Michael Roberts**

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3108-EL16 HEALTH PATIENT COUNCELLING IN PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Understand Counseling Principles**: To comprehend the fundamental principles and theories of counseling as they apply to physiotherapy practice.
- **Develop Communication Skills**: To enhance communication skills necessary for effective patient interaction, including active listening, empathy, and non-verbal communication.
- **Patient Assessment**: To learn methods for conducting patient assessments from a counseling perspective, including identifying patient needs, concerns, and readiness for behavior change.
- **Behavior Change Techniques**: To familiarize with evidence-based techniques for promoting behavior change in patients, such as motivational interviewing and goal-setting strategies.
- **Cultural Competence**: To recognize the importance of cultural competence in counseling and develop skills for working with diverse patient populations.
- **Ethical Considerations**: To understand the ethical guidelines and legal considerations involved in patient counseling within the physiotherapy context.

Category	THEORY	PRACTICAL
1. INTRODUCTION TO PATIENT COUNSELING Must to Know - Basic principles and importance of patient-centered care Nice to know - Historical perspectives on patient counseling Desirable to Know - Advanced techniques in motivational interviewing	1	

2. Communication Skills Must to Know - Effective communication techniques and active listening Nice to know - Cultural competence in communication Desirable to Know - Non-verbal communication cues and their impact on counseling	2	
3. Patient Education Strategies Must to Know - Methods for explaining medical conditions and treatment plans - Digital tools for patient education Nice to know - Health literacy assessment and strategies Desirable to Know - Digital tools for patient education	2	
4. Behavioral Change Techniques Must to Know - Motivational interviewing techniques Nice to know - Cognitive-behavioral approaches to behavior change Desirable to Know - Social cognitive theory and its application in behavior change	2	10

5. Psychosocial Aspects of Care Must to Know - Understanding the emotional and psychological impact of injury or illness Nice to know - Counseling strategies for anxiety and depression in patients Desirable to Know - Support group facilitation techniques	2	10
6. Ethical and Legal Considerations Must to Know - Patient confidentiality and informed consent Nice to know - Handling ethical dilemmas in patient care Desirable to Know - Legal aspects of patient counseling in different jurisdictions	2	
7. Health Promotion and Lifestyle Counseling Must to Know - Promoting healthy behaviors and lifestyle modifications Nice to know - Integrating mindfulness and stress management techniques Desirable to Know - Nutritional counseling basics and dietary recommendations for common conditions	2	

8. Patient Assessment in Counseling Must to Know - Assessing patient readiness for change and identifying barriers to adherence Nice to know - Using patient-reported outcomes measures (PROMs) in counseling Desirable to Know - Psychological assessment tools and their relevance in physiotherapy	2	10

BOOKS FOR BASICS HEALTH PATIENT COUNCELLING IN IN PHYSIOTHERAPY

- Patient Education in Rehabilitation **by Olga Dreeben-Irimia**
- Patient Practitioner Interaction: An Experiential Manual for Developing the Art of Health Care **by Carol M. Davis**
- Physical Therapy Case Files: Orthopedics **by Jason Brumitt, Erin Jobst, and Dania L. Scher**
- Physical Therapy Ethics **by Donald L. Gabard and Steven L. Finando**

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3108-EL17 PREVENTIVE PHYSIOTHERAPY

	HOURS	CREDIT
THEORY	**15**	**1**
PRACTICAL	**30**	**1**

OBJECTIVES

- **Understand the Principles of Preventive Physiotherapy:**

  - Define preventive physiotherapy and its role in healthcare.
  - Explain the importance of early intervention and prevention strategies.

- **Identify Risk Factors and Screening Methods:**

  - Recognize common risk factors for musculoskeletal injuries and conditions.
  - Learn how to conduct screening assessments to identify individuals at risk.

- **Develop Effective Prevention Strategies:**

  - Design personalized exercise programs to prevent injuries and promote musculoskeletal health.
  - Implement ergonomic assessments and interventions in various settings (workplace, sports, etc.).

- **Enhance Knowledge of Lifestyle Modifications:**

  - Educate clients on lifestyle changes (e.g., posture correction, ergonomic adjustments, activity modification) to prevent injuries.
  - Discuss the role of nutrition and hydration in preventing musculoskeletal problems.

- **Explore Psychological Aspects of Injury Prevention:**

  - Understand the psychological factors influencing injury risk and prevention.
  - Learn motivational techniques to encourage compliance with preventive measures.

Category	THEORY	PRACTICAL
1. Anatomy and Physiology <u>Must to Know</u> - Musculoskeletal system - Nervous system <u>Nice to know</u> - Principles of Biomechanics - Cardiovascular and respiratory systems - Endocrine system <u>Desirable to Know</u> - Advanced topics in Exercise Physiology - Neuromuscular adaptations to exercise - Age-related changes in physiology	1	
2. Pathophysiology <u>Must to Know</u> - Causes of musculoskeletal injuries - Risk factors for chronic diseases <u>Nice to know</u> - Common medical conditions - Metabolic disorders - Neurological disorders <u>Desirable to Know</u> - Genetics and exercise response - Immunological responses to exercise - Environmental influences on health	2	

3. Preventive Strategies Must to Know - Exercise prescription - Stretching and flexibility - Strength training Nice to know - Ergonomics and workplace health - Nutrition and its impact on health - Mental health and physical activity - Aging and exercise Desirable to Know - Public health policies and initiatives - Community health promotion - Global perspectives on preventive healthcare - Integrative approaches to healthcare	2	
4. Assessment Techniques Must to Know - Postural assessment - Gait analysis Nice to know - Functional movement screening - Sports-specific assessments - Biomechanical assessments Desirable to Know - Advanced diagnostic tools (e.g., imaging modalities) - Genetic testing in preventive medicine - Biomarkers of health and disease	2	10

5. Patient Education <u>Must to Know</u> - Injury prevention strategies - Ergonomic advice <u>Nice to know</u> - Lifestyle modification strategies - Stress management techniques - Sleep hygiene <u>Desirable to Know</u> - Health coaching and motivational interviewing techniques - Technology in healthcare (e.g., wearable devices) - Telehealth and remote monitoring	3	10
6. Exercise Rehabilitation <u>Must to Know</u> - Therapeutic exercises - Progression and regression of exercises <u>Nice to know</u> - Modalities for pain management - Aquatic therapy - Pilates and yoga <u>Desirable to Know</u> - Advanced manual therapy techniques - Complementary therapies (e.g., acupuncture, yoga) - Performance optimization	3	10

7. Clinical Reasoning and Decision Making Must to Know - Development of treatment plans Nice to know - Case studies and problem-solving Desirable to Know - Evidence-based practice - Ethics and professionalism in healthcare	2	

BOOKS FOR BASICS IN PREVENTIVE PHYSIOTHERAPY

- Preventive and Social Medicine by K. Park
- Preventive Orthopedics: Medicine by Dr. S.S. Agarwal
- Textbook of Preventive and Community Dentistry by S. S. Hiremath
- Physical Therapy in Acute Care: A Clinician's Guide by Daniel Joseph Malone

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