Shri Govind Guru University

(Established by Government of Gujarat Vide Gujarat Act no 24/2015)

Towards Smart Quality Education

Programme & Subject: **Bachelor of Physiotherapy – B.P.T**

(4½ Year Degree Course)

Under **The Faculty of Medicine**

Regulations & Curriculum

(In force for the students from academic year 2016-2017 and thereafter)

(Updated on 20th February 2018)

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BACHELOR OF PHYSIOTHERAPY (BPT)

Introduction:

The Bachelor of Physiotherapy program shall be under the Faculty of Medicine. The name of the Degree program shall be:

Bachelor of Physiotherapy (or, Bachelor of Physical Therapy) – **B.P.T**

These REGULATIONS & CURRICULUM will be applicable from the academic year 2016-2017 and thereafter.

LEARNING OBJECTIVES:

The purpose of this curriculum is to delineate the cognitive, affective and psychomotor skills deemed essential for completion of this program. At the completion of this course, the student should be –

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

EXPECTATIONS FROM THE FUTURE PHYSIOTHERAPY GRADUATES

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

Terminal Objectives (Expected Outcomes):

6. The graduate will be a competent and reflective physiotherapy practitioner who can function safely and effectively while adhering to legal, ethical and professional standards of practice in a multitude of physiotherapy settings for patients and clients across the lifespan and along the continuum of care from wellness and prevention to rehabilitation of dysfunction.
7. The graduate will utilize critical inquiry and evidence based practice to make clinical decisions essential for autonomous practice.
8. The graduate will function as an active member of professional and community organizations. The graduate will be a service-oriented advocate dedicated to the promotion and improvement of community health.
9. The graduate will demonstrate lifelong commitment to learning and professional development.

Regulations and Curriculum governing BPT degree course

O. GEN B.P.T- 1

CRITERIA OF ELIGIBILITY FOR ADMISSION

1. A candidate applying for the degree of BPT being eligible for admission to the Physiotherapy College affiliated to this university must have passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board and passed in physics, chemistry and biology and English.

OR,

Candidates who have studied abroad and have passed the equivalent examination as per the guidelines of the Association of Indian Universities to determine the eligibility and must have passed in the subjects: Physics, Chemistry, Biology and English up to 12th Standard level.

2. He/she has attained the age of 17 years as on the date of admission.
3. He/she has to furnish at the time of submission of application form, a certificate of Physical fitness from a registered medical practitioner that the candidate is physically fit to undergo Physiotherapy course.

A candidate fulfilling above requirements will be provisionally admitted in the First Semester of B.P.T Degree Programme, as per the rules of Admission Committee for Professional Medical Educational Courses of Gujarat and/or Government of Gujarat and/or Shri Govind Guru University, Godhra.

O. GEN B.P.T- 2

DURATION OF COURSE:

B.P.T is 4½ years regular & fulltime degree programme. The 4½ years includes **4 years** of 8 semesters (Minimum of 5640 hours) **and 6 months,** 9thsemester (minimum 1100 hours) of compulsory rotatory internship (and additional 100 hours for Dissertation / Project work).

Total Transcript Hours = 5640 hours + 1100 hours + 100 hours = 6840 hours

O. GEN B.P.T- 3

MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all the subjects of study and for examination of the course.

O. GEN B.P.T- 4

ADMISSION TO THE PROGRAMME:

Admission granted by the Central Admission Committee appointed by the State Government to any student shall be provisional till the enrollment/ registration/ enlistment is made by the university, and in case of admission is granted on the basis of provisional eligibility certificate, the condition & instruction given by the university should be complied with in the time limit fixed by the university otherwise term kept and fees paid by the such a student will be forfeited and no fees on any account will be refunded.

Registration: Candidate admitted to the course in any of the affiliated college shall register with this University by remitting the prescribed fee along with the application form for registration duly filled in and forwarded to this University through Head of the Institute within stipulated date.

O. GEN B.P.T- 5

RE-ADMISSION AFTER BREAK OF STUDY:

All re-admissions of candidates are subject to the approval of the Vice Chancellor.

O. GEN B.P.T- 6

COMMENCEMENT OF THE COURSE -

The course shall commence as per the notification of Central Admission Committee of Government of Gujarat.

Duration of odd number semester (1^{st}, 3^{rd}, 5^{th}, & 7^{th}) of an academic year– 6 Months - September to February

Duration of even number semester (2^{nd}, 4^{th}, 6^{th}& 8th) of an academic year– 6 Months - March to August

O. GEN B.P.T- 7

SCHEDULE OF EXAMINATION –

The scheme of examination for the B.P.T course shall be divided into 8 professional examinations, namely, 1^{st} semester B.P.T examination at the end of 1st academic semester, 2^{nd} semester at the end of 2nd academic semester, 3^{rd} semester B.P.T examination at the end of 3rd academic semester, 4^{th} semester B.P.T examination at the end of 4th academic semester, 5^{th} semester B.P.T examination at the end of 5th academic semester, 6^{th} semester B.P.T examination at the end of 6th academic semester, 7^{th} semester B.P.T examination at the end of 7th academic semester, 8^{th} semester B.P.T examination at the end of 8th academic semester.

There will be 2 internal examinations in each semester. Internal evaluation based on continuous assessment, for 20% of the marks of the subject. There will be University examination through written paper and/or practical examination for 80% of the marks of the subject at the end of every semester.

O. GEN B.P.T- 8

ELIGIBILITY CRITERIA TO APPEAR IN UNIVERSITY EXAMINATION

A. Attendance: A candidate has to secure minimum 80% of attendance

A candidate is required to attend at least 80 percent of the total classes conducted in a year in all subjects prescribed for that year, separately, in theory and practical / clinical to become eligible to appear for the university examination

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

B. Filling of University examination form:

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

O. GEN B.P.T- 9

STUDENTS' ASSESSMENT:

The performance of every student in each course will be evaluated as follows:

Internal evaluation based on continuous assessment, for 20% of the marks of the subject;

University examination through written paper and/or practical examination for 80% of the marks of the subject

O. GEN B.P.T- 10

SCHEME OF EXAMINATION: SUBJECTS AND DISTRIBUTION OF MARKS

BPT – 1st Semester

Paper. No.	Subject	Theory (Maximum Marks)			Practical & Viva Voce (Maximum Marks)		Total (Maximum Marks)
		Time	University Exam	Internal Assessment	University Exam	Internal Assessment	
1.	Human Anatomy I	3 Hours	80	20	80	20	200
2.	Human Physiology I	3 Hours	80	20	80	20	200
3.	Biochemistry	2 Hours	40	10	***	***	50
4.	Sociology	2 Hours	40	10	***	***	50
5.	Basic Principles of Biomechanics	3 Hours	80	20	***	***	100
						Total :	**600**

BPT – 2nd Semester

Paper. No.	Subject	Theory (Maximum Marks)			Practical & Viva Voce (Maximum Marks)		Total (Maximum Marks)
		Time	University Exam	Internal Assessment	University Exam	Internal Assessment	
1.	Human Anatomy II	3 Hours	80	20	80	20	200
2.	Human Physiology II	3 Hours	80	20	80	20	200
3.	Psychology	2 Hours	40	10	***	***	50
4.	Biomedical Physics	3 Hours	80	20	***	***	100
						Total:	**550**

BPT – 3rd Semester

Paper. No.	Subject	Theory (Maximum			Practical & Viva Voce (Maximum Marks)		Total (Maximum Marks)
		Time	University Exam	Internal Assessment	University Exam	Internal Assessment	
1.	Pathology	2 Hours	40	10	***	***	50
2.	Microbiology	2 Hours	40	10	***	***	50
3.	Pharmacology	2 Hours	40	10	***	***	50
4.	Foundation of Exercise Therapy and Therapeutic Massage	3 Hours	80	20	80	20	200
						Total:	**350**

BPT – 4th Semester

Paper. No.	Subject	Theory (Maximum			Practical & Viva Voce (Maximum Marks)		Total (Maximum Marks)
		Time	University Exam	Internal Assessment	University Exam	Internal Assessment	
1.	Biomechanics & Kinesiology	3 Hours	80	20	4	10	150
2.	Exercise Therapy	3 Hours	80	20	8	20	200
3.	Electrotherapy	3 Hours	80	20	8	20	200
						Total:	**550**

BPT – 5th Semester

Paper. No.	Subject	Theory (Maximum Marks)			Practical & Viva Voce (Maximum Marks)		Total (Maximum Marks)
		Time	University Exam	Internal Assessment	University Exam	Internal Assessment	
1.	Orthopaedics- Traumatology & Non- Traumatology	3 Hours	80	20	***	***	100
2.	Medicine	3 Hours	80	20	***	***	100
3.	Surgery	3 Hours	80	20	***	***	100
4.	Physical & Functional Diagnosis	3 Hours	80	20	80	20	200
						Total:	**500**

BPT – 6th Semester

Paper. No.	Subject	Theory (Maximum Marks)			Practical & Viva Voce (Maximum Marks)		Total (Maximum Marks)
		Time	University Exam	Internal Assessment	University Exam	Internal Assessment	
1.	Physiotherapy in Orthopedic Conditions & Sports	3 Hours	80	20	80	20	200
2.	Physiotherapy in Medical & Surgical Conditions	3 Hours	80	20	80	20	200
3.	Yoga & Alternative Medicine	2 Hours	40	10	***	***	50
4.	Clinical Reasoning and Evidence Based Physiotherapy	2 Hours	40	10	***	***	50
						Total	**500**

BPT – 7th Semester

Paper. No.	Subject	Theory (Maximum			Practical & Viva Voce (Maximum Marks)		Total (Maximum Marks)
		Time	University Exam	Internal Assessment	University Exam	Internal Assessment	
1.	Clinical Neurology & Neurosurgery	3 Hours	80	20	***	***	100
2.	Physiotherapy in Neuromuscular & Psychosomatic disorders	3 Hours	80	20	80	20	200
3.	Clinical Cardiovascular & Pulmonary Conditions	3 Hours	80	20	***	***	100
4.	Physiotherapy in Cardiovascular & Pulmonary Conditions	3 Hours	80	20	80	20	200
						Total:	**600**

BPT – 8th Semester

Paper. No.	Subject	Theor y (Maximum			Practical & Viva Voce (Maximum Marks)		Total (Maximum Marks)
		Time	University Exam	Internal Assessment	University Exam	Internal Assessment	
1.	Community Medicine	3 Hours	80	20	***	***	100
2.	Physiotherapy in Community Health	3 Hours	80	20	80	20	200
3.	Health Promotion, Fitness and Wellness	3 Hours	80	20	80	20	200
4.	Biostatistics & research Methodology	2 Hours	40	10	****	****	50
						Total:	**550**

O. GEN B.P.T- 11

INTERNAL ASSESSMENT:

The internal assessment will be done based on continuous evaluation method. Every semester, there will be two internal examinations for both the theory and the practical. For the award of internal marks in theory and practical, the better of the two internal examinations will be considered along with other components like attendance, seminar presentations, workshops & conferences attended and journal submission.

Internal marks calculation - 20% of total marks of a subject (Separately for theory and practical):

The better of two internal examinations : 10% of total marks

Attendance : 5% of total marks

Seminar presentations, workshops & conferences attended and journal submission : 5% of total marks

A candidate must obtain minimum of 35% marks of internal evaluation in each paper for both theory and practical separately. Failing which he/she would not be eligible in that paper(s)/ head of passing.

The subsidiary subjects in whom only the internal exam will be conducted, a candidate must obtain minimum of 35% of the total marks before appearing for University examination.

O. GEN B.P.T- 12

UNIVERSITY (EXTERNAL) EXAMINATION:

PASSING CRITERIA: Every student has to have an aggregate score of minimum 50% marks of both the internal and University (external) Examination of 100 % marks in theory and practical examination combined together to be declared pass in the University Examination. It is not compulsory to pass in section – I and section – II separately. But, the student has to score minimum 40 % of marks separately in theory and practical in the University Examination of 80 % marks in theory and practical examination.

e.g. A student appearing for University exam for Semester I.

Subject No	Subject		Internal evaluation		University Examination		Total		Remarks
			Maximum marks	Marks Secured	Maximum/Minimum marks	Marks Secured	Maximum/Minimum marks	Marks Secured	
1.	Human Anatomy I	Theory	**20**	11	**80/32**	42			
		Practical	**20**	12	**80/32**	35	**200/100**	100	Pass
2.	Human Physiology I	Theory	**20**	16	**80/32**	56			
		Practical	**20**	10	**80/32**	**30**	**200/100**	112	Fail
3.	Biochemistry	Theory	**10**	**03**	**40/16**	24	**50/25**	27	Fail
4.	Sociology	Theory	**10**	05	**40/16**	17	**50/25**	**22**	Fail
5.	Basic Principles of Biomechanics	Theory	**20**	14	**80/32**	38	**100/50**	52	Pass
							600/300	313	Failed in Subject Nos. 2, 3 & 4

STRUCTURE OF QUESTION PAPERS:

Paper-style for 80 marks subjects for University (External) examination
(Including section I and II for 40 marks each)

Duration: **3 Hours**

Section I

Que. 1 Long Answer	1 x 10 = 10	(Any 1 out of 2)
Que. 2 Short Answer	2 x 05 = 10	(Any 2 out of 3)
Que. 3 Very Short Answer	5 x 02 = 10	(Any 5 out of 7)
Que. 4 Multiple Choice Questions	1 x 10 = 10	(10 out of 10)

Section II

Que. 1 Long Answer	1 x 10 = 10	(Any 1 out of 2)
Que. 2 Short Answer	2 x 05 = 10	(Any 2 out of 3)
Que. 3 Very Short Answer	5 x 02 = 10	(Any 5 out of 7)
Que. 4 Multiple Choice Questions	1 x 10 = 10	(10 out of 10)

Applicable for following subjects

Human Anatomy I
Human Physiology I
Basic Principles of Biomechanics
Human Anatomy II
Human Physiology II
Biomedical Physics
Biomechanics & Kinesiology
Foundation of Exercise Therapy and Therapeutic Massage
Exercise Therapy
Electrotherapy
Orthopaedics- Traumatology & Non-Traumatology
Medicine
Surgery
Physical & Functional Diagnosis
Physiotherapy in Orthopedic Conditions & Sports
Physiotherapy in Medical & Surgical Conditions
Clinical Neurology & Neurosurgery
Physiotherapy in Neuromuscular & Psychosomatic disorders
Clinical Cardiovascular & Pulmonary Conditions
Physiotherapy in Cardiovascular & Pulmonary Conditions
Community Medicine
Physiotherapy in Community Health
Health Promotion, Fitness and Wellness

Paper-style for 40 marks subjects for University (External) examination
(Including only one section)

Duration: **2 Hours**

Que. 1 Long Answer	1 x 10 = 10	(Any 1 out of 2)
Que. 2 Short Answer	2 x 05 = 10	(Any 2 out of 3)
Que. 3 Very Short Answer	5 x 02 = 10	(Any 5 out of 7)
Que. 4 Multiple Choice Questions	1 x 10 = 10	(10 out of 10)

Applicable for following subjects

Biochemistry
Sociology
General and Clinical psychology
Pathology
Microbiology
Pharmacology
Biostatistics & research Methodology
Clinical Reasoning and Evidence Based Physiotherapy
Yoga & Alternative Medicine

GENERAL INSTRUCTIONS FOR UNIVERSITY PRACTICAL EXAMINATION

(1) Practical examination should be taken and marks should be given by pair of examiners only and not by single examiner.

(2) Sealed original and duplicate mark sheets should be submitted at the end of EACH SESSION to the special supervisor or co-ordinator of examination.

(3) Examiner shall not keep any kind of rough or fair copy of any mark sheet with him/her.

O. GEN B.P.T- 13

REVIEW OF ANSWER PAPERS OF FAILED CANDIDATES

As per the regulations prescribed for review of answer papers by the University

O. GEN B.P.T- 14

INTERNAL EVALUATION FOR REPEATERS:

A candidate who has been declared failed in University examination for either of 1st, 2nd, 3rd, 4th, 5th, 6th, 7thand 8thsemester BPT is a repeater for said examination /paper/ subject.

The eligibility criteria for appearing for university examination shall be applicable for the repeaters. But, the candidate may appear for the theory and practical held during that semester, for the improvement of internal marks for the subsequent University examination in the paper/papers he/she has failed.

O. GEN B.P.T- 15

PROMOTION CRITERIA / CARRY OVER SYSTEM:

i. It is not mandatory to pass in 1stsemester B.P.T Examination to proceed to 2nd semester B.P.T. However, it is mandatory to pass in all subjects of 1stsemester B.P.T examination to be eligibleto appear for 3rdsemester B.P.T examination.

ii. It is not mandatory to pass in 2nd semester B.P.T Examination to proceed to 3rd semester B.P.T. However, it is mandatory to pass in all subjects of 2nd semester B.P.T examination to be eligible to appear for 4th semester B.P.T examination.

iii. It is not mandatory to pass in 3rd semester B.P.T Examination to proceed to 4th semester B.P.T. However, it is mandatory to pass in all subjects of 3rd semester B.P.T examination to be eligible to appear for 5th semester B.P.T examination.

iv. It is not mandatory to pass in 4th semester B.P.T Examination to proceed to 5th semester B.P.T. However, it is mandatory to pass in all subjects of 4th semester B.P.T examination to be eligible to appear for 6th semester B.P.T examination.

v. It is not mandatory to pass in 5th semester B.P.T Examination to proceed to 6th semester B.P.T. However, it is mandatory to pass in all subjects of 5th semester B.P.T examination to be eligible to appear for 7th semester B.P.T examination.

vi. It is not mandatory to pass in 6th semester B.P.T Examination to proceed to 7th semester B.P.T. However, it is mandatory to pass in all subjects of both 6th & 7th semesters B.P.T examination to be eligible to appear for 8th semester B.P.T examination.

vii. It is not mandatory to pass in 7th semester B.P.T Examination to proceed to 8th semester B.P.T However, it is mandatory to pass in all subjects of both 6th & 7th semesters B.P.T examination to be eligible to appear for 8th semester B.P.T examination.

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

O. GEN B.P.T- 16

GRACE MARKS:

The Grace Marks may be awarded by the university to a student, who has failed in any paper, either theory or Practical; but it is a subject to discretion of the Vice Chancellor.

O. GEN B.P.T- 17

DEFINITION OF TRIAL/ATTEMPT

First trial/attempt is deemed to take place when the candidate is due to appear as per the regulation of University for the examination. Similarly 2nd, 3rd, etc, trials relating to subsequent examination….

O. GEN B.P.T- 18

EXEMPTION FROM RE-EXAMINATION:

Candidates who have failed in the examination, but obtained pass marks in any subjects shall be exempted from re-examination in that subject.

O. GEN B.P.T- 19

DECLARATION OF CLASS:

A successful candidate-

1. Who secures 75% and above in the aggregate marks shall be declared to have secured 'FIRST CLASS WITH DISTINCTION' provided he/she passes the whole examination in the FIRSTATTEMPT;

2. Who secures above 60% and less than 75% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the 'FIRST CLASS, provide he/she passes the whole examination in the FIRSTATTEMPT';
3. Who secures above 50% and less than 60% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the 'SECOND CLASS'; provide he/she passes the whole examination in the FIRST ATTEMPT and
4. All other successful candidates who passed the examination in more than first/one attempt shall be declared to have PASS CLASS; irrespective of percent of marks secured.

O. GEN B.P.T- 20

COMPULSORY ROTATORY INTERNSHIP

All students of Bachelor of Physiotherapy must undergo a compulsory 18 rotatory internship for a period of 6 months after passing 8thsemester examination in all subjects. It includes Minimum 1100 hours. Candidate will have to join internship within 15 days of declaration of 8thsemester University examination result. Internship should be done in only Hospitals/Institutions recognized by the University. No candidate shall be awarded degree certificate without successfully completing six months of Internship.

The Internship should be rotatory and cover clinical branches concerned with Physiotherapy such as Orthopaedics, Cardiothoracic including ICU, Neurology, Paediatrics, General Medicine, General Surgery, Obstetrics and Gynaecology both in-patient and out-patient services. On completion of all postings, the duly completed logbooks will be submitted to the Principal/Head of program to be considered as having successfully completed the internship program.

The student has to do a dissertation/Project work in the internship as part of the curriculum of BPT course and submit it before the completion of the degree. The student will get 100 additional hours in his/her transcript for his/her dissertation / project work.

O. GEN B.P.T- 21

AWARD OF RANK:

Award of rank shall be declared on the basis of aggregate marks obtained by a candidate in university examinations only. Students who have passed all the subjects in 1stattempt in all four years without a gracing shall be eligible for the award of rank.

For declaration of outstanding student of the University for the Batch, weightage of University examination marks will be as follows:

1stsemester BPT – 10%	5thsemester BPT – 10%
2ndsemester BPT – 10%	6thsemester BPT – 10%
3rdsemester BPT – 10%	7thsemester BPT – 20%
4thsemester BPT – 10%	8thsemester BPT – 20%

O. GEN B.P.T- 22

DRESS CODE:

Professionalism with respect to dressing is encouraged throughout the course. It is each student's responsibility to have appropriate attire during all class assignments and learning activities. Students are supposed to wear apron compulsorily during practical and clinical hours.

O. GEN B.P.T- 23

MIGRATION/TRANSFER OF CANDIDATES:

The Vice Chancellor shall have the powers to place any migration/transfer he deems fit for grant of permission for migration/transfer to candidates undergoing course of study in another University as prescribed by university

COURSE OF STUDY – SUBJECTS & HOURS DISTRIBUTION

Table – I: 1st Semester BPT

Paper No	Papers	Weekly Class Hours	Total	Hou		Mark		Total Marks
	Exam Papers			Theory	Practical	Theory (External +)	Practical (External + Internal)	
1	Paper I: Human Anatomy I	10	150	90	60	80+20	80+20	200
2	Paper II: Human Physiology I	8	120	90	30	80+20	80+20	200
3	Paper III: Biochemistry	4	60	60	*****	40+10	*****	50
4	Paper IV: Sociology	4	60	60	*****	40+10	*****	50
5	Paper-V: Basic Principles of Biomechanics	4	60	60	*****	80+20	*****	100
Non-Exam Papers								
6	Paper –VI: Introduction to Physiotherapy and National Healthcare delivery system in India	2	30	60	******	******	******	******
7	Paper –VII: English, Communication and soft skills	3	45	30	15	******	******	******
8	Paper –VIII: PBL / Assignment / ICT learning / Integrated seminar	3	45			******	******	******
9	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	-	75	75		******	******	******
10	Community orientation and clinical visit	4	60					
	Total Hours in FY- 1st Semester	**42**	**705 Hours**					

Table – II: 2nd Semester BPT

Paper No	Papers	Weekly Class Hours	Total	Hours		Marks		Total Marks
	Exam Papers			Theory	Practical	Theory (External + Internal)	Practical (External + Internal)	
1	Paper –I: Human Anatomy II	10	150	90	60	80+20	80+20	200
2	Paper-II: Human Physiology II	8	120	90	30	80+20	80+20	200
3	Paper –III: Psychology	4	60	60	*****	40+10	*****	50
4	Paper –IV: Biomedical Physics	6	90	90	*****	80+20	*****	100
Non-Exam Papers								
5	Paper –V: Introduction to quality and patient safety	4	60	60	******	******	******	******
6	Paper –VI: PBL / Assignment / ICT learning / Integrated seminar	4	60			******	******	******
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	-	75	75		******	******	******
8	Community orientation and clinical visit	6	90					
	Total Hours in FY- 2nd Semester	**42**	**705 Hours**					

Table – III: 3rd Semester BPT

Paper No	Papers	Weekly Class Hours	Total	Hours		Marks		Total Marks
	Exam Papers			Theory	Practical	Theory (External + Internal)	Practical (External + Internal)	
1	Paper –I: Pathology	4	60	60	******	40+10	*****	50
2	Paper –I: Microbiology	4	60	60	******	40+10	*****	50
3	Paper-III: Pharmacology	4	60	60	******	40+10	*****	50
4	Paper –IV: Foundation of Exercise Therapy and Therapeutic Massage	14	210	120	90	80+20	80+20	200
Non-Exam Papers								
5	Paper –V: Medical Law and ethics in physiotherapy	2	30	30	******	******	******	******
6	Paper –VI: Medical Terminology & Record keeping	2	30	30	*****	******	******	******
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	-	75	75		******	******	******
8	Supervised Clinical Practice	12	180					
	Total Hours in FY	42	705 Hours					

Table – IV: 4th Semester BPT

Paper No	Papers	Weekly Class Hours	Total	Hours		Marks		Total Marks
	Exam Papers			Theory	Practical	Theory (External + Internal)	Practical (External + Internal)	
1	Paper-I: Biomechanics & Kinesiology	6	90	60	30	80+20	40+10	150
2	Paper –II: Exercise Therapy	14	210	150	60	80+20	80+20	200
3	Paper –III: Electrotherapy	14	210	150	60	80+20	80+20	200
Non-Exam Papers								
4	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	-	75	75		******	******	******
5	Supervised Clinical Practice	8	120					
	Total Hours in FY	42	705 Hours					

Table – V: 5th Semester BPT

Paper No	Papers	Weekly Class Hours	Total	Hours		Marks		Total Marks
	Exam Papers			Theory	Practical	Theory (External + Internal)	Practical (External + Internal)	
1	Paper-I: Orthopedics – Traumatology & Non-Traumatology	5	75	75	*****	80+20	*****	100
2	Paper-II: Medicine	5	75	75	*****	80+20	*****	100
3	Paper – III: Surgery	5	75	75	*****	80+20	*****	100
4	Paper –IV: Physical & Functional Diagnosis	10	150	90	60	80+20	80+20	200
Non-Exam Papers								
5	Paper –V: Professionalism and values	1	15	15	******	******	******	******
6	Paper –VI: Basic Computers And Information Science	2	30	10	20	******	******	******
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	-	75	75		******	******	******
8	Clinical Training	14	210					
	Total Hours in FY		705 Hours					

Table – VI: 6th Semester BPT

Paper No	Papers	Weekly Class Hours	Total	Hours		Marks		Total Marks
	Exam Papers			Theory	Practical	Theory (External + Internal)	Practical (External + Internal)	
1	Paper –I: Physiotherapy in Orthopedic Conditions &Sports	10	150	90	60	80+20	80+20	200
2	Paper –II: Physiotherapy in Medical & Surgical conditions	10	150	90	60	80+20	80+20	200
3	Paper – III: Yoga & Alternative Medicine	4	60	40	20	40+10	*****	50
4	Paper –IV: Clinical Reasoning & Evidence Based Physiotherapy	4	60	60	******	40+10	******	50
Non-Exam Papers								
5	Paper –VII: Diagnostic imaging for physiotherapists	1	15	15	******	******	******	******
6	Paper –VIII: ENT + Ophthalmology	1	15	15	*****	******	******	******
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	-	75	75		******	******	******
8	Clinical Training	12	180					
	Total Hours in FY	42	705 Hours					

Table – VII: 7th Semester BPT

Paper No	Papers	Weekly Class Hours	Total	Hours		Marks		Total Marks
	Exam Papers			Theory	Practical	Theory (External + Internal)	Practical (External + Internal)	
1	Paper-I: Clinical Neurology & Neurosurgery	4	60	60	*****	80+20	*****	100
2	Paper – II: Physiotherapy in Neuromuscular & Psychosomatic disorders	12	180	120	60	80+20	80+20	200
3	Paper-III: Clinical Cardiovascular & Pulmonary Conditions	4	60	60	*****	80+20	*****	100
4	Paper-IV: Physiotherapy in Cardiovascular & Pulmonary Conditions	10	150	90	60	80+20	80+20	200
Non-Exam Papers								
5	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	-	75	75		******	******	******
6	Clinical Training	12	180					
	Total Hours in FY	42	705 Hours					

Table – VIII: 8th Semester BPT

Paper No	Papers	Weekly Class Hours	Total	Hours		Marks		Total Marks
	Exam Papers			Theory	Practical	Theory (External + Internal)	Practical (External + Internal)	
1	Paper-I: Community Medicine	4	60	60	*****	80+20	*****	100
2	Paper –II: Physiotherapy in Community Health	8	120	60	60	80+20	80+20	200
3	Paper –III: Health Promotion, Fitness and Wellness	6	90	60	30	80+20	80+20	200
4	Paper –IV: Biostatistics & research Methodology	4	60	60	*****	40+10	*****	50
Non-Exam Papers								
5	Paper –V: Administration & Management in Physiotherapy	1	15	15	******	******	******	******
6	Paper –VI: Teaching Skills	1	15	15	******	******	******	******
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	-	75	75		******	******	******
8	Clinical Training	18	270					
	Total Hours in FY	42	705 Hours					

Table – IX: INTERNSHIP & PROJECT WORK

Sr. No.	Program/Work	Weekly Hours	Total hours
1.	Internship	42-48	1100
2.	Project work / Dissertation	6	100
	Total		**1200**

BACHELOR OF PHYSIOTHERAPY-TRANSCRIPT

Sr.No	Subject /Paper	Total hour
	1st Semester BPT	
	Exam Papers	
1	Paper – I: Human Anatomy I	150
2	Paper –II: Human Physiology I	120
3	Paper –III: Biochemistry	60
4	Paper –IV: Sociology	60
5	Paper –V: Basic Principles of Biomechanics	60
	Non- Exam Papers	
6	Paper –VI: Introduction to Physiotherapy and National Healthcare delivery system in India	30
7	Paper –VII: English, Communication and soft skills	45
8	Paper –VIII: PBL / Assignment / ICT learning / Integrated seminar	45
9	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	75
10	Community orientation and clinical visit	60
	Total Hours in 1st Semester BPT	**705 Hours**
	2nd Semester BPT	
	Exam Papers	
1	Paper – I: Human Anatomy II	150
2	Paper – II: Human Physiology II	120
3	Paper – III: General and Clinical Psychology	60
4	Paper – IV: Biomedical Physics	90
	Non- Exam Papers	
5	Paper –V: Introduction to quality and patient safety	60
6	Paper –VI: PBL / Assignment / ICT learning / Integrated seminar	60
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	75
8	Community orientation and clinical visit	90
	Total Hours in 2nd Semester BPT	**705 Hours**

Sr.No	Subject /Paper	Total hour
	3rd Semester BPT	
	Exam Papers	
1	Paper –I: Pathology	60
2	Paper –I: Microbiology	60
3	Paper-III: Pharmacology	60
4	Paper –IV: Foundation of Exercise Therapy and Therapeutic Massage	210
	Non- Exam Papers	
5	Paper –V: Medical Law and ethics in physiotherapy	30
6	Paper –VI: Medical Terminology & Record keeping	30
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	75
8	Supervised Clinical Practice	180
	Total Hours in 3rd Semester BPT	**705 Hours**

Sr.No	Subject /Paper	Total hour
	4th Semester BPT	
	Exam Papers	
1	Paper-I: Biomechanics & Kinesiology	90
2	Paper –II: Exercise Therapy	210
3	Paper –III: Electrotherapy	210
	Non- Exam Papers	
4	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	75
5	Supervised Clinical Practice	120
	Total Hours in 4th Semester BPT	**705 Hours**

Sr.No	Subject /Paper	Total hour
	5th Semester BPT	
	Exam Papers	
1	Paper-I: Orthopedics - Traumatology & Non-Traumatology	60
2	Paper-II: Medicine	60
3	Paper – III: Surgery	60
4	Paper –IV: Physical & Functional Diagnosis	210
	Non- Exam Papers	
5	Paper –V: Professionalism and values	15
6	Paper –VI: Basic Computers And Information Science	30
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	75
8	Clinical Training	180
	Total Hours in 5th Semester BPT	**705 Hours**

Sr.No	Subject /Paper	Total hour
	6th Semester BPT	
	Exam Papers	
1	Paper –I: Physiotherapy in Orthopedic Conditions& Sports	150
2	Paper –II: Physiotherapy in Medical &Surgical conditions	150
3	Paper – III: Yoga & Alternative Medicine	60
4	Paper –IV: Clinical Reasoning & Evidence Based Physiotherapy	60
	Non- Exam Papers	
5	Paper –V: Diagnostic imaging for physiotherapists	15
6	Paper –VI: ENT + Ophthalmology	15
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	75
8	Clinical Training	180
	Total Hours in 6th Semester BPT	**705 Hours**

Sr.No	Subject /Paper	Total hour
	7th Semester BPT	
	Exam Papers	
1	Paper-I: Clinical Neurology & Neurosurgery	60
2	Paper – II: Physiotherapy in Neuromuscular & Psychosomatic disorders	180
3	Paper-III: Clinical Cardiovascular & Pulmonary Conditions	60
4	Paper-IV: Physiotherapy in Cardiovascular & Pulmonary Conditions	150
	Non- Exam Papers	
5	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	75
6	Clinical Training	180
	Total Hours in 7th Semester BPT	**705 Hours**

Sr.No	Subject /Paper	Total hour
	8th Semester BPT	
	Exam Papers	
1	Paper-I: Community Medicine	60
2	Paper –II: Physiotherapy in Community Health	120
3	Paper –III: Health Promotion, Fitness and Wellness	90
4	Paper –IV: Biostatistics & research Methodology	60
	Non- Exam Papers	
5	Paper –V: Administration & Management in Physiotherapy	15
6	Paper –VI: Teaching Skills	15
7	Extra-Curricular Activities (Conference, Tours, Seminar, Workshop, Sports and cultural activities)	75
8	Clinical Training	270
	Total Hours in 8th Semester BPT	**705 Hours**

INTERNSHIP & PROJECT WORK

Sr. No.	Program/Work	Weekly Hours	Total hours
1.	Internship	42-48	1100
2.	Project work / Dissertation	6	100
	Total		**1200**

Total Transcript Hours = 5640 Hours + 1200 Hours = **6840** Hours

SYLLABI

First Semester B.P.T

HUMAN ANATOMY I

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

THEORY –

1. **Histology [In Brief only]:Not for University Examination**
   General Histology, study of the basic tissues of the body; Microscope, Cell, Epithelium, Connective Tissue, Cartilage, Bone, Muscular tissue, Nerve Tissue– TS & LS, Circulatory system – large sized artery, medium sized artery, large sized vein, lymphoid tissue, Skin and its appendages.
2. **Embryology [In Brief only]:Not for University Examination**
   a. Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations.
   b. Development of skin, Fascia, blood vessels, lymphatic,
   c. Development of bones, axial and appendicular skeleton and muscles,
   d. Neural tube, brain vessels and spinal cord,
   e. Development of brain and brain stem structures
3. **General Anatomy**
   a. Introduction to Anatomy, terms and terminology.
   b. Regions of Body, cavities and Systems outline.
   c. Surface anatomy – Musculo-skeletal, cardiopulmonary system.
   d. Cell Structure and function of cell organelles (Brief outline only).
   e. Connective tissue & its modification, Endocrine System, membranes.
   f. Bone structure, blood supply, growth, ossification, and classification.
   g. Muscle classification, structure and functional aspect
   h. Nerve – structure, classification, microscopy with examples.
   i. Neurons, classification with examples.
   j. Parts of a typical spinal curve /Dermatome
4. **Regional Anatomy**
   a. **Thorax**:
      i. Cardio – Vascular System Mediastinum: Divisions and contents Pericardium: Thoracic Wall: position, shape and parts of theheart;conducting System; blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body – region wise.
      ii. **Respiratory system** - Outline of respiratory passages: Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on Bronchopulmonary segments.
      iii. **Diaphragm**: Origin, insertion, nerve supply and action, openings in the diaphragm.

iv. Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.

b. **Abdomen**:
   i. Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.
   ii. Large blood vessels of the gut.
   iii. Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, gallbladder.

c. **Pelvis**: Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system.

d. **Endocrine glands**: Position, shape, size, function, blood supply and nerve supply of the following glands: Hypothalamus and pituitary gland, thyroid glands, parathyroid glands, Adrenal glands, pancreatic islets, ovaries and testes, pineal glands,thymus.

List of Practical / Demonstrations:

1. Histology-Elementary tissue including surface Anatomy- **Not for University Examination**
2. Embryology-models, charts- **Not for University Examination**
3. Demonstration of regions of body, dermatomes, Myotomes, classification of the joints, muscles, movements and range of motion on the models and charts
4. Demonstration of Anatomical position of body
5. Demonstration of elementary tissue by specimen, charts, model etc
6. Thorax including surface anatomy, abdominal muscles
7. Demonstration of the muscles of the respiration, movements of the thorax (pump handle and bucket handle), organs in the thorax
8. Identification of the ribs, sternum, thoracic vertebra, its parts, attachment of the muscles, nerves and vessels relation to bone
9. Surface making of the lung, pleura, fissures and lobes of lungs, Heart
10. Male and female reproductive system
11. Demonstration of the muscles of anterior abdominal wall, surface marking of various abdominal organs and identification of the parts of abdominal organs.
12. Identification and surface anatomy of the endocrine organs.
13. Surface markings of various organs and bony prominences

Recommended Text books:

1. SNELL[Richard S], Clinical Anatomy for Medical students : Ed. 5. Little Brown and Company Boston.

2. B.D Chaurasia's Human Anatomy – Regional And Applied; Volume I, Volume Ii And Volume iii.
3. SINGH [Inderbir],Human Osteology. JP Brothers, New Delhi1990.
4. SINGH [Inderbir], Text book of Anatomy with colour atlas: Vol I, II,III.
5. SINGH [Inderbir], Essentials of Anatomy JP Brothers, NewDelhi
6. Anatomy by Vishram Singh
7. F. Netter Atlas
8. Atlas of Anatomy – Gilroy, Ross, Thieme Publishers
9. Adam`s Atlas.
10. McMinns Atlas
11. Grant`s Atlas

Recommended Text books for Practical:

1. ROMANES [G J], Cunningham manual of practical anatomy: Vol I, II,III

Reference Books :

1. PODAR - Handbook of Osteology : Ed. 11 Scientific book co.
2. Gray's Anatomy
3. TORTORA – Principles of Anatomy &Physiology : Ed. 8 Harper & Rowpub.
4. McMinn – McMinn's color atlas of Human Anatomy.

HUMAN PHYSIOLOGY – I

SUBJECT DESCRIPTION: The course in Physiology over the first year is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body. The major topics covered include the following: the cell; primary tissue; connective tissue; skin; muscle; nervous tissue; blood; lymphoid tissues; respiration; blood vessels; circulation; cardiac cycle; systemic circulation; gastrointestinal tract; kidneys; uterus; urinary tract; pregnancy; endocrine system.

THEORY

1. **General Physiology**
    a. Cell: Morphology. Organelles: their structure and functions
    b. Transport Mechanisms across the cell membrane
    c. Body fluids: Distribution, composition.
2. **Blood**
    a. Introduction: Composition and functions of blood.
    b. Plasma: Composition, formation, functions. Plasma proteins.
    c. RBC: count and its variations. Erythropoietin- stages, factors regulating. Reticulo-endothelial system (in brief) Haemoglobin –structure, function and derivatives Anemia (in detail), types of Jaundice. Blood indices, PCV,ESR.
    d. WBC: Classification. Morphology, functions, count, its variation of each.
    Immunity
    e. Platelets: Morphology, functions, count, its variations
    f. Hemostatic mechanisms: Blood coagulation–factors, mechanisms. Their disorders. Anticoagulants.
    g. Blood Groups: Landsteiner's law. Types, significance, determination, Erythroblastosisfoetalis.
    h. Blood Transfusion: Cross matching. Indications and complications.
    i. Lymph: Composition, formation, circulation and functions.
3. **Cardiovascular System**
    a. Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organisation of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.
    b. Conducting system: Components. Impulse conduction Cardiac Cycle: Definition. Phases of cardiac cycle. Pressure and volume curves. Heart sounds – causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.
    c. Cardiac Output: Definition. Normal value. Determinants. Stroke volume and its regulation. Heart rate and its regulation. Their variations
    d. Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP.
    e. Arterial pulse.
    f. Shock – Definition. Classification–causes and features
    g. Regional Circulation: Coronary, Cerebral and Cutaneous circulation.
    h. Cardiovascular changes during exercise.

4. **Respiratory System**-
    a. Introduction: Physiological anatomy – Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles.
    b. Mechanics of breathing: Intra pleural and Intrapulmonary pressure changes during respiration. Chest expansion. Lung compliance: Normal value, pressure-volume curve, factors affecting compliance and its variations. Surfactant – Composition, production, functions. RDS
    c. Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume.
    d. Dead Space: Types and their definition.
    e. Pulmonary Circulation. Ventilation-perfusion ratio and its importance.
    f. Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport – Different forms, oxygen-hemoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr effect. Carbon dioxide transport: Different forms, chloride shift.
    g. Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control. Chemical Regulation.
    h. Hypoxia: Effects of hypoxia. Types of hypoxia. Hyperbaric oxygen therapy. Acclimatization Hypercapnoea. Asphyxia. Cyanosis – types and features. Dysbarism
    i. Disorders of Respiration: Dyspnoea. Orthopnoea. Hyperpnoea, hyperventilation, apnoea, tachypnoea. periodic breathing – types Artificial respiration
    j. Respiratory changes during exercise.
5. **Digestive System**-
    a. Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system
    b. Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication (in brief)
    c. Swallowing: Definition. Different stages. Function.
    d. Stomach: Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting.
    e. Pancreatic Secretion: Composition, production, function. Regulation.
    f. Liver: Functions of liver. Bile secretion: Composition, functions and regulation. Gall bladder: Functions.
    g. Intestine: Succusentericus: Composition, function and regulation of secretion. Intestinal motility and its function and regulation.
    h. Mechanism of Defecation.
6. **Endocrine System**-
    a. Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones
    b. Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each

hormone. Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus. Physiology of growth and development: hormonal and other influences.

c. Pituitary-Hypothalamic Relationship.
d. Thyroid Gland: Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave's disease.
e. Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism. Calcium metabolism and its regulation.
f. Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol, and Androgens. Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome.
g. Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders:Phoechromocytoma.
h. Endocrine Pancreas: Secretory cells, action, regulation of secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.
i. Calcitrol, Thymus and Pineal gland (very brief).
j. Local Hormones.(Briefly) .

PRACTICALS –

1. **Hematology:**

    a. Study of Microscope and its uses

    b. Determination of RBC count

    c. Determination of WBC count

    d. Differential leukocyte count

    e. Estimation of hemoglobin

    f. Calculation of blood indices

    g. Determination of blood groups

    h. Determination of bleeding time

    i. Determination of clotting time

2. **Blood pressure**– palpatory and auscultatory method: Variation of blood pressure in posture.
3. Auscultation of Normal breath sound & heart sound
4. **Spirometry:** Recording of Lung volumes & capacities.
5. Breathe holding time
6. Mercury column test (40 mm Hg test)
7. Clinical Examination: Chest expansion, Pulse rate and Respiratory rate,

Demonstrations only**(NOT for University Exam)**

1. Determination of ESR
2. Determination of PCV

Recommended text books:

1. Text book of medical physiology – Guyton Arthur
2. Concise medical physiology – Chaudhuri SujitK.
3. Human Physiology – ChatterjeeC.C.
4. Text book of practical Physiology –Ranade.
5. Text of Physiology – A. K.Jain.
6. Basics of Medical physiology- Venkatesh D &Sudhakar HH
7. Manipal Manual of Physiology – Prof. C Chandrasekhar
8. Exercise Physiology – McArdle, Katch&Katch

Reference:

1. Review of Medical Physiology – Ganong WilliamF.
2. Physiological basis of Medical practice – Best &Taylor

BIOCHEMISTRY

THEORY

1. **Nutrition**–
    a. Introduction, Importance of nutrition Calorific values, Respiratory quotient – Definition, and its significance Energy requirement of a person - Basal metabolic rate: Definition, Normal values, factor affecting BMR Special dynamic action of food.
    b. Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person
    c. Balanced diet
        i. Recommended dietary allowances
        ii. Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers
        iii. Role of lipids in diet
        iv. Role of proteins in diet: Quality of proteins - Biological value, net protein utilization, Nutritional aspects of proteins-essential and non- essential amino acids. Nitrogen balance
        v. Nutritional disorders.
2. **Carbohydrate Chemistry**–
    a. Definition, general classification with examples, Glycosidic bond
    b. Structures, composition, sources, properties and functions of Mono
    c. Glycosaminoglycan (mucopolysaccharides)
3. **Lipid Chemistry**–
    a. Definition, general classification
    b. Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids,Cholesterol
    c. Essential fatty acids and their importance
    d. Lipoproteins: Definition, classification, properties, Sources and function Ketonebodies
4. **Amino-acid Chemistry**–
    a. Amino acid chemistry: Definition, Classification, Peptide bonds
    b. Peptides: Definition, Biologically important peptides
    c. Protein chemistry: Definition, Classification, Functions of proteins,
5. **Enzymes**–
    a. Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with examples, Factors effecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (clinical significance of enzymes)
6. **Nucleotide and Nucleic acid Chemistry**-
    a. Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body.
    b. Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA. Structure and functions of t RNA, rRNA,mRNA.

7. **Digestion and Absorption**-
    a. General characteristics of digestion and absorption, Digestion and absorption of carbohydrates, proteins and lipids. Disorders of digestion and absorption – Lactose intolerance.
8. **Carbohydrate Metabolism**-
    a. Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation.
    b. Glycogen metabolism – Glycogenesis, Glycogenolysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle
    c. Hormonal regulation of glucose, Glycosuria, Diabetes mellitus.
9. **Lipid Metabolism**-
    a. Introduction to lipid metabolism, Lipolysis, Oxidation of fatty acids -oxidation of fatty acids,
    b. Lipogenesis - Denovo synthesis of fatty acids, chain elongation, desaturation, triacylglycerol synthesis, fat metabolism in adipose tissues
    c. Ketonebody metabolism: Ketone body formation (ketogenesis),utilization (ketolysis), ketosis, Rothera's test.
    d. Cholesterol metabolism: synthesis, degradation, cholesterol transport
    e. Hypercholesterolemia and its effects (atherosclerosis and coronary heart diseases) Hypocholesterolemic agents, Common hyper lipoproteinemia, Fatty liver
10. **Amino acid and Protein Metabolism**-
    a. Catabolism of amino acids - Introduction, transamination, deamination, Fate of ammonia, transport of ammonia, Urea cycle
    b. Specialized products formed from amino acids - from glycine, arginine, methionine, phenylalanine and tyrosine.
11. **Vitamins**-
    a. Definition, classification according to solubility,
    b. Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity.
12. **Mineral Metabolism**-
    a. Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper. Phosphate, calcium and iron in detail.
13. **Muscle Contraction**–
    a. Contractile elements in muscle, briefly on the process of muscle contraction, Energy for muscle contraction.
14. **Biochemistry of Connective tissue**-
    a. Introduction, various connective tissue proteins: Collagen, elastin - Structure and associated disorders. Glycoproteins,Proteoglycans.
15. **Hormone Action**-
    a. Definition, classification, Mechanism of hormone action. Receptors, signal transduction, second messengers and cell function.

16. **Acid-Base balance**-
    a. Acids, bases and buffers, PH. Buffer systems of the body, bicarbonate buffer system Role of lungs and kidneys in acid base balance, Acid base imbalance.
17. **Water balance**-
    a. Water distribution in the body, Body water, water turnover, Regulation of water balance: role of ADH and thirst centre.
18. **Electrolyte balance**-
    a. Osmolarity. Distribution of electrolytes.
    b. Electrolyte balance: Role of aldosterone, rennin angiotensin system and ANF.
19. **Clinical Biochemistry**-
    a. Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate. Liver function tests, Renal function tests.

Recommended Textbooks:

1. Fundamentals of Biochemistry by U. Satyanarayana, UChakrapani.
2. Manipal manual of ClinicalBiochemistry.

Reference Books:-

1. Fundamentals of Biochemistry by A.C. Deb Publisher : New central bookagency
2. T.B. of Medical Biochemistry by MN Chatterjee, RanaShinde.
3. T.B. of Biochemistry by DM Vasudevan, shreekumariS.
4. MURRAY [ROBERT KK], Harper's Bio Chemistry Ed 24, Prentice Hall.1996
5. RAMAKRISHNA [S], PRASANNA [KG], RAJAN [R], Text Book of Medical Biochemistry.
6. VASUDEVAN [DM] and SREE KUMARI [S], Text Book of BioChemistry for Medical students.
7. DAS [Debajyothi],Biochemistry.
8. LEHININGER [Albert] et. al., Principles of Biochemistry.
9. ORTEN [James M] and NEUHAUS [OHO.W]. Human Biochemistry.
10. Strayer [LUBERT],Biochemistry.
11. DEVLIN [Thomas M], Biochemistry with Clinical Correlation.

SOCIOLOGY

SUBJECT DESCRIPTION - Sociology will introduce student to the basic sociology concepts, principles and social process, social institutions in relation to the individual, family and community and the various social factors affecting the family in rural and urban communities in India will be studied.

THEORY

1. Introduction:
    a. Meaning- Definition and scope of sociology
    b. Its relation to Anthropology, Psychology, Social Psychology.
    c. Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods.
    d. Importance of its study with special reference to Health Care Professionals.
2. Social Factors in Health and disease situations:
    a. Meaning of social factors
    b. Role of social factors in health and illness
3. Socialization:
    a. Meaning and nature of socialization.
    b. Primary, Secondary and Anticipatory socialization.
    c. Agencies of socialization.
4. Social Groups:
    a. Concepts of social groups, influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital and rehabilitation setup.
5. Family:
    a. The family, meaning and definitions.
    b. Functions of types of family
    c. Changing family patterns
    d. Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.
6. Community:
    a. Rural community: Meaning and features –Health hazards of ruralities, health hazards to tribal community.
    b. Urban community: Meaning and features- Health hazards of urbanities.
7. Culture and Health:
    a. Concept of Health
    b. Concept of Culture
    c. Culture and Health
    d. Culture and Health Disorders
8. Social change:
    a. Meaning of social changes.
    b. Factors of social changes.
    c. Human adaptation and social change
    d. Social change and stress.
    e. Social change and deviance.
    f. Social change and health programme
    g. The role of social planning in the improvement of health and rehabilitation.

9. Social Problems of disabled: Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems.

a. Population explosion
b. Poverty and unemployment
c. Beggary
d. Juvenile delinquency
e. Prostitution
f. Alcoholism
g. Problems of women in employment
h. Geriatric problems
i. Problems of underprivileged.

10. Social Security:

a. Social security and social legislation in relation to the disabled.

11. Social worker:

a. Meaning of Social Work
b. The role of a Medical Social Worker.

Recommended Books:

1. Bid D. (2006). **Sociology for Physiotherapists**. Jaypee Brothers, NewDelhi.

2. Sachdeva and Vidyabushan: Introduction to the study of Sociology.

3. K. Parks Textbook of Preventive & Social Medicine.

4. Textbook of Preventive & Social Medicine – P.K. Mahajan & M.C.Gupta

BASIC PRINCIPLES OF BIOMECHANICS

Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of musculoskeletal system. Students are taught to understand the various quantitative and qualitative methods of movement. Mechanical principles of various treatment methods are studied.

THEORY

1. Basic Concepts in Biomechanics
    - **i. Description of motion(Kinematics)**
        a. Types of motion,
        b. laws of motion,
        c. location of motion,
        d. direction of motion,
        e. magnitude of motion
        f. Planes and axis of motion (mechanical and anatomical)

    - **ii. Analysis of force(Kinetics)**
        a. Definition of force,
        b. magnitude of force,
        c. point of application,
        d. Linear force- Tensile Forces, Joint Distraction, Newton's Law of Inertia
        e. direction of force,
        f. Components of force,
        g. composite effects of two or more forces,
        h. torque,
        i. Force of friction,
        j. force of inertia,
        k. force of gravity,
        l. equilibrium
        m. Centripetal and Centrifugal force
        n. Work
        o. Lever: definition,
        p. orders of lever,
        q. mechanical advantage and disadvantage in lever
        r. anatomical lever,
        s. levers in Physiotherapy
        t. Equilibrium of levers
        u. Anatomical pulley,
        v. anatomical wheel &axis

2. Principles of stability
    a. Base of support,
    b. height,
    c. mass of body,
    d. the impact of forces(e.g. Gravity),
    e. segmentation,
    f. visual factors,
    g. psychological factors,
    h. physiological factors
3. Joint structure and Function-
    a. Joint design
    b. Materials used in human joints
    c. General properties of connective tissues
    d. Human joint design
    e. Joint function
    f. Joint motion
    g. General effects of disease, injury and immobilization.

4. Muscle structure and function-
    a. Classification of muscles & Elements of muscle structure
    b. Line of pull
    c. Types of contractions
    d. Role of muscles and tendons,
    e. Mobility and stability functions of muscles
    f. Muscle function, action of two joint motions, non customary action
    g. Effects of immobilization, injury and aging

5. **Impetus:** Impetus to external objects and receiving impetus

Recommended Text Books:

1. Joint Structure and Function – A comprehensive Analysis by Cynthia Norkin.
2. Brunnstrom's Clinical Kinesiology by Laura Smith, Elizabeth Beth Weiss, and Don Lehmkuhl.

Recommended Reference Books:

1. Clinical Kinesiology for Physical Therapist Assistants byLippert
2. Applied Kinesiology: A Training Manual and Reference Book of Basic Principles and Practices by Robert Frost (Mar 28,2002)
3. Kinesiology: The Mechanics and Pathomechanics of Human Movement by CarolA.Oatis
4. Kinesiology by K. Wells; Sauder’s Publications.
5. Basic Biomechanics of the Musculoskeletal System by Margareta Nordinand Victor H. Frankel

Not for University Exam

INTRODUCTION TO PHYSIOTHERAPY AND NATIONAL HEALTHCARE DELIVERY SYSTEM IN INDIA

SUBJECT DESCRIPTION: The course provides the students a basic insight into the main features of Indian health care delivery system and how it compares with the other systems of the world. Topics to be covered under the subject are as follows:

1. Introduction to healthcare delivery system
    a. Healthcare delivery system in India at primary, secondary and tertiary care
    b. Community participation in healthcare delivery system
    c. Health system in developed countries.
    d. Private Sector
    e. National Health Mission
    f. National Health Policy
    g. Issues in Health Care Delivery System in India
2. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.
3. Introduction to AYUSH system of medicine
    a. Introduction to Ayurveda.
    b. Yoga and Naturopathy
    c. Unani
    d. Siddha
    e. Homeopathy
    f. Need for integration of various system of medicine
4. Health scenario of India- past, present and future
5. Demography & Vital Statistics-
    a. Demography – its concept
    b. Vital events of life & its impact on demography
    c. Significance and recording of vital statistics
    d. Census & its impact on health policy
6. Epidemiology
    a. Principles of Epidemiology
    b. Natural History of disease
    c. Methods of Epidemiological studies
    d. Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance.
7. Components of Physiotherapy Profession
    a) History of Medical therapeutics.
    b) Information of education department, training and course detail.
    c) Information for new student commencing physiotherapy.
    d) Why to select physiotherapy?
8. Role of Physiotherapy in meeting Health Care Needs in India Needs versus Demands
    Physiotherapist as 'Educator' Educational resources.
    Common problems and solutions

ENGLISH, COMMUNICATION AND SOFT SKILLS

Major topics to be covered under Communication course –

1. Basic Language Skills: Grammar and Usage.
2. Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation.
3. Teaching the different methods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization.
4. Basic concepts & principles of good communication
5. Special characteristics of health communication
6. Types & process of communication – verbal, non-verbal and written communication. Upward, downward and lateral communication.
7. Therapeutic communication: empathy versus sympathy.
8. Communication methods for teaching and learning.
9. Communication methods for patient education.
10. Barriers of communication & how to overcome.

COMMUNITY ORIENTATION AND CLINICAL VISIT

The objective of this particular section of the foundation course is to sensitize potential learners with essential knowledge; this will lay a sound foundation for their learning across the under-graduate program and across their career. Innovative teaching methods should be used to ensure the attention of a student and make them more receptive such as group activities, interactive fora, role plays, and clinical bed-side demonstrations.

1. The community orientation and clinical visit will include visit to the entire chain of healthcare delivery system -Sub centre, PHC, CHC, SDH, DH and Medical College, private hospitals, dispensaries and clinics.

2. The student will also be briefed regarding governance at village level including interaction and group discussion with village panchayat and front line health workers.

3. Clinical visit to their respective professional department within the hospital.

Second Semester B.P.T

HUMAN ANATOMY II

Studies are concerned with the topographical and functional anatomy of the limbs and thorax. Particular attention is paid to the muscles, bones and joints of the regions. The head and neck and central nervous system (CNS) are studied with particular reference to topics of importance to physiotherapists. The study of the CNS includes detailed consideration of the control of motor function.

1. **Musculo Skeletal Anatomy -**
   a. Anatomical positions of body, axes, planes, common anatomical terminologies (Groove, tuberosity, trochanters etc)
   b. Connective tissue classification.
   c. Bones- Composition & functions, classification and types according to morphology and development.
   d. Joints-definition-classification, structure of fibrous, cartilaginous joints, blood supply and nerve supply of joints.
   e. Muscles – origin, insertion, nerve supply and actions of all muscles of body.
2. **Upper Extremity**
   i. Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals,Phalanges.
   ii. Soft parts: Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of fore arm, back of fore arm, palm, dorsum of hand, muscles, nerves, blood vessels and lymphatic drainage of upper extremity.
   iii. Joints: Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.
   iv. Arches of hand, skin of the palm and dorsum offhand.
   v. Applied anatomy of upper extremity
3. **Lower Extremity**
   i. Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metartarsals and phalanges.
   ii. Soft parts: Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot, skin of foot.
   iii. Joints: Hip Joint, Knee joint, Ankle joint, joints of the foot.
   iii. Applied anatomy of lower extremity

4. **Trunk &Pelvis:**
    i. Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs.
    ii. Soft tissue: Pre and Para vertebral muscles, intercostals muscles, anterior abdominal wall muscles, Inter-vertebral disc.
    iii. Pelvic girdle and muscles of the pelvic floor.
    iv. Applied anatomy of Trunk &Pelvis

5. **Head and Neck:**
    a. Osteology: Mandible and bones of the skull.
    b. Soft parts: Muscles of the face and neck and their nerve and blood supply- extra ocular muscles, triangles of the neck.
    c. Gross anatomy of eyeball, nose, ears and tongue.
    iv. Applied anatomy of Head and Neck

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

    i. Cranial nerves
    ii. Peripheral nervous system
    iii. Peripheral nerve
    iv. Neuromuscular junction
    v. Sensory end organs
    vi. Central Nervous System
    vii. Spinal segments and areas
    viii. Brainstem
    ix. Cerebellum
    x. Inferiorcolliculi
    xi. SuperiorColliculi
    xii. Thalamus
    xiii. Hypothalamus
    xiv. Corpus striatum
    xv. Cerebral hemisphere
    xvi. Lateral ventricles
    xvii. Blood supply to brain
    xviii. Basal Ganglia
    xix. The pyramidal system
    xx. Pons, medulla, extra pyramidal systems
    xxi. Anatomical integration
    xxii. Applied anatomy of CNS andPNS

PRACTICAL - List of Practical / Demonstrations *

1. Upper extremity including surface Anatomy. Demonstration of the muscles of the upper extremity, movements in joints, identification of body prominences on inspection and by palpation, points of palpation of nerves and arteries. Identification of the bones of the upper extremity, side determination, parts, attachment of the muscles, nerves and vessels relation to bone.
2. Lower extremity including surface Anatomy. Demonstration of the muscles of the lower extremity, movements in joints, identification of body prominences on inspection and by palpation, points of palpation of nerves and arteries. Identification of the bones of the lower extremity, side determination, parts, attachment of the muscles and relation of nerves and vessels to bone.
3. Demonstration of the Head & Neck and Spinal cord & Brain including surface Anatomy.
4. Demonstration of the muscles of the back, pelvic girdle, pre and para vertebral muscles, movements in joints, identification of body prominences on inspection and by palpation.
5. Identification of the bones of the vertebral column (cervical, lumbar, sacral and coccygeal) parts, attachment of the muscles and relation of nerves and vessels to bone.
6. Surface Markings of Various Organs and Bony Prominences
7. Radiographic Identification of Bone and Joints

Recommended Text books:

1. SNELL[RichardS],ClinicalAnatomyforMedicalstudents:Ed.5.LittleBrown and Company Boston.
2. B.D Chaurasia's Human Anatomy – Regional and Applied; Volume I, Volume Ii and Volume iii.
3. SINGH [Inderbir],Human Osteology. JP Brothers, New Delhi1990.
4. SINGH [Inderbir], Text book of Anatomy with colour atlas: Vol I, II,III.
5. SINGH [Inderbir], Essentials of Anatomy JP Brothers, NewDelhi

Recommended Text books for Practical:

1. ROMANES [G J], Cunningham manual of practical anatomy: Vol I, II,III

Reference Books :

1. PODAR - Handbook of Osteology : Ed. 11 Scientific book co.
2. Gray's Anatomy
3. TORTORA – Principles of Anatomy &Physiology : Ed. 8 Harper & Rowpub.
4. McMinn – McMinn's color atlas of Human Anatomy.

HUMAN PHYSIOLOGY II

1. **Special Senses-**
    i. Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor – glaucoma, lens – cataract, vitreous humor, rods and cones. Photopic vision. Scotopic vision.
    ii. Visual Pathway and the effects of lesions.
    iii. Refractive Errors: myopia, hypermetropia, presbyopia and astigmatism.
    iv. Visual Reflexes: Accommodation, Pupillary and Light. Visual acuity and Visual field. Light adaptation. Dark adaptation.Color vision – color blindness.Nyctalopia.
    v. Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear. Structure of Cochlea and organ of corti. Auditory pathway. Types of Deafness. Tests for hearing.Audiometry.
    vi. Taste: Taste buds. Primary tastes. Gustatory pathway.
    vii. Smell: Olfactory membrane. Olfactory pathway.
    viii. Vestibular Apparatus: Crista ampullaris and macula. Funcions.Disorders
2. **Nervous System-**
    i. Introduction: Organisation of CNS – central and peripheral nervous system. Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties.
    ii. Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts – Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract – their origin, course, termination and functions. The trigeminal pathway. Sensory cortex. Somatic sensations: crude touch, fine touch, tactile localization, tactile discrimination, stereognosis, vibration sense, kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain –slow and fast pain, hyperalgesia. Deep pain. Visceral pain – referred pain. Gate control theory of pain. tabesdorsalis, sensory ataxia.
    iii. Motor Mechanism: Motor Cortex. Motor pathway: The descending tracts – pyramidal tracts, extra pyramidal tracts – origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.
    iv. Reflex Action: components, Bell-Magendie law, classification and Properties. Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes. Stretch reflex– structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex. Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL

v. Brainstem: Functions of Pons, midbrain and medulla oblongata.
vi. Tracts of Spinal Cord, Spinal cord Lesions: Complete transection and Hemisection of the spinal cord.
vii. Cerebellum: Functions. Cerebella ataxia.
viii. Descending Tracts, Pyramidal and Extra pyramidal Tracts.
ix. Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain and cerebral reflexes.
x. Thalamus and Hypothalamus: Nuclei. Functions. Thalamic syndrome
xi. Reticular Formation and Limbic System: Components and Functions.
xii. Basal Ganglia: Structures included and functions. Parkinson's disease.
xiii. Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex – learning, memory and speech.
xiv. EEG: Waves and features. Sleep: REM and NREM sleep.
xv. CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.
xvi. ANS: Features and actions of parasympathetic and sympathetic nervous system.

3. Renal System-

i. Introduction: Physiological anatomy. Nephrons – cortical and juxtamedullary. Juxta-glomerular apparatus. Glomerular membrane.Renalblood flow and its regulation. Functions of kidneys.
ii. Mechanism of Urine Formation: Glomerular Filtration: Mechanism of glomerular filtration. GFR – normal value and factors affecting. Renal clearance. Inulin clearance. Creatinine clearance.
iii. Tubular Reabsorption: of Na+, glucose, HCO3-, urea and water. Filtered load. Renal tubular transport maximum. Glucose clearance: TmG. Renal threshold for glucose.
iv. Tubular Secretion: Secretion of H+ and K+. PAH clearance.
v. Mechanism of concentrating and diluting the Urine: Counter-current mechanism. Regulation of water excretion. Diuresis. Diuretics.
vi. Micturition: Mechanism of micturition. Cystometrogram. Atonic bladder, automatic bladder.
vii. Acid-Base balance (very brief)
viii. Artificial Kidney: Principle of haemodialysis.
ix. Skin and temperature regulation.

4. **Reproductive System-**
    i. Introduction: Physiological anatomy reproductive organs. Sex determination. Sex differentiation. Disorder
    ii. Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis. Testosterone: action. Regulation of secretion. Semen.
    iii. Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis. Hormones: estrogen and progesterone-action. Regulation of secretion. Menstrual Cycle: Phases. Ovarian cycle. Uterine cycle. Hormonal basis. Menarche. Menopause. Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods
5. **Nerve Muscle Physiology**
    i. Introduction: Resting membrane potential. Action potential – ionic basis and properties.
    ii. Nerve: Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibers. Nerve injury – degeneration and regeneration.
    iii. Neuroglia: Types and functions.
    iv. Muscle: Classification. Skeletal muscle: Structure. Neuromuscular junction: Structure. Neuromuscular transmission, myasthenia gravis. Excitation- Contraction coupling. Rigormortis. Motor unit. Properties of skeletal muscles, Length-tension relationship, fatigue, load.
    v. Smooth muscle: Structure, types, mechanism of contraction.
6. **Physiology of exercise–Effects of acute and chronic exerciseon**
    1. O_2 transport
    2. Muscle strength/power/endurance
    3. B.M.R./R.Q.
    4. Hormonal and metabolic effect
    5. Cardiovascular system
    6. Respiratory system
    7. Body fluids and electrolyte
7. **Effect of gravity / altitude /acceleration / pressure on physical parameters.**
8. **Physiology of Aging**

PRACTICAL AND DEMONSTRATIONS

Central Nervous System:

1. Testing of peripheral sensations and cranial nerves.
2. Superficial and deep reflexes.
3. Tests for Cerebral and Cerebellar functions- Equilibrium and Non-equilibrium Tests

Graphs-

1. Skeletal muscle-properties.
2. Cardiac muscle-properties

Physical fitness:

1. Cardiac efficiency test- Master's step test, Treadmill test
2. Six-minute walk test.

Clinical examination-

Higher functions, memory, time, orientation, reflexes, motor & sensory system

Recommended text books:

1. Text book of medical physiology – Guyton Arthur
2. Concise medical physiology – Chaudhuri SujitK.
3. Human Physiology – ChatterjeeC.C.
4. Text book of practical Physiology –Ranade.
5. Text of Physiology – A. K.Jain
6. Basics of Medical physiology- Venkatesh D &Sudhakar HH
7. Manipal Manual of Physiology – Prof. C NChandrasheka
8. Exercise Physiology – McArdle, Katch&Katch

Reference:

1. Review of Medical Physiology – Ganong William.
2. Physiological basis of Medical practice – Best &Taylor

GENERAL & CLINICAL PSYCHOLOGY

SUBJECT DESCRIPTION -

Human Psychology involves the study of various behavioral patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional and language development, communication and interaction skills appropriate to various age groups.

The study of these subjects will help the student to understand their clients while assessment and while planning appropriate treatment methods.

THEORY -

1. **Introduction to Psychology**
    a. Schools: Structuralism, functionalism, behaviorism, Psychoanalysis.
    b. Methods: Introspection, observation, inventory and experimental method.
    c. Branches: pure psychology and applied psychology
    d. Psychology and physiotherapy
2. **Growth and Development**
    a. Life span: Different stages of development (Infancy, childhood, adolescence, adulthood, middle age, oldage).
    b. Heredity and environment: role of heredity and environment in physical and psychological development, “Nature v/s Nurture controversy”.
3. **Sensation, attention and perception**
    a. Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense.
    b. Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants).
    c. Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context).
    d. Illusion and hallucination: different types.
4. **Motivation**
    a. Motivation cycle (need, drive, incentive, reward).
    b. Classification of motives.
    c. Abraham Maslow’s theory of need hierarchy
5. **Frustration and conflict**
    a. Frustration: sources of frustration.
    b. Conflict: types of conflict.
    c. Management of frustration and conflict
6. **Emotions**
    a. Three levels of analysis of emotion (physiological level, subjective state, and overt behavior).
    b. Theories of emotion
    c. Stress and management of stress.

7. **Intelligence**
    a. Theories of intelligence.
    b. Distribution of intelligence.
    c. Assessment of intelligence
8. **Thinking**
    a. Reasoning: deductive and inductive reasoning
    b. Problem solving: rules in problem solving (algorithm and heuristic)
    c. Creative thinking: steps in creative thinking, traits of creative people
9. **Learning**
    a. Factors effecting learning.
    b. Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.
    c. The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.
10. **Personality**
    a. Approaches to personality: type & trait, behaviorist, psychoanalytic and humanistic approach.
    b. Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.
    c. Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjections, acting out.
11. **Social psychology**
    a. Leadership: Different types of leaders. Different theoretical approaches to leadership.
    b. Attitude: development of attitude. Change of attitude.
12. **Clinical psychology** – Models of training, abnormal behavior assessment, clinical judgment, psychotherapy, self-management methods, physiotherapist patient interaction, aggression, self-imaging, stress management, assertive training, Group therapy, Body awareness, Pediatric, child and geriatric clinical psychology.

Recommended text books:

1. Ramalingam& Bid (2009). Psychology for Physiotherapists. Jaypee Brothers, NewDelhi.

2. Morgan et al (2003). Introduction to Psychology. New Delhi: Tata McGrawhill.

3. Feldman. R. H. (1996). Understanding Psychology. New Delhi: Tata McGrawhill.

4. Atkinson(1996). Dictionary of Psychology.

BIOMEDICAL PHYSICS (FUNDAMENTALS OF ELECTROTHERAPY):

SUBJECT DESCRIPTION - To understand the concept and basic principles to know electrotherapy equipments is given under this topic. The student will be taught about physics related to electrotherapy and application on human body tissues.

1. Physical principles
    a. Structure and properties of matter -solids, liquids and gases, adhesion, surface tension, viscosity, density and elasticity.
    b. Structure of atom, molecules, elements and compound
    c. Electricity: Definition and types. Therapeutic uses. Basic physics of construction. Working
    d. Importance of currents in treatment.
    e. Static Electricity: Production of electric charge. Characteristic of a charged body.
    f. Characteristics of lines of forces. Potential energy and factors on which it depends. Potential difference and EMF.
    g. Current Electricity: Units of Electricity: farad, Volt, Ampere, Coulomb, Watt
    h. Condensers: Definition, principle, Types- construction and working, capacity & uses.
    i. Magnetism: Definition. Properties of magnets. Electromagnetic induction. Transmission by contact. Magnetic field and magnetic forces. Magnetic effects of an electric field.
    j. Conductors, Insulators, Potential difference, Resistance and intensity
    k. Ohm's law and its application to DC and AC currents. Fuse: construction, working and application.
    l. Transmission of electrical energy through solids, liquids, gases and vacuum.
    m. Rectifying Devices-Thermionic valves, Semiconductors, Transistors, Amplifiers, transducer and Oscillator circuits.
    n. Display devices and indicators-analogue and digital.
    o. Transformer: Definition, Types, Principle, Construction, Eddy current, working uses
    p. Chokes: Principle, Construction and working, Uses
2. Effects of Current Electricity
    a. Chemical effects-lons and electrolytes, lonisation, Production of an EMF by chemical actions.
    b. Ionization: Principles, effects of various technique of medical ionization.
    c. Electromagnetic Induction.
    d. Electromagnetic spectrum.

3. Electrical Supply
    a. Brief outline of main supply of electric current
    b. Dangers-short circuit, electric shocks: Micro/ Macro shocks
    c. Precaution-safety devices, earthing, fuses etc.
    d. First aid and initial management of electric shock
    e. Burns: electrical & chemical burns, prevention and management

4. Various agents
    a. Thermal agents: Physical Principles of cold, Superficial and deep heat.
    b. Ultrasound: Physical Principles of Sound
    c. Electro- magnetic Radiation: Physical Principles and their Relevance to Physiotherapy Practice
    d. Electric Currents: Physical Principles and their Relevance to Physiotherapy Practice.
5. Therapeutic Electricity –
    a. Therapeutic currents –Impulses, definition and types, pulse duration and Depletion times.
    b. Galvanic current, Faradic currents, Surging current, exponentially progressive current, biphasic current.
    c. Types of electrodes of elector diagnostic and therapeutic application.

Recommended Books:

1. Biophysical Bases of Electrotherapy: by Alex Ward, 1stEdition
2. Physical Principles Explained: Low &Reed
3. Biophysics: An Introduction [Paperback] Roland Glaser
4. Principal of Electronics By. V. K.Mehta
5. Fundamentals of Physics By Robert Resnik

Not For University Exam

INTRODUCTION TO QUALITY AND PATIENT SAFETY

1. Quality assurance and management - The objective of the course is to help students understand the basic concepts of quality in health Care and develop skills to implement sustainable quality assurance program in the health system.
    a. Concepts of Quality of Care
    b. Quality Improvement Approaches
    c. Standards and Norms
    d. Quality Improvement Tools
    e. Introduction to NAB guidelines

2. Basics of emergency care and life support skills - Basic life support (BLS) is the foundation for saving lives following cardiac arrest. Fundamental aspects of BLS include immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), and rapid defibrillation with an automated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS. The student is also expected to learn about basic emergency care including first aid and triage. Topics to be covered under the subject are as follows:

    a. Vital signs and primary assessment

    b. Basic emergency care – first aid and triage
        i. Importance of First Aid in Physiotherapy.
        ii. Instrumentation used in First Aid (First Aid kit).
        iii. Examination of Vital Signs
        iv. First Aid in cardiac arrest.
        v. First Aid in Respiratory failure.
        vi. First Aid in Burns.
        vii. First Aid in Electric shock.
        viii. First Aid in Drowning.
        ix. First Aid in Spinal cord injuries and fractures**.**
        x. First Aid in Hypovolemic Shock.
        xi. First Aid in Poisoning
        xii. First Aid in RTA.

c. Ventilations including use of bag-valve-masks(BVMs)

d. Choking, rescue breathing methods

e. One- and Two-rescuer CPR

f. Using an AED (Automated external defibrillator).

g. Managing an emergency including moving a patient

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

3. Disaster preparedness and management- The objective of this section will be to provide knowledge on the principles of on-site disaster management. Concepts to be taught should include-

    a. Fundamentals of emergency management,

    b. Psychological impact management,

    c. Resource management,

    d. Preparedness and risk reduction,

    e. Key response functions (including public health, logistics and governance, recovery, rehabilitation and reconstruction), information management, incident command and institutional mechanisms.

Third Semester B.P.T

PATHOLOGY

SUBJECT DESCRIPTION: This subject follows the basic subjects of Anatomy, Physiology and Biochemistry and it forms a vital link between preclinical subjects and clinical subjects. Pathology involves the study of causes and mechanisms of diseases. Microbiology involves the study of common organisms causing diseases including nosocomial infections and precautionary measures to protect one from acquiring infections. The knowledge and understanding of Microbiology & Pathology of diseases is essential to institute appropriate treatment or suggest preventive measures to the patient. Particular effort is made in this course to avoid burdening the student.

THEORY –

A. General Pathology

1. Introduction to Pathology
2. Cell injuries–
    a. Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure. Reversible cell injury: Types, Sequential changes, Cellular swellings, vacuolation, Hyaline changes, Mucoid changes. Irreversible cell injury: Types of Necrosis & Gangrene, Autolysis. Pathologic calcification: Dystrophic and Metastatic. Intracellular Accumulations - Fatty changes, Protein accumulations, Glycogen accumulations,
    b. Pigments - Melanin /Hemosiderin.
    c. Extra cellular accumulations: Amyloidosis - Classification, Pathogenesis, Pathology including special stains.

3. Inflammation and Repair–

a. Acute inflammation: features, causes, vascular and cellular events.
b. Inflammatory cells and Mediators. Chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples.
c. Repair, Wound healing by primary and secondary union, factors promoting and delaying the process.
d. Healing in specific site including bone healing.

4. Immunopathology–

a. Immune system: General concepts.
b. Hypersensitivity: type and examples, antibody and cell mediated tissue injury with examples. . Secondary immunodeficiency including HIV infection. Auto-immune disorders: Basic concepts and classification,SLE.
c. AIDS-Aetiology, Modes of transmission, Diagnostic procedures, handling of infected material and health education.

5. Infectious diseases–

a. Mycobacterial diseases: Tuberculosis, Leprosy and Syphilis.
b. Bacterial disease: Pyogenic, Diphtheria, Gram negative infection, Bacillary

dysentery.

c. Viral diseases: Poliomyelitis, Herpes, Rabies, Measles, Rickttsia, Chlamydial infection, HIV infection.
d. Fungal disease and opportunistic infections.
e. Parasitic diseases: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatidcyst.

6. Circulatory Disturbances–

a. Hyperemia/Ischemia and Haemorrhage Edema: Pathogenesis and types. Chronic venous congestion: Lung, Liver, Spleen, Systemic Pathology Thrombosis and Embolism: Formation, Fate and Effects.
b. Infarction: Types, Common sites.
c. Shock: Pathogenesis, types, morphologic changes.

7. Growth Disturbances and Neoplasia

a. Atrophy, Hypertrophy, Hyperplasia, Aplasia, Hypoplasia, Metaplasia, Malformation, agenesis,dysplasia.
b. Precancerous lesions.
c. Neoplasia: Definition, classification, Biological behaviour : Benign and Malignant, Carcinoma and Sarcoma.
d. Malignant Neoplasia: Grades and Stages, Local & Distant spread.
e. Carcinogenesis: Environmental carcinogens, chemical, viral, occupational. Heredity and cellular oncogenes and prevention of cancer.
f. Benign & Malignant epithelial tumours Eg. Squamous papilloma, Squamous cell carcinoma, Malignant melanoma. Benign & Malignant mesenchymal tumours Eg: Fibroma, Lipoma, Neurofibroma, Fibrosarcoma, Liposarcoma, Rhabdo-myosarcoma,Teratoma.

8. Nutritional Disorders–

a. Protein energy malnutrition: Marasmus, Kwashiorkor, and Vitamin deficiency disorders, classification with specific examples.

9. Genetic Disorders–

a. Basic concepts of genetic disorders and some common examples and congenital malformation.

B. Systemic pathology

10. Hematology–

a. Constituents of blood and bone marrow, Regulation of hematopoiesis. Anemia: Classification, clinical features & lab diagnosis.
b. Nutritional anemias: Iron deficiency anemia, Folic acid,Vit. B 12 deficiency anemia including pernicious anemia. Hemolytic Anaemias: Classification and Investigations. Hereditary hemolytic anaemias: Thalessemia, Sickle cell anemia, Spherocytosis and Enzyme deficiencies.
c. Acquired hemolytic anemia

Alloimmune, Autoimmune
Drug induced, Microangiopathic Pancytopenia - Aplastic anemia.

c. Hemostatic disorders, Vascular and Platelet disorders & lab diagnosis. Coagulopathies–
    - Inherited
    - Acquired with lab diagnosis.
d. Leukocytic disorders: Leukocytosis, Leucopenia, Leukemoid reaction.
e. Leukemia: Classification, clinical manifestation, pathology and Diagnosis. Multiple myeloma and disproteinemias.
f. Blood transfusion; Grouping and cross matching, untoward reactions, transmissible infections including HIV & hepatitis, Blood-components & plasma-pheresis.

11. Respiratory System

a. Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis, Carcinoma of lungs, Occupational lung diseases

12. Cardiovascular Pathology

a. Congenital Heart disease: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy, Patent ductusarteriosus.
b. Endocarditis. Rheumatic Heart disease.
c. Vascular diseases: Atherosclerosis, monckeberg's medial calcification, Aneurysm and Arteritis and tumours of Blood vessels.
d. Ischemic heart Disease: Myocardial infarction. Hypertension and hypertensive heart Disease.

13. **Alimentary tract**:

a. Oral Pathology: Ulcers, leukoplakia, Carcinoma, oral cavity diseases and tumour of salivary gland & esophagus and precancerous lesions, Esophagus inflammatory, functional disorders and tumours.
b. Stomach: Gastritis, Ulcer &Tumours.
c. Tumours and tumour like condition of the small and large Intestine: Polyps, carcinoid, carcinoma, Lymphoma.
d. Pancreatitis and pancreatic tumours :i) Exocrine, ii) Endocrine Salivary gland tumours : Mixed,Warthin's

14. Hepato – biliary pathology.

a. Jaundice: Types, aetio-pathogenesis and diagnosis. Hepatitis: Acute, Chronic,neonatal.
b. Alcoholic liver disease
c. Cirrhosis: Post necrotic, Alcoholic, Metabolic and Portal hypertension Liver abscesses; Pyogenic, parasitic and Amoebic. Tumours of Liver

15. Lymphatic System

a. Diseases of the gall bladder: Cholecystitis, Cholelithiasis, Carcinoma. Lymphadenitis - Nonspecific and granulomatous. Causes of Lymph Node enlargements. Reactive Hyperplasia, Primary Tumours - Hodgkin's and Non hodgkin's Lymphomas, MetastaticTumours.
b. Causes of Splenic Enlargements.

16. Musculoskeletal System

a. Osteomyelitis: acute, chronic; Pyogenic, tuberculous
b. Metabolic diseases: Rickets/Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease.
c. Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma. Arthritis: Suppurative, Rheumatoid. Osteoarthritis, Gout, Tuberculous.

17. Endocrine pathology

a. Diabetes Mellitus: Types, Pathogenesis, Pathology, Laboratory diagnosis Non-neoplastic lesions of Thyroid: Iodine deficiency goiter, autoimmune Thyroiditis, Thyrotoxicosis, myxedema, Hashimoto's thyroiditis.
b. Tumours of Thyroid: Adenoma, Carcinoma: Papillary, Follicular, Medullary, Anaplastic. Adrenal diseases: cortical hyperplasia, atrophy, tuberculosis, tumours of cortex and medulla.

18. Neuropathology

a. Inflammations and Infections: TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess
b. Tuberculosis, Cysticercosis
c. CNS Tumors, Astrocytoma, Neuroblastoma, Meningioma, Medullo blastoma

19. Dermato pathology

a. Skin tumors: Squamos cell carcinoma, Basal cell carcinoma, Melanoma

PRACTICAL

Demonstration of Slides – The students may be demonstrated the common histopathological, hematological and cytological slides and specimens and charts and their interpretations.

Recommended Textbooks

1. Text book of pathology:Harshmohan
2. General Systemic pathology: Churchill Livingstone
3. Text book of Pathology: Robbins
4. Textbook of Pathology. : S. G.Deodhare
5. Pathology. Anderson (reference).

MICROBIOLOGY

THEORY

1. **General Microbiology-**
    a) Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate.
    b) Normal flora of the human body.
    c) Routes of infection and spread; endogenous and exogenous infections; source at reservoir of infections.
    d) Bacterial cell. Morphology limited to recognizing bacteria in clinical samples Shape, motility and arrangement. Structures, which are virulence, associated.
    e) Physiology: Essentials of bacterial growth requirements.
    f) Sterilization, disinfection and universal precautions in relation to patient care and disease prevention. Definition of asepsis, sterilization, disinfection.
    g) Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance spectrum of activity.
2. **Immunology-**
    a) Basic principles of immunity immunobiology: lymphoid organs and tissues. Antigen, Antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis.
    b) Humoral immunity and its role in immunity Cell mediated immunity and its role in immunity. Imunology of hypersensitivity, Measuring immune functions.
3. **Bacteriology-**
    a. To be considered under the following headings
    b. Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, collection and transport of samples for laboratory diagnosis, interpretation of laboratory reports.
    c. Staphylococci, and Streptococci.
    d. Mycobacteria: Tuberculosis, M.leprae, atypical mycobacteria, Enterobacteriaceae,
    e. Vibrois: V. cholerae and other medically important vibrios, Campylobacters and Helicobacters,Pseudomonas.
    f. Bacillus anthracis, Sporing and non-sporing anaerobes: Clostridia, Bacteroides and Fusobacteria.

4. **General Virology-**
    a. General properties: Basic structure and broad classification of viruses. Pathogenesis and pathology of viral infections. Immunity and prophylaxis of viral diseases. Principles of laboratory diagnosis of viral diseases. List of commonly used antiviral agents.

5. **Mycology-**
    a. General properties of fungi. Classification based on disease: superficial, subcutaneous, deep mycosel opportunistic infections including Mycotoxins, systemic mycoses. General principles of fungal diagnosis, Rapid diagnosis. Method of collection of samples. Antifungal agents.

6. **Clinical/Applied Microbiology-**
    a. Streptococcal infections: Rheumatic fever and Rheumatic heart disease, Meningitis.
    b. Tuberculosis, Pneumonia
    c. Pyrexia of unknown origin, leprosy,
    d. Sexually transmitted diseases, Poliomyelitis,
    e. Hepatitis
    f. Acute-respiratory infections, Central nervous System infections, Urinary tract infections
    g. Pelvic inflammatory disease, Wound infection, Opportunistic infections, HlV infection
    h. Malaria, Filariasis, Zoonotic diseases.

Recommended Textbooks:

1. Short textbook of Medical Microbiology by Sathish Gupta
2. Microbiology & Parasitology by Rajeshwar Reddy
3. Text book of Microbiology by Anantha Narayanan and Jayaram Panicker
4. Microbiology by Baveja
5. Text book of Microbiology by Chakraborthy

PHARMACOLOGY –

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

1. **General Pharmacology–**
    a. Introduction, Definitions, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, Adverse effects.

2. **Autonomic Nervous system–**
    a. General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System
    b. Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

3. **Cardiovascular Pharmacology–**
    a. Drugs used in the treatment of heart failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators
    b. Antiarrhythmic Drugs
    c. Drugs used in the treatment of vascular disease and tissue ischemia : Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers, Cerebral Ischemia Peripheral Vascular Disease.

4. **Neuro pharmacology–**
    a. Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines
    b. Antianxiety Drugs: Benzodiazepines, Other Anxiolytics
    c. Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium
    d. Antipsychotic drugs

5. **Disorders of Movement-**
    a. Drugs used in Treatment of Parkinson's disease
    b. Antiepileptic Drugs
    c. Spasticity and Skeletal Muscle Relaxants
6. **Inflammatory/Immune Diseases-**
    a. Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Non aspirin NSAIDs, drug Interactions with NSAIDs
    b. Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids
    c. Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout
    d. Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematous, Scleroderma, Demyelinating Disease
    e. Respiratory Pharmacology: Obstructive Airway Diseases, Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis
7. **Digestion and Metabolism-**
    a. Gastrointestinal Pharmacology: Peptic Ulcer Disease, Constipation, Diarrhea Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemic
8. **Geriatrics-**
    a. Pharmacology and the geriatric Population: Adverse effects of special concern in the Elderly, Dementia, Postural hypotension.

9. **Antibiotics**: Definition, choice of agents, resistance, prophylactic groups**,** Very brief introduction of drugs name, mechanism, uses and specific toxicity

Recommended Textbooks

1. Essential of Medical Pharmacology by K. D.Tripathi
2. Text book of Medical Pharmacology by Padmaja Udaykumar
3. Pharmacology by N.Murugesh
4. Pharmacology &Pharmacotherapeutics bySatoskar.

Reference Books:

1. Clinical Pharmacology – D.R Laurence, Pn Ben net, MJBrown
2. Goodman's & Gilman's the Pharmacological basis of therapeutics

FOUNDATION OF EXERCISE THERAPYAND THERAPEUTIC MASSAGE

SUBJECT DESCRIPTION - In this course, the students will learn the principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.

THEORY

1. **Introduction to Exercise Therapy** - The aims of Exercise Therapy, The techniques of Exercise Therapy, Basic of exercise: Physiological effects and Therapeutic uses of exercises, Psychogenic aspects of exercises, Pharmacological effects of exercises
2. **Starting Positions** – Fundamental positions & derived Positions
3. **Evaluation Measures/Tests**
    a. Measurements of Vital parameters
    b. Measurement of Joint range: ROM-Definition, Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses, Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints
    c. Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations, Techniques of MMT for group & individual: Techniques of MMT for upper limb / Techniques of MMT for lower limb / Techniques of MMT for spine.
    d. Measurement of Limb Length and Girth
    e. Pelvic tilt and Measurement of the angle of Pelvic Inclination
4. **Passive Movements**: Causes of immobility, Classification of Passive movements, and Specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses, Techniques of giving passive movements.
5. **Active Movements**: Definition and Classification
    a. Definition of strength, power & work, endurance, muscle actions.
    b. Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical events during contraction &relaxation, muscle fiber type, motor unit, force gradation.
    c. Causes of decreased muscle performance
    d. Physiologic adaptation to training: Strength & Power, Endurance.
    e. Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses
    f. Active Assisted Exercise: Principles, techniques, indications, contraindications, effects and uses
    g. Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses
    h. Resisted exercises: Definition, Classification, principles, indications, contraindications, effects and uses, techniques, Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise.

6. **Relaxation**- Definitions, Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indications of relaxation, Principles, techniques & Methods of relaxation, Types & uses: General, Local. Jacobson's, Mitchel's, additional methods of Relaxation.
7. **Suspension Therapy:** Definition, principles, equipments& accessories, Indications & contraindications, Benefits of suspension therapy, Types of suspension therapy: axial, vertical, pendular Techniques of suspension therapy for upper limb Techniques of suspension therapy for lower limb
8. **Walking Aids**: Types: Crutches, Canes, Frames; Principles and gait training with walking aids, Pre-crutch training
9. **Individual and Group Exercises**: Advantages and Disadvantages, Organization of Group exercises, Recreational Activities and Sports
10. **Trick movements**
11. **Use of apparatuses/equipments in Exercise Therapy**

THERAPEUTIC MASSAGE

1. History and Classification of MassageTechnique
2. Principles, Indications and Contraindications
3. Technique of Massage Manipulations
4. Physiological and Therapeutic Uses of Specific Manipulations

PRACTICAL: The students to be trained in Practical Laboratory work for all the topics discussed in theory. They must be able to

1. Demonstrate muscle strength using the principles and technique of MMT
2. Demonstrate Starting positions and Derived positions
3. Demonstrate different Evaluation methods
4. Demonstrate relaxation techniques.
5. Demonstrate the techniques of passive movements
6. Demonstrate various techniques of Active movements
7. Demonstrate the techniques of suspension therapy for mobilizing and strengthening joints and muscles
8. Demonstrate to use the walking aids for gait training
9. Demonstrate massage technique application according to body parts.
10. Demonstrate the uses of different exercise therapy equipment
11. Demonstrate the technique of measuring ROM using Goniometer
12. Demonstrate techniques for measuring limb length and Girth.

Recommended books:

1. Principles of exercise therapy- Dena Gardiner
2. Practical exercise therapy- Margaret Hollis
3. Guide line for goniometry-Cynthia Norkin& JoyceWhite
4. Principals of therapeutic soft tissue manipulation – A. G.Sinha

Reference Books:

1. Therapeutic exercise – Carolyn Kisner and Colby
2. Massage for Therapist- Margaret Hollis
3. Physical Rehabilitation- Susan B.O'Sullivan
4. Physiotherapy in Orthopaedic conditions-by Jayant Joshi

(Not for University Exam)

MEDICAL/ PHYSIOTHERAPY LAW AND ETHICS

Legal and ethical considerations are firmly believed to be an integral part of medical practice in planning patient care. Advances in medical sciences, growing sophistication of the modern society's legal framework, increasing awareness of human rights and changing moral principles of the community at large, now result in frequent occurrences of healthcare professionals being caught in dilemmas over aspects arising from daily practice.

Medical/ Physiotherapy ethics has developed into a well based discipline which acts as a "bridge" between theoretical bioethics and the bedside. The goal is "to improve the quality of patient care by identifying, analyzing, and attempting to resolve the ethical problems that arise in practice". Doctors are bound by, not just moral obligations, but also by laws and official regulations that form the legal framework to regulate medical practice. Hence, it is now a universal consensus that legal and ethical considerations are inherent and inseparable parts of good medical practice across the whole spectrum.

Few of the important and relevant topics that need to focus on are as follows:

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

MEDICAL TERMINOLOGIES AND RECORD KEEPING

This course introduces the elements of medical terminology. Emphasis is placed on building familiarity with medical words through knowledge of roots, prefixes, and suffixes. Topics include: origin, word building, abbreviations and symbols, terminology related to the human anatomy, reading medical orders and reports, and terminology specific to the student's field of study. Spelling is critical and will be counted when grading tests. Topics to be covered under the subject are as follows:

1. Derivation of medical terms.
2. Define word roots, prefixes, and suffixes.
3. Conventions for combined morphemes and the formation of plurals.
4. Basic medical terms in health care and physiotherapy.
5. Form medical terms utilizing roots, suffixes, prefixes, and combining roots.
6. Interpret basic medical abbreviations/symbols.
7. Utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system, nervous system, and endocrine system.
8. Interpret medical records/reports.
9. Data entry and management on electronic health record system.

Fourth Semester B.P.T

BIOMECHANICS AND KINESIOLOGY –

Course Description:
Kinesiology involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of musculoskeletal system. Students are taught to understand the various quantitative methods of movement. Mechanical principles of various treatment methods are studied. Study of posture and gait are also included.

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

2. **Biomechanics of the Thorax and Chest wall-**
    a. General structure and function
    b. Rib cage and the muscles associated with the ribcage
    c. Ventilatory motions: its coordination and integration
    d. Developmental aspects of structure and function
    e. Changes in normal structure and function I relation to pregnancy, scoliosis and COPD

3. **The Temporomandibular Joint-**
    a. General features, structure, function and dysfunction

4. **Biomechanics of the peripheral joints-**
    a. The shoulder complex: Structure and components of the shoulder complex and their integrated function
    b. The elbow complex: Structure and function of the elbow joint – humer oulnar and humeroradial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.
    c. The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex;Prehension; functional position of the wrist and hand.
    d. The hip complex: structure and function of the hip joint; hip joint pathology-arthrosis, fracture, bony abnormalities of the femur:
    e. The knee complex: structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.

f. The ankle and foot complex.: structure and function of the ankle joint, subtalar joint, talocalcaneonavicular joint, transverse tarsal joint, tarsometatarsal joints, metatarso phalangeal joints, interphalangeal joints, structure and function of the plantar arches, muscles of the ankle and foot, deviations from normal structure and function – Pes Planus and Pes Cavus

5. **Analysis of Posture and Gait** – Types of Posture, Static and dynamic posture, postural control, kinetics and kinematics of posture, ideal posture analysis of posture, effects of posture on age, pregnancy, occupation and recreation;
   General features of gait, gait initiation, kinematics and kinetics of gait, energy requirements, kinematics and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running, effects of age, gender, assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities, injuries and mal alignments in gait;

6. **Movement Analysis**: ADL activities like sitting to standing, lifting, Pushing and pulling, Various grips and pinches.

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

Recommended Text Books:

1. Joint Structure and Function – A comprehensive Analysis by Cynthia Norkin.
2. Brunnstrom's Clinical Kinesiology by Laura Smith, Elizabeth Beth Weiss, and Don Lehmkuhl.

Recommended Reference Books:

1. Clinical Kinesiology for Physical Therapist Assistants byLippert
2. Applied Kinesiology: A Training Manual and Reference Book of Basic Principles and Practices by Robert Frost (Mar 28,2002)
3. Kinesiology: The Mechanics and Pathomechanics of Human Movement by Carol A.Oatis
4. Kinesiology by K. Wells; Sauder’s Publications.
5. Basic Biomechanics of the Musculoskeletal System by Margareta Nordinand Victor Frankel

EXERCISE THERAPY

SUBJECT DESCRIPTION- After the course on exercise therapy student will be able to understand the different types of exercise for the benefit of patient in different situations and conditions both in health and disease or disorder.

1. **Strengthening of muscles:** Definition of strength, power & work, endurance, muscle actions. Factors that influence the strength of the normal muscle, Principles of Muscle strengthening, Principles, indications, contraindications, precautions of strength training, Physiologic adaptation to strength training: Strength & Power, Endurance.
   Progressive strengthening of muscles (loads assisted and resisted exercises), use of equipments, reeducation of muscles and restoration of functions,
   Practice of strengthening of muscles of limbs, neck, trunk and face, emphasis on hand and foot muscles, quadriceps, glutei, triceps, deltoid and face muscles, use of manual and mechanical resistance, contraindications;
   Specific exercise regimens, Isotonic: de Lorme's, Oxford, Mac Queen, Circuit weight training, Isometric: BRIME (Brief Resisted Isometric Exercise), Plyometrics, MET (Muscle Energy Techniques)

2. **Proprioceptive Neuromuscular Facilitation**
   a. Definitions &goals
   b. Basic neurophysiologic principles of PNF: Muscular activity, Diagonals patterns of movement: upper limb, lower limb
   c. Procedure: components of PNF
   d. Techniques of facilitation
   e. Mobility: Contract relax, Hold relax, Rhythmic initiation
   f. Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization Stability: Alternating isometric, rhythmic stabilization
   g. Skill: timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal

3. **Functional Re-education:** Indications, Effects and Uses. Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities; Lower limb and Upper limb activities.

4. **Aerobic Exercise**: Definition and key terms; Physiological response to aerobic exercise, Examination and evaluation of aerobic capacity – Exercise Testing, Determinants of an Exercise Program, The Exercise Program, Normal and abnormal response to acute aerobic exercise, Physiological changes that occur with training, Application of Principles of an Aerobic conditioning program for patients – types and phases of aerobic training.

5. **Stretching**: Definition of terms related to stretching; Types of Contracture, Tissue response towards immobilization and elongation, Determinants of stretching

exercise, Effects of stretching, Inhibition and relaxation procedures, Precautions and contraindications of stretching, Techniques of stretching.

6. **Manual Therapy & Peripheral Joint Mobilization**
    a. Schools of Manual Therapy, Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn,Mulligan
    b. Biomechanical basis for mobilization, Effects of joint mobilsation, Indications and contraindications, Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb, Precautions.

7. **Balance** –Definition, Physiology of balance: contributions of sensory systems, processing sensory information, generating motor output
    a. Components of balance (sensory, musculoskeletal,biomechanical)
    b. Causes of impaired balance, Examination & evaluation of impaired balance, Activities for treating impaired balance: mode, posture, movement, Precautions & contraindications, Types of Balance training.

8. **Co-ordination Exercise**: Definitions: Co- ordination,In-coordination
    a. Anatomy & Physiology of cerebellum with its pathways
    b. Causes for Inco-ordination, Test for co-ordination: equilibrium test, non-equilibrium test Principles of co-ordination exercise.
    c. Frenkel's Exercise: uses of Frenkel's exercise, technique of Frenkel's exercise, progression, home exercise.

9. **Posture**: Definition, Types, Postural Mechanism, Patterns of Posture, And Factors influencing Posture, Principles of re-education: corrective methods and techniques, Patient education. Crawling exercises: principles, types, effects and uses of Clapp's crawl

10. **Basics in Manual Therapy**
    i. Examination of joint integrity
        1. Contractile tissues
        2. Non contractile tissues
    ii. Mobility - assessment of accessory movement & Endfeel
    iii. Assessment of articular & extra-articular soft tissue status
        1. Myofascial assessment
        2. Acute & Chronic muscle hold
        3. Tightness
        4. Pain-original &referred

iv. **Basic principles**, Indications & Contra-Indications **of mobilization** skills for joints & soft tissues.

1. Maitland
2. Mulligan
3. McKenzie
4. Muscle Energy Technique
5. Myofascial stretching
6. Cyriax
7. Neuro Dynamic Testing

11. **Hydrotherapy**: Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Use of special equipment, techniques, Effects and uses, merits and demerits

12. **Breathing exercises:** Mechanisms of normal breathing, muscles of respiration, changes in thoracic cage during the process of Breathing, segmental and diaphragmatic breathing exercises, pursed lip breathing, Forced Expiratory Technique, Postural drainage, assistive measures, techniques, indications and contraindications

PRACTICAL

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. They must be able to

1. Demonstrate the techniques for muscle strengthening based on MMT grading
2. Demonstrate the PNF techniques
3. Demonstrate techniques for Aerobic exercises
4. Demonstrate exercises for training co-ordination – Frenkel's exercise
5. Demonstrate techniques for functional re-education
6. Demonstrate mobilization of individual joint regions
7. Demonstrate the techniques for muscle stretching
8. Assess and evaluate posture and gait
9. Demonstrate techniques of strengthening muscles using resisted exercises
10. Demonstrate techniques for Breathing exercises

Recommended Textbooks:

1. Therapeutic Exercise: Foundations and Techniques: Carolyn Kisner, Lynn Allen Colby
2. Principles of exercise therapy: M. Dena Gardiner
3. Practical Exercise therapy by Hollis Margaret
4. PNF in Practice: An Illustrated Guide: Susan S.Aler, Dominiek Beckers,MathBuck

Reference Books:

1. Principles of muscle testing by Hislop.
2. Proprioceptive Neuromuscular Facilitation: Patterns and Techniques: Voss, Ionta & Myers
3. Facilitated Stretching -Robert McAtee, Jeff Charland
4. Relaxation Techniques: A Practical Handbook for the Health Care Professional , Marie Donaghy, Rosemary A. Payne &KeithBellamy
5. Water Exercise : 78 Safe and Effective Exercises for Fitness and Therapy Martha White
6. Yoga as Therapeutic Exercise: A Practical Guide for Manual Therapists Luise Worle, ErikPfeiff
7. Proven Therapeutic Exercise Techniques: Best Practices for Therapists and Trainers R. EricOestmann
8. Therapeutic Exercise in Developmental Disabilities Barbara H. Connolly, Patricia Montgomery
9. Therapeutic Exercise: Moving Toward Function - Lori Thein Brody, CarrieM.Hall
10. Therapeutic Exercises Using the Swiss Ball: Caroline Corning Creager, Caryl Riedel , MikeBerry
11. Ultimate Core Ball Workout: Strengthening and Sculpting Exercises JeanineDetz
12. Therapeutic Exercises Using Foam Rollers[Paperback] Caroline Corning Creager
13. Therapeutic Exercises Using Resistive Bands[Paperback] Caroline CorningCreager
14. Therapeutic Exercise: Techniques for Intervention : William D. Bandy, Barbara Sanders
15. Advanced Fitness Assessment and Exercise Prescription : Vivian H.Heyward
16. Progressive Exercise Therapy in Rehabilitation and Physical Education: John H.Colson
17. New Directions in Progressive Relaxation Training: A Guidebook for Helping Professionals: Douglas A. Bernstein , Thomas D.Borkovec

ELECTROTHERAPY

SUBJECT DESCRIPTION - In this course the student will learn the Principles, Techniques, Effects, Indication, Contra-Indication and the dosage parameter for various indications of electro therapeutic modalities in the restoration of physical function. The objective of this course is that the student will be able to list the indications, contra indications, dosages of electro therapy modalities, demonstrates the different techniques, and describe their effects on various conditions.

THEORY

A - LOW FREQUENCY CURRENTS

1. **Basic types of current**
    a. Direct Current: types, physiological &therapeutic effects.
    b. Alternating Current
2. **Types of Current used in Therapeutics**
    a. Modified D.C
        i. Faradic Current
        ii. Galvanic Current
    b. Modified A.C
        i. Sinusoidal Current
        ii. Diadynamic Current.
3. **Faradic Current**: Definition, Modifications, Techniques of Application of Individual, Muscle and Group Muscle stimulation, Physiological & Therapeutic effects of Faradic Current, Precautions, Indications & Contra-Indications, Dangers.
4. **Galvanic Current:** Definition, Modifications, Physiological & Therapeutic effects of Galvanic Current, Indications & Contra-Indications, Dangers, Effect of interrupted galvanic current on normally innervated and denervated muscles and partially denervated muscles.
5. **Sinusoidal Current & Diadynamic Current in Brief.**
6. **HVPGS** – Parameters & its uses
7. **Ionization / Iontophoresis**: Techniques of Application of Iontophoresis, Indications, Selection of Current, Commonly used Ions (Drugs) for pain, hyperhydrosis, would healing.
8. **Cathodal / Anodal galvanism.**
9. **Microcurrent & Macrocurrent**
10. **Types of Electrical Stimulators**
    a. NMES- Construction component.
    b. Neuro muscular diagnostic stimulator- construction component.
    c. Components and working Principles
11. **Principles of Application:** Electrode tissue interface, Tissue Impedance, Types of Electrode, Size & Placement of Electrode – Water bath, Unipolar, Bi-polar, Electrode coupling, Current flow in tissues, Lowering of Skin Resistance.

12. **Nerve Muscle Physiology**: Action Potential, Resting membrane potential, Propagation of Action Potential, Motor unit, synapse, Accommodation, Stimulation of Healthy Muscle, Stimulation of Denervated Muscle, Stimulation for Tissue Repair.
13. **TENS**: Define TENS, Types of TENS, Conventional TENS, Acupuncture TENS, Burst TENS, Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications &Contraindications.
14. **Pain**: Define Pain, Theories of Pain (Outline only), Pain Gate Control theory in detail.

B. MEDIUM FREQUENCY CURRENTS

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

C- THERMO & ACTINOTHERAPY (HIGH FREQUENCY CURRENTS)

1. **Electro Magnetic Spectrum.**
2. **SWD**: Define short wave, Frequency & Wavelength of SWD, Principle of Production of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning, Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters.
3. **Pulsed Electro Magnetic Energy:** Principles, Production & Parameters of PEME, Uses of PEME.
4. **Microwave Diathermy:** Define Microwave, Wave length & Frequency, Production of Microwave, Applicators, Dosage Parameters, Physiological & Therapeutic effects, Indications & Contraindications, Dangers of MWD.
5. **Ultrasound**: Define Ultrasound, Frequency, Piezo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous& Pulsed mode, Intensity, US Fields: Near field, Far field, Half value distance, Attenuation, Coupling Media, Thermal effects, Non-thermal effects, Principles & Application of US: Direct contact, Water bag, Water bath, Solid sterile gel pack method for wound. Uses of US, Indications & Contraindications, Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, commonly used drugs, Uses. Dosages of US.
6. **IRR**: Define IRR, wavelength& parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & frequency of treatment, Indication & Contraindication.

7. **UVR**: Define UVR, Types of UVR, UVR generators: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, Kromayer lamp, Fluorescent tube, Theraktin tunnel, PUVA apparatus. Physiological & Therapeutic effects. Sensitizers & Filters. Test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications, contraindications. Dangers. Dosages for different therapeutic effects, Distance in UVR lamp

8. **LASER**: Define LASER. Types of LASER. Principles of Production. Production of LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER. Energy density & power density

D . SUPERFICIAL HEATING MODALITIES

1. **Wax Therapy:** Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers.
2. **Contrast Bath:** Methods of application, Therapeutic uses, Indications & Contraindications.
3. **Moist Heat Therapy:** Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications &Contraindications.
4. **Whirl Pool Bath:** Construction, Method of Application, Therapeutic Uses, Indications &Contraindications.
5. **Cryotherapy:** Define- Cryotherapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, Methods of application with dosages.

PRACTICAL

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

1. Demonstrate the technique for patient evaluation – receiving the patient and positioning the patient for treatment using electrotherapy.
2. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.
3. Demonstrate placement of electrodes for various electrotherapy modalities
4. Electrical stimulation for the muscles supplied by the peripheral nerves
5. Faradism under Pressure for UL and LL
6. Plotting of SD curve with chronaxie and rheobase
7. Demonstrate FG test
8. Application of Ultrasound for different regions-various methods of application
9. Demonstrate treatment techniques using SWD, IRR and Microwave diathermy

10. Demonstrate the technique of UVR exposure for various conditions – calculation of test dose
11. Demonstrate treatment method using IFT for various regions
12. Calculation of dosage and technique of application of LASER
13. Technique of treatment and application of Hydro collator packs, cry therapy, contrast bath, wax therapy
14. Demonstrate the treatment method using whirl pool bath
15. Winding up procedure after any electrotherapy treatment method.

Recommended Textbooks:

1. Claytons Electrotherapy by Forster & Plastanga
2. Electrotherapy Explained by Low &Reed
3. Clinical Electrotherapy by Nelson
4. Principles and Practice of Electrotherapy: Joseph Kahn

Reference Books:

1. Electrotherapy: Clinical Procedures Manual: Theresa Nalty, Mohammed A.Sabbahi
2. Electrotherapy in Rehabilitation : Meryl RothGersh
3. Electrotherapy and light therapy:Richard Kovács
4. Handbook of Electrotherapy for Practitioners and Students : Baker Grover
5. Physical Agents in Rehabilitation: From Research to Practice: Michelle H. Cameron
6. Physical Agents: Theory and Practice: Barbara J. Behrens, Susan L.Michlovitz
7. Ultrasound and Laser Light Handbook Package: From Research to Practice: Michelle H.Cameron
8. Laboratory Manual for Physical Agents Theory and Practice PT,BarbaraJ.Behrens MS
9. Manual for Physical Agents : Karen W. Hayes, Roger M.Nelson
10. Evidence-Based Guide to Therapeutic Physical Agents: Alain Ivan Belanger
11. Therapeutic Electro physical Agents: Evidence Behind Practice Alain Ivan Belanger
12. Therapeutic Modalities in Rehabilitation. William Prentice
13. Electrotherapy Evidence based practice by Sheila Kitchen

Fifth Semester B.P.T

CLINICAL ORTHOPEDICS-TRAUMATOLOGY& NON-TRAUMATOLOGY

SUBJECT DESCRIPTION - This subject follows the basic science subjects to provide the knowledge about Orthopedic conditions the therapist would encounter in their practice. The objective of this course is that after completion of the lectures and discussion the student will be able to demonstrate an understanding of orthopedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

1. **Introduction**
    a. Introduction to orthopaedics.
    b. Clinical examination in an Orthopedic patient.
    c. Common investigative procedures.
    d. Radiological and Imaging techniques in Orthopeadics.
    e. Inflammation and repair, Soft tissue healing.
2. **Traumatology**
    a. Fracture: definition, types, signs and symptoms.
    b. Fracture healing.
    c. Complications of fractures.
    d. Conservative and surgical approaches.
    e. Principles of management – reduction (open/closed, immobilization etc).
    f. Subluxation/dislocations – definition, signs and symptoms, management (conservative and operative).
3. **Fractures and Dislocations of Upper Limb**
    a. **Fractures of Upper Limb** - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:
        i. Fractures of clavicle and scapula.
        ii. Fractures of greater tuberosity and neck of humerus.
        iii. Fracture shaft of humerus.
        iv. Supracondylar fracture of humerus.
        v. Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles.
        vi. Side swipe injury of elbow.
        vii. Both bone fractures of ulna and radius.
        viii. Fracture of forearm – monteggia, galaezzi fracture–dislocation.
        ix. Chauffer’s fracture.
        x. Colle’s fracture.
        xi. Smith’s fracture.
        xii. Scaphoid fracture.
        xiii. Fracture of the metacarpals.

xiv. Bennett's fracture.
xv. Fracture of the phalanges. (Proximal and middle.)

b. Dislocations of Upper Limb–

i. Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (putti plat, bankart's) etc.
ii. Recurrent dislocation of shoulder.
iii. Posterior dislocation of shoulder – mechanism of injury, clinical features and management.
iv. Posterior dislocation of elbow – mechanism of injury, clinical feature, complications &management.

4. Fracture of Spine

a. Fracture of Cervical Spine - Mechanism of injury, clinical feature, complications (quadriplegia); Management- immobilization (collar, cast, brace, traction); Management for stabilization, management of complication (bladder and bowel,quadriplegia).
   i. Clay shoveller's fracture.
   ii. Hangman's fracture.
   iii. Fractureodontoid.
   iv. Fracture of atlas.
b. Fracture of Thoracic and Lumbar Regions - Mechanism of injury, clinical features, and management— conservative and surgical of common fractures around thoracic and lumbar regions.
c. Fracture of coccyx.
d. Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs, Fracture of sternum.

5. Fractures and Dislocations of Lower Limb

a. **Fracture of Pelvis and Lower Limb** - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:
   i. Fracture of pelvis.
   ii. Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical.
   iii. Fractures of trochanters.
   iv. Fracture shaft femur—clinical features, mechanism of injury, complications, management-conservative and surgical.
   v. Supracondylar fracture of femur.
   vi. Fractures of the condyles of femur.
   vii. Fracture patella.
   viii. Fractures of tibial condyles.
   ix. Both bones fracture of tibia and fibula.

x. Dupuytren's fracture
xi. Maisonneuve's fracture.
xii. Pott's fracture – mechanism of injury, management.
xiii. Bi-malleolar fracture
xiv. Tri-malleolar fracture
xv. Fracture calcaneum – mechanism of injury, complications and management.
xvi. Fracture of talus.
xvii. Fracture of metatarsals—stress fractures jone's fracture.
xviii. Fracture of phalanges.

b. **Dislocations of Lower Limb** - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb.

i. Anterior dislocation of hip.
ii. Posterior dislocation of hip.
iii. Central dislocation of hip.
iv. Dislocation of patella.
v. Recurrent dislocation of patella.

6. **Soft Tissue Injuries** - Define terms such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis,bursitis.
   a. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries:
      i. Meniscal injuries of knee.
      ii. Cruciate injuries of knee.
      iii. Medial and lateral collateral injuries of knee.
      iv. Lateral ligament of ankle.
      v. Wrist sprains.
      vi. Strains- quadriceps, hamstrings, calf, biceps, triceps etc.
      vii. Contusions- quadriceps, gluteal, calf, deltoid etc.
      viii. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc.
7. **Hand Injuries** - mechanism of injury, clinical features, and management of the following–
   a. Crush injuries.
   b. Flexor and extensor injuries.
   c. Burn injuries of hand.
8. **Amputations** - Definition, levels of amputation of lower and upper limbs, indications, complications.
9. **Traumatic Spinal Cord Injuries** - Clinical features, complications, medical and surgical management of Paraplegia and Quadriplegia.

NON-TRAUMATOLOGY

10. **Deformities** - clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.

a. Congenital Deformities–

i. CTEV.
ii. CDH.
iii. Torticollis.
iv. Scoliosis.
v. Flat foot.
vi. Vertical talus.
vii. Hand anomalies- syndactyly, polydactyly and ectrodactly. Arthrogryposis multiplex congenita (amyoplasia congenita).
viii. Limb deficiencies- Amelia and Phocomelia. Klippel feil syndrome, Osteogenesis imperfect (fragileossium).
ix. Cervical rib.

b. Acquired Deformities–

i. Acquired Torticollis.
ii. Scoliosis.
iii. Kyphosis.
iv. Lordosis.
v. Genu varum.
vi. Genu valgum.
vii. Genu recurvatum
viii. Coxavara.
ix. Pescavus.
x. Hallux rigidus.
xi. Hallux valgus.
xii. Hammer toe.
xiii. Metatarsalgia.

11. **Disease of Bones and Joints:** Causes, Clinical features, Complications, Management- medical and surgical of the following conditions:
    a. Infective conditions: Osteomyelitis (Acute / chronic). Brodie's abscess. TB spine and major joints like shoulder, hip, knee, ankle, elbow etc.
    b. Arthritic conditions: Pyogenic arthritis. Septic arthritis. Syphilytic infection of joints.
    c. Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors: Osteoma. Osteosarcoma, Osteochondroma.Enchondroma.
       Ewing's sarcoma. Giant cell tumor. Multiple myeloma. Metastatic tumors.
    d. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis.
    e. Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia, Osteoporosis

12. **Inflammatory and Degenerative Conditions**: causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions:
    a. Osteoarthritis. Rheumatoid arthritis. Ankylosing spondylitis Gouty arthritis. Psoriatic arthritis. Hemophilic arthritis. Still's disease (juvenile rheumatoid arthritis). Charcot's joints.
    b. Connective Tissue Disorders- Systemic Lupus Erythematosis, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease(MCTD)

13. **Syndromes**: Causes, Clinical features, complications, management- conservative and surgical of the following:
    a. Cervico brachial syndrome. Thoracic outlet syndrome. Vertebro- basilar syndrome. Scalenus syndrome. Costo clavicular syndrome. Levator scapulae syndrome. Piriformis syndrome.
14. **Neuromuscular Disorders**: Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions:
    a. Cerebral palsy.
    b. Poliomyelitis.
    c. Spinal Dysraphism.
    d. Leprosy.
15. **Cervical and Lumbar Pathology:** Causes, clinical feature, pathos-physiology, investigations, management-Medical and surgical for the following:
    a. Prolapsed interverbral disc(PID),
    b. Spinal Canal Stenosis.
    c. Spondylosis (cervical and lumbar)

d. Spondylolysis.
e. Spondylolisthesis.
f. Lumbago/ Lumbo sacralstrain.
g. Sacralisation.
h. Lumbarisation.
i. Coccydynia.
j. Hemi vertebra.

16. **Orthopedic Surgeries:** Indications, Classification, Types, Principles of management of the following Surgeries:
    a. Arthrodesis.
    b. Arthroplasty (partial and total replacement).
    c. Osteotomy,
    d. External fixators.
    e. Spinal stabilization surgeries (Harrington's, Luque's, Steffi plating) etc,
    f. Limb reattachments.

17. **Regional Conditions:** Definition, Clinical features and management of the following regional conditions
    a. Shoulder: Periarthritic shoulder (adhesive capsulitis). Rotator cuff tendinitis. Supraspinatus Tendinitis. Infraspinatus Tendinitis. Bicipital Tendinitis. Subacromial Bursitis.
    b. Elbow: Tennis Elbow. Golfer's Elbow. Olecranon Bursitis(student's elbow). Triceps Tendinitis.
    c. Wrist and Hand: De Quervain's Tenosynovitis. Ganglion. Trigger Finger/ Thumb. Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture.
    d. Pelvis and Hip: IT Band Syndrome. Piriformis Syndrome. Trochanteric Bursitis.
    e. Knee: Osteochondritis Dissecans. Prepatellar and Suprapatellar Bursitis. Popliteal Tendinitis. Patellar Tendinitis. Chondromalacia Patella. Plica Syndrome. Fat Pad Syndrome (Hoffa's syndrome).
    f. Ankle and Foot: Ankle Sprains. Plantar Fasciitis / Calcaneum Spur. Tarsal Tunnel Syndrome. Achilles Tendinitis. Metatarsalgia. Morton's Neuroma.

Recommended Books:

1. Apley's System of Orthopaedics and Fractures by Louis Solomon, David Warwick, and Selvadurai Nayagam (2010)
2. Text book of Orthopedics. Maheswari.
3. Orthopedic Principles - A Resident's Guide by David Ip(2005)
4. Campbell's Operative Orthopaedics by S. Terry Canale and James H. Beaty (2007)
5. Outline of Orthopedics. — John Crawford Adams.

MEDICINE

SUBJECT DESCRIPTION - This subject follows the basic science subjects to provide the knowledge about relevant aspects of general medicine. The student will have a general understanding of the diseases the therapist would encounter in their practice. The objective of this course is that discussion the student will be able to list the etiology, pathology, clinical features and treatment methods for various medical conditions.

1. **Infection** : Effects of Infection on the body – Pathology – source and spread of infection – vaccinations – generalized infections – rashes and infection – food poisoning and gastroenteritis – sexually transmitted diseases – HIV infections and Aids.
2. **Poisoning**: Clinical features – general management – common agents in poisoning – pharmaceutical agents – drugs of misuse – chemical pesticides – Envenomation.
3. **Food and Nutrition**: Assessment – Nutritional and Energy requirements; Deficiency diseases – clinical features and treatment; Protein – Energy Malnutrition: Clinical features and treatment; Obesity and its related disorders: Causes – Complications – benefits of weight loss – management of Obesity – diet, exercise and medications.
4. **Endocrine diseases**: Common presenting symptoms of Endocrine disease – common classical disease presentations, clinical features and its management; Diabetes Mellitus: Etiology and pathogenesis of diabetes – clinical manifestations of the disease – management of the disease – Complications of diabetes.
5. **Diseases of the blood:** Examinations of blood disorders – Clinical manifestations of blood disease; Anemia – signs and symptoms – types and management ; Hemophilia - Cause – clinical features severity of disease – management – complications due to repeated hemorrhages – complications due to therapy.
6. **Diseases of the digestive system :** Clinical manifestations of gastrointestinal disease – Etiology, clinical features, diagnosis, complications and treatment of the following conditions : Reflux Oesophagitis, Achlasia Cardia, Carcinoma of Oesophagus, GI bleeding, Peptic Ulcer disease, Carcinoma of Stomach, Pancreatitis, Mal absorption Syndrome, Ulcerative Colitis, Peritonitis, Infections of AlimentaryTract;Clinicalmanifestationsofliverdiseases-Aetiology,clinical features, diagnosis, complications and treatment of the following conditions : Viral Hepatitis, Wilson's Disease, Alpha1-antitrypsin deficiency, Tumors of the Liver, Gall stones,Cholycystitis.
7. **Diseases of the Skin**: Examination and clinical manifestations of skin diseases; Causes, clinical features and management of the following skin conditions: Leprosy, Psoriasis, Pigmentary Anomalies, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections.

8. **Pediatrics** : Problems and management of LBW infants, Perinatal problems and management, Congenital abnormalities and management, Respiratory conditions of childhood, Cerebral Palsy– causes, complications, clinical manifestations, treatment; Spina Bifida – management and treatment, Epilepsies – types, diagnosis and treatment; Recognizing developmental delay, common causes of delay ; Orthopedic and Neuromuscular disorders in childhood, clinical features and management ; Sensory disorders – problems resulting from loss of vision and hearing ; Learning and behavioral problems – Hyperactivity, Autism, Challenging behaviors, Educational delay, The Clumsy Child.
9. **Geriatric Medicine**: A) Basic Sciences: Biology of human ageing, Epidemiology of human ageing, Immunology of human ageing, Effect of ageing on different organs, death. B) Clinical Geriatric Medicine: chronic disease conditions; hypertension, diabetes, asthma, ischemic heart disease, obesity and osteoarthritis.
10. **Psychiatric Disorders**: Classifications, Causes, Clinical manifestations and treatment methods used in Psychiatry. Modalities of psychiatric treatment, Psychiatric illness and physiotherapy, Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses -. Anxiety neurosis, Depression, Obsessive compulsive neurosis, Psychosis, Maniac-depressive psychosis, Post-traumatic stress disorder, Psychosomatic reactions: Stress and Health, theories of Stress –Illness.

Etio-pathogenesis, manifestations, and management of psychiatric illness

a. Drug dependence and alcoholism,
b. Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue,
c. Personality disorders
d. Child psychiatry - manifestations, and management of childhood disorders -attention deficit syndrome and behavioral disorders.
e. Geriatric psychiatry.

Recommended Text Books:

1. Davidson's Essentials of Medicine by Stanley Davidson(2009)
2. Medicine for Students:Golwala
3. Clinical Psychiatry, Mayol – gloss; 3rd Edition,AITBS
4. Psychiatry, James Scully, 4th Edition, Lippincott Williams &Wilkins
5. A short textbook of Psychiatry, Ahuja; 5th Edition –Jaypee
6. Handbook of Psychiatry, Dr. L.P. Shah, 3rd Edition, Uni U.C.B. Pvt.Ltd.

Reference books:

1. Harrison's Principles of Internal Medicine, 17th Edition by Anthony S.Fauci,
2. Braunwald Text of Cardiology
3. Text Book of Cardiology by Hurst
4. Davidson's Principles and Practice of Medicine by Nicki R. Colledge (Ed), Brian R. Walker (Ed), and Stuart H. Ralston MD (2010)

SURGERY

SUBJECT DESCRIPTION - This subject follows the basic science subjects to provide the knowledge about relevant aspects of general surgery. The student will have a general understanding of the surgical conditions the therapist would encounter in their practice. The objective of this course is that after 60 hrs of lectures and discussion the student will be able to list the indications for surgery, etiology, clinical features and surgical methods for various conditions.

GENERAL SURGERY INCLUDING BURNS AND PLASTIC SURGERY, OBSTETRICS AND GYNECOLOGY

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

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

3. Causes, Clinical Presentation, Diagnosis and treatment of the following **Thoracic Trauma** situations – Airway obstruction, Pnuemothorax, Hemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal disruption, Cardiac and Pulmonary Contusions.

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

5. **Disorders of the Chest Wall, Lung and Mediastinum**

6. **Thoracic surgeries** – Thoracotomy – Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications. Lung surgeries: Pnumonectomy, Lobectomy, segmentectomy – Indications, Physiological changes and Complications; Thoracoplasty, Pleurectomy, Pleurodesis and

Decortications of the Lung. Cardiac surgeries – An overview of the Cardio-

Pulmonary Bypass Machine – Extra cardiac Operations, Closed Heart surgery, Open Heart surgery. Transplant Surgery – Heart, Lung and Kidney – Indications, Physiological changes and Complications.

7. **Diseases of the Arteries and Veins** : Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases

   : Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins.

8. Definition, Indication, Incision, Physiological changes and Complications following **Common operations** like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias, Appendicectomy Mastectomy, Neprectomy,Prostectomy.

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

OBSTETRICS AND GYNECOLOGY

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

1. Describe the normal and abnormal physiological events during the puberty, labor, puerperium, post – natal stage and menopause.
2. Discuss the various complications during pregnancy, labour, puerperium and post – natal stage, pre and post-menopausal stage and various aspects of urogenital dysfunction and their management in brief.
3. Acquire the skill of clinical examination of pelvic floor
4. Acquire the skill of clinical examination of pregnant woman.

THEORY

1. Anatomy and physiology of the female reproductive organs. Puberty dynamics
2. Physiology of menstrual cycle–
3. Hormonal disorders of females-obesity and female hormones

4. Pregnancy

   a. Diagnosis of pregnancy
   b. Abortion
   c. Physiological changes during pregnancy
   d. Importance of antenatal care exercise
   e. High risk pregnancy, prenatal common complications – investigation and management
   f. Musculoskeletal disorders during pregnancy
   g. Multiple child birth

h. Normal labor

5. **Child birth** complications, investigation and management
6. **Normal puerperium**, lactation and importance of post-natal exercises
7. **Family planning**.
8. **Medical termination of pregnancy**
9. **Infection of female genital tract** including sexually transmitted diseases, low backache
10. **Prolapse of uterus and vagina**
11. **Principle of common gynaecological operations** – hysterectomy, D&C, D&E, Pop smear
12. **Menopause**: Its effect on emotions and musculoskeletal system
13. **Urogenital dysfunction** – pre and post-natal condition
14. **Sterility**: Pathophysiology, investigations, management, Malnutrition and deficiencies in females.
15. **Surgical procedures involving childbirth**.
    a. Definition, Indications and Management of the following surgical procedures – pelvic repair, caesarian section, nephrectomy, Hysterosalphyngography, Dilatation and Curettage, Laparoscopy, Colposopy, Hysterectomy.
16. **Carcinoma of female reproductive organs** – surgical management in brief Mastectomy – Simple, radical.Hysterectomy.
17. **Incontinence** – Types, Causes, Assessment and Management.

Recommended Text books:

1. Textbook of surgery-das
2. Bailey and Love's – Short Practice of Surgery
3. Obstetrics & Gynecology-Dutta

Reference books:

1. General Surgical Operations – by Kirk /Williamson
2. Surgery by Nan
3. Chest Disease by Crofton and Douglas.
4. Surgery – S.Basu

PHYSICAL AND FUNCTIONAL DIAGNOSIS

Course description:

This course serves to integrate knowledge gained by the students in basic and clinical medical science with the skills gained by basic physiotherapy subject. Thus enabling them to apply this in evaluation of functions and measurements in clinical situations of dysfunction of different system

THEORY

Introduction and general consideration of evaluation and measurement of:

1. **Assessment of Cardio – pulmonary dysfunction:**
   a) Physical and functional evaluation of cardio pulmonary, normal and pathological conditions.
   b) Posture: Recumbent, erect and orthopnea
   c) Breathing Pattern and breath hold (rate, rhythm, use of accessory muscles), chest deformities, cough, sputum, tactile and vocal fremitus, mobility of thoracic spine and rib cage, percussion, breath sounds. Chest expansion measurements.
   d) Measurements of lung volumes and lung capacities, blood gas level, exercise tolerance test,etc.
   e) Heart rate, blood pressure, heart sounds, pulse rate (volume and pressure), exercise tolerance test.
   f) Pulmonary function test, spirometry, gas analysis
   g) Cardiac efficiency tests: Stress ECG, treadmill test and ergometry
   h) BMI, Waist circumference, Waist – Hip ratio
2. **Assessment of Musculoskeletal dysfunction:**
   a) Anthropometric measurements, Posture and postural disorder evaluation
   b) Physical examination of joints in normal and pathos–mechanical conditions; special tests
   c) Assessment of Muscle strength, power and endurance, Range of motion of joints, flexibility, Agility, Measurement of girth, leg length, pelvic inclination, Angle of scoliotic curve, etc
   d) Gait analysis in pathological conditions and measurement of gait parameters
   e) Assessment of pelvic floor muscle strength and dysfunction
   f) Assessment of Hand: Pinches, Grips, Routine sensory motor evaluation, Stereognosis
   g) **Assessment of Pain:** with techniques and clinical reasoning Types of pain: Somatic, referred, Neurogenic, Visceral, etc. Location, duration, progressive or non-progressive, localize or generalize, distribution, quality, diurnal variations, Modifying factors, Severity, nature of pain, tissue irritability, Measurement and Documentation

3. **Assessment of Neurological Dysfunction:**
    a. Evaluation of function and measurement in general and with reference to upper motor and lower motor neuron lesions; Higher Motor functions, cranial nerves, sensations & sensory organization, body image, tone, reflexes: superficial & deep, voluntary control, muscle strength, co-ordination, balance, Tone, Spasticity, posture, gait
    b. Myotomes and Dermatomes
    c. Nerve Entrapments
    d. Muscle tone, voluntary movement and voluntary control tests (isolated and skilled)
    e. Tests for disorder of cerebellum, and basal ganglia, etc and coordination tests abnormal movements – clonus, tremors, chorea, athetosis
    f. Reflexes (superficial and deep, Cortical & Neonatal reflexes, etc) neural control of bladder

4. **Electro –Diagnosis:**
    a. Review of electro physiology
    b. Surface and needle electromyography
    c. Nerve conduction velocity test (motor and sensory)
    d. H-Reflex and F-wave
    e. SD curve
    f. Biofeedback: Introduction, principles of biofeedback, therapeutic effects, indications and contraindications, Advantages and disadvantages

5. **Functional Evaluation**:
    a. Introduction, What, Why and How to evaluate, Quantitative versus Qualitative data, Uses of evaluation findings, Percentage of disability (temporary and permanent)
    b. International Classification of Functioning, Disability, and Health (ICF) and Documentation based on ICF.
    c. Scales: FRT, Berg's Balance, modified Ashworth, Glasgow Coma, TUG, FIM,
    d. Barthel Index and HRQoL – SF36
    e. Mobility in bed, transfers, ambulation
    f. Personal care – eating, dressing, washing, bathing etc
    g. Household jobs
    h. Work and recreation.

6. **Interpretation of various investigations:**
    a) Radiological (X-rays, CT scan, MRI).
    b) Normal Values of Routine Biochemical investigations (ABG, Blood, CSF, ECG).

Recommended Books:

1. Textbook of Physical Diagnosis with DVD: History and Examination MarkH.Swartz
2. Physical Diagnosis Secrets: Salvatore MangioneMD
3. Bates' Guide to Physical Examination and History Taking, 10thEdition LynnS.Bickley
4. Differential Diagnosis for Physical Therapists: Screening for Referral Catherine C.Goodman ,Teresa KellySnyder
5. Pocket Guide to Musculoskeletal Diagnosis [Paperback] Grant Cooper
6. Differential Diagnosis for the Orthopedic Physical Therapist [Paperback] James Meadows
7. Electro-Diagnosis and Electro-Therapeutics: A Guide for Practitioners and Students Toby Cohn
8. Electrodiagnosis in Diseases of Nerve and Muscle: Principles and Practice [Hardcover] Jun KimuraM.D.
9. Biofeedback, Third Edition: A Practitioner's Guide [Paperback] Mark S. SchwartzPhD (Editor), Frank Andrasik PhD(Editor)
10. ACSM's Guidelines for Exercise Testing and Prescription. American College of Sports Medicine
11. Principles of Exercise Testing and Interpretation: Including Pathophysiology and Clinical Applications. Karlman Wasserman, James E. Hansen, Darryl Y. Sue,William W. Stringer , Brian J.Whipp
12. The Physiotherapist's Pocket Guide to Exercise: Assessment, Prescription and Training. Angela Jane Glynn, Helen Fiddler
13. Neuro musculoskeletal Examination and Assessment: A Handbook for Therapists. Nicola J.Petty
14. Physiotherapy Assessment [Paperback] Anne Parry.
15. Neurological Disabilities: Assessment and Treatment Susan E. Bennett , James L. Karnes.
16. Clinical Orthopedic Assessment Guide -2ndEdition JaniceLoudon, MarcieSwift, StephaniaBell
17. Pocket Guide to Musculoskeletal Assessment Richard E.Baxter

(Not for University Exam)

PROFESSIONALISM AND VALUES

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

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

BASIC COMPUTERS AND INFORMATION SCIENCE

SUBJECT DESCRIPTION: The students will be able to appreciate the role of computer technology. The course has focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data worksheet and PowerPoint presentation. Topics to be covered under the subject are as follows:

1. Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.
2. Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).
3. Processor and memory: The Central Processing Unit (CPU), main memory.
4. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.
5. Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing,etc.).

6. Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.
7. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.
8. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.
9. Introduction of Operating System: introduction, operating system concepts, types of operating system.
10. Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of Network.
11. Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.
    a. Application of Computers in clinical settings.

PRACTICAL: Practical on fundamentals of computers -

1. Learning to use MS office: MS word, MS Power Point, MS Excel.

2. To install different Software.

3. Data entry efficiency

Recommended Books:

1. V. Rajaraman: Fundamentals of Computers, Prentice Hall of India,2002

2. R. Hunt, J. Shelley: Computers and Commonsense, Prentice Hall of India,2002

3. A. Leon, M. Leon, Fundamentals of Information Technology, Leon Vikas,2002

4. MS Office2007.

5. Ajay Gaur :SPSS

Sixth Semester B.P.T

PHYSIOTHERAPY IN ORTHOPEDIC CONDITIONS& SPORTS

SUBJECT DESCRIPTION -The subject serves to integrate the knowledge gained by the students in orthopedics and Traumatology with skills to apply these in clinical situations of dysfunction and musculoskeletal pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify disabilities due to musculoskeletal dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function.

1. **PT assessment for Orthopedic conditions** - SOAP format. Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling-methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination – ROM – active and passive, resisted isometric tests, limb length-apparent, true and segmental , girth measurement, muscle length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination- dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program. Documentation of case records, and follow-ups.
2. **Fractures** - types, classification, signs and symptoms, complications. Fracture healing - factors affecting fracture healing. Principles of fracture management - reduction - open and closed, immobilization - sling, cast, brace, slab, traction - manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing. PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases. Aims of PT management in fracture cases - short and long term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.
3. **Specific fractures and dislocations**: PT assessment and management of upper limb fractures and dislocations. PT assessment and management of lower limb fractures and dislocations including pelvis. PT assessment and management spinal fractures

4. **Selection and application of physiotherapeutic techniques**, maneuver's, modalities for preventive, curative and rehabilitative means in all conditions.
5. **Principles of various schools of thought in manual therapy**. (Briefly Maitlandand McKenzie).
6. **Degenerative and inflammatory conditions**: Definition, signs and symptoms, clinical features, path physiology, radiological features, deformities, medical, surgical management. Describe the PT assessment and management and home program for the following conditions – Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritic shoulder.
7. **Infective conditions**: Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. Describe PT assessment and management for following conditions – Osteomyelitis – acute and chronic, Septic arthritis, pyogenic arthritis, TB spine and major joints - knee and hip.
8. Define, review the postural abnormalities of spinal column, clinical features, deformities, medical and surgical management. Describe PT assessment and management and home program.
9. **Deformities**: Review in detail the causes, signs and symptoms, radiological features, medical and surgical management. Describe the PT. assessment and management of the following conditions: Congenital: CTEV, CDH, Torticollis, pes planus, pes cavus and other common deformities. Acquired: scoliosis, kyphosis, coxa vara, genu varum, valgum and recurvatum.
10. **Cerebral palsy**: Definition, etiology, classification, clinical features, complications, deformities, medical and surgical management and home program with special emphasis on carrying techniques. PT management after surgical corrections.
11. **Poliomyelitis**: Definition, etiology, types, pathophysiology, clinical features, deformities, medical and surgical management. PT. assessment and management after surgical corrections and reconstructive surgeries - emphasis on tendon transfer and home program.
12. **Leprosy:** Definition, cause, clinical features, medical and surgical management. PT assessment, aims, and management after surgical procedures such as tendon transfer both pre and postoperatively.
13. **Amputations**: Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management.
14. **Spinal conditions**: Review the causes, signs and symptoms, investigations, radiological features, neurological signs. PT assessment, aims, and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac

joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta.

15. **Effects of spinal traction**, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction.
16. **Osteoporosis**- causes, predisposing factors, investigations and treatment.
17. **Orthopedic surgeries**: Pre and post-operative PT assessment, goals, precautions and PT management of following surgeries such as : Arthrodesis, Osteotomy, Arthroplasty-partial and total - Excision arthroplasty, excision arthroplasty with implant, interpositional arthroplasty and total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.
18. **Shoulder joint**: Shoulder instabilities, TOS, RSD, Impingement syndrome - conservative and post-operative PT management. Total shoulder replacement and Hemi replacement. - Post operative PT management. AC joint injuries - rehabilitation. Rotator cuff tears-conservative and surgical repair. Subacromial decompression - Post operative PT management.
19. **Elbow and forearm**: Excision of radial head - Post operative PT management. Total elbow arthroplasty- Post operative PT management.
20. **Wrist and Hand**: Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations - Post operative PT management. **Hip**: Joint surgeries - hemi and total hip replacement - Post operative PT management Tendonitis and bursitis. -Management.
21. **Knee**: Lateral retinacular release, chondroplasty- Post operative management. Realignment of extensor mechanism. ACL and PCL reconstruction surgeries - Post operative rehabilitation. Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome-conservative management. TKR- rehabilitation protocol. Patellar tendon ruptures and Patellectomy-rehabilitation.
22. **Ankle and foot**: Ankle instability. Ligamentous tears- Post operative management.
23. **Introduction to Bio-Engineering**; Classification of Orthoses and prostheses; Biomechanical principles of orthotic and prosthetic application; Designing of upper extremity, lower extremity and spinal orthosis, indications and check out; Designing of upper extremity and lower extremity prostheses, indications and check out; Psychological aspects of orthotic and prosthetic application; prescription and designing of footwear and modifications; Designing and construction of adaptive devises.
24. **Sports Physiotherapy**: Physical fitness. Stages of soft tissue healing. Treatment guidelines for soft tissue injuries- Acute, Sub acute and chronic stages. Repair of soft tissues- rupture of muscle, tendon and Ligamentous tears. Soft tissue injuries- prevention and rehabilitation of, Lateral ligament sprain of ankle. Rotator

cuff injuries. Collateral and Cruciate injuries of knee. Meniscal injuries of knee. Supraspinatus and Bicipital tendonitis. Pre patellar and Sub-acromial bursitis. Tennis and Golfer's elbow. Hamstring strains, Quadriceps contusion, TA rupture. Dequervain's tenosynovitis. Trigger and Mallet finger. Plantar fasciitis. Wrist sprains.

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

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

Recommended books:

1. Tidy's physiotherapy –Porter
2. Physical Therapies in Sport and Exercise by Gregory Kolt and Lynn Snyder-Mackler,2007.
3. Clinical orthopedic rehabilitation-Brotzman.
4. Orthopedic physiotherapy - Jayant Joshi.
5. Physical Rehabilitation Assessment and Treatment – O'SullivanSchmitz
6. Sports Injuries: Diagnosis and Management for Physiotherapists by Christopher M. Norris(1992)
7. Orthopedic Physical Therapy – Donatelli&Wooden
8. Management of Common Musculoskeletal Disorders – Hertling & Kessler
9. Treatment and Rehabilitation of Fractures by Stanley Hoppenfeldand Vasantha LMurthy
10. Physiotherapy In Orthopaedics: A Problem-Solving Approach by Karen Atkinson Fiona Coutts, and Anne-Marie Hassen kamp
11. Principles of Neuro musculoskeletal Treatment and Management by NicolaJ.Petty(2004)
12. Therapy for Amputees by Barbara Engstrom and Catherine Van de VenZ
13. Pocketbook of Taping Techniques by Rose MacDonald
14. Orthopedic Physical Assessment by David J. Magee(2007)
15. Orthopaedic Physiotherapy (Cash's Textbook) by MarianTidswell
16. Rehabilitation for the Postsurgical Orthopedic Patient by Lisa Maxey MS PT and Jim Magnusson
17. Orthopedic and Sports Physical Therapy by Terry Malone, Thomas McPoil and Arthur J.Nitz
18. Differential Diagnosis for the Orthopedic Physical Therapist by James Meadows(1999)
19. In-Patient Physiotherapy: Management of Orthopaedic Surgery by LucyS.Chipchase, ScottA.
20. Pocket Guide to Musculoskeletal Assessment by Richard Baxter.
21. Sports physiotherapy- MariaZuluaga

PHYSIOTHERAPY IN MEDICAL & SURGICAL CONDITIONS

SUBJECT DESCRIPTION -At the end of the course the candidate will be able to:

1. Identify discuss and analyze cardiovascular and pulmonary dysfunctions based on pathophysiological principles and arrive at appropriate functional diagnosis.
2. Acquire knowledge of rationals of basic investigative approaches in the medical system and surgical intervention, regimes in general surgeries (special emphasis on abdominal surgeries)
3. Execute effective physiotherapeutic measures (with appropriate clinical reasoning) and exercise, conditioning in general medical and surgical conditions.
4. Acquire knowledge of the overview of patient's care in the I.C.U. for bronchial hygiene and continuous monitoring of the patient in I.C.U.
5. Select strategies for cure, care and prevention; adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, work and in community.
6. Acquire the knowledge of evaluation and physiotherapeutic treatment for obstetric and gynecological conditions
7. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation (psychiatry, dermatology, geriatric and ENT conditions)
8. Evaluate, grade and treat non healing wounds.

THEORY

1. Woman's Health:

A. Adolescent phase–

a) Obesity
b) Menstrual disorders like PCOD (poly cystic ovarian disorder), pre-menstrual syndrome and dysmenorhea with its PT management

B. Child-bearing phase–

a) Complications during pregnancy and its PT management according to specific conditions/complications.
b) Antenatal Phase– specific breathing exercise, relaxation, postural training, pelvic floor exercise and strengthening exercise.
c) Physiotherapy during labor.
d) Postnatal Phase – complication and its physiotherapy management. Postnatal exercise after normal labour and labour with invasive procedures like: Episiotomy, Forceps delivery, Caesarian section

C. Climacteric Phase-

a) Menopause, Osteoporosis & Physiotherapy management
b) Gynecological conditions like Incontinence & its types, Prolapse & displacement along with its PT management
c) Gynecological operations - hysterectomy, prostatectomy, Mastectomy-Simple and Radical, pelvic repair and other operations with PT

management.

2. **Management of vascular disease**: thrombosis, phlebitis and phlebothrombosis, burger's disease, varicose veins, DVT, venous ulcers, lymphoedema& its PT management
3. **Skin conditions & Venereal diseases:** Acne, Psoriasis, Alopecia, Vitiligo, Hyperhidrosis, And STD's: AIDS, syphilis, and gonorrhea along with PT management. Wounds, local infection, ulcers, pressure sore-UVR and other electrotherapeutic modalities for healing of wounds, hypergranulated scars, relief of pain and modality.
4. **Role of Physiotherapy** in diabetes Mellitus, Hypertension, Vertigo, Leprosy, Myofascial Pain, Acute and Chronic Pain Syndromes, Obesity, and Hemophilia.
5. **Psychiatry** - physiotherapy in psychiatric conditions:
    A Introduction to Psychiatry in Physiotherapy.
    B Substance related disorders-alcohol, opium, hallucinogens,etc.
    C Sleep disorders.
    D Anxiety disorders - GAD, phobias, panic disorder, ASD, PTSD, and OCD.
6. **Physiotherapy management of Complication common to all operations**
7. **Physiotherapy management of Abdominal incisions**
8. **Physiotherapy in pre and post operative stages**
9. **Physiotherapy management of Operations of upper G.I. Tract - esophagus, stomach, duodenum.**
10. Physiotherapy management of Operations of large and small intestine: Appendicectomy, Cholecystectomy, partial colostomy, colostomy, Ileostomy, hernia and herniotomy, hernioraphy, hernioplasty.
11. **Burns and its treatment:** Physiotherapy in burns, skin graft, and reconstructive surgeries.
12. **ENT**: Physiotherapy management of sinusitis, non suppurative and chronic suppurative otitis media, otosclerosis, labrynthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngeo-laryngectomy, facialpalsy.
13. **Oncology**: Etiology, stages and types of cancer developments; Clinical manifestations, Diagnosis of cancer; Physiotherapy examination and treatment of specific representative cancers: Breast and lung cancer.

PRACTICAL:

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

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

Recommended books:

1. Tidy's Physiotherapy (Physiotherapy Essentials) by Stuart Porter(2008)

2. Physiotherapy in Obstetrics and Gynaecologyby Jill Mantle; Jeanette Haslam and SueBarton

3. Women's Health: A Textbook for Physiotherapists by Ruth Sapsford, Joanne Bullock-Saxton, and SueMarkwell.

4. Burn Care and Rehabilitation: Principles and Practice (Contemporary Perspectives in Rehabilitation) by Reginald L. Richard and Marlys J. Stanley (1994).

5. Cash's Textbook of Medical and Surgical conditions for Physiotherapists by Joan E. Cash and Patricia A. Downie (1993)

Reference Books:

1. Obstetric and Gynecologic Care in Physical Therapy, by Rebecca G.Stephenson andO'Connor

2. Rehabilitation and palliation of cancer patients by Herrmann Delbruck

3. Physiotherapy in Psychiatry by Mary Hare

4. Physiotherapy in Mental Health: A Practical Approach by Tina Everett, Dennis, and Eirian Ricketts.

5. Health Promotion Throughout the Life Span by Carole Lium Edelman and Carol Lynn Mandle

6. Geriatric Physical Therapy by Andrew A., Ph.D.Guccione.

7. Essentials of Geriatric Physical Therapy by Jennifer M.,Bottomley

8. Saunders Manual of Physical Therapy Practice by Rose Sgarlat Myers; W. B. Saunders Company

YOGA & ALTERNATIVE MEDICINE

SUBJECT DESCRIPTION- After the course on Yoga & Alternative Medicine, the student will be able to understand the different types of Yoga & Alternative Medicine treatment for the benefit of patient in different situations and conditions both in health and disease or disorder.

THEORY

A. YOGA (University exam-Questions for Long, Short answers & MCQ**)**

1. **The Principles and Techniques of Yoga**- Basic yogic postures and their physiological effects and therapeutic uses

I. Sukshama Kriya Yoga- Yogic Joint mobilization techniques

1. Pancham Kriya
2. Joint mobilization in Standing
3. Upper limb joint mobilization
4. Spinal mobilization
5. Lower limb joint mobilization

II. Yogasanas

1. **For Meditation**- Sukhasana, Swastikasana, Padmasana,Vajrasana
2. **For Relaxation**- Shavasana, Makarasana,Balakasana
3. **For Health**-

i. Asanas in Supine lying

a. Uttanpadasan
b. Pavanmuktasan
c. Katiutthanasan
d. Naukasan
e. Matsyasan
f. Setubandhasan
g. Udarkunchanasan

ii. Asanas in Prone lying

a. Bhujangasan
b. Sarpasan
c. Shalabhasan
d. Dhanurasan
e. ViparitNaukasan
f. Niralambasan
g. Dradhasan

iii. Asanas in Sitting Posture

a. Yogamudrasan
b. Shashankasan
c. Ustrasan

d. Janushirasan
e. Paschimotanasan
f. Vakrasana
g. Ardhamastyendrasan
h. Dandasan

iv. Asanas in Standing posture

a. Tadasan
b. Dhruvasan
c. Trikonasan
d. Utkatasan
e. Padahastasan

v. **Suryanamaskar Asana** – Combination of 12 Asanas

III. Pranayam and Respiratory Physiology

1. Suryabhedan
2. Ujjayi
3. Sitkari
4. Sheetali
5. Bhastrika

IV. Bandh

1. Jalandhara Bandh
2. Uddiyan Bandh
3. Moola Bandh

V. Mudra- Types and Benefits

2. **The Patanjali's Ashtang Yoga**- Yama, Niyama, Asana and Pranayam

3. **The Yogic Physiotherapy**-The comparative guidelines between Physical Exercise and Yogic Exercise. The integrated approach:Physio-Yoga

4. Yoga and Biomechanics

5. **Yoga and Exercise therapy**-
   a. Types of exercises and it's yogic applications
   b. Principles of Exercise therapy and Yogic application
   c. The fundamental starting postures in Exercise therapy and Yoga

6. Applications of Yoga:
   a. Personality development
   b. Stress management
   c. Complete Health
   d. Disease prevention and Management

7. Applied Yoga in orthopedic conditions and Pain relief.

8. **Applied Yoga in Women's health**- Antenatal & Postnatal issues, Menstrual disorders, Menopausal &post menopausal syndrome.

9. Applied Yoga in Neurological conditions and psychosomatic disorders.

10. **Yoga as therapy in Cardio-vascular and Pulmonary conditions** like Coronary Artery Disease, Peripheral Vascular Disease, Bronchial Asthma

ALTERNATIVE MEDICINE (University exam-Questions for Very Short answers only)

- **B. Acupuncture & Acupressure:** Definition, Principles, Techniques, Physiological effects, Indications, Contra-Indications, Dangers & Integration of Acupuncture & Accupressure with Physiotherapy
- **C.** Introduction to **Magnetotherapy**
- **D.** Introduction to **Naturopathy**
- **E.** Introduction to **Ayurvedic Medicine**
- **F.** IntroductiontoTai-Chi,ReikiandPranicHealing,Reflexology,Vipassana,Sujok.

PRACTICALS- Practical demonstration of Yogasanas, Relaxation, Meditation, and Pranayama

TEXT BOOKS & REFERENCE BOOKS: YOGA & ALTERNATIVE MEDICINE

1. Yoga and Rehabilitation, Patel Nilima, Jaypee Publications,2008
2. Yoga for common ailments and IAYT for different diseases, Dr R Nägarthna, Dr H R Nägendra and DrShamanthakamni, Swami Vivekananda Yoga Prakashana, Bangalore,2002.
3. Alternative Therapies by Swati Bhagat. 1st Edition. JaypeePublications.
4. Yogic Exercises by Datta Ray. 1st Edition. JaypeePublications.
5. Acupuncture and Trigger Points by Peter. 3rd Edition.Elsevier.
6. Acupressure in Clinical Applications by John . 1st Edition. B & HPublications.
7. The Program for Reversing Heart Disease–The Ornish Spectrum by Dean Ornish
8. Back Health Through Yoga, Ramesh Bijlan, Rupa Publications India Pvt. Ltd, 2011.
9. Yoga Therapy Series, MDNIY Publications, MDNIY Publications: 10 Booklets, New Delhi,2009.
10. Yogic Therapy, Reddy M Venkata& others: Sri M.S.R Memorial Yoga Series Arthamuru A.P.2005
11. Yogic Therapy, Swami Kuvalayananda& SL Vinekar:1963
12. Discovering Human Potential energy: A Physiologycal Approch to Yoga, Rai, Lajpat: Anubhava Rai Publications,1998

CLINICAL REASONING AND EVIDENCE BASED PHYSIOTHERAPY PRACTICE -

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

Recommended books:

1. Practical Evidence Based Physiotherapy: Robert Herbert, GroJamtvedt, Judy Mead, and Kare Birger Hagen;Elsevier.
2. Evidence-Based Physiotherapy Practice; Mary AnnO'Brien
3. Guide to Evidence-Based Physical Therapy Practice by Dianne V. Jewell(2007)

4. Evidence-Based Rehabilitation: A Guide to Practice by Mary C. Law PhD and Joy MacDermid PhD(2007)
5. Evidence-Based Healthcare: A Practical Guide for Therapists by Tracy J. Bury and Judy M. Mead(1998)
6. Therapists and Physiotherapists: Theory, Skills and Application by Alison J. Laver Fawcett (2007)

(Not for University Exam)

DIAGNOSTIC IMAGING FOR PHYSIOTHERAPIST

SUBJECT DESCRIPTION- This course covers the study of common diagnostic and therapeutic imaging tests. At the end of the course students will be aware of the indications and implications of commonly used diagnostic imaging tests as they pertain to patient's management. The course will cover that how X-Ray, CT, MRI, Ultrasound and Other Medical Images are created and how they help the health professionals to save lives.

1. **IMAGE INTERPRETATION**
    a. History
    b. A New Kind of Ray
    c. How a Medical Image Helps
    d. What Imaging Studies Reveal
    e. Radiography(x-rays)
    f. Fluoroscopy
    g. Computed Tomography(CT)
    h. Magnetic Resonance Imaging(MRI)
    i. Ultrasound
    j. Endoscopy.
2. **RADIOGRAPHY AND MAMMOGRAPHY**
    a. Equipment components
    b. Procedures for Radiography &Mammography
    c. Benefits versus Risks and Costs
    d. Indications and contraindications.
3. **FLUOROSCOPY**
    a. What is Fluoroscopy?
    b. Equipment used for fluoroscopy
    c. Indications and Contraindications
    d. How it helps in diagnosis
    e. The Findings in Fluoroscopy
    f. Benefits versus Risks and Costs.
4. **COMPUTED TOMOGRAPHY(CT)**
    a. What is Computed Tomography?
    b. Equipment used for Computed Tomography
    c. Indications and Contraindications

d. How it helps in diagnosis
e. The Findings in Computed Tomography
f. Benefits versus Risks and Costs.

5. MAGNETIC RESONANCE IMAGING(MRI)

a. What is MRI?
b. Equipment used for MRI
c. Indications and Contraindications
d. How it helps in diagnosis
e. The Findings in MRI
f. Benefits versus Risks and Costs
g. Functional MRI.

6. ULTRASOUND

a. What is Ultrasound?
b. Equipment used for Ultrasound
c. Indications and Contraindications
d. How it helps in diagnosis
e. The Findings in Ultrasound
f. Benefits versus Risks and Costs.

5. ENDOSCOPY

a. What is Endoscopy?
b. Equipment used for Endoscopy
c. Indications and Contraindications
d. How it helps in diagnosis
e. The Findings in Endoscopy
f. Benefits versus Risks and Costs.

8. NUCLEARMEDICINE

a. What is Nuclear Medicine?
b. Equipment used for Nuclear Medicine
c. Indications and Contra-indications
d. How it helps in diagnosis.
e. Benefits versus Risks and Costs.

Recommended books:

1. James Swain & Kenneth W. Bush. Diagnostic Imaging for Physiotherapists.
2. Lynn N. McKinnis. Fundamentals of Musculoskeletal Imaging; F.A.Davis
3. L.C. Gupta & A. Gupta. X-ray Diagnosis and Imaging.

ENT

Course Description:

This course will introduce to the student to acquire knowledge to describe pathophysiology, signs & symptoms, clinical features, examination & management of diseases of ENT conditions.

THEORY

1. Anatomy and physiology of hearing
2. General introduction to diseases of E.N.T., emphasis on otitis media, facial palsy classification, medical and surgical management of lower motor neuron type of facial palsy, sinusitis,rhinitis.
3. Mastoid surgery**.**
4. Larynx and associated functional paralysis with tracheostomy and care of tracheostomy.
5. Causes of hearing loss, Conservative and surgery intervention including types and availability of hearing aids**.**

Recommended Books:

1. Maqbool: TB of Nose Throat & Ear: 11/e2007
2. Tuli: TB of Nose Throat & Ear:2005
3. Golwalla –Medicine for students
4. Principles and practice of Medicine-Davidson

OPHTHALMOLOGY

Course Description:

This course will introduce to the student to acquire knowledge to describe pathophysiology, signs & symptoms, clinical features, examination & management of diseases of Ophthalmic conditions.

THEORY

Ophthalmologic surgical conditions, Refractions, Conjunctivitis, Glaucoma, Corneal ulcer, Iritis, Cataract, Retinitis, Detachment of retina, Defects of extra-ocular muscles-surgical management

Recommended Books:

1. Maqbool: TB of Nose Throat & Ear: 11/e2007
2. Tuli: TB of Nose Throat & Ear:2005
3. Golwalla –Medicine for students
4. Principles and practice of Medicine-Davidson

Seventh Semester B.P.T
CLINICAL NEUROLOGY & NEUROSURGERY

SUBJECT DESCRIPTION-This subject follows the basic science subjects to provide the knowledge about relevant aspects of neurology & neurosurgery. The student will have a general understanding of the diseases the therapist would encounter in their practice. The objective of this course is that after 60 hrs of lectures and discussion the student will be able to list the etiology, pathology, clinical features and treatment methods for various neurological conditions.

1. **Disorders of function in the context of Pathophysiology**, Anatomy in Neurology and Cortical Mapping.
2. **Classification of neurological** involvement depending on level of lesion.
3. **Neurological assessment**: Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system.
4. **Vertigo, and imbalance**: Physiology of vestibular function, vertigo, peripheral vestibular disorders, central vestibular vertigo.
5. **Lower cranial nerve paralysis** – Etiology, clinical features, investigations, and management of following disorders - lesions in trigeminal nerve, trigeminal neuralgia, trigeminal sensory neuropathy, lesions in facial nerve, facial palsy, bell's palsy, hemi facialspasm,Glossopharangial neuralgia, lesions of Vagus nerve, lesions of spinal accessory nerve, lesions of hypoglossal nerve, Dysphagia – swallowing mechanisms, causes of dysphagia, symptoms, examination, and management of dysphagia
6. **Cerebro-vascular diseases**: Define stroke, TIA, RIA, stroke in evolution, multi infarct dementia and Lacunar infarct. Classification of stroke – Ischemic, hemorrhagic, venous infarcts. Risk factors, cause of ischemic stroke, causes of hemorrhagic stroke. Classification of hemorrhagic stroke, classification of stroke based on symptoms, stroke syndrome, investigations, differential diagnosis, medical and surgical management.
7. **Head injury**: Etiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications.
8. **Higher cortical, neuro psychological and neurobehavioral disorders**: Causes of blackouts, physiological nature of Epilepsy, classification, clinical features, investigations, medical& surgical management of following disorders – Non- epileptic attacks of childhood, Epilepsy in childhood, Seizers, and Epilepsy syndromes in adult. Classification and clinical features of Dyssomnias, Parasomnias, Dementia, Obsessive-compulsive disorders. Neural basis of consciousness, causes &investigations of Coma, criteria for diagnosis of Brain death. Etiology, pathophysiology, classification, clinical signs & symptoms,

investigations, differential diagnosis, management of Perceptual disorders and Speech disorders.

9. **Movement disorders**: Definition, etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Parkinson's disease, Dystonia, Chorea, Ballism, Athedosis, Tics, Myoclonus and Wilson'sdisease.
10. **Cerebellar and coordination disorders**: Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Congenital ataxia, Friedreich's ataxia, Ataxia talengiectasia, Metabolic ataxia, Hereditary cerebellar ataxia, Tabes dorsalis and Syphilis.
11. **Spinal cord disorders**: Functions of tracts, definition, etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Spinal cord injury, Compression by IVD prolapse, Spinal epidural abscess, Transverse myelitis, Viral myelitis, Syringomyelia, Spina bifida, Sub acute combined degeneration of the cord, Hereditary spastic paraplegia, Radiation myelopathy, Progressive encephalomyelitis, Conus medullaris syndrome, Bladder & bowel dysfunction, and Sarcodosis.
12. **Brain tumors and spinal tumors**: Classification, clinical features, investigations, medical and surgical management.
13. **Infections of brain and spinal cord**: Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Meningitis, Encephalitis, Poliomyelitis and Post-polio syndrome. Complications of systemic infections on nervous system – Septic encephalopathy, AIDS, Rheumatic fever, Brucellosis, Tetanus, and Pertussis
14. **Motor neuron diseases**: - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications of following disorders - Amyotrophic lateral sclerosis, Spinal muscular atrophy, Hereditary bulbar palsy, Neuromyotonia and Post-irradiation lumbosacral polyradiculopathy.
15. **Multiple sclerosis** - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications.
16. **Disorders of neuromuscular junction** – Etiology, classification, signs & symptoms, investigations, management, of following disorders Myasthenia gravis, Eaton-Lambert syndrome, and Botulism.
17. **Muscle diseases:** Classification, investigations, imaging methods, Muscle biopsy, management of muscle diseases, genetic counseling. Classification, etiology, signs & symptoms of following disorders – Muscular dystrophy,

Myotonic dystrophy, Myopathies, Non-dystrophicmyotonia.

18. **Polyneuropathy** – Classification of Polyneuropathies, Hereditary motor sensory neuropathy, hereditary sensory and Autonomic neuropathies, Amyloid neuropathy, acute idiopathic Polyneuropathies. Guillain-Barre syndrome – Causes, clinical features, management of GBS, Chronic Idiopathic Polyneuropathies, diagnosis of polyneuropathy, nerve biopsy.
19. **Focal peripheral neuropathy**: Clinical diagnosis of focal neuropathy, neurotmesis, Axonotmesis, Neuropraxia. Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – RSD, Nerve tumors, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & Intercostal nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, Sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, Pudental nervepalsy.
20. **Paediatric neurology**: Neural development, Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders - Cerebral palsy, Hydrocephalus, Arnold-chiari malformation, Basilar impression, Klippel-Feil syndrome, Achondroplacia, Cerebral malformations, Autism, Dandy walker syndrome and Down's syndrome.
21. **Toxic, metabolic and environmental disorders**: Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – Encephalopathy, Alcohol toxicity, Recreational drug abuse, Toxic gases & Asphyxia, Therapeutic & diagnostic agent toxicity, Metal toxicity, Pesticide poisoning, Environmental & physical insults, Pant & Fungal poisoning, Animal poisons, & Complications of organ transplantation.
22. Introduction, Indications and Complications of following Neuro surgeries: Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr-hole, Shunting, Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery, Endarterectomy, Embolization, Pituitary surgery, Ablative surgery - Thalamotomy and Pallidotomy, Coiling of aneurysm, Clipping of aneurysm, and Neural implantation.

Recommended books: Text books:

1. Davidson's Principles and Practice of Medicine
2. Brains Clinical Neurology.
3. Bailey and Love's – Short Practice of Surgery
4. Textbook of Surgery ByDas

Reference books:

1. Illustrated Neurology & Neurosurgery
2. Brain's Diseases of Nervous System
3. Textbook of Neurology- Victor Adams
4. Neurology & Neuro surgery By Lindsay

PHYSIOTHERAPY IN NEUROLOGY & PSYCHOSOMATIC DISORDER

SUBJECT DESCRIPTION - The subject serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify disabilities due to neurological dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function.

1. **Neurological Assessment**: Required materials for examination, Chief complaints, History taking – Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function – Consciousness, Orientation, Wakefulness, memory, Speech, Reading, Language, Writing, Calculations, Perception, Left right confusion, Reasoning, and Judgment, Motor Examination

   – Muscle power, Muscle tone, Spasticity, Flaccidity, Reflexes – Developmental reflexes, deep tendon reflexes, Superficial reflexes, Sensory examination – Superficial, Deep and Cortical sensations, Special tests – Romberg's, Kerning's sign, Brudzinski sign, Tinels's sign, Slump test, Lehermitte's sign, Bells Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc, Balance examination, coordination examination, Gait analysis – Kinetics & Kinematics (Quantitative & Qualitative analysis), Functional Analysis, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading. Differential diagnosis.
2. **Neuro physiological Techniques** – Concepts, Principles, Techniques, Effects of following Neurophysiological techniques: NDT, PNF, Vojta therapy, Rood's Sensory motor Approach,Sensory Integration Approach, Brunnstorm movement therapy, Motor relearning program, Contemporary task oriented approach, Muscle re- education approach and Constraint induced movement therapy.
3. **Paediatric Neurology**: Paediatric Examination, Developmental milestones, developmental reflexes, Neuro developmental screening tests. Evaluation & Management - History, Observation, Palpation, Milestone Examination, developmental reflex Examination, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Risk babies, Minimum brain damage, Developmental disorders, Cerebral palsy, Autism, Down's Syndrome, Hydrocephalus, Chorea, Spina bifida, and Syringomyelia.

4. **Evaluation and Management of Brain and Spinal Cord Disorders** : History, Observation, Palpation, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Cerebro vascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumors, Perceptual disorders, Amyotrophic lateral sclerosis, and Multiple sclerosis.
5. **Evaluation and Management of Cerebellar, Spinal Cord and Muscle Disorders** : History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Ataxia, Sensory Ataxia, Parkinson's disease, Muscular dystrophy (DMD), Myasthenia Gravis, Eaton-Lambert Syndrome, Spinal tumors, Spinal cord injury, Transverse myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post-Polio Syndrome.
6. **Evaluation and Management of Peripheral Nerve Injuries and Disorders** : History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Hereditary motor sensory neuropathy, Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic &intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy,Axillarynervepalsy,Longthoracicnervepalsy,Suprascapularnerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudental nerve palsy.
7. **Assessment and management of Neurological gaits:** Quantitative and Qualitative (Kinetic & Kinematics) analysis, List of Problems, short & Long Term goals, Management of following Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Chorea form Gait, Diplegic Gait, and Myopathic Gait.
8. **Pre and post-surgical assessment and treatment following conditions** - Spinal disc herniation, Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine, Spinal cord and peripheral nerves, Cerebral

aneurysms, Subarachnoid hemorrhages, epilepsy, Parkinson's disease, Chorea, Hemiballism, Psychiatric disorders, Malformations of the nervous system, Carotid artery stenosis , Arteriovenous malformations, and Spina bifida.

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

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

Recommended books: Text books:

1. Cash's Textbook of Neurology for Physiotherapists
2. Physical Rehabilitation Assessment and Treatment – Susan O'SullivanSchmitz
3. Neurological Rehabilitation By Darcy Umphred.

Reference books:

1. Neurological Rehabilitation: Optimizing Motor Performance by Janet H. Carr and Roberta B.Shepherd
2. Treatment of Cerebral Palsy and Motor Delay by Sophie Levitt
3. Tetraplegia and Paraplegia: A Guide for Physiotherapists by Ida Bromley Elements of Pediatric Physiotherapy-Eckersley
4. Physical Management in Neurological Rehabilitation by Maria Stokes
5. Neurological Physiotherapy: A Problem-Solving Approach by Susan Edwards and Susan Edwards
6. Steps to follow By Patricia M.Davies
7. Right in the Middle By Patricia M.Davies
8. Neurological Examination made easy By Fuller.
9. Physical Rehabilitation By Braddom.

CLINICAL CARDIOVASCULAR AND PULMONARY CONDITIONS

SUBJECT DESCRIPTION - Following the basic science and clinical science course, this course introduces the Student in cardio-thoracic conditions which commonly cause disability.

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

1. **Anatomy and Physiology**
    - **a. Respiratory system**
        - i. Upper respiratory tract
        - ii. Lower respiratory tract – Trachea, Bronchial tree, Bronchopulmonary segments
        - iii. Respiratory unit, hilum of lung.
        - iv. Muscles of respiration
        - v. Pleura, intra pleural space, intra pleural pressure, surfactant
        - vi. Mechanics of respiration – Chest wall movements, lung & chest wall compliance
        - vii. V/Q relationship, airway resistance
        - viii. Respiratory centre, Neural & chemical regulation of respiration
        - ix. Lung volumes and lung capacities, Spiro meter, lung function test
        - x. Pulmonary circulation, Lung sounds, cough reflex
    - **b. Cardiovascular systems**
        - i. Chambers of heart, semi lunar and atria ventricular valves
        - ii. Coronary circulation, conductive system of heart
        - iii. Cardiac cycle, ECG, Heart sounds
        - iv. Blood pressure, pulse, cardiac output
2. **Cardio Vascular system**
    - a. **Define**, etiology, pathogenesis, clinical features, complications,
    - **b. Conservative and surgical management of the following conditions**
        - i. Ischemia heart disease
        - ii. Myocardial infarction
        - iii. Heart failure
        - iv. Cardiac arrest
        - v. Rheumatic fever
        - vi. Hypertension
        - vii. Infective endocarditis
        - viii. Myocarditis &cardiomyopathy
    - c. **Cardiovascular Disease** : Examination of the Cardiovascular System Investigations : ECG, Exercise Stress Testing, Radiology ; Clinical manifestations of Cardiovascular disease ; Definition, Etiology, Clinical

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

d. **Disorders of the Heart** – Definition, Clinical features, diagnosis and choice of management for the following disorders : Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease : Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetraology of Fallot, Transposition of Great Vessels ; Acquired Heart Disease – Mitral Stenosis & Insufficiency, Aortic Stenosis and Insufficiency, Ischemic Heart Disease – Coronary Artery Disease, Cardiac tumors.

3. Respiratory System

a. **Respiratory Disease** : Examination of the Respiratory System – Investigations : Chest Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis ; Clinical manifestations of Lung disease ; Patterns of lung disease – Chronic Obstructive Lung Disease and Restrictive Lung Disease ; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following lung diseases : Chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic Fibrosis, Upper Respiratory Tract Infections, Pneumonia, Tuberculosis, Fungal Diseases, Interstitial Lung Diseases, Diseases of the pleura, diaphragm and chest wall ; Respiratory failure – Definition, types, causes, clinical features, diagnosis and management.

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

Recommended Text Books:

1. Davidson's Essentials of Medicine by Stanley Davidson(2009)
2. Medicine for Students:Golwala
3. Textbook of surgery-das
4. Bailey and Love's – Short Practice of Surgery

Reference books:

1. Harrison's Principles of Internal Medicine, 17th Edition by Anthony S.Fauci,
2. Braunwald Text of Cardiology
3. Text Book of Cardiology by Hurst
4. Davidson's Principles and Practice of Medicine by Nicki R. Colledge (Ed), Brian R. Walker (Ed), and Stuart H. Ralston MD (2010)
5. General Surgical Operations – by Kirk /Williamson
6. Surgery by Nan
7. Chest Disease by Crofton and Douglas.
8. Surgery – S.Basu

PHYSIOTHERAPY IN CARDIO VASCULAR & PULMONARY CONDITIONS

SUBJECT DESCRIPTION - The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for various General, Medical and Surgical conditions. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra-indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

THEORY -

1. Anatomical and Physiological differences between the Adult and Pediatric lung.
2. Bed side assessment of the patient-Adult &Pediatric.
3. Investigations and tests – Exercise tolerance Testing – Cardiac & Pulmonary, Radiographs, PFT, ABG, ECG, Hematological and Biochemical Tests.
4. Physiotherapy techniques to increase lung volume – controlled mobilization, positioning, breathing exercises, Neurophysiological Facilitation of Respiration, Mechanical aids -Incentive Spirometry,CPAP,IPPB.
5. Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, mechanical aids IPPB, CPAP,BiPAP.
6. Physiotherapy techniques to clear secretions – Hydration, Humidification & Nebulisation, Mobilisation and Breathing exercises, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical Aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Nasopharyngeal Suctioning.
7. Drug therapy – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulisers.
8. Neonatal and Pediatric Physiotherapy – Chest physiotherapy for children, The neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit.
9. Physiotherapy in Obstructive lung conditions.
10. Physiotherapy in Restrictive lung conditions.
11. Management of breathlessness.
12. Pulmonary Rehabilitation.

13. Physiotherapy following Lung surgeries
14. Respiratory failure – Oxygen Therapy and Mechanical Ventilation.
15. Introduction to ICU : ICU monitoring –Apparatus, Airways and Tubes used in the ICU - Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with an Emergency Situation in the ICU.
16. Physiotherapy management following cardiac-surgeries.
17. Cardiac Rehabilitation.
18. Home program and education of family members in patient care.

PRACTICAL:

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

i. Bedside case presentations and case discussions
ii. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Recommended books: Text Book:

1. Tidy's Physiotherapy by Stuart Porter(2008)
2. Cash's Textbook of Chest, Heart and Vascular Disorders for Physiotherapists by Joan E. Cash and Patricia A. Downie(1993)
3. Physiotherapy for Respiratory and Cardiac Problems: Adults and Pediatrics by Ammani S Prasad and Jennifer A. Pryor(2008)
4. Principles and Practice of Cardiopulmonary Physical Therapy by Elizabeth, Ph.D. Dean, Donna Frown felter, Donna L. Frown felter, and Elizabeth Dean1996.

Reference Books:

1. The Brompton Hospital Guide to Chest Physiotherapy byGASKELL.
2. Cardiopulmonary Physiotherapy by M. Jones and F. Moffatt.
3. Physical Therapy by W. Darlene Reid and Frank hung
4. Cardiopulmonary Rehabilitation: Basic Theory and Application by Margaret Wiley Foley, Julie Ann Starr, Lauren M. Saul, and Frances J.Brannon
5. Essentials of Cardiopulmonary Physical Therapy by H. Steven Sadowsky andEllen A. Hillegass.
6. Cardiopulmonary Physical Therapy: A Clinical Manual by Joanne Watchie.
7. Cardiovascular and Pulmonary Physical Therapy : An Evidence-based Approach by William DeTurk and LawrenceCahalin.
8. Respiratory and Management by Alexandra Hough by Jonathan Corne and Kate Pointon (Paperback - Sept. 22,2009).
9. ECG Made Easy. John R. Hampton, Churchill Livingstone.

Eighth Semester B.P.T

COMMUNITY MEDICINE

SUBJECT DESCRIPTION - This subject follows the basic science subjects to provide the knowledge about conditions the therapist would encounter in their practice in the community. The objective of this course is that after 60 hrs of lectures and discussion the student will be able to demonstrate an understanding of various aspects of health and disease list the methods of health administration, health education and disease preventive measures.

1. **Health and Disease**: Definitions, Concepts, Dimensions and Indicators of Health, Concept of well-being, Spectrum and Determinants of Health, Concept and natural history of Disease, Concepts of disease control and prevention, Modes of Intervention, Population Medicine, The role of socio-economic and cultural environment in health and disease.
2. **Epidemiology**, definition and scope. Principles of Epidemiology and Epidemiological methods: Components and Aims, Basic measurements, Methods, Uses of Epidemiology, Infectious disease epidemiology, Dynamics and modes of disease transmission, Host defenses and Immunizing agents, Hazards of Immunization, Disease prevention and control, Disinfection. Screening for Disease: Concept of screening, Aims and Objectives, Uses and types of screening.
3. **Epidemiology of communicable disease**: Respiratory infections, Intestinal infections, Arthropod-borne infections, Zoonoses, Surface infections, Hospital acquired infections Epidemiology of chronic non-communicable diseases and conditions: Cardio vascular diseases: Coronary heart disease, Hypertension, Stroke, Rheumatic heart disease, Cancer, Diabetes, 0besity, Blindness, Accidents and Injuries.
4. **Public health administration**- an overview of the health administration set up at Central and state levels. The national health programme-highlighting the role of social, economic and cultural factors in the implementation of the national programmes. Health problems of vulnerable groups- pregnant and lactating women, infants and pre-school children, occupational groups.
5. **Health programmes in India**: Vector borne disease control programme, National leprosy eradication programme, National tuberculosis programme, National,AIDScontrolprogramme, National programme for control of blindness, Iodine deficiency disorders (IDD) programme, Universal Immunisation programme, Reproductive and child health programme, National cancer control programme, National mental health programme. National diabetes control programme, National family welfare programme, National sanitation and water supply programme,

Minimum needs programme.

6. **Demography and Family Planning**: Demographic cycle, Fertility, Family planning-objectives of national family planning programme and family planning methods, A general idea of advantage and disadvantages of the methods.
7. **Preventive Medicine in Obstetrics, Pediatrics and Geriatrics**: MCH problems, Antenatal, Intranasal and post-natal care, Care of children, Child health problems, Rights of child and National policy for children, MCH services and indicators of MCH care, Social welfare programmes for women and children, Preventive medicine and geriatrics.
8. **Nutrition and Health:** Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition programmes.
9. **Environment and Health**: Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology.
10. **Hospital waste management**: Sources of hospital waste, Health hazards, Waste management.
11. **Disaster Management**: Natural and man-made disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness.
12. **Occupational Health:** Occupational environment, Occupational hazards, Occupational diseases, Prevention of occupational diseases. Social security and other measures for the protection from occupational hazard accidents and diseases. Details of compensation acts.
13. **Mental Health**: Characteristics of a mentally healthy person, Types of mental illness, Causes of mental ill health, Prevention, Mental health services, Alcohol and drug dependence. Emphasis on community aspects of mental health. Role of Physiotherapist in mental health problems such as mental retardation.
14. **Health Education**: Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education.

RECOMMENDED BOOKS:-

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

PHYSIOTHERAPY IN COMMUNITY HEALTH

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

1. **Rehabilitation**: Definition, Types.
2. **Community:** Definition of Community, Multiplicity of Communities, and Community based approach, Community Entry strategies, CBR and Community development, Community initiated versus community oriented programme, Community participation and mobilization.
3. **Introduction to Community Based Rehabilitation**: Definition, Historical review, Concept of CBR, Need for CBR, Difference between Institution based and Community based Rehabilitation, Objectives of CBR, Scope of CBR, Members of CBR team, Models of CBR.
4. **Principles of Community based Rehabilitation**. W.H.O.`s policies-about rural health care, concept of primary/Secondary/tertiary health centers-district hospitals etc-Role of P.T, Principles of a team work of Medical person/P.T./O.T. audiologist/speech therapist /P.&O./vocational guide in C.B.R. of physically handicapped person, Agencies involved in rehabilitation of physical handicapped - Legislation for physically handicapped. Concept of multipurpose health worker. Role of family members in the rehabilitation of a physically handicapped.
5.**Disability:** Definition of Impairment, Disability, and Handicap. Difference between impairment, disability, and handicap, Causes of disability, Types of disability, Prevention of disability, Disability in developed countries, Disability in developing countries. Disability Surveys: Demography. Screening: Early detection of disabilities and developmental disorders, Prevention of disabilities- Types and levels.

6. **Role of Social work in CBR**: Definition of social work, Methods of social work, History of social work, Role of social worker in rehabilitation.
7. **National / District Level Rehabilitation Programme**: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker
8. **Role of Physiotherapy in CBR in Architectural Barriers & Possible Modifications**:
   a) Screening for disabilities, Prescribing exercise programme, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation programmes for various neuro-musculoskeletal and cardiothoracic disabilities.

b) Keeping in mind conditions like RA, Hemiplegia, Paraplegia, Cerebral palsy, Polio, severe OA, Amputation; sensory loss—vision, hearing, speech impairment, Degenerative, geriatric patients, Other disabling conditions.

9. **Screening and rehabilitation of pediatric disorders in the community**: Early detection of high risk babies, Maternal nutrition and education, Rehabilitation of Cerebral Palsy, Polio, Down's Syndrome, Muscular Dystrophies etc., Prevention and rehabilitation of mental retardation and Behavioral disorders, Early intervention in high risk babies, Genetic counseling.

10. **Vocational training in rehabilitation**: Introduction, Need, Vocational evaluation, Vocational rehabilitation services.

11. **Community Based Rehabilitation in chronic neurological, musculoskeletal and cardio-respiratory disorders**

i. Degenerative arthritis
ii. Osteoporosis (including stress fracture)
iii. Incontinence
iv. Parkinson's disease
v. Motor neurone diseases
vi. Stroke, Spinal Cord Injury
vii. Leprosy, PPRP, PPS, CTEV,CDH and Spina bifida

12**.Geriatrics-Physiology of Aging /degenerative changes**-Musculoskeletal/Neuromotor /cardio–respiratory/Metabolic, Endocrine, Cognitive, Immune systems, Posture, Balance and fall in Aging Adults, Acute changes and chronic adaptations to exercise in aged, Role of PT in Ageing (Evaluation and Management), Psychosocial implications in ageing, Role of Physiotherapy in Hospital based care, Residential homes, Home for the aged, Institution based Geriatric Rehabilitation, Physiotherapeutic interventions for improving Gross and Fine Motor Control in Aging Adults, Physiotherapy management in Alzheimer's disease, Dementia, Degenerative arthritis, Parkinson's disease, Incontinence, and Pain in Aging Adults, Preventive Geriatrics

13. **Industrial Health & Ergonomics**–

A. **Ability Management**-

i. Job analysis: - Job description, Job demand Analysis, Task Analysis, Ergonomic Evaluation including Anthropometric data, Injury Prevention, Employee Fitness Programme
ii. Disability Management:- Acute care, Concept of Functional Capacity
iii. Work Conditioning, Work Hardening

B. Occupational Hazards and physiotherapy management in the industrial area-

i. Physical agents-e.g.-Heat/cold, light, noise, Vibration, U.V. radiation, Ionizing radiation,
ii. Chemical agents-Inhalation, local action, ingestion,

iii. Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & ergonomic evaluation of work place-mechanical stresses per hierarchy–
   a. sedentary table work –executives,clerk,
   b. inappropriate seating arrangement- vehicle drivers
   c. constant standing- watchman- Defense forces, surgeons,
   d. Over-exertion in laborers, Common accidents

iv. Psychological hazards- e.g.-executives, monotonicity & dissatisfaction in job, anxiety of work completion with quality, Role of P.T. in Industrial setup & Stress management-relaxation modes.

v. Biological Hazards

PRACTICAL: This will consist of Field visits to urban and rural PHC's, Industrial visits, Visits to regional rehabilitation training center, Regular mobile camps, Disability surveys in villages, Disability screening, Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, pediatric, gynecological and geriatric problems Bed-side and community, Demonstration of evaluation and prescription techniques for ambulatory and assistive devices, Assessment and management of Occupational hazards.

Recommended books:

1. A textbook on physical medicine and rehabilitation by Howard A Rusk(1964)
2. Community Based Rehabilitation of Persons with Disabilities by Pruthvish; Jaypee Brothers.
3. Ergonomics for Beginners: A Quick Reference Guide, Third Edition by Jan Dul and Bernard
4. Ergonomics for Therapists by Karen Jacobs
5. Ergonomic Living : How to Create a User-Friendly Home & Office: Gordon Inkeles and IrisSchencke
6. Textbook of Rehabilitation by Sunder, JaypeePublications
7. Physical Medicine and Rehabilitation: Principles and Practice (2 Volume Set) by Joel A DeLisa, Bruce M Gans, Nicolas E Walsh, and William LBockenek
8. Essentials of Physical Medicine and Rehabilitation: Walter R. Frontera MD PhD, Julie K. Silver MD, and Thomas D. Rizzo Jr. MD(2008)
9. Community Based Rehabilitation by Peat (Paperback - July1997)
10. Physical Medicine & Rehabilitation Secrets by Bryan J. O'Young MD, Mark A Young MD, and Steven A. Stiens MD MS(2007)
11. Physical Rehabilitation by Susan B. O'Sullivan and Thomas J. Schmitz(2006)
12. Orthotics and Prosthetics in Rehabilitation by Michelle M. Lusardi and Caroline
13. Nielsen(2006)
14. Preventive & social medicine by Park &Park
15. Textbook of community medicine & community health by BhaskaraRao.
16. Legal rights of disabled in India by GautamBannerjee
17. Geriatric Physiotherapy by Andrew Guccione.
18. Industrial Therapy by Glenda Key

HEALTH PROMOTION, FITNESS AND WELLNESS

SUBJECT DESCRIPTION - This course includes discussion on the theories of health and wellness, including motivational theory, locus of control, public health initiative, and psycho-Social, spiritual and cultural consideration. Health risks, screening, and assessment considering epidemiological principles are emphasized. Risk reduction strategies for primary and secondary prevention, including programs for special populations are covered.

1. **Prevention practice: a holistic perspective for physiotherapy**
    a. Defining Health
    b. Predictions of HealthCare
    c. Comparing Holistic Medicine and Conventional Medicine
    d. Distinguishing Three Types of Prevention Practice.
2. **Healthy People**
    a. Definition of healthy people
    b. Health education Resources
    c. Physiotherapist role for a healthy community.
3. **Key concepts of fitness**
    a. Defining & Measuring Fitness
    b. Assessment of Stress with survey
    c. Visualizing Fitness
    d. Screening for Mental and Physical Fitness
    e. Body Mass Index calculations.
4. **Fitness training**
    a. Physical Activities Readiness Questionnaire
    b. Physical Activities Pyramid
    c. Exercise Programs
    d. Evidence-Based Practice.
5. **Acute and Chronic Physiological effects of Aerobic Exercises**, Principles of Aerobic and Anaerobic Training, Principles for Training- Strength, Power and Endurance, Clinical Reasoning for Advocating Aerobic Exercises as preventive measure in Obesity &its Related Conditions / in Cardio- Respiratory Conditioning/Aging/Reconditioning, Effects after prolonged Bed Rest/ Diabetes.
6. Health, fitness, and wellness issues during childhood and adolescence
7. Health, fitness, and wellness during adulthood
8. Women's health issues: focus on pregnancy- Antenatal and postnatal management
9. Prevention practice for older adults
10. Resources to optimize health and wellness
11. Health protection.
12. Prevention practice for musculoskeletal conditions
13. Prevention practice for cardio-pulmonary conditions
14. Prevention practice for neuro-muscular conditions
15. Prevention practice for integumentary disorders
16. Prevention practice for individuals with developmental disabilities
17. Marketing health and wellness.

BIOSTATISTICS & RESEARCH METHODOLOGY-

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

RESEARCH METHODOLOGY

1. **Introduction to Research methodology**: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs. methodology, Criteria for good research, Problems encountered by researchers in India.
2. **Research problem**: Statement of research problem., Statement of purpose and objectives of research problem, Necessity of defining the problem
3. **Research design**: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design
4. **Sampling Design**: Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design
5. **Measurement & scaling techniques**: Measurement in research- Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification. Important scaling techniques.
6. **Methods of data collection**: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.
7. **Sampling fundamentals**, need for sampling & some fundamental definitions, important sampling distributions.
8. **Processing & analysis of data**: Processing operations, problems in processing, Types of analysis, Statistics in research, Measures of central tendency, Dispersion, Asymmetry, relationship.
9. **Testing of hypothesis**: What is hypothesis? Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, limitations of the tests of hypothesis
10. **Computer technology**: Introduction to Computers, computer application in research, computers & researcher.

BIOSTATISTICS

1. **Introduction**: Meaning, definition, characteristics of statistics., Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.
2. **Tabulation of Data**: Basic principles of graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve.

3. **Measure of Central Tendency**: Need for measures of central Tendency, Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped., Meaning and calculation of mode, Comparison of the mean, median and mode, Guidelines for the use of various measures of central tendency.
4. **Probability and Standard Distributions**: Meaning of probability of standard distribution, the binominal distribution, the normal distribution, Divergence from normality – scenes, kurtosis.
5. **Sampling techniques**: Need for sampling - Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors, Sampling variation and tests of significance.
6. **Analysis of variance & covariance**: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA).
7. **Format of scientific documents**. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis).

Recommended Textbooks:

1. Research Methods for Clinical Therapists -- Applied Project Design and Analysis by Carolyn M. Hicks.
2. Research Methodology By Kothari.
3. Elements of Research in Physical Therapy: Dean P. Currier
4. First Steps in Research: A Pocketbook for Healthcare Students by Stuart B. Porter.
5. Practical Research: A Guide for Therapists by Sally French, Frances Reynolds, and John Swain, 2001.
6. The Researching Therapist: A Practical Guide to Planning, Performing and Communicating Research by Sue Jenkins, Connie J. Price, and Leon Straker
7. Physical Therapy Research: Principles and Applications by Elizabeth Domholdt.
8. Evaluating Research: Methodology for People Who Need to Read Research by Francis C. Dare (2010)
9. How to Read a Paper: The Basics of Evidence-Based Medicine by Trisha Greenhalgh (2010).
10. How to Write a Great Research Paper, New Edition by Leland Graham and Isabelle McCoy (2007)
11. How to Write a Paper : George M. Hall (2008) Elements of Health Statistics: Rao.N.S.N
12. An introduction of Biostatistics: Sunder Rao. P.S.S.
13. Methods in Bio-Statistics 6thEdn. 1997: B.K. Mahajan
14. Biostatistics: A manual of Statistics Methods: K. Visweswara Rao
15. Elementary Statistics 1stEdn, 1990. in Medical Workers: Inderbir Singh
16. Statistics in Psychology and education: Great and Henry
17. Biostatistics: Ramakrishnan

(NOT FOR UNIVERSITY EXAMINATION)

ADMINISTRATION & MANAGEMENT IN PHYSIOTHERAPY

Course description:

This course serves to integrate knowledge gained by the students in basic management knowledge and skills essential for effective functioning and to be conversant with planning organization, work scheduling, and cost & control of quality in relation to physiotherapy care & service.

THEORY

1. Administration, Management and Supervision

a) Introduction: Branches of administration, Nature and scope of administration, How to be an effective administrator, Planning hospital administration as part of a balanced health care program. [3hours]
b) Principles of hospital administration and its applications to physiotherapy. [2 hours]
c) Hospital administration: Organization, Staffing, Information, Communication, Coordination, Cost of services, Monitoring and evaluation. [3hours]
d) Organization of physiotherapy department: Planning, Space, Manpower, Other basic Resources. [5hours]
e) Organizing meetings, committees, and negotiations [2hour]
f) Personnel management: Personnel performance appraisal system, Quality care delivery from the staff [2hours]
g) Public relations in hospital and human resource management. [3hours]

2. Standards of Practice

a) IAP
b) American Physical Therapy Association
c) EUROPEAN CORE STANDARDS OF PHYSIOTHERAPY PRACTICE OF WCPT.

3. Clinical Audit
4. Documentation
5. Clinical Decision-making
6. Outcome Measures in Physiotherapy

Recommended books:

1. Consumer Protection Act – 1986, Government of India, NewDelhi.
2. Francis C M – Hospital Administration
3. Davies, R and Macaulay, BMC – Hospital Planning and Administration
4. Prescription Writing by Frederic HenryGerrish
5. Innovations in Rehabilitation Sciences Education: Preparing Leaders for the Future by Patricia Solomon and SueBaptiste
6. Management in Physical Therapy Practice by Catherine G.Page

7. Physical Therapy Management by Ronald W. Scott and Christopher LPetrosino
8. Management in Physiotherapy byJones
9. Clinical Decision Making and Outcomes In Sports Rehabilitation by Dinesh A. Kumbhare and John V.Basmajian
10. Ethical Decision Making in Therapy Practice (Skills for Practice Series) by JuliusSim
11. Documentation for Rehabilitation: A Guide to Clinical Decision Making by Lori Quinn EdD PT and James Gordon EdDPT
12. Expertise in Physical Therapy Practice by Gail M. Jensen, Jan M. Gwyer , Laurita M. Hack, and Katherine F. Shepard .
13. Legal Aspects of Physiotherapy by BridgitDimond
14. Therapy Outcome Measures Manual: Physiotherapy, Occupational Therapy,Rehabilitation Nursing by Pam Enderby, Alexandra John, and BrianPetheram
15. Therapy Outcome Measures for Rehabilitation Professionals: Speech andLanguage Therapy, Physiotherapy, Occupational Therapy by Pamela Enderby, Alexandra John, and BrianPetheram
16. Evidence-Based Rehabilitation: A Guide to Practice by Mary C. Law PhD and Joy MacDermidPhD
17. Writing Soap Notes: With Patient/Client Management Formats by GingeKettenbach
18. Writing Patient/ Client Notes: Ensuring Accuracy in Documentation by GingeKettenbach

TEACHING SKILLS

1. Aims of physiotherapy education

a. Concepts of teaching and learning
b. Curriculum development
c. Principles and methods of academic and clinical teaching
d. Measurement and evaluation
e. Guidance and counseling
f. Faculty development program
g. Administration in clinical setting
h. Use of A-V aids in teaching
i. Taxonomy of education

RESEARCH PROJECT-

The project may be a case study or of recent technique or literature reviews and etc. to make the student to have research mind and to facilitate for higher studies.

During the Internship, candidate has to undertake a Scientific Project. Project will be a clinical assignment on given topic or condition. This may be done in the form of a literature review or a small research project. This will give the student a practical background on research methods and recent advances. Selection of topic & place for the conduct shall be in consultation & with consent of the Guide and the Head of the institution – Physiotherapy & the Ethical Clearance Committee of Parent Institution. Scientific inquiry shall be based on Comparative diagnostic, clinical trials, reviews, Meta analysis, Research Article etc. This can be done as a **group work** of 3-4 students on a given research title.

Research Proposal for this project should be approved before fourth year B. Physiotherapy University Examination. **Project Guide** will be assigned by the Principal to the students. The Candidate shall submit the project 2 weeks prior to the Day of Completion of Internship & the Head of Parent Institution/ Concerned Guide shall sign on the same if the project is up to her /his satisfaction.

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

1. PhysiotherapyOPD
2. Neurology, Neurosurgery & NeuroICU
3. Community-PHC
4. Orthopedics
5. General Medicine &MICU
6. General Surgery & CTSICU
7. Developmental Pediatrics & Child Guidance Clinic
8. OBG
9. Geriatric – Old Age Homes
10. Industrial Visits -Ergonomics

Ninth Semester

INTERNSHIP - The internship time period provides the students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. Students will demonstrate competence in beginning, intermediate, and advanced procedures in both areas. Students will participate in advanced and specialized treatment procedures. The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The students are expected to work for minimum 7- 8 hours perday.

1. **Initial Assessment Documentation:** Clinical staff must document the following information:

    a. Initial assessment documented based on SOAP format.
    b. Subjective examination(symptomatic)
    c. Objective examination (measureable,observable)
    d. Action/Analysis (interpretation of current condition/intervention provided)
    e. Plan ofaction
    f. Written or verbal feedback to the client or other relevant carers
    g. Discharge plan documented
    h. Agreement to treatment plan by patient or “person responsible”

2. **Progress Documentation:** Progress documentation may include the following information:

    a. Any individual intervention should be documented in SOAP format (including response to intervention/s using outcome measures)
    b. Oral consent obtained and documented when there is a significant change in treatment/ treatment options/ status of patient’s health.
    c. Written consent obtained for designated invasive procedures
    d. Change in status or events that may affect discharge plans/goals
    e. Documented consultation with key clinical team members

SKILLS BASED OUTCOMES AND MONITORABLE INDICATORS FOR BACHELOR OF PHYSIOTHERAPY

Bachelor of
Physiotherapy
Competency Statements

1. Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes.
2. Collects assessment data relevant to the client's needs and physiotherapy practice.
3. Be able to conduct the patient evaluation and assessment as precondition.
4. Analyzing Assessment findings & Establish a physiotherapy diagnosis and prognosis.
5. Develops and Recommends an intervention strategy.
6. Be able to prepare the patient (physically and emotionally) and as well as the equipment to be used as per treatment plan
7. Implements intervention.
8. Be able to accurately explain the treatment plans and able to demonstrate and teach self exercises
9. Advise patient on appropriate nutrition, exercises, rest, relaxation other issues
10. Evaluates the effectiveness of interventions.
11. Be able to complete accurate treatment documentation.
12. Develops, builds, and maintains rapport, trust, and ethical professional relationships through effective communication.
13. Establishes and maintains inter professional relationships, which foster effective client-centered collaboration.
14. Understand the principles of continuous quality improvement.
15. Be able to carry out the daily/weekly Quality Control (QC)checks.
16. Be able to review the literature.
17. Be able to suggest implementation of research findings.
18. Be able to suggest/ initiate topics for physiotherapy research
19. Be able to interpret, apply and disseminate information as a member of the physiotherapy team.