

**The Tamil Nadu
Dr. M. G. R. Medical University
MADRAS**

Regulations of the University

In exercise of the powers conferred by Section 44 of the Tamil Nadu Dr. M. G. R. Medical University, Madras, Act, 1987 (Tamil Nadu Act 37 of 1987), the Standing Academic Board of the Tamil Nadu Dr. M. G. R. Medical University, Madras hereby makes the following regulations:—

SHORT TITLE AND COMMENCEMENT :—

These regulations shall be called “THE REGULATIONS FOR THE BACHELOR OF PHYSIOTHERAPY (B.P.T.) DEGREE COURSE OF THE TAMIL NADU DR. M. G. R. MEDICAL UNIVERSITY, MADRAS”.

They shall come into force from the academic year 1994-95 session onwards except the regulation, relating to the eligibility criteria, which come into effect from 1992-93 session.

The regulations framed is subject to modification from time to time by the Standing Academic Board.

REGULATIONS

1. OVERALL OBJECTIVES

An under graduate course in Physiotherapy is to impart in depth knowledge and skill to a student to become competent in the techniques and develop the proper attitude required for the practice of Physiotherapy and carry out treatment prescribed by the Physician.

2. OBJECTIVES

The graduate of Physiotherapy programme :

- acquires adequate knowledge of the basic medical subjects in the practice of Physiotherapy ;
- develops skills and techniques of therapeutic massage and exercise for the management of various medical and surgical conditions ;
- development of proper attitude for compassion and concern for the individuals and welfare of the physically handicapped in the community ;
- demonstrates skills in teaching management, research guidance and counselling ;
- practices moral and ethical values.

3. ELIGIBILITY

a. Candidates belonging to all categories for admission to the Bachelor of Physiotherapy course should have passed at the qualifying examinations (Academic Stream) after a period of 12 years of study with the following subjects of Physics, Chemistry and Biology / Botany and Zoology.

b. Candidates who have studied abroad and have passed the equivalency of qualification as determined by the Association of Indian Universities will form the guidelines to determine the eligibility and must have passed in the subjects of Physics, Chemistry, Biology (Botany / Zoology) and English upto 12th Standard level.

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

a) English, Physics, Chemistry, Botany, Zoology.

b) English, Physics, Chemistry, Biology and any other language.

4. TRANSITORY COURSE

The candidates who have passed the D.P.T. Course in Physiotherapy are eligible for admission to this course. The course for these (Transitory Course) candidates shall be of one year duration. i.e. they have to undergo only the final B.P.T. course and to write examinations prescribed for final year.

5. AGE LIMIT FOR ADMISSION

A candidate should have completed the age or 17 years at the time of admission or would complete the age on or before 31st December of the year of admission to the B.P.T. degree course.

6. PHYSICAL FITNESS CERTIFICATE

Every candidate before admission to the course shall submit to the Principal of the Institution a certificate of medical fitness from an authorised medical officer that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious diseases.

7. ELIGIBILITY CERTIFICATE

Candidates who have passed any qualifying examination other than Higher Secondary Course Examination conducted by the Government of Tamil Nadu shall obtain an Eligibility Certificate from the University by remitting the prescribed fees along with the application form.

8. REGISTRATION

A candidate admitted to the course in any of the affiliated B.P.T. 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 the Head of the Institution within the stipulated date.

9. DURATION OF THE COURSE

The duration of certified study for the Bachelor of Physiotherapy Course shall extend over a period of Three academic years comprising of 6 semester and six months of compulsory internship.

10. MEDIUM OF INSTRUCTIONS

English shall be the Medium of Instructions for all the subjects of study and for examinations of the Bachelor of Physiotherapy Degree Course.

11. CURRICULUM

The curriculum and the syllabi for the course shall be as prescribed by the Standing Academic Board from time to time.

12. COMMENCEMENT OF THE COURSE

The course shall commence from 1st July of the Academic year.

13. COMMENCEMENT OF EXAMINATIONS

April 15 / November 15th.

If the date of commencement of Examination falls on Saturdays, Sundays or declared Public Holidays the examination shall begin on the next working day.

4. CUT - OFF DATES FOR ADMISSION TO EXAMINATIONS

- The Candidates admitted from 1st July to 15th July of the Academic year shall be registered to take their first semester examination, after fulfilment of the regulations only in the month of November of the academic year.
- The candidates admitted from 16th July to 30th November of the academic year shall be registered to take up their first semester examination, after fulfilment of the regulations in the month of April of the ensuing year.
- Candidates admitted from December 1st to 31st March of the academic year shall be registered for the academic year of admission but they have to undergo the course to take up their first semester examination along with the subsequent year batch of students.

15. WORKING DAYS DURING A SEMESTER

Each semester shall consist of not less than 100 working days.

16. ATTENDANCE REQUIRED FOR ADMISSION TO EXAMINATIONS

- No candidate shall be permitted to appear in any one of the parts of B.P.T. Degree Course unless he / she has attended the course in the subject for the prescribed period in an affiliated institution recognised by this University and produces the necessary certificate of study, attendance and satisfactory conduct progress from the Head of the institution.
- A candidate is required to put in minimum 80% of attendance in both theory and practical separately in each subject before admission to the examination.
- A candidate lacking in the prescribed attendance and progress in any one subject in theory and practical in the first appearance shall not be permitted for admission to the entire examinations.

17. CONDONATION OF LACK OF ATTENDANCE

Condonation of shortage of attendance upto a maximum of 10% in the prescribed eligible attendance for admission to an examination rests with the discretionary powers of the Vice-Chancellor. A candidate lacking in attendance should submit an application in the prescribed form and remit the stipulated fee 15 days prior to the commencement of the theory examination.

Participation in NCC/NSS and other co-curricular activities represent the institution or University. (The Head of the Institution shall instruct the concerned officers in-charge of the student activities in their institution to endorse the leave).

18. INTERNAL ASSESSMENT MARKS

- A minimum of three written examinations shall be conducted in each subject during a semester and the average marks of the three performances shall be taken into consideration for the award of sessional marks.

b) A minimum of two practical examinations shall be conducted in each subject (wherever practicals have been included in the curriculum) during a semester and an average of the two performances shall be taken into consideration for award of sessional marks.

c) A failed candidate in any subject shall be provided an opportunity to improve his sessional marks by conducting a minimum of two examinations in theory and practicals separately.

d) If a failed candidate does not appear for any "Improvement Mark Examinations" in the failed subject(s) the internal marks awarded for the previous examination shall be carried over for his subsequent appearance(s).

e) The internal assessment marks should be submitted to the University endorsed by the Head of the Institution 15 days prior to the commencement of the theory examinations.

18. MARKS QUALIFYING FOR PASS

A candidate shall be declared to have passed the examination if he/she obtains the following qualifying marks:

a) 40% of marks in theory in the subjects where University examinations are conducted and aggregate of 50% marks in University theory examination and internal evaluation taken together in the subject.

b) 40% of marks in the University theory examinations and 50% marks in University theory, oral and internal evaluation marks taken together.

c) 40% of marks in the University theory examination; 50% marks in University practical examination and 50% aggregate in theory, practical and internal evaluation marks taken together.

19. EXEMPTION FROM RE-EXAMINATION IN A SUBJECT

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

20. CARRY-OVER OF FAILED SUBJECTS

a. Candidates are permitted to carry-over the failed subject in first semester to second semester.

b. Candidates will be permitted to undergo study and training in third semester only after passing all the subject (s) in first and second semesters.

c. Candidates will be permitted to carry-over the failed subject (s) in the third semester to the fourth semester.

d. Candidates will be permitted to undergo study and training in fifth semester only after passing all the subject (s) of third semester.

e. Candidates are permitted to carry-over of failed subject(s) of fourth semester to fifth semester.

f. Candidates will be permitted to undergo study and training in sixth semester only after passing all the subject (s) of fourth semester.

g. Candidates are permitted to carry-over of failed subject(s) of fifth semester to sixth semester.

21. REVIEW OF ANSWER PAPERS OF FAILED CANDIDATES

As per the regulations prescribed for review of answer papers by the university.

22. RE-ADMISSION AFTER BREAK OF STUDY

a. Candidates having a break of study of 5 years and above from the date of admission and more than two spells of break will not be generally considered for re-admission.

- b. The five years period of break of study shall be calculated from the date of first admission of the candidate to the course for the subsequent spells of break of study.
- c. Candidates having break of study shall be considered for re-admission provided that they are not subjected to any disciplinary action and no charges are pending or contemplated against them.
- d. All re-admissions of candidates are subject to the approval of the Vice-Chancellor.
- e. The candidates having a break of study upto 5 years shall apply for re-admission to the Academic Officer of this University. The candidates may be re-admitted in the correspondence course of study at the commencement of the session and shall undergo a minimum period of study of 3 months and after fulfilment of the regulations of this University be admitted for the examination. The candidates shall be granted exemption in the subjects they have already passed.

23. MIGRATION / TRANSFER OF CANDIDATES

- a. Migration / Transfer of candidates from one recognised institution to another Institution of this University or from another University will not be generally considered
- b. However, under extraordinary circumstances, the Vice-Chancellor shall have the powers to place any migration / transfer he deems fit in the Governing Council and get approval for grant of permission migration / transfer to candidates undergoing course of study in affiliated institution of this University.

24. VACATION

The Heads of Institutions shall declare 6 weeks vacation in an academic year to the students. The period(s) of vacation can be decided by the Head of the Institution.

25. SCHEME OF EXAMINATIONS

The scheme of examinations is as follows:

(Duration Hours :-Dur. Hrs. ; Sessional Marks :-Sec. Mks.
University Marks :-Unv. Mks.)

		Dur Hrs	Sec Mks	Unv Mks
SEMESTER I				
Psychology & Sociology		3	50	100
SEMESTER II				
Anatomy	theory	3	50	100
	oral	—	—	50
Physiology	theory	3	50	100
	oral	—	—	50
SEMESTER III				
Exercise therapy & Massage	theory	3	50	100
	oral & practical	—	—	100
Electrotherapy I	theory	3	50	100
(Low & Medium Frequency)	oral & practical	—	—	100
Gen. Med., Gen. Sur., & Paeds.	theory	3	50	100
SEMESTER IV				
Community Medicine	theory	3	50	100
Electrotherapy—II	theory	3	50	100
(High Frequency)	oral & practical	—	—	100
Biomechanics	theory	3	50	100

SEMESTER V

Clinical Neurology	theory	3	50	100
	oral	—	—	50
Clinical orthopaedics	theory	3	50	100
	oral	—	—	50
Clinical Cardio-respiratory diseases	theory	3	50	100
	oral	—	—	50

SEMESTER VI

PT in Neurology	theory	3	50	100
	oral & practical	—	—	100
PT in Orthopaedics	theory	3	50	100
	oral & practical	—	—	100
PT in Cardio respiratory	theory	3	50	100
	oral & practical	—	—	100
Rehab. Med.	theory	3	50	100
	oral	—	—	50

26. RECOMMENDED CLOCK HOURS OF INSTRUCTION FOR EACH SUBJECT:

Orientation & Instruction to treatment	
Sociology	
Psychology (Parts A & B)	90
Anatomy	
Biomechanics & Applied Anatomy	
Physiology	
Applied Physiology	
Basic Nursing & First Aid	

General Medicine, General Surgery,

Paeds., ENT, Ophthal., etc.

Pathology & Microbiology	50
Clinical Orthopaedics	55
Clinical Neurology	55
Clinical Cardio Respiratory	55
Principles of Rehabilitation Medicine	55
Community Medicine	55
Exercise Therapy	270
Massage	80
Electrotherapy (LF & HF)	350
PT in Neuro. conditions	120
PT in Ortho. conditions	120
PT in Cardio. conditions	120
Administration, Supervision & Ethics	60
Physical Education	45
Visits & Special Lectures	75
Clinicals (Semester III to VI)	1220
Clinicals (Internship)	1150
Total Hours	3580
Internship	1150

27. COMPULSORY INTERNSHIP

70 Every candidate admitted to Bachelor of Physiotherapy
 50 Degree Course shall under go Six(6) months of compulsory intern-
 ship in the institution he has studied after successful completion
 200 of the final examination.

28. AWARD OF DEGREE

80 The Degree shall be awarded by the University only after the
 100 completion of the compulsory Internship.
 30
 40

29. AUTHORITY FOR ISSUE OF INTERNSHIP COMPLETION CERTIFICATE

The Heads of Institutions shall issue a certificate of successful completion of internship to each candidate after satisfying that the candidate has completed the training programme and has acquired the skills to function independently.

30. AUTHORITY TO ISSUE TRANSCRIPT

The University shall be the Authority for issuing Transcript after remitting the prescribed fee of Rs. 100/- (Rupees One Hundred only.)

Model Question Paper For All Subjects of B.P.T. Degree Examinations

Time: 3 Hours

Maximum: 100 Marks

Separate answer books must be used for section A and B.

SECTION - A (50 Marks)

1. Write an essay on any one of the following :

- (a)
- (b)

(14 Marks)

2. Write brief answers on any 2 of the following :

- (a)
- (b)
- (c)

(2 × 8 = 16 Marks)

3. Write short notes on any 5 of the following :

- (a)
- (b)
- (c)
- (d)
- (e)
- (f)
- (g)

(5 × 4 = 20 Marks)

SECTION—B

(50 Marks)

1. Write an essay on any one of the following :

- (a)
(b)

(14 Marks)

2. Write brief answers on any 2 of the following :

- (a)
(b)
(c)

(2 × 8 = 16 Marks)

3. Write short notes on any 5 of the following :

- (a)
(b)
(c)
(d)
(e)
(f)
(g)

(5 × 4 = 20 Marks)

Format for furnishing details of candidates in whose cases Condonation of shortage of attendance has been granted for appearing for THEORY EXAMINATIONS

Name of the College :

Academic Year for which Condonation has been granted for :

Sl. No.	Name of the Candidate (s)	Name of the Course and Branch	Total No of working days / hours for the year / Semester	Minimum No. of days required for attendance certificate [80%]	No of days attended by the candidate	Actual shortage of attendance
1	2	3	4	5	6	7

1.
2.
3.
4.
5.

1. Requested Condonation of attendance in respect of the above candidate / s as the shortage of attendance is within the Condonation limit.

2. The Demand Draft for Rs.....being the Condonation fee of shortage of attendance, drawn in favour of the Registrar, The Tamil Nadu Dr. M.G.R. Medical University, Madras is / are enclosed.

Date :

Place :

Note :

Signature of the Principal with College Seal
Signature of the Head of the
University Departments with seal

1. The fee prescribed for Condonation of shortage of attendance is Rs. 50/- per student.
2. The forms should reach the University at least 15 days before the commencement of respective University Examinations.
3. A separate list (Three copies Degreeewise) showing candidates who have not earned the required attendance and are not eligible for Condonation should also be sent at least 15 days before the commencement of Examinations.

Syllabus

ELEMENTARY SOCIOLOGY

Examination at the end of : I Semester Instruction hours : 150

COURSE DESCRIPTION

This course will introduce to the students the basic sociological 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.

COURSE OBJECTIVES

The objective of this course is that after 50 hours of lectures, demonstrations, Practicals and clinics the student will be able to demonstrate and understanding of the role of sociocultural factors as determinants of health and behaviour in health and sickness. They will be able to relate this to therapeutic situations in the practice of physiotherapy and occupational therapy.

In addition the student will be able to fulfil with 75% accuracy (as measure by written, oral & practical internal evaluation) the following objectives of the course.

- A. Understand the role of family and community in the development of human behaviour.
- B. Develop a holistic outlook toward the structure of the society and community resources.
- C. Identify the subtle influence of culture in the development of human personality, the role of beliefs and value as determinants of individual and group behaviour.
- D. Understand the social and economic aspect of community that influence the health of the people.

E. Learn to assess the social problem and participate in social planning.

Fi. Identify social Institution and resources.

G. Understand the significance of social interaction in the process of rehabilitation.

H. Appreciate the role of therapist as a member of society, and the interdependence of individuals and society.

COURSE OUTLINE

A. INTRODUCTION

Definitions of sociology, Sociology as a science of society, uses of the study of sociology, application of knowledge of sociology in physiotherapy and occupational therapy.

B. SOCIOLOGY AND HEALTH

Social factors affecting health status, Social consciousness and perception of illness, Social consciousness and meaning of illness, Decision making in taking treatment. Institutions of health, their role in the improvement of the health of the people.

C. SOCIALIZATION

Meaning of socialization, influence of social factors on personality, socialization in hospitals, socialization in the rehabilitation of patients.

D. SOCIAL GROUPS

Concept of social groups, influence of formal and informal groups on health and sickness, the role of primary groups and secondary groups in the hospital and rehabilitation settings.

E. FAMILY

Influence of family on human personality, discussion of changes in the functions of a family, influence of the family on the individual's health, family and nutrition, the effects of sickness on family, and psychosomatic disease.

F. COMMUNITY

Concept of community, role of rural and urban communities in public health, role of community in determining beliefs, practices and home remedies in treatment.

G. CULTURE

Components of culture, impact of culture on human behaviour, Cultural meaning of sickness, Response of sickness & choice of treatment (role of culture as social consciousness in moulding the perception of reality), Culture induced symptoms and disease, Sub-culture of medical workers.

H. CASTE SYSTEM

Features of the modern caste system and its trends

I. SOCIAL CHANGE

Meaning of social change, Factors of social change, human adaption and social change, Social change and stress, Social change and deviance, Social change and health programmes, the role of social planning in the improvement of health and in rehabilitation.

J. SOCIAL CONTROL

Meaning of social control, role of norms, folkways, customs, morals, religion law and other means of social control in the regulation of human behaviour, Social deviance and disease.

K. SOCIAL PROBLEMS OF THE DISABLED

Consequences of the following social problems in relation to sickness and disability; remedies to prevent these problems :

Population explosion,

Poverty and unemployment

Beggary

Juvenile delinquency

Prostitution

Alcoholism

Problems of women in employment

L. SOCIAL SECURITY

Social security and social legislation in relation to the disabled.

M. SOCIAL WORKER

The role of a medical social worker.

EVALUATION

BOOKS FOR REFERENCE

1. SACHDEVA, D. R. AND BHUSHAN, V. An Introduction to Sociology - Allahabad; Kitab Mahal Limited, 1974.

2. MADAN, G. R. Indian Social Problems, Vol. I Madras, Applied Publications, 1973.

Elementary General And Health Psychology

Part A – General psychology

Examination at the end of : 1 Semester Instruction hours :

Part B – Health Psychology

Not for University Examination

Instruction hours :

COURSE DESCRIPTION

This course will enable the student to understand specific psychological factors and effects in physical illnesses and thus help them to have a holistic approach in their dealings with patients during admission, treatment, rehabilitation and discharge.

COURSE OBJECTIVES

The objective of this course is that after 90 hours of lectures, demonstrations, practicals and clinics the student will be able to recognize and help with the psychological factors involved in disability, pain, disfigurement, unconscious patients, chronic illnesses, death, bereavement and medical - surgical patients/ conditions. They should also understand the elementary principles of behaviour for applying in the therapeutic environment.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral & practical internal evaluation) the following objectives of the course.

1. Psychosocial assessment of patients in various developmental stages.
2. Explain the concept of stress and its relationship to health, sickness and one's profession.
3. Identify ego defence mechanisms and learn counselling techniques to help those in need.
4. Help them to understand the reasons of non-compliance among patients and improve compliance behaviour.

COURSE OUTLINE

The course will be divided into Parts A & B. Part A will be a pre-clinical subject devoted to the elementary principles of behaviour and will be examined separately at the end of the first semester. Part B will be taught as an applied subject after the student has been exposed to clinical work. There will be a separate examination in Part B for the B. O. T. course students only

PART A - GENERAL PSYCHOLOGY

A. DEFINITION OF PSYCHOLOGY

1. Definition of psychology, basic information in relation to following schools methods and branches.

- a. Schools : Structuralism, functionalism, behaviourism, psychoanalysis, gestalt psychology.
- b. Methods : Introspection, observation, inventory and experimental method.
- c. Branches : General, child, social, abnormal, industrial, clinical, counselling, educational.

B. HEREDITY AND ENVIRONMENT

Twins, Relative importance of heredity and environment, their role in relation to physical characteristics, intelligence and personality, nature—nature controversy.

C. DEVELOPMENT AND GROWTH BEHAVIOUR

Infancy, childhood, adolescence, adulthood, middle age, old age.

D. INTELLIGENCE

Definitions : IQ, Mental Age, List of various intelligence testes - WAIS, WISC, Bhatia's performance test, Raven's Progressive Matrices test.

E. MOTIVATION

Definitions: motive, drive, incentive and reinforcement, Basic information about primary needs: hunger, thirst, sleep, elimination activity, air, avoidance of pain, attitude to sex.

Psychological needs: information, security, self-esteem, competence, love and hope

F. EMOTIONS

Definition, Differentiate from feelings, physiological changes of emotion, Role of RAS, hypothalamus, cerebral cortex, sympathetic nervous system, adrenal gland, heredity and emotion, Nature and control of anger, fear and anxiety.

G. PERSONALITY

1. Definition, List the components: Physical characteristics, character, abilities, temperament interest and attitudes.

2. Discuss briefly the role of heredity, nervous system, physical characteristics, abilities, family and culture on personality development.

3. Basic concepts of Freud: Unconscious, conscious, Id, ego and superego List and define the oral, anal and phallic stages of personality development. List and define the 8 stages as proposed by Erickson, 4 concepts of learning as proposed by Dollard and Miller; drive, cue, response and reinforcement.

4. Personality assessment; interview, standardised, non-standardised. Exhaustive and stress interviews, List and define inventories BAI, CPI and MMPI. Projective tests: Rorschach, TAT and sentence completion test.

H. LEARNING

Definition, List the laws of learning as proposed by Thorndike. Types of learning: Briefly describe, classical conditioning, operant conditioning, insight, observation and Trial and Error

type List the effective ways to learn: Massed Vs. Spaced, Whole Vs. Part, Recitation Vs. Reading, Serial Vs. Free recall, knowledge of results, Association, Organization, Mnemonic methods, Incidental Vs. Intentional learning, role of language.

I. THINKING

Definition, concepts, creativity, steps in creative thinking, list the traits of creative people, delusions.

J. FRUSTRATION

Definition, sources, solution. Conflict: Approach - approach, avoidance - avoidance, and approach - avoidance, solution.

K. SENSATION, ATTENTION AND PERCEPTION

1. List the senses: Vision, Hearing, Olfactory, Gustatory and cutaneous sensation, movement, equilibrium and visceral sense. Define attention and list factors that determine attention: nature of stimulus intensity, colour, change, extensity, repetition, movement size, curiosity, primary motives.

2. Define perception and list the principles of perception: Figure ground, constancy, similarity, proximity, closure, continuity, values and interests, past experience context, needs, moods, religion, sex and age, perceived susceptibility perceived seriousness, perceived benefits, and socioeconomic status.

3. Define illusion and hallucination.

4. List visual, auditory, cutaneous, gustatory and olfactory hallucination.

L. DEMOCRATIC AND AUTHORITARIAN LEADERSHIP

Qualities of leadership: Physical factors, intelligence, self-confidence, sociability, will and dominance. Define attitude. change of attitude by: Additional information, changes in group-affiliation, enforced modification by law and procedures that affect personality. (Psychotherapy, Counselling and religious conversion).

M. DEFENCE MECHANISMS OF THE EGO

Denial, rationalization, projection, reaction formation, identification, repression, emotional insulation, undoing, introjection, acting out, depersonalization.

PART B—HEALTH PSYCHOLOGY

A. PSYCHOLOGICAL REACTIONS OF A PATIENT

Psychological reactions of a patient during admission and treatment: anxiety, shock, denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection fear, withdrawal, depression, egocentricity, concern about small matters, narrowed interests, emotional over reactions, perpetual changes, confusion, disorientation, hallucinations, delusions, illusions, anger, hostility, loss of hope.

B. REACTIONS TO LOSS

Reactions to loss, death and bereavement: shock and disbelief, development of awareness, restitution, resolution. Stages of acceptance as proposed by Kubler - Ross.

C. STRESS

Physiological and psychological changes, Relation to health and sickness: Psychosomatics, professional stress, burnout.

D. COMMUNICATIONS

1. Types - verbal, non-verbal, elements in communication, barriers to good communication, developing effective communication, specific communication techniques.

2. Counselling: Definition, Aim, differentiate from guidance, principles in counselling and personality qualities of counsellors.

E. COMPLIANCE

Nature, factors, contributing to non-compliance, improving compliance.

F. EMOTIONAL NEEDS

Emotional needs and psychological factors in relation to unconscious patients, handicapped patients, bed-ridden patients, chronic pain, spinal cord injury, paralysis, cerebral palsy, burns, amputations, disfigurement, head injury, degenerative disorders, parkinsonism, leprosy, incontinence and mental illness.

G. GERIATRIC PSYCHOLOGY

Specific psychological reactions and needs of geriatric patients.

H. PAEDIATRIC PSYCHOLOGY

Specific psychological reactions and needs of paediatric patients.

I. BEHAVIOUR MODIFICATION

Application of various conditioning and learning principles to modify patient behaviour.

K. SUBSTANCE ABUSE

Psychological aspects of substance abuse: smoking, alcoholism and drug addiction.

L. PERSONALITY STYLES

Different personality styles of patients.

EVALUATION

ANATOMY

Examination at the end of : II Semester Instruction hrs : 200

COURSE DESCRIPTION

The study of Anatomy will include identification of all gross anatomical structures. Particular emphasis will be placed on description of bones, joints, muscles, the brain, Cardio-pulmonary and nervous systems, as these are related to the application of physiotherapy and occupational therapy.

COURSE OBJECTIVES

The objective of this course is that after 200 hours of lectures, demonstrations, and practicals, the student will be able to demonstrate knowledge in human anatomy as is necessary for the study and practice of physiotherapy and occupational therapy.

In addition, the student will be able to fulfil with 75% accuracy (as measured written & oral internal evaluation) the following objectives of the course.

A. INTRODUCTION

1. Define Anatomy and mention its subdivisions.
2. Name regions, cavities and systems of the body.
3. Defines anatomical positions and anatomical terms.

B. CELL

1. Defines a cell.
2. Mentions the shape, size and parts of a cell.
3. Names and gives functions of organelles Names inclusion bodies.
4. Defines chromosomes, genes.
5. Reviews mitosis and meiosis. Mentions the main events, but stages not necessary.

C. TISSUES

1. Classifies tissues.
2. Classifies and mentions the microscopic structure of types of tissues such as epithelial, connective, muscular and nervous tissues. Gives examples for each type of tissue.

D. CARDIO - VASCULAR SYSTEM

1.
 - a. Comprehends the external and internal features of the structure of the heart and their implications.
 - b. Mentions position of the heart
 - c. Identifies and names the chambers of the heart, surfaces and borders of the heart.
 - d. Identifies the venae cavae, pulmonary trunk and aorta.
 - e. Mentions the internal features of the chambers of the heart.
2.
 - a. States the basic features of the blood supply & nervous supply of the heart.
 - b. States the basic arrangement of the pericardium
 - c. Identifies the coronary arteries and coronary sinus
 - d. Names the parts of the conducting system of heart.
3.
 - a. Mentions the position and general distribution of major arteries and major veins, and names their main branches.
 - b. Names the types of arteries and veins; gives examples and indicates a basic microscopic structure of types of blood vessels.

E. LYMPHATIC SYSTEM

1. Comprehends the general and regional arrangements of the lymphatic system.

2. Names the lymphatic organs and mentions their location.
3. Illustrates the basic structural features of lymphatic vessels, lymphnodes, thymus, spleen and tonsils.
4. Assigns functional roles to the lymphatic system.
5. States the position and immediate relations of spleen.

F. RESPIRATORY SYSTEM

1.
 - a. Lists the parts of the respiratory system.
 - b. Comprehends the functional anatomy of the parts of the respiratory system.
 - c. Mentions the basic features of innervation of bronchi and lungs.
2.
 - a. States the position extent and gross and microscopic structure of the parietal pleura.
 - b. Comprehends the arrangements of pleura. Mentions the parts, and position of the parietal pleura.
 - c. Names the recesses of pleura.
 - d. Identifies the trachea and bronchi.
 - e. Identifies the right lung and left lung.
 - f. Names the components of the hilum of lung.
 - g. Names the bronchopulmonary segments.
 - h. Illustrates the main features of the microscopic structure of lung.
 - i. Identified the borders and surfaces of the lung on the specimen.

G. DIGESTIVE SYSTEM (n. b. no details are required)

1.
 - a. Liste the parts of the digestive system.

- b. Mentions the boundaries and features of the mouth.
 - c. Classifies teeth.
 - d. Mentions position, extent, subdivisions, communications, internal features ond muscles of pharynx.
 - e. Names the tonsils and defines fauces.
 - f. Identifies internal features of the mouth and pharynx of the specimen.
2.
 - a. States the position, course and extent of oesophagus.
 - b. Identifies oesophagus of the specimen.
 - c. States the basic nerve supply.
3.
 - a. Mentions the position and gross structure of the stomach.
 - b. Identifies the stomach and its borders, the surfaces and subdivisions.
 - c. Enumerates the immediate relations of the stomach.
 - d. States the basic nerve supply of the stomach.
4.
 - a. Names the subdivisions of the intestine and mentions their positions.
 - b. Mentions the difference between small and large intestine.
5.
 - a. Names the arteries arising from the abdominal aorta. Names the organs supplied by these branches.
 - b. Is aware of the names and positions of the principal autonomic visceral nerve plexus in the abdomen and pelvis, and the organs supplied by them.

6. Mentions the position and gross features of the liver and biliary system.

7. Names the position and subdivisions of the pancreas.

8. a. Names the major salivary glands.

b. Indicate their positions.

c. Mentions the site of openings of their ducts.

H. GENITO - URINARY SYSTEM (n. b. no details are required)

1. a. Comprehends the basic functional implications and the basic structure of the kidney and ureter.

b. Mentions the position, size and shape of kidney.

c. Names the immediate relations of the kidney.

d. Indicate the cortex, medulla, pyramids, sinus, calyces, and pelvis of ureter in a macro section of the kidney.

e. Illustrates the structure of a nephron.

f. Identifies the ureter and indicate the position of the ureter.

2. a. States the anatomy of the bladder and urethra.

b. Mentions the positions, shape and size and surfaces of the bladder.

c. Indicates the immediate relations of the bladder.

d. Mentions the basic innervation of the bladder.

e. Names and identifies the subdivisions the the male urethra.

f. Mentions the position, extent and immediate relations of male urethra.

g. Locates and Identifies the female urethra.

h. Mentions the position, extent and immediate relations of the female urethra.

i. Names the sphincters of the urethra.

3. a. Lists and locates the parts of the male reproductive system. States the anatomy and functional considerations of the testis, male accessory organs of reproduction and external organs.

b. Name the constituent structures of the spermatic cord.

c. Mentions the position of the inguinal canal.

d. Names the component structures and parts of the penis.

4. a. List and locates the parts of female reproductive system. States the anatomy and functional considerations of ovary, uterine tubes, uterus, vagina and female external genitalia.

b. Mentions the basic features of parts of the female external genitalia.

c. Enumerates the factors responsible for the maintenance of the position of the uterus and anatomy of its prolapse.

d. Mentions the position, extent and gross structure of the female breast.

5. Name the common, internal, and external iliac arteries.

NERVOUS SYSTEM

1. a. Defines the subdivisions of the nervous system.

Defines central, peripheral and autonomic nervous systems and names their subdivisions.

Comprehends the position and form of the spinal cord, its structure and functions in terms of neuronal connections.

- b. Indicates the position and extent of the spinal cord.
 - c. Illustrates the principal features shown in a transverse section of the spinal cord.
 - d. Specifies the basic features of a mono and multisynaptic spinal reflex pathway.
 - e. Illustrates the white and gray matter, and anterior, lateral and posterior columns of the spinal cord.
 - f. Mentions the origin, termination and position of important ascending and descending tracts, sites of crossing of fibres of these tracts, and function of each tract.
 - g. States the main consequences of spinal cord transection and hemi section, and explains the rationale of cordotomy.
 - h. Indicates the blood supply and meninges of spinal cord.
2. a. Names the subdivision of the brain. Identifies and mentions the external features of parts of the brain.
 - b. Mentions the internal structure and basic features of parts to the brain stem and names the nuclei and fibre tracts with special emphasis on cranial nerve nuclei.
 - c. Identifies and mentions parts of the cerebellum.
 - d. Mentions the external features and internal structures of the cerebellum and names its various afferent and efferent fibres tracts and their termination.

- e. Mentions the features of the gross components of the cerebrum.
 - f. Mentions and identifies the location of gyri, sulci, and cortical areas.
 - g. States and identifies association, commissural and projection fibres.
 - h. Defines and identifies components of forebrain, including cerebral cortex, insula, olfactory bulb, olfactory tract, uncus, fornix, basal ganglia, thalamus, hypothalamus, internal capsule, corpus callosum etc.
 - i. Predicts the results of damage to internal capsule.
 - j. Outlines sensory and motor pathways and is able to trace these pathways.
 - k. Names sensory and motor nerve endings with function.
 - l. Defines pyramidal motor system and names its tracts.
 - m. Defines upper and lower motor neurones.
 - n. Names the parts and tracts of the extra - pyramidal system and indicate the functions.
3. Outlines the basic structures of sensory organs:- Nose, tongue, eye, ear, and skin.
 4. Briefly outlines the nature and basis of muscle tone.
Mentions the anatomical pathways involved in the production and maintenance of muscle tone.
 5. a. States the formation, circulation and drainage of CSF.
 - b. Locates and identifies the ventricles.

- c. Identifies and names the meninges and space around and locates the cisterns.
 - d. Defines lumbar puncture and cisternal puncture.
 - e. States the features of the meninges.
 - f. Recognises the differences between extradural, subdural and subarachnoid haemorrhage.
6. a. Outlines the arrangement of major blood vessels around the brain and spinal cord.
- b. Mentions the arteries forming the Circle of Willis.
- c. Name the branches of major arteries supplying the brain and spinal cord and mentions the parts of their supply.
- d. Predicts the result of blockage or rupture of central deep branches.
- e. Predicts the result of occlusion of cerebral arteries.
- f. Predicts the result of occlusion of vertebral or basilar arteries.
- g. Identifies and mentions the connections of dural venous sinuses.
- h. Names and identifies the parts of the limbic system. Mentions their function in emotion and behaviour.
7. a. Mentions the position and structure of the autonomic nervous system.
- b. Mentions the sites of origin and termination of the preganglionic and postganglionic sympathetic and parasympathetic fibres.
- c. Names and locates the sympathetic and parasympathetic ganglia.

- d. Summarises the functional differences between the sympathetic and parasympathetic systems.
8. a. Enumerates the cranial nerves in serial order.
- b. Mentions the nuclei of origin & termination and indicates the site of attachment to brain / brain stem.
- c. Explains the general distribution of the cranial nerves and the course of the Vth nerve.
- d. Predicts the result of injury to cranial nerves.
9. a. Anatomy of spinal cord—review.
- b. Names the groups of spinal nerves.
- c. Explains the formation and branches of the spinal nerves and distribution of anterior and posterior rami.
- d. Locates and names the plexuses of nerves.
- e. Indicates and course and distribution of branches of the plexuses of the nerves.

J. ENDOCRINE SYSTEM

1. Lists the endocrine organs and mentions their position.
2. Mentions the hormones produced by each endocrine organ.

K. INTRODUCTION TO BONES (Osteology)

1. a. Defines skeleton.
- b. Mentions the subdivisions of the skeleton. Names the bones in each subdivision. Knows the number of bones in each subdivision and total number of bones.
- c. Classifies the bones and gives examples.
- d. Enumerates the common surface features of bones.

e. Defines ossification. Explains the types of ossification and gives examples. Defines ossification centre. Explains the growth of long bone in length and width.

f. Indicates blood supply and nerve supply of a bone.

2. When regional anatomy is taught :

a. Identifies, names and correctly orientates the bone

b. Identifies surfaces, borders and all other surface features

c. Marks and indicates the muscular and ligamentous attachments on the bone.

L. INTRODUCTION TO JOINTS (Syndesmology/Arthrology)

1. a. Defines a joint or articulation.

b. Classifies the joints and gives examples for each type. Defines each type of joint.

c. Mentions the basic features of a synovial joint.

d. Defines the axis and movements possible in a synovial joint.

e. Defines range of movements and limiting factors.

f. Indicates the blood supply and nerve supply in general.

g. Defines stability of a joint.

h. Demonstrates common movements.

2. When regional anatomy is taught :-

a. Mentions the type, the articular surfaces, ligaments, movements, axes of movements. Chief muscles producing the movements, limiting factors and nerve supply and blood supply of all individual joints.

b. Mentions the factors for stability.

c. Articulates the bones correctly.

d. Indicates applied anatomy for all joints.

M. INTRODUCTION TO MUSCLES (SKELETAL MUSCLE) (Myology)

1. a. Defines a skeletal muscle.

b. Defines fascia, tendon, aponeurosis.

c. Classifies the skeletal muscles by shape etc, and gives examples.

d. Defines origin, insertion, muscle work (contractions), types of muscle work, range of muscle work, group actions - antagonists, synergists and fixators; shunt and spurt muscles; types of levers with examples.

2. When the regional anatomy is taught :

a. Mentions the position, origin, insertion, nerve supply and actions of the skeletal muscles. (for the skeletal muscles of soft palate, pharynx and larynx, position, action and nerve supply may be sufficient).

b. Indicates groups of muscles by position and action, group action and nerve supply of groups of muscles.

c. Indicates segmental innervation of muscles.

d. Predicts the result of paralysis of individual and groups of muscles.

N. UPPER EXTREMITY

1. Pectoral region :

a. Outlines the features of the pectoral region.

b. Names, identifies and correctly orientates the sternum, clavicle, scapula and humerus.

- c. Outlines the main features of the bones of shoulder girdle.
- d. Identifies the parts, borders and surfaces of sternum. Mentions its other features.
- e. Identifies the ends, surfaces, curvatures and other features of clavicle.
- f. Identifies the borders, angles, surface, processes fossae and other features of scapula.
- g. Identifies the ends, head, greater and lesser tubercles and anatomical and surgical necks of humerus; also the capitulum, trochlea, and radial, coronoid and olecranon fossae and epicondyles.
- h. Locates and identifies the muscles of pectoral region. Mentions their origin, insertion, nerve supply and action.

2. Scapular region :

- a. Comprehends the main features of the muscles in the scapular region.
- b. States the layered arrangements of the muscles of the back.
- c. Names and identifies the muscles of the scapular region. Mentions their origin, insertion, nerve supply and actions.
- d. Demonstrates the bony landmarks of scapula, humerus and clavicle.

3. Axilla :

- a. Mentions and identifies the boundaries and contents of axilla. Names the branches of axillary artery. Names and identifies the cords and branches of brachial plexus and mentions their root value.

- b. Illustrates the formation of brachial plexus.

4. Shoulder girdle :

- a. Comprehends and applies to function the main features of joints of the shoulder girdle.
- b. Names the joints of shoulder girdle. Identifies the articular surfaces and names the ligaments and movements of sternoclavicular and acromioclavicular joints. Mentions the types of the joints.
- c. Demonstrates and names the movements of scapula. Mentions the chief muscles producing these movements.

Correlates movements of scapula

- d. Assigns functional roles to the articular disc and costoclavicular ligament of sternoclavicular joint and coracoclavicular ligament.

5. Shoulder joint :

- a. Mentions the type, articular surfaces and ligaments of the shoulder joint.
- b. Defines and demonstrates the movements of shoulder joint.
- c. Names and identifies the chief muscles producing these movements. Analyses these movements and mentions limiting factors.
- d. Mentions the blood supply and nerve supply of this joint.
- e. Analyses the association of movements of scapula and movements of the shoulder joints.
- f. Mentions the limiting factors and the factors for its stability. Indicates applied anatomy.

6. Upper arm :

- a. Names and identifies the muscles at the front and back of the upper arm.
- b. Names and identifies the ends, borders, surfaces and features of the humerus. Identifies the head anatomical neck, tubercles, surgical neck, bicipital groove, condyle, capitulum, trochlea epicondyles, radial, coronoid and olecranon fossae.
- c. Mentions the origin, insertion, nerve supply and actions of the muscles of the front and back of the upper arm.
- d. Indicates the course, relations and distribution of radial and musculo - cutaneous nerves.

7. Elbow joint :

- a. Mentions the type, articular surfaces and ligaments of elbow joint.
- b. Defines and demonstrates the movements possible and names the chief muscles producing these movements.
- c. Mentions the factors for stability and limiting factors.
- d. Indicates the applied anatomy.
- e. Mentions the blood supply and nerve supply.
- f. Explains the carrying angle.

8. Forearm, wrist and hand :

- a. Mentions the bones of forearm, identifies the ends, borders, surfaces and features of radius and ulna.
- b. Identifies the head, neck, tuberosity and styloid process of radius. Identifies the coronoid process, olecranon process, trochlear notch, tuberosity, head and styloid process of ulna. Also the radial notch of ulna and ulnar notch of radius.

- c. Names and identifies the carpal bones, metacarpal bones and phalanges in an articulated hand.
- d. Identifies the muscles of front and back of the forearm.
- e. Mentions the position, origin, insertion, nerve supply and action of these muscles.
- f. Indicates the course, relations and distribution of median, ulnar and radial nerves.
- g. Mentions the type, articular surface and ligaments of radioulnar joints. Defines the movements of supination and pronation. Mentions the axis and muscles producing these movements. Analyses these movements and applies to functional role in routine day to day actions.
- h. Mentions the position and distribution of ulnar and radial arteries and ulnar, median and radial nerves.
- i. Names and locates the carpal bones. Mentions the type, articular surface and ligaments of wrist joint.

Defines and demonstrates the movements and mentions the muscles producing them. Mentions its blood supply and nerve supply.

Mentions the visible tendons around the wrist and their synovial sheaths.

- j. Predicts the result of paralysis of muscles of the forearm.
- k. Mentions the functional implications of prehension in the structure of hand.
- l. Indicates the arrangement of tendons of the digits, retinaculae, fibrous flexor sheaths, and synovial sheaths.
- m. Evaluates the hinge type of interphalangeal joints, ellipsoid type of metacarpophalangeal joints and saddle type of carpometacarpal joint.

n. Names and identifies the small muscles of the hand. Mentions their position, origin, insertion, nerve supply and action.

o. Mentions the types of bones forming and ligaments of the joints of the hand. Defines the movement and the muscles producing these movements. Predicts the results of paralysis of the small muscles of hand.

p. Demonstrates the types of grip.

9. Nerves of upper limb :

a. Comprehends and applies the knowledge of position and distribution of nerves of upper limb.

b. Mentions the root value of the nerves.

c. Identifies the nerves and mentions the position, course, relations and distribution of nerves of upper limb.

d. Predicts the result of injury to these nerves.

10. Blood Vessels of upper limb :

a. Comprehends and applies the knowledge of the position and distribution of blood vessels and lymph nodes.

b. Traces the main arteries and veins.

c. Indicates their position and names the main branches of tributaries.

d. Names and locates the lymph nodes.

11. Cutaneous Nerves of upper limb :

a. Names the cutaneous nerves and illustrates the areas of their distribution.

b. Illustrates the dermatomes.

O. LOWER EXTREMITY

1. a. Names, identifies and orientates hip bone, femur, tibia, fibula and patella.

b. Identifies the components and features of hip bones. Identifies the ends, borders, surfaces, head, neck, trochanters, condyles and epicondyles of femur and the features of the tibia and fibula.

c. Identifies and mentions the origin, insertion, nerve supply and action of the muscles in the front of thigh.

d. Mentions the boundaries and contents of femoral triangle and subsartorial canal.

e. Indicates the position, course and distribution of femoral nerve.

f. Indicates the course and main branches of femoral artery and mentions the blood supply of neck of femur.

g. Indicates the position of femoral vein.

2. Medical side of thigh :

a. Names and identifies the muscles of the medical side of thigh. Mentions their origin, insertion, nerve supply and action.

b. Indicates the course, relations and distribution of obturator nerve.

3. Back of thigh :

a. Identifies and mentions the position, origin, insertion, nerve supply and action of the hamstring muscles.

b. Indicates the position, course, relation and distribution of sciatic nerve.

4. Gluteal region :

- a. Identifies and mentions the position, origin, insertion, nerve supply and action of the muscles.
- b. Names and mentions the position and course of the nerves found there and names the arteries there.

5. Hip joints :

- a. Mentions the type, articular surface and ligaments.
- b. Defines the movements and names the chief muscles producing the movements.
- c. Mentions the blood supply, nerve supply, factor for stability and limiting factors.
- d. Indicates applied anatomy.

6. Knee joint :

- a. Mentions the type, articular surfaces, and ligaments.
- b. Defines the movements and names and chief muscles for the movements.
- c. Analyses the movements.
- d. Knows the blood supply and nerve supply.
- e. Indicates applied anatomy.
- f. Defines locking and unlocking of the joint.

7. Popliteal fossa :

- a. Indicates the boundaries and contents.
- b. Mentions the position and branches of tibial and common peroneal nerves.

8. Front of leg and dorsum of foot :

- a. Names and identifies the tarsal bones, metatarsal bones and phalanges in an articulated foot.

b. Names and identifies the muscles.

- c. Mentions the positions, origin, insertion, nerve supply and action of the muscles.
- d. Position and distribution of deep peroneal nerve.
- e. Indicates the position and attachments of extensor retinaculae.
- f. Mentions and identifies the features of the tibia and fibula.

9. Lateral Side of leg :

- a. Names and identifies the muscles
- b. Mentions the position, origin, insertion, nerve supply and action of muscles.
- c. States the position, course and distribution of superficial peroneal nerve.
- d. States the position and attachment of peroneal retinacula.

10. Back of leg and sole of foot :

- a. Name and identifies the features of the bones of the foot
- b. Names and identifies the muscles of back of leg.
- c. Mentions the position, arrangement, origin, insertion, nerve supply and action of the muscles.
- d. States the position course and distribution of tibial artery.
- e. States the position, and distribution of posterior tibial artery.

- f. Mentions the position, and attachment of flexor retinaculum.
- g. Mentions the arrangement, origin, insertion, nerve supply and action of muscles of the foot.
- h. Indicates the types of formation, and factors for the maintenance of the arches of foot.
- i. Mentions the type, articular surface, ligaments, movements chief muscles for the movement. Axes of movements and applied anatomy of tibiofibular joints, ankle joints, subtalar joints, M.P. joints and I.P. joints.
- j. Palpates and identifies the tendons around the ankle and dorsum of foot.

11. Nerves :

- a. Indicates the position, formation and branches of lumbar and sacral plexuses.
- b. Mentions the root value of the nerves.
- c. Mentions the position, course, relation and distribution of the nerves.
- d. Predicts the result of injury to the nerves.
- e. Illustrates cutaneous innervation of dermatomes.

12. Blood Vessels :

- a. Indicates the position of arteries and their main branches.
- b. Indicates the position of veins and their main tributaries.
- c. Indicates the position of lymph nodes.

P. TRUNK - THORAX - ABDOMEN

Vertebral Column :

1. States the basic osteology of vertebral column.
2. Identifies the parts of a typical vertebra. Identifies and states the main features of typical vertebra of each group of vertebrae. Identifies a typical vertebrae.
3. States the form, structure and movements of joints of vertebral column. Mentions the movements and the muscles producing them.
4. Identifies the intervertebral disc and mentions its parts.
5. States the formation and ligaments of the intervertebral joints.
6. Names and identifies the curvatures of the vertebral column and indicate deformities.
7. States the contents of vertebral canal.

THORAX :

1. a. States the main features of the bones and joints of thoracic cage. Mentions the boundaries.
- b. States the parts and features of sternum.
- c. Defines ¹true, ³false and ²floating ribs. Mentions the parts and features of typical ribs. Knows the main features of a typical rib.
- d. Mentions the type and formation of the joints between rib and vertebrae, between costal cartilage and sternum, and between costal cartilages.
- e. Mentions the type and formation of joints between parts of sternum. Indicates the importance of sternal angle.

- f. Analyses pump handle and bucket handle movements of ribs.
- g. Palpates bony land marks such as jugular notch, sternal angle, xiphisternum and spines of thoracic vertebrae.

2. a. Defines intercostal space and lists the contents.

Mentions the course and branches of typical intercostal nerve
Names the muscles of thorax. Mentions the origin insertion, nerve supply and action of intercostal muscles and diaphragm.

- b. Names the structures passing through the diaphragm and mentions the orifices in the diaphragm.

3. a. Defines the boundaries, and subdivisions of the mediastinum and lists the contents. Identifies the contents.

- b. States the features of thoracic parts of sympathetic trunk.

Abdomen :

- 1. a. Mentions the main features of lumbar vertebrae, sacrum and coccyx.
- b. Mentions the formation and subdivisions of the bony-pelvis Lists the features of the female bony pelvis and their roles.
- c. Mentions the type, articular surfaces, ligaments and movements of the joints of pelvis.

2. a. Defines abdominal cavity.

- b. Lists the layers of anterior abdominal wall. Names and mentions the origin, insertion, nerve supply and action of the muscles, and the features of these muscles.

- c. Explains the formation of rectus sheath and lists its contents.

- d. Defines inguinal canal and knows its position, extent, formation and contents. Indicates its clinical importance. Defines inguinal hernia.

- e. Names and identifies the muscles of posterior abdominal wall. Gives their origin, insertion, and action. Lists the organs on the posterior abdominal wall. Names the blood vessels on the posterior wall.

- f. Mentions the position and formation of lumbar plexus. Names its branches.

- g. States the anatomy of lumbar region. Understands the disposition of muscles of the layers. Mentions the arrangement of lumbar fascia. Identifies the muscles in lumbar region. Understands the lumbar roots to abdomen. Identifies and mentions the attachments and actions of the large muscles of back. (at least the ones ending capitis).

- h. Distinguishes abdominal cavity and peritoneal cavity.

- i. Mentions the features of lumbar part of sympathetic trunk and other sympathetic ganglia

- j. Mentions the branches and distribution of the abdominal aorta and iliac arteries.

- k. States the inferior vena cava and iliac veins and mentions their tributaries.

G. PELVIS

- 1. States the main features of subdivision, boundaries, walls and floor of pelvis.

- 2. Mentions the features of the public symphysis and sacro-iliac joints.

3. Distinguishes and mentions the major difference between the male and female pelvis.

4. Identifies the muscles of the pelvic floor and mentions their attachments, actions and nerve supply.

5. Mentions the structure of the urogenital diaphragm.

R. HEAD AND NECK

Musculo skeletal and neurovascular features. Identifies the anterior and posterior triangles of neck. Names the subdivisions. Lists the contents.

1. a. States the main features of the skull and the facial skeleton.

b. Identifies the large skull bones and their parts.

c. Identifies the cranial fossae and hypophyseal fossa.

d. Identifies the internal and external auditory meatuses, foramen magnum and styloid process and names the main structures passing through them.

e. Identifies and names the main muscles of the face. Mentions their nerve supply and action.

f. Predicts the results of paralysis to the facial muscles and sequel of injury to the facial nerve. (VII nerve)

g. Maps the cutaneous distribution of the three divisions of the trigeminal (Vth) nerve on the face.

2. a. Identifies the general feature of a typical cervical vertebra, atlas, axis and seventh cervical vertebra.

b. Identifies the erector spinae, sternomastoid and scalene muscles geniohyoid. Mentions their attachments, actions and nerve supply.

c. Identifies the phrenic, accessory and vagus nerves. Mentions their distribution.

d. Identifies and states the position, distribution and root values of the nerves of cervical and brachial plexuses.

e. Demonstrates the action of sternomastoid.

f. Mentions the type, articular surfaces, ligaments, movements, and muscles producing these movements, at the atlanto-occipital and atlanto-axial joints. Demonstrates these movements and the movements of the cervical part of vertebral column.

3. a. Identifies the subclavian, vertebral and carotid arteries. Mentions the position and extent of these arteries.

b. Identifies the components of the Circle of Willis. Mentions the distribution of internal and external carotid and vertebral arteries. Predicts the sequelae of occlusion of these arteries.

c. Identifies the internal jugular and subclavian veins. Mentions their position, formation and termination.

4. a. States the basic organization of the autonomic nervous system.

b. States the sites of craniosacral and thoracolumbar outflows.

c. Defines the modes of distribution of pre and postganglionic efferent neurones in sympathetic and parasympathetic nervous system.

d. Names the cranial nerves containing parasympathetic fibres and mentions their distribution.

e. Distinguishes between sympathetic and parasympathetic systems in relation to their functions.

Eye :

1. States the position of the lacrimal apparatus, the functional implications of structure of the eye and the lacrimal apparatus.

2. Names and illustrates the coats, their subdivisions, the refractive media, the chambers of the eye and the optic nerve.

3. Mentions the structure of retina and optic pathway

4. Has a basic understanding of the light and accommodation reflex. (omitting the pathway).

5. Mentions the distribution of the three divisions of trigeminal (Vth) nerve.

6. Names and states the nerve supply and simple actions of the extraocular muscles.

7. Predicts the results of lesions of 3rd, 4th and 6th cranial nerves.

Nose :

1. Names the bony components of the nose.

2. Mentions the parts and boundaries of the nose.

3. States the main features of the nasal cavity.

4. Names and identifies the para nasal air sinuses and locates their openings.

Temporomandibular joint :

1. States the type, articular surface, ligaments, possible movements, muscles performing the movements and nerve supply of the temporomandibular joint.

2. Palpates and identifies the joint and its articular surfaces.

3. Identifies and names the muscles of mastication. Mentions their actions and nerve supply.

Mouth :

1. States the main features of the mouth cavity tongue, Palate, salivary glands, teeth and gums.

2. Mentions the sensory and motor innervation of the tongue.

3. Identifies the salivary glands.

4. Demonstrates movements of the tongue and palate.

5. Tests and produces the swallowing (gag) reflex.

6. Predicts the sequelae of lesions of the VIIth and XIIth cranial nerves.

Pharynx :

1. States the position and extent of the pharynx.

2. States the three subdivisions and the features of each subdivision.

3. Names the muscles of pharynx and their action.

4. Mentions the sensory and motor innervation of the pharynx.

Larynx and trachea :

1. Identifies the hyoid and states its parts.

2. Identifies the larynx and names the laryngeal cartilages.

3. States the boundaries of laryngeal inlet and glottis.

4. Identifies the vocal and vestibular folds.

5. States the movements of the laryngeal cartilages. Names the laryngeal muscles and mentions their attachments, action and nerve supply.

6. Defines the position, extent and gross structure of the trachea.

7. States the mechanics of phonation and speech, production of sound voice and speech.

Ear :

1. States the basic structural plan of the organs of hearing and equilibrium.
2. Mentions the three subdivisions of the ear.
3. Mentions the nerve endings for hearing and equilibrium.

Cranial nerves :

1. Enumerates the cranial nerves in serial order.
2. Relates interprets the number to the names.
3. Indicates the nuclei of origin of termination.
4. Mentions the attachments to the brain and the cranial exit.
5. States the sensory and motor distribution.
6. States the position and course of VII nerve.
7. Predicts the sequel of lesion.

EVALUATION

Applied Anatomy & Biomechanics

Examination at the end of : IV Semester

Instruction hours :

COURSE DESCRIPTION

This course supplements the knowledge of anatomy and enables the student to have a better understanding of the principles of biomechanics and their application in musculo-skeletal function and dysfunction.

COURSE OBJECTIVES

The objectives of this course is that after 80 hours of lectures, demonstrations and practicals the student will be able to demonstrate an understanding of the principles of Biomechanics and Kinesiology and their application in health and disease.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written & oral evaluation) the following objectives of the course.

COURSE OUTLINE

Hours

A. MECHANICS

1. Describe types of motion, planes of motion, direction of motion and quantity of motion.
2. Define forces, force vectors, components of forces.
3. Describe gravity, segmental centres of gravity, center of gravity of the human body, stability and center of gravity, re-location of the centre of gravity.
4. Describe Reaction forces, Newton's Law of Reaction.
5. Describe equilibrium - Law of inertia and Establishing equilibrium of an object.

6. Describe objects in motion; Law of Acceleration, Joint distraction in a linear force system and Force of friction.

7. Describe concurrent Force Systems: Composition of forces, Muscle Action Lines, Total muscle force vector, Divergent muscle pulls, Anatomic pulleys.

8. Describe parallel Force Systems:-First class levers second class levers - Third class levers - Torque - Mechanical Advantage.

9. Define moment Arm: Moment Arm of a muscle force, Moment arm of gravity and Anatomic pulleys.

10. Describe equilibrium of a lever.

DESCRIBE THE FOLLOWING :

1. Three types of motion.
2. The plane in which a given joint motion occurs, and the axis around which the motion occurs.
3. The location of the centre of gravity of a solid object, the location of the centre of gravity of a segmental object, the location of the centre of the gravity of the human body.
4. The action line of a single muscle.
5. The name, point of application, direction, and magnitude of any interforce, given its reaction force.
6. A linear force system, a concurrent force system, a parallel force system.
7. The relationship between torque, moment arm and rotatory force component.
8. The methods of determining torque for the same given set of forces.
9. How anatomic pulleys may change action line, moment arm, and torque of muscles passing through them.

10. In general terms, the point in the joint range of motion at which a muscle acting over that joint is biomechanically most efficient.

11. How external forces can be manipulated to maximise torque.

12. Friction, its relationship to contacting surfaces and to the applied forces.

DETERMINE THE FOLLOWING :

1. The identity (name) of diagrammed forces on an object.
2. The new centre of gravity of an object when segments are rearranged, give the original centres of gravity.
3. The resultant vector in a linear force system, a concurrent force system, and a parallel force system.
4. If a given object is in linear and rotational equilibrium.
5. The magnitude and direction of acceleration of an object not in equilibrium.
6. Which forces are joint distraction forces and which are joint compression forces. What are the equilibrium force for each?
7. The magnitude and direction of friction in a given problem.
8. The class of term in a given problem.

COMPARE THE FOLLOWING :

1. Mechanical advantage in a second and third class lever.
2. Work done by muscles in a second and third class lever.
3. Stability of an object in two given situations in which location of the centre of gravity and the base of support of the object.

DRAW THE FOLLOWING :

1. The action line of a muscle.
2. The rotary force component, the translatory force component, and the moment arm for a given force on a lever.

B. JOINT STRUCTURE AND FUNCTION

1. Describe the basic principles of joint design and a human joint.
2. Describe the tissues present in human joints; including dense fibrous tissue, bone, cartilage and connective tissue.
3. Classify Joints - synarthrosis, Amphiarthrosis, Diarthrosis, subclassification of synovial joints.
4. Describe joint function, kinematic chains, range of motion
5. Describe the general effects of injury and disease.

RECALL THE FOLLOWING :

1. The elementary principles of joint design.
2. The three main classification of joints.
3. The five features common to all diarthrodial joints.
4. Types of materials used in human joint construction.
5. Properties of connective tissue.

IDENTIFY THE FOLLOWING :

1. The axis of motion for any given motion at a specific joint (knee, hip, metacarpophalangeal).
2. The plane of motion for any given motion at a specific joint, shoulder, interphalangeal, wrist.
3. The degree of freedom at any given joint.

4. The distinguishing features of a diarthrodial joint.
5. The structures that contribute to joint stability.

COMPARE THE FOLLOWING :

1. A synarthrosis with an amphiarthrosis on the basis of methods, materials and function.
2. A synarthrosis with a diarthrosis on the basis of methods, materials and function.
3. Closed kinematic chain with an open kinematic chain
4. Dense fibrous tissue with bone.
5. Hyaline cartilage with fibrocartilage.

C. MUSCLE STRUCTURE AND FUNCTION

1. Describe Mobility and stability functions of muscles.
2. Describe elements of muscle structure - Composition of a muscle fibre, the motor unit, types of muscle fibres, muscle fibre size, arrangement and number, Muscle tension, length-tension relationship.
3. Describe types of muscle contraction, speed and angular Velocity, Applied load, Voluntary control, Torque & Isokinetic exercise.
4. Summarise factors affecting muscle tension.
5. Classify muscles - spurt and shunt muscles, Tonic and phasic muscles.
6. Factors affecting muscle function: Type of joint and location of muscle attachment, number of joints, passive insufficiency, Sensory receptors.

DESCRIBE THE FOLLOWING :

1. Ordering of the myofibrils in a sarcomere.

2. An alpha motor neuron.
3. The connective tissue in a muscle.
4. How tension develops in a muscle.
5. Isokinetic exercise.

DEFINE THE FOLLOWING :

1. Active and passive insufficiency.
2. Active and passive tension.
3. Concentric, eccentric and isometric contractions.
4. Reverse action.
5. Agonists, antagonists and synergists.

RECALL THE FOLLOWING :

1. Factors affecting muscle tension.
2. Characteristics of different fibre types.
3. Characteristics of motor units.
4. Factors affecting angular velocity.

DIFFERENTIATE THE FOLLOWING :

1. A spurt from a shunt muscle.
2. A phase from a tonic muscle.
3. Agonist from an antagonist.
4. Active from passive insufficiency.
5. Concentric from eccentric contractions.

COMPARE THE FOLLOWING :

1. Tension development in eccentric versus concentric contractions.

2. The angular velocity of isometric versus concentric & isokinetic contractions.

3. Isokinetic exercise with concentric exercise.

(D) THE VERTEBRAL COLUMN

1. Articulations, Ligaments and muscles, typical vertebra, intervertebral disc.
2. Describe factors affecting stability and motility.
3. Regional structure and function of cervical, dorsal, lumbar and sacral vertebrae.
4. Describe the muscles of the vertebral column - Flexors, Extensors, Rotators and Lateral flexors.
5. Describe the effects of injury and developmental deficits.

DESCRIBE THE FOLLOWING :

1. The curves of the vertebral column using appropriate terminology.
2. The articulations of the vertebral column.
3. The major ligaments of the vertebral column.
4. The structural components of typical and atypical vertebrae.
5. The intervertebral disc.
6. Regional characteristics of vertebral structure.
7. Motions of the vertebral column.
8. Lumbar-pelvic rhythm.
9. Rotation of the vertebrae in each region.
10. Movements of the ribs during rotation.

IDENTIFY THE FOLLOWING :

1. Structure that provide stability for the column.
2. Muscles of the vertebral column and the specific functions of each.
3. Ligaments that limit specific motions (i. e. flexion extension, lateral flexion, rotation).
4. Forces acting on the vertebral column during specific motions.

EXPLAIN THE FOLLOWING :

1. The relationship between the intervertebral and facet joints during motions of the vertebral column.
2. The role of the intervertebral disc in stability and mobility.
3. The effects of forces acting on the structural components during motion and at rest.

ANALYSE THE FOLLOWING :

1. The effects of disease process, injury, or other defects in the vertebrae.
2. The effects of an increased lumbosacral angle on the pelvis and lumbar vertebral column.

(F) THE SHOULDER COMPLEX

1 Describe the structural components of the shoulder complex including the articulating surfaces, capsular attachments and ligaments and movements of the following joints :

- | | |
|----------------------|-----------------------|
| i) Sternoclavicular | ii) Acromioclavicular |
| iii) Scapulothoracic | iv) Glenohumeral |

2. Describe the function of the shoulder complex including dynamic stability of the glenohumeral joint, musculohumeral Rhythm, Scapulothoracic and glenohumeral contributions.

3 Describe the muscles of elevation (Deltoid, Supraspinatus, Infraspinatus, Teres minor, Subscapularis, Upper Trapazius, lower Trapazius, Serratus anterior, Middle Trapazius & Rhomboides).

4. Describe the muscles of depression Latissimus dorsi Pectoralis, Teres Major, Rhomboides).

DESCRIBE THE FOLLOWING :

1. The articular surfaces of the joints of the complex.
2. The function of the ligaments of each joint.
3. Accessory joint structures and the function of each.
4. Motions and ranges available at each joint and movement articular surfaces within the joint.
5. The normal mechanism of dynamic stability of the glenohumeral joint, utilizing principles of biomechanics.
6. The normal mechanism of glenohumeral stability in the dependent arm
7. Scapulohumeral rhythm, including contributions of each joints.
8. The extent of dependent or independent function of each joint in scapulohumeral rhythm.
9. How restriction in the range of elevation of the arm may occur.
10. One muscular force couple at a given joint and its function.
11. The effect a given muscular deficit may have on shoulder complex function.

COMPARE THE FOLLOWING :

1. The advantages and disadvantages of coracoacromial arch.

2. The structural stability of the three joints, including the tendency toward degenerative changes and derangement.

Draw the action lines of muscles of the shoulder complex and the moment arm for each, and resolve each into components.

G. THE ELBOW COMPLEX

1. Describe the structure of the Humero-ulnar and Humeroradial joints including articulating surfaces, joint capsule, Ligaments & Muscles.

2. Describe the function of the Humero-ulnar and Humeroradial joints including the Axis of motion, Range of motion, Muscle action.

3. Describe the structure of the superior and inferior radioulnar joints.

4. Describe the function of the superior and inferior Radioulnar joints.

5. Describe the mobility and stability of the Elbow complex and its relationship to Hand and Wrist.

6. Describe the effects of injury and the resistance to longitudinal compression forces, to distraction forces & to Medial lateral forces.

DESCRIBE THE FOLLOWING :

1. All of the articulating surfaces associated with each of the following joints-humero-ulnar, humeroradial superior and inferior radioulnar.

2. The ligaments associated with all the joints of the elbow complex.

IDENTIFY THE FOLLOWING :

1. Axes of motion for supination and pronation and flexion and extension.

2. The degrees of freedom associated with each of the joints of the elbow complex.

3. Factors limiting the range of motion in flexion and extension.

4. Factors that create the carrying angle.

5. Factors limiting motion in supination and pronation.

COMPARE THE FOLLOWING :

1. The translatory and rotatory components of the brachioradial is and brachialis at all points in the range of motion.

2. The moment arms of the flexors at any point in the range of motion.

3. Muscle activity of the extensors in a closed kinematic chain with activity in an open kinematic chain.

4. The role of pronator teres with the role of pronator quadratus.

5. The role of biceps with that of brachialis.

6. The resistances of elbow joint to longitudinal tensile forces with its resistances to compressive forces.

7. The features of a classic tennis elbow with the features of cubital tunnel syndrome.

8. The role of and structure of the annular ligament with the role and structure of the articular disc.

H. THE WRIST AND HAND COMPLEX

1. Describe the wrist complex including Radiocarpal joint, Midcarpal joint and the Ligaments of the wrist complex.

2. Describe the function of the radiocarpal and midcarpal joints including the movements and muscles involved.

3. Describe the Hand complex including: Structure on fingers (Carpometacarpal, Metacarpophalangeal and interphalangeal joints of fingers, ligaments Range of motion).

4. Describe the finger musculature including Extrinsic & MCP, PIP and DIP joint function, and intrinsic finger muscles

5. Describe the structure of the Carpometacarpal, MCP and IP joints of thumb.

6. Describe the structure including the Extrinsic & Intrinsic thumb muscles.

7. Describe Prehension, Power, Cylindrical, Spherical & Hook grips.

8. Describe Precision handling, Pad to pad, Tip to tip and Pad to side prehension and Functional position of wrist and hand.

DESCRIBE THE FOLLOWING :

1. The articular surfaces of the joints of the wrist and hand complexes.

2. The ligaments of the joints of the wrist and hand, including the significance of each.

3. Accessory joint structures found in the wrist and hand complex, including the function of each.

4. Types of movements and types of motion of the radiocarpal joint, the midcarpal joint, and the total wrist complex.

5. The sequence of joint activity occurring from full wrist flexion to extension including the role of the scaphoid, the sequence of joint activity in radial and ulnar deviation from neutral.

6. The role of the wrist musculature in producing wrist motion.

7. Motions and ranges available to joints of the hand complex.

8. The gliding mechanisms of the extrinsic finger flexors.

9. The structure of the extensor mechanism, including the muscles and ligaments that compose it.

10. How M.C.P. extension occurs, including the muscles that produce and control it.

11. How flexion and extension of the PIP joint occur, including the muscular and ligamentous forces that produce and control these motions.

12. How flexion and extension of DIP joints occur, including the muscular and ligamentous forces that produce and control these motions.

13. The role of the wrist in optimising length-tension in the extrinsic hand muscles.

14. The activity of reposition, including the muscles that perform it.

15. The functional position of the wrist and hand.

DIFFERENTIATE BETWEEN

1. The role of the interossei and lumbrical muscles at the MCP and IP joints.

2. The muscles used in cylindrical grip to those active in spherical grip, hook grip, and lateral prehension.

3. The muscles that are active in pad-to-pad, tip-to-tip, and pad to side prehension.

COMPARE

1. The activity of muscles of the thumb (in opposition of the thumb to the index finger) with the activity of those active in opposition to the little finger.

2. The characteristics of power grip with those of precision handling.

3. The most easily disrupted form of precision handling that may be used some one without any active hand musculature; what are the pre-requisites: for each?

I. THE HIP COMPLEX

1. Describe the general features of the hip joint including the articulating surfaces on the pelvis & the femur; Angulations; Angle of indication, Angle of Torsion; Internal architecture of femur and pelvis; joint capsule. Ligaments & Muscles (Flexors, Extensors - one joint extensors, two joint extensors, Adductors, Medial Rotators and Lateral Rotators).

2. Describe the function of hip - Rotation between pelvis, lumbar spine and hip; Pelvic motion - Anterior posterior pelvic tilting, Lumbar pelvic rhythm, Lateral pelvic tilting, Pelvic rotation.

3. Summarise the pelvic motions in the static erect posture.

4. Describe Femoral motion.

5. Describe Hip stability in Erect Bilateral stance, sagittal plane equilibrium and Unilateral stance.

6. Describe reduction of Forces with weight shifting and using a cane and deviations from normal in muscular weakness & Bony abnormalities.

DESCRIBE THE FOLLOWING :

1. The articulating surfaces of the pelvis and femur.
2. The structure and function of the trabecular systems of the pelvis and femur.
3. The structure and function of the ligaments of the hip joint.

4. The angle of inclination and the angle of torsion.

5. The planes and axes of the following pelvic motions and the accompanying motions at the lumbar spine and hip joints, pelvic rotation, and anterior, posterior and lateral tilting of the pelvis.

6. The muscle activity that produces tilting and rotation of the pelvis.

7. Motions of the femur on the pelvis including planes and axes of motion.

8. The structure and function of all the muscles associated with the hip joints.

9. The forces that act on the head of femur.

10. The position of greatest stability at the hip.

EXPLAIN THE FOLLOWING :

1. How sagittal and frontal plane equilibrium are maintained in erect bilateral stance.

2. How frontal plane equilibrium is achieved in unilateral stance.

3. How force acting on the femoral head may be reduced.

4. How the function of the two joint muscle at the hip are affected by changes in the position of the knee and hip.

5. The functional and structural relationship among the hip, knee, pelvis and lumbar spine.

COMPARE THE FOLLOWING :

1. Forces acting on the femoral head in erect bilateral stance with the forces acting on the head in erect unilateral stance.

2. Coxa valga with coxa vara on the basis of hip stability and mobility.

3. The motions that occur at the hip, pelvis and lumbar spine during forward trunk bending with the motions that occur during anterior and posterior tilting of the pelvis in the erect standing position.

4. Anterversion with retroversion on the basis of hip stability and mobility.

5. The structure and function of the following muscles. Flexors and extensors, abductors and adductors, lateral and medial rotators.

J. THE KNEE COMPLEX

1. Describe the structure of the Tibiofemoral joint. Articulating surfaces on femur and tibia, the menisci, Joint capsule and bursae, Ligaments and other supporting structures, Anterior-posterior and Medial-Lateral stability; Muscle structure; Knee flexors & extensors: Axes of knee complex: Mechanical axis, Anatomic axis and axis of motion.

2. Describe the function of the Tibiofemoral joint: Range of motion. Flexion and extension, Rotation, Abduction and Adduction, locking and unlocking; Function of Menisci and Muscle function.

3. Describe the structure of the patellofemoral joint.

4. Describe the function of the patellofemoral joint.

5. Describe the effects of injury and disease in the Tibiofemoral and patellofemoral joints.

DESCRIBE THE FOLLOWING :

1. The articulating surfaces of tibiofemoral and patellofemoral joints.

2. The joint capsule.

3. The anatomic and mechanical axes of knee.

4. Motion of the femoral condyles during flexion and extension in a closed kinematic chain.

5. Motion of the tibia in flexion & extension in an open kinematic chain.

DRAW :

The Q angle when given an illustration of the lower extremity.

2. Moment arm of quadriceps at the following degree of knee flexion : 90 deg., 130 deg., 30 deg., 10 deg.

3. The action lines of vastus lateralis and the vastus medialis oblique.

LOCATE :

1. The origins and insertion of all the muscles at the knee.

2. The bursae surrounding the knee.

3. The attachments of the ligaments of the medial and lateral compartments.

IDENTIFY :

1. Structures that contribute to the medial stability of the knee including dynamic and static stabilisers.

2. Structures that contribute to the lateral stability of the knee including dynamic and static stabilisers.

3. Structures that contribute to the posterior stability of the knee including dynamic and static stabilisers.

4. Structures that contribute to the anterior stability of the knee including dynamic and static stabilisers.

5. Structures that contribute to the rotatory stability of knee.

6. The normal forces that are acting on the knee.

COMPARE :

1. The knee and the elbow joint on the basis of similarities / dissimilarities in structure and function.
2. The lateral with the medial meniscus on the basis of structure and function.
3. The forces on the patellofemoral joint in full flexion with full extension.
4. The action of quadriceps in an open kinematic chain with that in a closed kinematic chain.
5. The effectiveness of the hamstrings as knee flexors in each of the following hip positions :- hyperextension, ten degrees of flexion and full flexion (open kinematic chain).
6. The effectiveness of the rectus femoris as a knee extensor at sixty degree of knee flexion with its effectiveness at ten degrees of knee flexion.

EXPLAIN :

1. The function of the menisci.
2. How a tear of the medial collateral ligament may affect joint function.
3. The functions of the suprapatellar, gastrocnemius, infrapatellar and prepatellar bursae.
4. Why the semiflexed position of the knee is the least painful position.
5. Why the knee may be more susceptible to injury than the hip joint.

(K) TYPE ANKLE - FOOT COMPLEX

DESCRIBE the structure, ligaments, axis and function of the following : ankle joint, tibiofibular joints, subtalar joints, Talocal-

caneonavicular joints, Transverse Tarsal joint, Tarsometatarsal joint, Plantar arches, Metatarsophalangeal joints, Interphalangeal joints.

Define the terminology unique to the ankle foot complex, including inversion - exarsion, pronation - supination, dorciflexion - plantar flexion, flexion - extension and adduction and abduction.

DESCRIBE :

1. The compound articulations of the ankle, subtalar, talocalcaneonavicular, transverse tarsal and tarsometatarsal joints.
2. The role of the tibiofibular joints and supporting ligaments.
3. The degrees of freedom and range of motion available at the joint of the ankle and the foot.
4. The significant ligaments that support the ankle, subtalar and transverse tarsal joints.
5. The triplanar nature of ankle joint motion.
6. The articular movements that occur in the weight-bearing subtalar joint during inversion-eversion.
7. The relationship between tibial rotation and subtalar / talocalcaneonavicular inversion-eversion.
8. The relationship between hind foot inversion-eversion and motility-stability of the transverse tarsal joint.
9. The function of the tarsometatarsal joints, including when motion at these joints is called upon.
10. Supination - pronation of the forefoot at the tarsometatarsal joints.
11. Distribution of weight within the foot.

12. The structure and function of the plantar arches including the primary supporting structure.

13. When muscles supplement arch support, including those muscles that specifically contribute.

14. The effects of toe extension on the plantar arches.

15. The general function of the extrinsic muscles of ankle & foot

16. The general function of the intrinsic muscle of foot.

L. POSTURE

1. Describe the effects of gravity and indicate the location of the gravity line in the sagittal plane in optimal posture.

2. Analyse posture with respect to the optimal alignment of joints in the antero-posterior and lateral views.

DESCRIBE :

1. The position of hip, knee and ankle joints in optimal erect posture.

2. The position of body's gravity line in optimal erect posture, using appropriate points of reference.

3. The effects of gravitational moments on body segments in optimal erect posture.

4. The gravitational moments acting around the vertebral column, pelvis, hip, knee and ankle in optimal erect posture.

5. Muscles and ligamentous structures that counter balance gravitational moments in optimal erect posture.

6. The following postural deviations : pes planus, hallux valgus, pes cavus, idiopathic scoliosis, kyphosis and lordosis.

7. The effects of the above postural deviations on body structures i. e. ligaments, joints and muscles.

DETERMINE :

1. How changes in the location of the body's gravity line will affect gravitational moments acting around specified joints axes.

2. How changes in the alignment of body segments will affect either the magnitude or the deviation of the gravitational moments.

3. How changes in alignment will affect supporting structures such as ligaments, joints capsules, muscles, and joints surfaces.

M. GAIT

DEFINE :

1. The stance, swing and double support phases of gait.

2. The subdivisions of the stance and swing phases of gait.

3. The time and distance parameters of gait.

DESCRIBE :

1. Joint motion at the hip, knee and ankle for one extremity during a gait cycle.

2. The location of line of gravity in relation to the hip, knee, and ankle during the stance phases of gait.

3. The gravitational moments of force acting at the hip, knee and ankle during the stance phase.

EXPLAIN :

1. Muscle activity at the hip, knee and ankle throughout the gait cycle, including why and when a particular muscle is active and type of contraction required.

2. The role each of the determinants of gait.

3. The muscle activity that occurs in the upper extremity and trunk.

COMPARE :

1. Motion of upper extremities and trunk with motion of pelvis and lower extremities.
2. The traditional gait terminology with the new terminology.
3. Normal gait with a gait in which there is a weakness of the hip extensors and abductors.
4. Normal gait with a gait in which there is unequal leg lengths.

EVALUATION**Physiology**

Examination at the end of : II Semester Instruction hours : 100

COURSE DESCRIPTION

This course which runs concurrently with the anatomy course helps the student to understand the basis of normal human physiology with special emphasis on the functioning of the cardiovascular, musculo-skeletal and nervous systems.

COURSE OBJECTIVES

The objective of this course is that after 100 hours of lectures, demonstrations, practicals and clinics the student will be able to demonstrate an understanding of elementary human physiology.

The student will be able to fulfil with 75% accuracy (as measured by written & oral internal evaluation) the following objectives of the course.

LECTURE OUTLINES

Hours

A. CELL INTRODUCTION

Outline of basic concepts of cell structure functions of components ; transport across membranes.

B. SKIN

Structure ; functions ; blood flow ; temperature regulation.

C. BLOOD

1. Outline of components ; and their function ; RBC, WBC, platelets, Blood groups.
2. Significance of RBC & WBC counts, ESR and other related tests.
3. Clotting mechanisms ;
4. Blood volume and its regulation.

D. CIRCULATION

1. Structure & Properties of cardiac muscle; Cardiac cycle.
2. ECG; Heart sounds Cardiac output.
3. Factors regulating the action of the heart.
4. Blood pressure; its maintenance and regulation.
5. Cerebral circulation; Renal circulation; Pulmonary circulation.
6. Effects of exercise; effects of postural changes.
7. Lymph; factors affecting its flow.

E. RESPIRATION

1. Defence mechanisms in the Respiratory tree; mucociliary transport. Mechanics of Respiration.
2. Transport of blood gases, Acid-base balance.
3. Lung function tests (including lung volumes). Artificial ventilation.
4. Nervous and chemical regulation of respiration.
5. Hypoxia-types and causes.
6. Effects of exercise on respiration.

F. DIGESTION

1. Digestion in the mouth, stomach and intestine.
2. Bile; Pancreatic secretion.
3. Mechanisms of control of secretions and motility.
4. Diet and Nutrition.

G. EXCRETION

1. Structure of the nephrons.

2. Formation of urine.

3. Micturation.

H. ENDOCRINES

1. General metabolism. Carbohydrates, protein and fat metabolism.
2. Outline of the various hormones and their actions with special emphasis on Thyroxine and Parathyroid hormone.

I. REPRODUCTION

1. Male reproductive system.
2. Female reproductive system.
3. Outline of pregnancy; functions of placenta; Parturition; lactation; contraceptive measures.
4. Physiology of foetus; factors that affect foetal growth.

J. NERVOUS SYSTEM

1. Structure of neurones.
2. Properties of neurones; (excitation & conduction)
3. Synapses and synaptic transmission; Reflexes and properties of reflexes;
4. Sensory endings.
5. Spinal cord; Pathways in the spinal cord.
6. Brain stem; Thalamus; Basal ganglia; Cerebellum; Cerebral cortex;
7. Control of posture and control of voluntary motor activity.
8. Autonomic nervous system.

K. SPECIAL SENSES

1. Vision.
2. Audition; Olfaction; Gustation; Vestibular apparatus.

L. MUSCLE

1. Structure of muscle tissue: Gross structure and microscopic structure. Arrangement of myofibrills. Myoneural junction.
2. Chemical processes involved in muscle contraction.
3. Physiology of muscle contraction, Single muscle twitch, Quantal Summation, Wave Summation, Treppe, Tetany, Effects of temperature changes, All or none law, Fatigue, Isotonic, isometric and isokinetic contractions.
4. Exercise metabolism, Oxygen debt, Respiratory quotient.
5. Development of endurance, Factors affecting endurance and muscle strength, Factors affecting general and cardiorespiratory endurance, Aerobic and anaerobic work, Efficiency of muscular activity, aerobic versus anaerobic (eg, speed, work, load, fatigue, diet, obesity).
6. Age and exercise, Age changes in muscle function, Age changes in CVS, Age changes in pulmonary function, Age and physical work capacity Age and nervous system.
7. Environment and exercise, Adaptation to heat and cold, Exercise in heat and in cold. Human limitation in heat, Acclimatization to heat, Exercise at high altitudes.

PRACTICAL DEMONSTRATIONS

- A. Determination of RBC & WBC counts.
- B. Examination of different types of WBC in stained blood smears.
- C. Circulation in the web of the frog's feet.

D. Ischaemic pain.

E. & F. Muscle contraction in frog: simple muscle curve, tetany, wave summation, quantal summation, fatigue.

G. Lung Volumes.

H. Effect of exercise on ventilation.

I. Physical fitness.

K. Determination of BP; effect of exercise on BP.

L. Examination of sensory and motor systems;
Examination of superficial and deep reflexes.

M. Tests of vision (acuity and colour perception) and hearing (Rhine's test and Weber's test).

EVALUATION

APPLIED PHYSIOLOGY

Not for University Examination

Instruction hours : 30

COURSE DESCRIPTION

This course supplements the knowledge of physiology and enables the student to have a better understanding of how abnormal physiology affects human function and dysfunction.

COURSE OBJECTIVES

The objective of this course is that after 30 hours of lectures, demonstrations, practicals and clinics the student will be able to demonstrate an understanding of the effect of abnormal physiology on function and dysfunction of the human body.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written & oral internal evaluation) the following objectives of the course.

COURSE OUTLINE

A. THE HEART AND CIRCULATION

1. Structure and properties of heart muscles.
2. The action of the heart.
3. Determinants of cardiac performance.
4. Normal E.C.G.
5. Maintenance of blood pressure.
6. Cardiac arrest and heart failure.
7. Outline of lymphatic circulation & pulmonary circulation.
8. Cardiovascular compensation for postural and gravitational changes.
9. Hypertension.

10. Oedema.

11. Central and peripheral venous pressures.

B. NERVOUS SYSTEM AND MUSCLES

1. Outline of structure and function of the control nervous system.
2. Outline of the autonomic nervous system.
3. Types of nerve cells, electrical phenomena in nerve cells.
4. Properties of mixed nerves.
5. Reflex action, reciprocal innervation.
6. Degeneration and re generation of nerves.
7. Control of posture.
8. Outline of voluntary movement.
9. Cutaneous, deep and superficial sensation.
10. Synaptic transmission.
11. Neuro Muscular transmission.
12. Properties of muscles, contractile responses, types of contraction, electrical phenomena and tonic reflexes.

C. RESPIRATION

1. Mechanics of respiration.
2. Breath sounds.
3. Properties of gases.
4. Exchange of gases.
5. Gas tensions in air at sea level, tracheal air, cellular air, mixed air, plasma, arterial blood and mixed venous blood.

6. Lung volumes.
7. Magnitude of death space.
8. Control of bronchial smooth muscle.
9. Lung compliance.
10. Nervous control of respiration.
11. Chemical control of respiration.
12. Voluntary control of respiration.
13. Oxygen and carbon dioxide transport.
14. Acid base reactions in blood.
15. Effects of exercise on respiration.
16. Artificial respiration.

EVALUATION

Nursing and First Aid

Not for University Examination

Instruction hours. 40
(Theory-24, Pract -12)

COURSE DESCRIPTION

This course enables students to have a better understanding of and develop skill in giving first aid treatment in emergencies in either the hospital or the community.

COURSE OBJECTIVES

The objectives of this course is that after 36 hours of lectures, demonstrations, practicals and clinics the student will be able to demonstrate an understanding of the principles of first aid and demonstrate skill in giving first aid treatment in emergencies that may be met in the community and in their practice as therapists.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral % practical internal evaluation) the following objectives of the course.

- A Understand the importance of first aid and explain the rules of first aid.
- B. Explain the scope of first aid and concept of emergency.
- C. Identify and give first aid in burns, fire accidents, road accidents, poisoning, drowning, insect bites and trauma due to a foreign body.
- D. Identify various fractures and practice bandaging and splinting in care of fractures.
- E. Describe the types of wounds, haemorrhages, shock and respiratory emergencies.
- F. Transportation of persons with various types of injuries
- G. Identify and give first aid treatment in community emergencies and in natural disasters.

H. Identify and utilise the community resources like voluntary agencies, local, national and international agencies.

I. Acquire knowledge about ambulances service and their functions in relation to emergencies.

COURSE OUTLINE

A INTRODUCTION

Definition of first aid, Importance of first aid, Golden rules of first aid, Scope and concept of emergency.

B. FIRST AID EMERGENCIES

1. Burns & scalds: Causes, Degrees of burns, First aid treatment, General treatment.

2. Poisoning: Classification (irritants, acid alkali, narcotics,) Signs and symptoms, First aid treatment, General treatment.

3. Trauma due to foreign body insertion: Eye, ear, nose, throat, stomach and lung.

4. Bites: First aid, signs, symptoms and treatment.

a. Dog bites: rabies.

b. Snake bite: neurotoxin, bleeding diathesis.

C. SKELETAL INJURIES

Definition, Types of fractures of various parts of the body, Causes, Signs, and symptoms, Rules of treatment, Transport of patient with fracture, First aid measures in dislocation of joints, Treatment of muscle injuries.

D. RESPIRATORY EMERGENCIES

1. Asphyxia: Etiology, signs & symptoms, rules of treatment.

2. Drowning: Definition and management.

3. Artificial respiration: types and techniques.

F. WOUNDS AND HAEMORRHAGE

1. Review of Anatomy and Physiology of the circulatory system.

2. Wounds: Classification, management.

3. Haemorrhages: Classification, signs and symptoms, rules for treatment of haemorrhage.

4. Treatment of haemorrhage from special areas (scalp, mouth, nose, ear, palm and various veins).

5. Internal haemorrhages: Visible and concealed.

F. SHOCK AND UNCONSCIOUSNESS

Definition, Types of shock, Common causes of shock, Signs and symptoms of shock (assessment of established shock), General and special treatment of established shock.

G. TRANSPORTATION OF THE INJURED

1. Methods of transportation: Single helper, Hand seat, Stretcher, Wheeled transport (ambulance).

2. Precautions taken: Blanketlift, Air and sea travel.

H. COMMUNITY EMERGENCIES

Role of first aider (immediate and late) in fires, explosions, floods, earth quakes, famine.

I. COMMUNITY RESOURCES

Police Assistance, Voluntary agencies (local, national, international), Ambulance service (Functions).

EVALUATION

Unit tests, term examinations, assignments, term examinations by doctor.

1. Test papers.
2. Final Practical + Oral test.

REFERENCE

1. Hoon R.S. "First aid to the injured" 1st edition, Delhi, St. John Ambulance Association.
2. Raine Hardhines and Hunt Vaheins "Urgencies and emergencies for Nurses" 1965 English Universities Press Ltd.
3. Gardner Hard "New Advanced First Aid" London Butter Worthy 1969.
4. First Aid Textbook by American Red Cross 1945 The Blackiston Company, Philadelphia.
5. Golwalla Asoi "A Handbook of Emergencies" 2nd edition, Bombay Samet and Company, 1981.

General Medicine, General Surgery and Paediatrics

Examination at the end of: III Semester

Instruction hours: 135

COURSE DESCRIPTION

This course follows basic courses on Anatomy, Physiology, Psychology and Sociology. It covers relevant aspects of General Medicine, General Surgery, Paediatrics, Plastic Surgery, E.N.T., Ophthalmology and Radiology. A very short course in Pathology and Microbiology will be conducted concurrently.

COURSE OBJECTIVES

The objective of this course is that after 135 hours of lectures & demonstrations, in addition to clinics the student will be able to demonstrate a general understanding of the diseases that therapists would encounter in their practice. They should have a brief idea of the etiology and pathology, what the patients symptoms and the resultant functional disability. This would help the candidates to understand the limitations imposed by the diseases on any therapy that may be prescribed.

A particular effort has been made to avoid over burdening the student with clinical signs and diagnostic manoeuvres except in certain specific diseases such as rheumatoid arthritis.

Broad outlines of goals of pharmacological and surgical therapy should be imparted in those diseases in which physical or occupational therapy will be an important component of overall treatment.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral & practical internal evaluation) the following objectives of the course.

COURSE OUTLINE

GENERAL MEDICINE

A. INFECTIONS

Outline the mode of spread, and appropriate prevention measures of the following communicable diseases.

Bacteria - Tetanus.

Viral - Herpes simplex, zoster, varicella, Measles, German measles, Hepatitis B., AIDS.

Protozoal - Filaria.

B. HAEMATOLOGY

1. Define and briefly describe clinical aspects of iron deficiency, B 12 and folic acid deficiency anemias.

2. List types of bleeding diathesis.

3. Describe the clinical features of Haemophilia.

C. RESPIRATORY TRACT

1. Bronchitis - Define, list etiological factors and describe symptoms.

2. Pneumonia - List types of pneumonia (lobar, bronchoaspiration pneumonias.)

3. List etiologic agents and briefly outline symptoms and complications of pneumonia.

4. Asthma - Define, describe briefly the etiological factors and clinical features of acute exacerbation.

5. Chronic obstructive airway diseases - Define emphysema and chronic bronchitis. Briefly describe the pathology, symptoms of diseases and clinical course.

6. Tuberculosis - Describe the etiology, pathology and clinical features of pulmonary TB.

7. Bronchiectasis - Define and describe briefly the pathology, and clinical symptoms of bronchiectasis, bronchopulmonary segments and basis of postural drainage.

8. Emphysema - Define and briefly describe etiological factors.

9. Chest wall deformities - Describe funnel chest, Pigeon chest, barrel chest, kyphoscoliosis of thoracic spine.

10. Briefly outline functional disability of occupational lung diseases. List pneumoconioses.

D. CARDIO - VASCULAR SYSTEM

1. Cardiac failure - Define, List causes and symptoms.

2. Rheumatic fever - Define and briefly describe etiology and gross pathology of rheumatic heart disease.

3. Infective endocarditis - Define and outline etiology, symptoms and complications.

4. Ischaemic heart disease - Outline pathology of IHD, define angina pectoris and Myocardial infarction. Describe clinical features and broadly outline medical and surgical therapy.

5. Hypertension - Define and outline the clinical features, complications & goals of therapy.

6. Outline pathogenesis and clinical features of: Pulmonary embolism, Deep vein thrombosis, pulmonary infarct.

7. Congenital heart disease - List ASD, VSD, Fallot's Tetralogy and PDA & briefly outline the pathologic anatomy.

E. BONE, JOINT AND CONNECTIVE TISSUE DISORDERS

1. Brief introduction to concept of autoimmune disease.

2. Define: Systemic lupus erythematosus, Polymyositis, Dermatomyositis, polyarthritis Nodosa, Scleroderma.

3. Rheumatoid arthritis - Describe etiology, clinical features and complications, drug therapy and non pharmacological therapy.

4. Osteoarthritis - Describe etiology, clinical features and complications and review nonsteroidal antiinflammatory drugs and steroids.

F. RENAL DISEASES

1. Define and briefly outline acute and chronic renal failure.
2. Urinary tract infection. Pathogenesis. Outline common clinical conditions complicated by UTI.

G. METABOLIC DISEASES

1. Diabetes - define and outline etiology. List types of diabetes & complications and briefly outline use of insulin, diet and oral hypoglycaemic agents in management of diabetes.
2. Obesity - Define and outline management.

H. GERIATRICS

1. List diseases commonly encountered in the elderly population and their role in causing disability; Hypertension, Ischaemic Heart disease, Cerebrovascular accidents, Benign prostatic Hyperplasia, Cataracts & other causes of failing vision.

GENERAL & PLASTIC SURGERY

1. Describe abdominal surgical incisions.
2. Outline the post operative complications in: Nephrectomy, Appendicectomy, Herniorrhaphy Mastectomy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy, Ileostomy.
3. Classify burns by depth and surface area, outline the causes, medical management and precautions in the acute stage.

4. List the potential deformities due to burns, methods of prevention and precautions. Mention cosmetic and functional treatment measures.

5. Outline the plastic surgery procedures and management in rehabilitation of burns, including splinting methods for common deformities and prevention of burns contractures.

PAEDIATRICS

1. Describe growth and development of a child from birth to 12 years: including physical, social, adaptive development.

2. List the maternal and neonatal factors contributing to high risk pregnancy the neonate: inherited diseases; maternal infections - viral and bacterial; maternal diseases incidental to pregnancy, such as gestational diabetes, pregnancy induced hypertension; chronic maternal diseases such as heart diseases, renal failure, tuberculosis, diabetes, epilepsy; bleeding in the mother at any trimester.

3. Briefly describe community programmes: International (WHO), national and local, for prevention of poliomyelitis, blindness, deafness, mental retardation and hypothyroidism. Outline the immunisation schedule for children.

4. Cerebral Palsy: Define and briefly outline etiology - Prenatal, perinatal and postnatal causes; briefly mention pathogenesis, types of cerebral palsy (Classification), findings on examination; General examination, examination of C.N.S. Musculoskeletal system, respiratory system, I tract & nutritional status.

Briefly outline associated defects: Mental retardation, microcephaly, blindness, hearing and speech impairment, squint and convulsions.

Briefly outline treatment.

Outline prevention: Appropriate management of high risk pregnancies, prevention of neonatal and postnatal infections, metabolic problems.

5. Muscular dystrophy: Outline various forms, modes of inheritance and clinical manifestation; physical findings in relation to disabilities progression of various forms and prognosis. Describe treatment goals in forms which are and are not fatal.

6. Spinabifida, meningomyelocele: Outline development; clinical features lower limbs, bladder and bowel control; complications-U.T.I. & hydrocephalus; medical treatment and surgical treatment.

7. Still's disease: classification, pathology in brief, physical findings, course & prognosis. Outline treatment, prevention and correction of deformity.

8. Acute C. N. S. infections: Classify (Bacterial and viral) and outline the acute illness, CNS sequelae leading to mental retardation, blindness, deafness, speech defect, motor paralysis, bladder and bowel problems seizure disorder and specific problems such as subdural effusion, hydrocephalus, pressure sores, feeding difficulties.

9. Normal diet of newborn and child: List dietary calorie, fat, protein, mineral and vitamin requirement in a normal child and in a child with malnutrition. Classify and outline etiology, findings and treatment of Rickets: Vitamin D deficiency and resistant rickets.

10. Lung infections: Outline the clinical findings, complications and medical treatment of bronchiectasis, lung abscess and Bronchial asthma.

The following: X-ray demonstrations, Ophthalmology, E.N.T. and Obstetrics & Gynaecology are not for University examinations.

OPHTHALMOLOGY

Lecture - demonstrations only

Briefly outline the following:

1. Eye lesions in leprosy, including causes, treatment and complications of lagophthalmos.

2. Field defects arising from lesions in the visual pathway, their clinical symptoms and methods of testing.

3. Effects of paralysis of the ocular muscles and treatment.

4. Causes, clinical features and a treatment of disorders of ocular movement occurring in diseases such, as myasthenia gravis, progressive supranuclear palsy and lower motor neuron diseases.

5. Causes, clinical features, treatment and prognosis in visual failure arising from cataract, inflammatory disorders, vitamin A deficiency, Glaucoma and Trachoma; emphasis on preventable causes and prophylactic measures.

6. Definition of blindness, and visual disability evaluation. Investigative procedures used for testing visual failure, including basic screening procedures for visual acuity suitable for community health surveys.

E.N.T.

Lecture - demonstrations only

1. Outline the Anatomy and physiology of hearing and the use of audiometry in assessment of hearing.

2. Briefly classify causes of hearing loss Outline conservative and surgical intervention, including types and availability of hearing aids.

3. Briefly outline the functions of the vestibular apparatus.

4. Briefly outline common ENT infections and diseases which affect hearing, breathing and speech; and their management.

OBSTETRICS & GYNAECOLOGY

Lecture demonstrations only

1. Review the anatomy of the female pelvis and embryonic and foetal development.
2. Outline the physiological skeletal changes during pregnancy, delivery and post - partum period.
3. Describe an ante - natal programme in preparation for labour: ante - natal training, breathing, relaxation, pelvic and lower extremity exercises.
4. Outline the mechanism of labour and post - natal management after normal delivery, forceps delivery and caesarean sections.
5. Outline the pre - disposing factors and the role of exercises in the management of stress incontinence and prolapse uterus.

EVALUATION

Introduction to Pathology and Microbiology

Not for University Examination

Instruction hours: 50

COURSE DESCRIPTION

This course follows the basic courses in anatomy and physiology, and compliments the course in general medicine & surgery being taught concurrently. 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 pathology on the functioning of the individual.

COURSE OBJECTIVES

The objective of this course is that after 25 hours of lectures, demonstrations, practicals and clinics the student will be able to demonstrate an understanding of the pathology and microbiology of common diseases that therapists would encounter in their daily practise. The course will also help therapists understand how to protect themselves and their patients from nosocomial infections during their interactions.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written & oral internal evaluation) the following objectives of the course.

COURSE OUTLINE

PATHOLOGY

A. Introduction: Concepts of diseases, classification of lesions.

B. Bacterial, viral and parasitic infections - a general outline.

C. Inflammation and repair, Degeneration, necrosis and gangrene.

- D. Haemorrhage, shock, embolism, thrombosis.
- E. Tuberculosis, Leprosy, typhoid.
- F. Deficiency diseases.
- G. Tumours: Aetiology & spread. Common tumours.
- H. Blood: Anaemia, Heart and blood vessels, common congenital anomalies, Rheumatic & coronary heart diseases.
- I. Respiratory system: Pneumonias, Bronchiectasis, Emphysema, Chronic bronchitis, Asthma.
- J. Bone and joints: Autoimmune diseases, septic arthritis, Osteomyelitis.
- K. Skin: Leprosy.
- L. Urinary system.
- M. Central nervous system: CNS infections, vascular disorders.
- N. Rheumatoid Arthritis.
- O. Sclerodema and Psoriasis.
- P. Diseases of muscle including poliomyelitis, Myopathies.
- Q. Volkmann's Ischaemia.

MICROBIOLOGY

L - Lecture.

LD - Lecture demonstration.

- A. Introduction and history of microbiology. (L)
- B. General lectures on micro - organisms: (LD)
 - 1. Classification.

- 2. Shape and arrangement.
- 3. Special characteristics - spores, capsules, enzymes, motility, reproduction.
- C. Disinfection and antiseptics.
- D. Sterilization and asepsis. (LD)
- E. Antibacterial agents - fundamental aspect, susceptibility tests.
- F. Infection— source of infection (LD)
 - portals of entry (L)
 - spread of infection
- G. Non - specific immunity (L)
- H. Immunity - natural and acquired (L)
- I. Allergy and hypersensitivity (L)
- J. Outline of common pathogenic bacteria and diseases produced by them. Treatment and prevention. (L)
 - 1. Respiratory tract infections.
 - 2. Meningitis.
 - 3. Enteric infections.
 - 4. Anaerobic infections.
 - 5. Urinary tract infections
 - 6. Leprosy, tuberculosis and miscellaneous infections.
 - 7. Wound infections.
 - 8. Sexually transmitted diseases.
 - 9. Hospital acquired infections.
- K. Pathogenic yeasts and fungi. (LD)
- L. Virology - Virus infections, with special mention of Hepatitis, Poliomyelitis & Rabies. (LD)

EVALUATION

Clinical Neurology

Examination at the end of: V Semester

Instruction hours: 55

COURSE DESCRIPTION

Following the basic science and clinical science course, this course introduces the student to the neurological conditions which commonly cause disability. 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 neurological pathology on the functioning of the individual.

COURSE OBJECTIVES

The objective of this course is that after 55 hours of lectures & demonstrations, in addition to clinics, the student will be able to demonstrate an understanding of neurological conditions causing disability and their management.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral & practical, internal evaluation) the following objectives of the course.

COURSE OUTLINE

A. NEUROANATOMY

Review the basic anatomy of the brain and spinal cord including: Blood supply of the brain and spinal cord, anatomy of the visual pathway, Connections of the cerebellum, and extrapyramidal system, relationship of the spinal nerves to the spinal cord segments, Long tracts of the spinal cord, the brachial and lumbar plexuses, and cranial nerves.

B. NEUROPHYSIOLOGY

Review in brief the Neurophysiological basis of: tone and disorders of tone and posture, bladder control, muscle contraction and movement and pain.

C. CLINICAL FEATURES & MANAGEMENT

Briefly outline the clinical features and management of the following Neurological Disorders:

1. Congenital and childhood disorders.
 - a. Cerebral palsy.
 - b. Hydrocephalus.
 - c. Spina Bifida.
2. Cerebrovascular accidents.
 - a. General classification; thrombotic, embolic, haemorrhagic & inflammatory strokes.
 - b. Gross localisation and sequelae.
 - c. Detailed rehabilitative programme.
3. Trauma - broad localisation, first aid and management of sequelae of head injury and spinal cord injury.
4. Diseases of the spinal cord.
 - a. Craniovertebral junction anomalies.
 - b. Syringomyelia.
 - c. Cervical and lumbar disc disease.
 - d. Tumours.
 - e. Spinal arachnoiditis.
5. Demyelinating diseases (central and peripheral).
 - a. Guillain - Barre syndrome.
 - b. Acute disseminated encephalomyelitis.
 - c. Transverse myelitis.
 - d. Multiple sclerosis.

6. Degenerative disorders.
 - a. Parkinson's disease.
 - b. Dementia.
7. Infections.
 - a. Pyogenic Meningitis sequelae.
 - b. Tuberculous infection of central nervous system.
 - c. Poliomyelitis.
8. Diseases of the muscle : classification, signs, symptoms, progression and management.
9. Peripheral nerve disorders.
 - a. Peripheral nerve injuries : localisation and management.
 - b. Entrapment neuropathies.
 - c. Peripheral neuropathies.
10. Miscellaneous.
 - a. Epilepsy : Definition, classification and management.
 - b. Myasthenia Gravis ; Definition, course and management.
 - c. Intracranial tumours: Broad classifications, signs and symptoms.
 - d. Motor neuron disease.

D. ASSESSMENT

Clinical assessment of neurological function to be taught through bedside or demonstration clinics spread out over at least 5 sessions.

1. Basic history taking to determine whether the brain, spinal cord or peripheral nerve is involved.

2. Assessment of higher mental function such as orientation, memory, attention, speech and language.
3. Assessment of cranial nerves.
4. Assessment of motor power.
5. Assessment of sensory function touch, pain and position.
6. Assessment of tone - spasticity, rigidity and hypotonia.
7. Assessment of cerebellar function.
8. Assessment of higher cortical function - apraxia etc.
9. Assessment of gait abnormalities.

EVALUATION

Clinical Orthopaedics

Examination at the end of : V Semester

Instruction hours : 55

COURSE DESCRIPTION

Following the basic science and clinical science courses this course introduces the student to the orthopaedic conditions which commonly cause disability. 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 orthopaedic pathology on the functioning of the individual.

COURSE OBJECTIVES

The objective of this course is that after 55 hours of lectures & demonstrations, in addition to clinics, the student will be able to demonstrate an understanding of orthopaedics conditions causing disability and their management.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral & practical internal evaluations) the following objectives of the course.

COURSE OUTLINE

A. INTRODUCTION TO ORTHOPAEDICS

Introduction to orthopaedic terminology, types of pathology commonly dealt with, clinical examination, common investigations and outline of non-operative & management.

B. PRINCIPLES OF OPERATIVE TREATMENT

List indications, contraindications and briefly outline principles of: Arthrodesis, Arthroplasty, Osteotomy, Bonegrafting and Tendon - Transfers.

C. SPRAINS AND MUSCLE STRAINS

List common sites of sprains and muscle strains and describe the clinical manifestations and treatment.

D. FRACTURES & DISLOCATIONS: General Principles

Outline the following :

1. Types of Fractures including patterns, open and closed fractures and fracture - dislocations.
2. Differences between dislocation & subluxation.
3. General & Local signs & symptoms of fractures dislocations.
4. Principles of management of fractures & dislocations.
5. Prevention & treatment of complications including : Fracture - disease, Volkmann's ischaemic contracture, Sudek's Atrophy, Carpal Tunnel syndrome, Myositis ossificans, and shoulder - hand syndrome.
6. Fracture healing.

E. UPPER LIMB FRACTURES & DISLOCATIONS

1. Enumerate major long bone fractures and joint injuries.
2. Briefly describe their clinical features, principles of management and complications.

F. LOWER LIMB FRACTURES & DISLOCATIONS

1. Enumerate major long bone fractures and joint injuries.
2. Briefly describe their clinical features, principles of management and complication.

G. SPINAL FRACTURES AND DISLOCATIONS

Outline the mechanism, clinical features, principles of management and complications of spinal injuries.

H. RECURRENT DISLOCATIONS

Outline the mechanism, clinical features principles of management and complications of recurrent dislocation of the shoulder and patella.

I. AMPUTATIONS

1. Classify amputations, list indication for surgery.
2. Outline pre-operative, operative and prosthetic management.
3. Outline prevention and treatment or complications.

J. BONE & JOINT INFECTIONS

Outline the etiology, clinical features, management and complications of: septic arthritis, osteomyelitis, Tuberculosis (including spinal T.B.)

K. BONE JOINT TUMORS

Classify and outline the clinical features, management and complications of the following (benign / malignant bone and joint tumours, osteomas, osteosarcomas, osteoclastomas, Ewing's sarcoma, multiple myeloma).

L. CHRONIC ARTHRITIS

Outline the pathology, clinical features, mechanism of deformities, management and complications of: Rheumatoid arthritis, Osteoarthritis of major joint and spine, Ankylosing spondylitis.

M. LOW BACK ACHE, PAINFUL ARC SYNDROME, TENDONITIS FASCITIS & SPASMOIDIC TORTICOLLIS

Outline the above including clinical features and management.

N. SPINAL DEFORMITIES

Classify spinal deformities and outline the salient clinical features, management and complications.

O. POLIOMYELITIS

Describe the pathology, microbiology, prevention, management and complications of polio, outline the treatment of residual paralysis including use of orthoses. Principles of muscle transfers.

P. CONGENITAL DEFORMITIES

Outline the clinical features and management of CTEV, CDH, Flat foot, vertical talus, limb deficiency (Radial club hand and femoral, tibial and fibular deficiencies), meningocele, Arthrogryposis multiplex congenita, osteogenesis imperfecta.

Q. PERIPHERAL NERVE INJURIES

Outline the clinical features and management, including reconstructive surgery of:

1. Radial, median and ulnar nerve lesions.
2. Sciatic and lateral popliteal lesions.
3. Brachial Plexus injuries including Erbs, Klumpke's crutch palsy.

R. HAND INJURIES

Outline of clinical features, management and complications of: Skin and soft tissue injury, Tendon injury, Bone and joint injury.

S. LEPROSY

Outline of clinical features, management and complications of neuritis, muscle paralysis, trophic ulceration and hand & feet deformities.

EVALUATION

Clinical Cardio - Respiratory

Examination at the end of : V Semester

Instruction hours : 55

COURSE DESCRIPTION

Following the basic science and clinical science courses, this course introduces the student to the cardio - thoracic conditions which commonly cause disability. 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 cardio - thoracic pathology on the functioning of the individual.

COURSE OBJECTIVES

The objective of this course is after 55 hours of lectures & demonstrations. In addition to clinics, the student will be able to demonstrate an understanding of cardio - thoracic conditions causing disability and their management.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral & practical internal evaluation) the following objectives of the course.

COURSE OUTLINE

A. ANATOMY AND PHYSIOLOGY

1. Describe in detail the anatomy of the lungs, bronchi and bronchopulmonary segments.

2. List the relationship of the bony thorax and lungs to each other and to the abdominal contents.

3. Briefly describe the variations in the bony cage in the following conditions :

- a. Cervical ribs
- b. rickets - rickety rosary

c. Pigeon chest

d. Funnel chest

e. Scoliosis

f. Kyphosis

4. Describe the movements of the thorax: Bucket handle, pump hand.

5. List the muscles of respirations involved in inspirations and expirations (including accessory muscles that are involved).

6. Describe in brief the anatomy of the heart and its blood supply and briefly outline the electrical activity of the myocardium and normal ECG.

7. Describe the physiological control of respiration and highlight the function of the medullary and pontine respiratory centres and peripheral chemoreceptors.

8. Describe the mechanism for maintenance of blood pressure.

9. Describe in detail the cough reflex.

10. List the mechanical factors involved in breathing. Describe briefly factors affecting lung compliance and airway resistance.

11. List the factors affecting diffusion of oxygen and carbon dioxide in the lungs. Explain ventilation, perfusion and their interrelationship.

12. Outline the energy expenditure of various common activity of daily living.

13. Pulmonary function assessment: Briefly describe the pulmonary function tests and their use, briefly outline the basis and value of blood gas analysis.

14. Briefly outline the principles of cardio vascular stress testing.

B. CARDIAC SURGERY

1. List the cardiac conditions requiring closed heart surgery and briefly describe the following :

Acquired heart diseases (Mitral stenosis and Aortic stenosis),
Congenital heart diseases (patent ductus arteriosus, Coarctation of aorta.)

2. List the cardiac conditions requiring open heart surgery and briefly describe the following : Congenital (Atrial septal defect, ventricular septal defect, pulmonary stenosis, Tetralogy of Fallot, Transposition of great vessels and A.V. malformation),
Acquired (Mitral stenosis, Mitral regurgitation, aortic stenosis & regurgitation, coronary artery disease)

C. THORACIC SURGERY

1. Describe very briefly the clinical features and management of the following : Fracture ribs, Flail chest, Stove-in chest, pneumothorax, Haemothorax, Haemopneumothorax, Lung contusion & laceration, Injury to Heart, Great vessels & Bronchus.

2. List the causes of empyema and its treatment. Describe briefly: Intercostal drainage, Rib resection, Decortication and window operation.

3. List the manifestation of pulmonary Tuberculosis and briefly describe tuberculoma, Bronchiectasis sicca, Bronchostenosis, Massive haemoptysis, Empyema & Destroyed lung.

4. Outline briefly the clinical features and management of the following suppurative lesions of the lung; Bronchiectasis, Lung abscess, Bronchopneumonia & Aspergillosis.

5. Outlin briefly the clinical features and management of carcinoma lung.

6. Outline the extent, use and complication of the following surgical incisions: Anterolateral thoracotomy, Posterolateral thoracotomy and Median sternotomy.

7. Describe the post operative management of patients with : Segmentectomy, Lobectomy, Bilobectomy, Pneumonectomy, Pleuropneumonectomy & Tracheostomy.

8. Outline briefly the principles of various ventilators and their use.

9. Describe in detail the preoperative assessment and management of a patient posted for thoracotomy.

10. Describe in detail the following post operative procedures : management of endotracheal / endonasal tubes, tracheal suction, weaning the patient from the ventilator extubation technique & post extubation care

11. Describe the principles of Cardio - pulmonary resuscitation : Cardiac massage, artificial respiration, defibrillators and their use.

D. MISCELLANEOUS

1. Briefly outline the management of a patient after a myocardial infarct.

2. Briefly outline the management of a patient with chronic obstructive airway disease.

EVALUATION

Community Medicine

Examination at the end of : IV Semester

Instruction hours : 55

COURSE DESCRIPTION

This course will enable students to understand the effects of the environment and the community dynamics on the health of the individual.

COURSE OBJECTIVES

The objective of this course is that after 55 hours of lectures, demonstrations, practicals and clinics, the student will be able to demonstrate an understanding of the influence of social and environmental factors on the health of the individual and society.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral and practical internal evaluation) the following objectives of the course.

A. Outline the natural history of diseases and the influence of social, economic and cultural aspects of health and diseases.

B. Outline the various measures of prevention and methods of intervention - especially for diseases with disability.

C. Outline the national care delivery system and the public health administration system and the central and state level.

D. Outline selected national health programmes.

E. Define occupational health and list methods of prevention of occupational diseases and hazards.

F. Outline the Employees State Insurance scheme and its various benefits.

G. Describe the social security measures for protection from occupational hazards, accidents, diseases, and the workman's compensation act.

H. Outline the objectives and strategies of the national Family Welfare Programme.

I. Define community based and institution based rehabilitation. Describe the advantage and disadvantages of institution and community based rehabilitation.

J. Describe the following communicable diseases with reference to reservoir, mode of transmission, route of entry and levels of prevention. a. Poliomyelitis, b. Meningitis, c. Encephalitis, d. Tuberculosis, e. Filariasis, f. Leprosy, g. Tetanus & h. Measles.

K. Describe the Epidemiology of Rheumatic heart disease, cancer, Chronic degenerative disease and cerebrovascular accidents.

L. Outline the influence of nutritional factors such as Protein Energy Malnutrition, Anaemia, Vitamin deficiency and minerals on disability.

M. List the principle of health education, methods of communication and role of health education in rehabilitation services.

N. Define the role of community leaders and health professionals in health education.

O. Outline the role of International health agencies in rehabilitation of the disabled.

EVALUATION

Rehabilitation Medicine

Examination at the end of : VI Semester

Instruction hrs : 55

COURSE DESCRIPTION

Following the basic sciences and clinical science courses, this course will enable the students to understand their role in the management of disability within the rehabilitation team.

COURSE OBJECTIVES

The objectives of this course is that after 55 hours of lectures & demonstrations, in addition to clinics, the student will be able to demonstrate an understanding of :

A. The concept of team approach in rehabilitation will be discussed and implemented, through practical demonstration, with contributions from all members of the team.

B. Observation and identification of diagnostic features in physical conditions will be practised through clinical demonstration.

C. Medical and surgical aspects of disabling conditions will be explained in relation to rehabilitation.

D. Identification of residual potentials in patients with partial or total disability (temporary or permanent).

E. Formulation of appropriate goals (long & short term) in treatment & rehabilitation will be discussed.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral & practical internal evaluation) the following objectives of the course.

COURSE OUTLINE

A. INTRODUCTION

Define the term rehabilitation. Explain its aims and principles.

Discuss team work involved in rehabilitation, explaining briefly the role of each team member.

B. THERAPEUTIC TECHNIQUES

Explain the theory and mechanisms of therapeutic techniques and relevant precautions, for the following :

1. Joint mobilisation
2. Reducing spasm
3. Assisting weak muscles
4. Increasing endurance
5. Muscle re-education following muscle transfer surgery
6. Strengthening muscles
7. Increasing co-ordination
8. Improving balance
9. Gait training

C. COMMUNICATION PROBLEMS

Identify communication problems, classify these and outline principles of treatment / training.

D. BEHAVIOURAL PROBLEMS

Identify behavioural problems in the disabled and outline the principles of management.

E. PAIN

Describe the theories of pain and discuss therapeutic management of pain using various modalities. Describe the common myo-fascial pain syndromes and outline their management.

F. EVALUATION OF PHYSICAL DYSFUNCTION

Demonstrate methods of evaluation for physical dysfunction & management of disabilities with particular reference to : Spinal cord injury (paraplegia and tetraplegia), Poliomyelitis, Brain injury, (including stroke and cerebral palsy) Arthritic conditions, Muscular Dystrophy, Hansen's disease, Peripheral nerve lesions, Fracture disease & Chronic cardio-respiratory dysfunction.

G. ORTHOTIC DEVICES

Explain the principles involved in prescribing orthotic devices for different parts of the body. Outline the purpose of each type and list major indications & contraindications and demonstrate methods of training in their use.

H. PROSTHETIC DEVICES

Describe types of artificial limbs and their functions. Demonstrate methods of training in their use.

I. MOBILITY AIDS

Demonstrate knowledge of the indications for different types of mobility aids, and their functions, eg wheelchairs, walkers, crutches.

J. PRE-VOCATIONAL EVALUATION

Discuss methods and team involvement in pre-vocational evaluation and training.

K. ARCHITECTURAL BARRIERS

Describe architectural barriers and possible modifications, with reference to Rheumatoid arthritis, Cerebrovascular accident, Spinal cord injury, and other disabling conditions.

L. DISABILITY EVALUATION

Outline the principles of disability evaluation and discuss its use.

M. LEGAL ASPECTS

Outline legal aspects of disability in terms of compensation for disability and benefits available to the disabled.

N. SOCIAL IMPLICATIONS

Outline the social implications of disability for the individual and for the community.

O. COMMUNITY BASED REHABILITATION MODULE

Describe a CBR module and compare this with an institutional based rehabilitation system.

EVALUATION

Massage

Examination at the end of : III Semester

Instruction hours: 80

COURSE DESCRIPTION

In this course the student will learn the principles, technique and effects of massage as a therapeutic modality in the restoration of physical function.

COURSE OBJECTIVES

The objective of this course is that after 80 hours of lectures, demonstrations, practicals and clinics the student will be able to list the indications and contra-indications of various types of massage, demonstrate the different techniques, and describe their effects.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral & practical internal evaluation) the following objectives of the course.

COURSE OUTLINE

A. Describe briefly :

1. History of massage
2. Mechanical points to be considered
3. Points to be considered while giving massage
 - a. Manipulations
 - b. The time of day for treatment
 - c. The comfort and support of the patient (draping and positioning)
 - d. Position of operator (therapist's stance)
 - e. Using body weight

f. Contact and continuity

g. Techniques, indications, and contra - indications.

4 Physiological effects of massage on various system of body. Effects on : Excretory system, Circulatory system Muscular system, Nervous system & Metabolic system.

B. Define and describe the various manipulation techniques used in massage.

1. Stroking manipulation : Effleurage, Stroking.

2. Pressure manipulations : Kneading : Squeezing, Stationary, Circular Ironing (reinforced kneading), Finger kneading, Petrissage (picking up, wringing, rolling), Frictions.

3. Percussion manipulation : Tapotement, Hacking, Clapping, Beating & Pounding.

4. Shaking manipulations : Vibration, Shaking.

C. Define and describe the technique, effects, uses and contra-indications of the following manipulations :

1. Stroking manipulations.
2. Pressure manipulations:
3. Percussion manipulations.
4. Shaking manipulations.

D. Demonstrate the following techniques on patients / models :

1. Massage for upper limb :
 - a. Scapular region
 - b. Shoulder joint
 - c. Upper arm
 - d. Elbow joint

- e. Forearm
 - f. Wrist joint
 - g. Hand
2. Massage for lower limb :
 - a. Thigh
 - b. Knee joint
 - c. Leg
 - d. Foot (including ankle joints and toes)
 3. Massage for back :
 - a. Neck and upper back
 - b. Middle and lower back
 - c. Gluteal region, arm & leg
 4. Massage for the face :

EVALUATION

REFERENCES : Manual of massage and measurements - Edith M. Prosser.

Exercise Therapy

Examination at the end of: III Semester

Instruction hours : 270

COURSE DESCRIPTION

In this course the student will learn the principles, technique and effects of exercise as a therapeutic modality in the restoration of physical function.

COURSE OBJECTIVES

The objective of this course is that after 270 hours of lectures, demonstration, practicals and clinics the student will be able to list the indications and contraindications of various types of exercise therapy, demonstrate the different techniques and describe their effects.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral & practical internal evaluation) the following objectives of the course.

COURSE OUTLINE

A. MECHANICS

Define the following terms and describe the principles involved with suitable examples.

1. Force : Composition of force, Parallelogram of forces.
2. Equilibrium : Stable, unstable, neutral.
3. Gravity : Centre of gravity, Line of gravity.
4. Levers : 1st order, 2nd order, 3rd order, Their examples in the human body and their practical applications in physiotherapy, Forces applied to the body levers.
5. Pulleys : Fixed, Movable.

6. Springs : Series; Parallel.
7. Tension.
8. Elasticity : Hook's law.
9. Axis : Sagittal, Frontal, Transverse, Vertical.
10. Planes : Sagittal, Frontal, Horizontal.
11. Definitions of : Speed, Velocity, work, Energy, power, Acceleration, Momentum, Friction and Inertia.

B. MUSCLE ACTION

Explain the following :

1. Muscle work : Isotonic (concentric, eccentric), isometric (static)
2. Group action : Agonists (prime movers), Antagonists synergists, Fixators
3. Angle of muscle pull, Mechanical efficiency of the muscles.

C. PELVIC TILT

Describe the following :

1. Normal pelvic tilts; Alterations from normal, Anterior tilt (forward), posterior tilt (backward), Lateral tilt.
2. Muscles responsible for alterations and pelvic rotation.
3. Identification of normal pelvic tilt, pelvic rotation and altered tilts and their corrective measures.

D. STARTING POSITIONS

Describe the following starting positions, their muscle work, effects and uses. Specify the importance and derived positions for each one.

Standing, Kneeling, Sitting, Lying, Hanging.

E. MOVEMENTS

Explain the following terms, with suitable examples :

1. Anatomic movements : Flexion, Extension, Abduction, Inversion, Eversion, Supination, Pronation, Internal rotations, External rotations, Gross flexion, Gross extension, Trunk side flexion.

2. Surface Anatomy of the individual joints.

3. Rhythm of movement.

4. Timing of movement.

5. Duration of movement.

6. Classification of movement : Active, Passive.

7. Effects of exercise : Physiological effects, Therapeutic effects.

8. List the indications and contra - indications of the following and demonstrate the technique for each :

Active movements : Voluntary (free, active assisted, assisted-resisted, resisted), Involuntary (associated reflex, peristaltic / Visceral, cardiac).

Passive movements : Relaxed passive, mobilizing passive (forced P.M., manipulations, serial manipulations), passive stretching.

F. PASSIVE MOVEMENTS

Demonstrate passive stretching of following muscles / muscle groups and describe the indications, contra - indications, physiological effects, advantages and disadvantages of each.

Upper limb : pectoralis major, biceps brachii, triceps brachii, long flexors of the fingers.

Lower limb : rectus femoris, iliotibial band (tensor fascia lata), gastro-soleus, hamstrings, hip abductors, iliopsoas.

Neck : Sternocleidomastoid.

6. ACTIVE MOVEMENTS

1. Describe the types, techniques, indication and contraindications, physiological effects, advantages and disadvantages and demonstrate three progressive resisted exercises in progression for the following muscle groups: Shoulder abductors, shoulder forward flexors, Triceps Brachii, Hip abductors, Hip flexors, Quadriceps femoris, Abdominal muscles, Back extensors.

2. Describe the home programme for strengthening neck muscles and back extensors.

H. PROGRESSIVE RESISTED EXERCISES

1. Describe the following exercises, their advantages and disadvantages and demonstrate the techniques of the following types of PREs: Fractional system, Macqueen's set system, MacQueen's power system.

2. Demonstrate practically each system using: Dleorme's Boot, Dumbbells, Sand bags in pulleys, Powder board and suspension therapy.

I. MUSCLE GRADING

1. Describe the types of muscle grading, key to muscle grading techniques of muscle testing—easy test and hard test, and functional test (ADL).

2. Demonstrate the skill to grade upper and lower limb, neck and trunk muscles.

J. RE-EDUCATION OF MUSCLES

1. Describe the following in re-education of muscles: The term re-education of muscles, Technique, Spatial summation, Temporal summation.

2. Demonstrate the various re-education techniques and facilitating methods on various groups of muscles.

3. Demonstrate the progressive exercises in strengthening using various application: (according to their muscle power) Grade I—Grade IV.

K. JOINT MOBILITY

Describe the following:

1. Joint ranges (outer range, middle range, inner range), individual joint structures, joint movements (anatomic, accessory), Causes of joint range limitations, prevention of joint stiffness, positioning (physiological resting position).

2. Passive range of movement, methods of relaxation, Active exercises, Manual mobilisation techniques.

3. Pain relieving modalities: Moist heat, Infra red, Ultra sound S.W.D., Microwave.

4. Forced passive movements: small amplitudes, Large amplitudes.

5. Muscle strengthening techniques (PNF): Hold-relax, Slow-reversal, Rhythmic stabilisation, repeated contractions.

6. Accessory movements: Posterior glide, Anterior glide, superior and inferior glide, Traction and approximation.

7. Indications and contra-indications for mobilisation of individual joints and demonstrate practically the various mobilisation techniques for individual joints and teaching home programme.

L. GONIOMETRY

1. Describe the following: Normal range of various joints, Description of goniometer, Range of measuring systems (180 foot trunk and head), Techniques of goniometry.

2. Demonstrate measuring of individual joint range using of goniometer.

3. Demonstrate measurement of limb girth (using measuring tape): arm, forearm, thigh, calf.

M. CRUTCH WALKING

Describe the following: Components of a crutch, types of classification of crutches, characters of a good crutch, Preparing a patient for crutch walking, crutch walking muscles, Measurement of crutches (axillary piece, hand piece), Crutch stance, crutch palsy, Types of crutch walking (4 point, 3 point, 3 point (non-weight bearing and partial weight bearing), modified 3 point (paraplegic and shuffling gait, swing to and swing-through).

2. Demonstrate crutch measurement (sitting, standing and lying positions) and various types of crutch walking (even ground, stairs and ramps).

N. RELAXATION

1. Describe: Relaxation, Muscle fatigue, Muscle spasm.
2. Describe: General causes, Signs, Symptoms of tension (mental and physical).
3. Factors contributing to fatigue, Types of relaxation (local and general), Indications of relaxation, Techniques of relaxation.
4. Demonstrate the techniques of relaxation (local and general)

O. POSTURE

1. Describe the following: Posture (static and dynamic), Definition of good posture, Muscles responsible for good posture, Postural mechanisms, Definition of abnormal posture (Kyphosis, Scoliosis, Lordosis, Khypho-scoliosis, Khypholordosis), Assessment of posture (inspection, measurement - length of legs, width of pelvis, plumb line - R.O.M. of trunk in flexion, extension, side flexion and rotation).

2. Describe and demonstrate postural correction by: Strengthening of muscles, Mobilisation of trunk, Relaxation, Active correction of the deformities. Passive correction (traction), Postural awareness, abdominals and back extensors.

3. Outline principles in bracing of the trunk and surgical correction.

4. Demonstrate practically: identification of abnormal posture and postural corrective measures.

P. GAIT

1. Define gait and centre of gravity of the human body.
2. Describe muscles responsible for normal gait, Six determinants of gait (pelvic rotation, pelvic tilt, hip flexion, lateral displacement of pelvis, knee flexion, in stance phase, normal foot pattern during walking).
3. Describe the walking cycle: Stance (heel strike, foot flat, mid stance, and push off), Swing (acceleration, mid swing and deceleration).
4. Describe the following pathological gaits: Gluteus medius Gait, Gluteus maximus gait, Hip flexor weakness gait, Quadriceps weakness gait, Foot drop gait, emiplegic gait, Ataxic waddling gait, quinus gait, Calcaneus gait, Equinovarus gait.
5. Demonstrate skill in identifying pathological gait and proper gait training

Q. CO-ORDINATION

1. Define balance (static and dynamic).
2. Explain the mechanism of neuromuscular co-ordination.
3. Describe the incoordination due to: Lower motor neuron lesions (flaccidity), Upper motor neurone lesions (spasticity), Cerebellar lesions, Loss of kinaesthetic sense (tabes dorsalis, syringomyelia, leprosy), Imbalance due to muscular disease.

4. Describe re-education of balance.

5. Describe re-education of co-ordination; Frenkels exercises, proprioceptive neuromuscular facilitation (PNF) techniques.

6. Demonstrate the re-education techniques of balance and coordination.

R. SUSPENSION THERAPY

1. Describe the basic physics of simple pendulum and pendular movement.

2. Describe type of suspension: Pendular, Axial, Eccentric fixation (anterior, posterior, medial & lateral).

3. Explain the indications and technique for each type of suspension.

4. Demonstrate axial and eccentric fixation for mobilizing, strengthening and re-education of various muscles and joints.

S. HYDROTHERAPY

1. Describe: Hydrotstatic pressure, Upward thrust of water, bouyancy.

2. List the indications and contra-indications for hydrotherapy.

3. Describe the dress of patients and therapists, and necessary hydrotherapy equipment.

4. Types of hydro therapy: Sterile pool, Contrast bath, whirlpool bath, Hubbard tank.

5. Construction of hydrotherapy tank: Design, Construction, Safety features, cleaning the pool, water heating systems, Hygiene of patient and pool.

T. BED REST COMPLICATIONS

1. Describe the complications of patients on prolonged bed rest.

2. Demonstrate maintenance exercises for patients on prolonged bed rest.

EVALUATION

REFERENCES

1. Principles of Exercise Therapy - Dena Gareliner.

2. Practical Exercise Therapy - Hollis.

Electrotherapy

Electrotherapy I (Low & Medium Frequency)

Examination at end of : III Semester.

Electrotherapy II (High Frequency Laser & Actinotherapy)

Examination at the end of : IV Semester

Instruction hours : 350

COURSE DESCRIPTION

In this course the student will learn the principles, technique, and effects of electrotherapy as a therapeutic modality in the restoration of physical function.

COURSE OBJECTIVES

The objective of this course is that after 350 hours of lectures, demonstrations, practicals and clinics the student will be able to list the indications and contra-indications of various types of electrotherapy, demonstrate the different techniques, and describe their effects.

In addition, the student will be able to fulfil with 75% accuracy (as measured by written, oral & practical internal evaluation) the following objectives of the course.

COURSE OUTLINE

INTRODUCTORY PHYSICS

DESCRIBE the following

A. Electricity :

1. Definition and types.
2. Therapeutic uses.
3. Basic physics of construction.
4. Working.
5. Importance of currents in treatment.

B. Static Electricity :

1. Production of electric charge.
2. Characteristic of a charged body.
3. Characteristics of lines of forces.
4. Potential energy and factors on which it depends.
5. Potential difference and E.M.F.

C. Current Electricity :

1. Units of Electricity : Farad, Volt, Ampere, Coloumb, watt.
2. Resistance : In series & in parallel.
3. Ohm's law and its application to DC and AC currents
4. Potentiometer : Construction and working
5. Fuse : Construction, working and application.
6. Transmission of electrical energy through solids, liquids, gases and vacuum.
7. Direct current :
 - a. Definition.
 - b. Physiological and chemical effects.
 - c. Therapeutic and polar effects.
 - d. Dangers of DC : Shocks, safety precautions and management.
8. Burns, Electrical & chemical : Prevention & management.
9. Condensers : Definition, Principle, Types; Construction and working, capacity and uses.
10. Alternating current.
 - a. Faradism

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- b. Surged Faradism.
- c. Physiological effects.
- d. Therapeutic uses.

D. Magnetism :

1. Definition.
2. Properties of magnets.
3. Electro - magnetic induction.
4. Transmission by contact.
5. Magnetic field and magnetic forces.
6. Magnetic effects of an electric field.

E. Moving coil milliammeter : Construction, working and uses

F. Voltmeter :

G. Transformer :

1. Definition
2. Types
3. Principle
4. Construction
5. Eddy current
6. Working uses

H. Chokes :

1. Principle
2. Construction and working
3. Uses

I. Electric valves or thermionic valves :

1. Types : Diode, Triode, Double anode diode.
2. Principles of Thermionic valves.
3. Construction and working of different valves.
4. Uses.

J. Metal valve rectifiers :

1. Definition
2. Construction
3. Working
4. Uses

K. Ionisation :

1. Theory.
2. Effects of various ions.
3. Techniques of medical ionisation and surgical ionisation.

LOW FREQUENCY

A. Interrupted galvanic current :

1. Types of frequencies - low and high
2. Types of duration - short and long

B. Effects of interrupted galvanic current on innervated and denervated muscles.

C. Characteristics of stimulating current :

1. Type
2. Duration
3. Shape
4. Frequency

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D. Threshold of stimulation ;

1. Rheobase
2. Chronaxie
3. Masking

E. Physiological effects of IG current, chemical and therapeutic effects.

F. Electrodiagnostic tests as follows :

1. Strength duration curves :
 - a. Definition
 - b. Type of current required
 - c. Shape
 - d. Frequency
 - e. Procedure
2. F. G. Test
3. Fatigue test
4. Outline of EMG

G. Characteristics of normal and denervated muscle.

H. Peripheral nerve lesions: Neuropraxia, Axonotmesis, Neurotmesis. Describe clinical symptoms and signs, aims in treatment. Methods and selections of currents in different lesions.

I. Selection of current: Differentiate between the type of current, duration, shape & frequency of current used in stimulating nerve and muscle.

HIGH FREQUENCY

A. Define electricity : Discuss its properties briefly
Describe the 2 types of electricity-static, current.

B. Magnetism. Discuss briefly :

1. Nature-molecular theory.
2. Properties.
3. Magnetic effect of an electric current.

C. Define electromagnetic induction. Discuss :

1. Principles, construction & types of transformers.
2. Choke coil.

D. Condensers. Define and discuss :

1. Principles
2. Measurement
3. Factors
4. Construction
5. Field between condensers
7. Discharge through inductance & capacitive resistance

E. Valves. Describe :

1. Types
2. Construction
3. Function (illustrate with aid of diagram)

F. Rectifiers Discuss briefly.

G. Fuse and grid-explain with diagram the working and use of these two.

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H. Discuss the various devices used in regulating intensity of current.

I. Define oscillation. What is "capacitance" and "inductance"? Give an example of an oscillating system :

1. What is the frequency of oscillation and how is it calculated in brief.

2. What do you mean by damping of oscillation.

3. How does transfer of energy between 2 circuit take place.

J. Radiant energy and its properties (discuss in brief)

K. Electro magnetic waves and its properties (discuss in brief)

L. Physiological and therapeutic effects of HF (discuss in brief)

SHORT WAVE DIATHERMY

DESCRIBE THE FOLLOWING

A. Properties of H.F. currents

1. Sustained and Unsustained.

2. Damped and undamped.

3. Impedance.

4. Define Nodes and Antinodes. Explain, with examples, the fields, set up, etc.

5. Define wavelength.

B. Types of high freq. currents (in brief)

C. Production of H.F. currents :

1. Principles.

2. Construction of apparatus with diagram.

3. Tuning of machine.

4. Regulation of current.

D. Methods :

1. Condenser field.

2. Cable method.

3. Effects of 2 fields.

E. Physiological and therapeutic effects of S.W.D.

F. Technique of Application :

1. Testing machine.

2. Preparation of patient.

3. Types of electrodes.

4. Position and size to electrodes

5. Leads.

6. Application of current.

7. Dosage.

G. Specific requirement-application of :

1. Condenser field method.

a. Spacing-need & type.

b. Position.

c. Application.

d. Size of electrode.

2. Cable method - type of application.

H. Dangers and precautions

I. Pulsed diathermy : Indications and contra-indications.

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ACTINOTHERAPY

DESCRIBE THE FOLLOWING :

BASIC PHYSICS (part I)

1. Define heat and temperature (in brief)
2. Physical effects of heat - (in brief)
3. Transmission of heat - (in brief)
4. Sources of therapeutic heating and its physiological effects.
5. Radiant energy and its properties.
6. Electromagnetic spectrum - production and its properties.
7. Laws governing radiation.
8. Skin.
 - a. Structure
 - b. Depth of penetration
9. Discuss in brief piezo-electric effect.

INFRA RED

- A.
 1. I.R. rays - wavelength and frequency.
 2. Types of generators and its working.
 3. Physiological effects.
 4. Therapeutic effects and uses.
- B. Technique of Irradiation
 1. Choice of apparatus.
 2. Preparation of patient
 3. Arrangement of lamp.

4. Application of treatment.
5. Duration and frequency.

C. Dangers - briefly discuss

D. Indications & contra - indications

E. Therapeutic uses - its physiological effects.

MICROWAVE DIATHERMY (M.W.)

- A.
 1. Production - explain with diagram.
 2. Explain how the magnetron within works.
 3. Application of M.W.
 4. Physiological effects.
 5. Therapeutic effects.

B. Technique of application - dosage (in detail)

C. Indications & contra - indications

D. Dangers

PARAFFIN WAX & MOIST HEAT

1. Method.
2. Effects and indications.
3. Circulatory effects.
4. Effects on sensory nerves.
5. Effect on skin.
6. Indications & contra indications.
7. Its uses in various conditions.

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ULTRASONIC THERAPY

1. What is U.S. therapy
2. Explain with the aid of diagram the production of U.S.
3. Properties of U.S.:
 - a. reflection
 - b. transmission
 - c. absorption (in detail)
4. Properties of ultrasonic field: depth of penetration in relation to (a) intensity and (b) frequency.
5. Effect on tissues:
 - a. thermal
 - b. mechanical
 - c. chemical and biological
6. Coupling media
7. Pulsed U.S.
8. Uses of U.S.
9. Techniques of application:
 - a. Methods
 - direct contact
 - water bath
 - water bag
 - b. Dosage in acute and chronic conditions
 - c. Testing of apparatus
10. Dangers
11. Indications & contra - indications.

CYROTHERAPY

1. Physical principles
2. Physiological effects and uses
 - a. Circulatory response and uses.
 - b. Normal response and uses.
3. Techniques of application:
 - a. Preparation
 - b. application
 - c. modification
4. Methods:
 - a. Ice pack
 - b. Ice towel
 - c. immersion
 - d. Ice cube
5. Indications & contr - indications to treatment.

INTERFERENTIAL THERAPY (M.F.)

1. Define interferential current.
2. Discuss - production,
3. Physiological effects.
4. Indications and contra - indications.
5. Dangers.
6. Techniques of treatment.
7. Therapeutic uses.

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T.E.N.S. (L.F.)**A. 1. Define TENS.**

2. What is the principles involved

3. Working of TENS (in brief)

a. frequency output etc.

b. placement of electrodes.

c. Types - monophasic.

B. Basic physiology :

1. Theory of pain :

a. Specificity theory

b. Pattern theory

c. Gate control theory

2. Cutaneous innervation

C. Basic Anatomy**D. Indications & contra-indications****LASER (H.F.)**

Define Laser and briefly outline its therapeutic indications, contra-indications, efficacy, and precautions advisable.

ULTRA VIOLET RADIATION (H.F.)

1 a. Physics

—Electric arc

—Process of ionisation

—Transmission of current through gases

b. Types of lamps

2. a. Construction of lamps

—High pressure Hg vapour lamps

—Kromayer lamp

b. Tridymite formation

c. Cooling

d. Spectrum - Hg vapour lamps (in brief)

e. Fluorescent tube for U.V. production

f. PUVA apparatus

g. Care of lamp

3. Physiological and Therapeutic effects - in detail Photo-sensitization - in brief.

4. Indication, contra - indications and dangers.

5. Technique of application :

a. Test dose

b. Local treatment

c. General irradiation

d. Treatment

6. Conditions (common) in which above treatment given.

7. Sensitisers (in brief)

8. Filters

9. Comparison between I.R. & U.V.

Miscellaneous :

A. Erythema - Development, Appearance, Duration

B. Wavelength

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- C. Penetration
- D. Pigmentation
- E. Tolerance
- F. Practical on the following conditions.
 1. Acne - shoulder and chest.
 2. Neck and face
 3. Psoriasis.
 4. Alopecia areata and totalis.
 5. Ulcer - non infected, infected.
 6. Pressure - sores.
 7. Rickets.
 8. General body bath.

EVALUATION

Physiotherapy in Neurological Conditions

Examination at the end of: VI Semester
Instruction hours: 120

COURSE DESCRIPTION

This course serves to integrate the knowledge gained by the students in Clinical Neurology, with the skills gained in exercise therapy, electrotherapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to pathology in the nervous system.

COURSE OBJECTIVES

The objectives of this course is that after 120 hours of lectures demonstrations, practicals and clinics the student will be able to identify disability due to neurological dysfunction, set treatment goals and apply their skills in exercise therapy, electrotherapy and massage in clinical situation to restore neurological function.

In addition the student will be able to fulfil with 75% accuracy (as measured by written, oral and practical internal evaluation) the following objectives of the course

COURSE OUTLINE

A. REVIEW OF NEUROANATOMY AND PHYSIOLOGY:
Review the structure and function of a) neuron b) synapse c) supporting tissue. Review the organisation and function of a) cerebral hemispheres b) cerebellum c) spinal cord d) peripheral nerves e) pyramidal system f) extrapyramidal system. Review the factors influencing alpha motor neuron activity. Review the neurological basis of muscle tone and movement and demonstrate the following: a) hypotonia b) hypertonia - spasticity and rigidity c) ataxia d) athetosis e) chorea.

B. PRINCIPLES OF ASSESSMENT: Review a) skills in history taking b) assessment of higher functions, cortical sensations, cranial nerves, dorsal column sensation and pain & tempera-

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ture sensations c) assessment of motor function: grading of muscle power, assessment of range of movement, balance and coordination d) assessment of superficial and deep reflexes e) assessment of reflex maturation in terms of stimulus, position, negative / positive reactions and their significance f) assessment of gait - both normal and abnormal (spastic, ataxic and paralytic patterns) Emphasis should be placed on teaching accurate assessment techniques and various recording methods eg. colour coding on body charts, graphs etc.

C. PRINCIPLES OF TREATMENT: Review the treatment principles as follows:-

a. Sensory re-education: hypersensitivity, hyposensitivity and anesthesia.

b. Treatment of altered tone: hypertonicity and hypotonicity

c. Motor re-education: Strengthening exercise coordination exercises, joint mobilization exercises, use of equilibrium and labyrinthine systems, use of PNF patterns, controlled sensory stimulation to bias the spindle cells eg. vibration, tactile, ice etc., use of stretch to elicit movement (facilitation), light joint compression (inhibition) use of reflex activity to improve motor function, physiogenic sequence of motor behaviour.

d. Treatment to improve functions: Free exercises gait training with and without aids, activities of daily living, mat exercises and exercises and recreation.

e. Review the use of ambulatory aids in neurological conditions: in spastic upper motor neuron lesions, in lower motor neuron lesions, in dorsal column dysfunction and cerebellar dysfunction.

f. Review the use of splints and braces in spastic upper motor neuron and in flaccid lower motor neuron lesions in both upper and lower limbs.

g. Review the management of chronic pain in neurological conditions with respect to the types of pain, treatment modalities available, selection criteria for each modality and possible complications.

D. CEREBRAL PALSY: Define cerebral palsy and describe the topographical classification - monoplegia, diplegia, paraplegia hemiplegia & tetraplegia. Describe types of cerebral palsy: spastic, athetoid mixed. Identify common associated problems: Visual, hearing, speech and intelligence. Assess reflex activity at different levels: Cortical, mid abrain, brain stem, spinal. Assess developmental milestones from birth to five years. Assess functional ability: Prone to supine (rolling), coming to sitting, quadripod, crawling, kneeling kneel - stand, stand with support and walking. Examine for contractures as follows: hip flexion, adduction, internal rotation: knee flexion; ankle plantar flexion, inversion / eversion: flexion contractures of elbow, wrist & fingers and spinal deformities.

Treatment - Describe and demonstrate the treatment motor disabilities: Passive movement stretching of soft tissue tightness, use of ice to reduce spasticity, positioning the child to prevent soft tissue contractures, to inhibit abnormal reflexes and to facilitate volitional movement. Describe and demonstrate techniques of carrying of different types of CP children, encouraging bimanual activities in different starting positions like phone, sitting and standing and activities across the midline. Describe appropriate home programmes for positioning the child, handling them and assisting improvement of function. Introduction to treatment techniques: Bobath, Rood.

E. PERIPHERAL NERVE LESIONS: Identify types of peripheral nerve lesions. Assess the motor system: Specific muscles. range of motion, active and passive ranges, muscle girth. Assess sensory system: touch, pain, temperature, paraesthesia, nerve regeneration. Assess autonomic function: sweating, skin condition, soft tissue atrophy. Treatment: describe muscle reeducation

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techniques: electrical stimulation (selection of current): active, assisted, resisted movements: Passive and autoassisted stretching, and massage. Describe sensory reeducation and a pain relief by various modalities. Describe the common splints used in peripheral nerve lesions: static, dynamic and functional. Muscle transfers: Preparation for transfer-assessment of muscle power, stretching of soft tissue tightness, isolation of muscle contraction, specific muscle strengthening.

Post-operative management: Pressure bandaging & muscle reeducation after transfer. Describe a home programme.

F. MUSCULAR DYSTROPHY Describe stages of the disease: ambulatory, wheelchair and bed stages. Describe significance of exercises: resisted, active and free. Identify and assess common contractures and deformities. Assess range of motion and muscle power. Assess functional ability.

Demonstrate treatment programme for strengthening weak muscles: active movements and hydrotherapy. Increase range of motion by suspension therapy, powder board, passive stretching, positioning etc. Demonstrate gait training with appropriate orthoses, Describe management of chest complications: breathing exercises, chest percussion, drainage of secretions and assisted coughing.

G. PARKINSONISM: Review the natural history, course and prognosis of the disease. Identify and assess problems in posture, sitting, kneeling and standing balance, voluntary and automatic movements, rigidity, tremor and gait. Assess also hearing, speech and finger dexterity. Describe disability grading according to Yulu.

Demonstrate treatment: postural awareness and relaxation training, gait training techniques: associated reactions, heel-toe gait, overcoming obstacles, start and stop on command, turning and walking backwards, forwards and sideways. Describe an appropriate home exercise programme.

H. SPINAL CORD LESIONS: Describe types of spinal cord lesions. Describe signs of tract and root interruptions. Describe positioning of the patient in acute spinal cord injury. Describe assessment of the motor system: tone, power of specific muscles, range of motion and limb girth. Describe assessment of sensory system and reflexes. Describe assessment of functional ability and balance reactions in appropriate cases. Describe assessment of respiratory function: Muscles of respiration, coughing ability and vital capacity. Describe how the level of lesion is ascertained.

Treatment: Describe the stages of immobilization & stage when loading of the spine is allowed. Describe spinal orthosis. Demonstrate motor reeducation programmes and a programme for respiratory care in high level paraplegics and quadriplegics. Demonstrate progressive ambulation, mat exercises, various strengthening programmes, methods of decreasing spasticity and improving sitting balance. Demonstrate various types of paraplegic gaits and reeducation in functional activities: transfers and protective falling. Describe common ambulatory aids used in paraplegics and common splints used in tetraplegics. Describe the use of hydrotherapy in paraplegics. Describe the concept of team approach in rehabilitation of these patients.

I. HEMIPLEGIA Define hemiplegia and identify the following: Sensory disturbance, alteration in tone, loss of selective movement, loss of balance reactions and communications problems

Treatment: Describe the unilateral and bilateral approaches to treatment. Describe positioning in the supine position, on the affected and on the unaffected sides. Demonstrate activities in the recumbent position: arm mobilization, trunk elongation, scapular movement, arm elevation, activities for a recovering arm: activities for the lower limb i.e hip and knee flexion over the side of the bed, knee extension with dorsiflexion, heel control, isolated knee extension.

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Mat activities: demonstrate rolling on to affected and unaffected sides, sitting and kneeling. Describe the technique of making a patient sit passively and active assisted sitting. Demonstrate transfer techniques. Describe activities in sitting: ~~carry~~ weight transference on both buttocks shuffling on buttocks, weight transfer through arms balance reactions of trunk - head. Demonstrate activities in the standing position: standing from plinth, from chair (assisted and independent), weight bearing on affected leg, knee control in standing, weight transfers forward, backward and sideways, gait training and stair climbing. Describe tilt board activities in the lying and sitting positions. Describe additional methods of stimulation using verbal cues, ice, pressure & tapping. Describe management of shoulder pain and shoulder hand syndrome. Identify and describe hemiplegic gait, identify synergy components and abnormal reflex activities.

Demonstrate reeducation of gait: motor relearning techniques functional approach and use of orthoses.

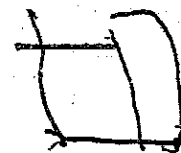
J. CEREBELLAR LESIONS: Identify and assess abnormal tone, decomposition of movement, rapid alternate movements, pleurothotonus, proprioception, dysmetria, posture and gait.

Treatment: Demonstrate exercises for incoordination - Frenkel's and weighted exercises. Demonstrate techniques for reeducation of balance and equilibrium reactions by visual compensation. Describe use of appropriate aids for ambulation depending on the severity of affectation - walker, elbow crutches, quadripod walking sticks etc.

K. POLIOMYELITIS: Define poliomyelitis and review the stages in the disease - acute, recovery and residual paralysis. Describe treatment in the acute stage: heat, chest care, positioning. Describe the assessment of a patient in the recovery stage: active and passive range of motion, soft tissue tightness, muscle power & Spinal deformities. Demonstrate treatment in the recovery stage: muscle strengthening - progressive resistive

exercises, active - assisted, active & active - resisted exercises. Describe the role of suspension and hydrotherapy. Describe the treatment of soft tissue tightness by passive stretching. auto-stretching and positioning. Demonstrate treatment in the stage of residual paralysis Pre-operative assessment of contractures: hip flexion, TEL contracture, knee flexion and foot deformities. Describe also assessment of limb length discrepancy and spinal deformities. Review orthotic aids commonly used the management of polio. Describe tendon transfer operations commonly performed. Describe functional retraining for self care, gait training and posture correction.

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Physiotherapy in Orthopaedic Conditions

Examination at the end of : IV Semester
Instruction hours : 120

COURSE DESCRIPTION

This course serves to integrate the knowledge gained by the students in clinical orthopaedics with skills gained in exercise therapy, electrotherapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to musculoskeletal pathology.

COURSE OBJECTIVES

The objectives of this course is that after 120 hours of lectures, demonstration, practicals and clinics the student will be able to identify disability due to musculoskeletal dysfunction, set treatment goals and apply their skills in exercise therapy, electrotherapy and massage in clinical situations to restore musculoskeletal function.

In addition the student will be able to fulfil with 75% accuracy (as measured by written, oral and practical internal evaluation) the following objectives of the course.

COURSE OUTLINE

- Define fractures, Review the types, the signs and symptoms, first-aid measures, principles of immobilization and healing of fractures.
- Describe the PT assessment of a patient with a fracture during the immobilization and post immobilization periods.
- List the aims of T management in a patient with a fracture.
- Review manual, mechanical, skin, skeletal, lumbar and cervical traction.

E. Describe the methods of mobilization of a patient / extremity after healing of a fracture.

F. Review the mechanism of injury, clinical features, treatment and complications and describe the PT management and home programme for the following injuries: 1. Fracture clavicle, upper 1/3 of humerus, shaft of humerus, supra- and intercondylar fractures of the humerus. 2. Fracture head of radius, olecranon process, shafts of radius and ulna Colles'. 3. Fracture scaphoid. Bennett's and metacarpal neck. 4. Fracture pelvis: neck, trochanter and shaft of femur; supracondylar fracture and injuries of the knee joint & patella. 5. Fracture proximal tibia, both bones of leg, Potts' and Dupeytre's, calcaneum and metatarsal (march). 6. Dislocation of (a) Hip (Congenital), Traumatic, Posterior & Central (b) Shoulder (Anterior & Recurrent (c) Patella.

G. Describe briefly the general and PT assessment of the vertebral column:

Subjective history; occupation, symptoms, major problems; Objective examination: (1) Observation-body type, musculature, deformity & gait. (2) Palpation - Temperature, swelling, bony prominences, local tenderness. (3) Postural evaluation using a plumb line. (4) Active movements the vertebral column-flexion, extension, lateral flexion and rotation. (5) Specific tests-straight leg raising, proneknee bend, passive neck flexion, kernig's sign. (6) Proximal joints of pelvic and shoulder girdles. (7) Neurological tests-muscle strength, sensation and reflexes.

H. Review cervical and lumbar spondylosis, spondylolysthe-sis, TB spine and spinal fracture. Outline PT assessment and PT aims and management and a detailed home programme.

I. List the common postural abnormalities affecting the spine. Review Kyphosis, Lordosis and Scoliosis; Outline PT assessment and PT aims and management along with a home programme

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J. Review the clinical features and describe the PT management of Ankylosing spondylitis.

K. Intervertebral Disc Prolapse: Review basic anatomy and biomechanics of the spine. Review causes, signs, symptoms and investigations done for IVDP. Review the different types and degrees of IVDP. List PT aims and demonstrate treatment techniques

L. Define the following terms, review their etiology & clinical features and describe their treatment-strains, sprains (Medial ligament of knee, and Lateral ligament of ankle), bursitis (Subacromial & Prepatellar) synovitis, tendonitis, tenosynovitis, fibrositis, fibromyositis, rupture and avulsion of tendons (Tendoachillis & Quadriceps), tennis elbow, torticollis, tendonitis (supraspinatus & biceptal), periarthrits shoulder, and shoulder - hand syndrome.

M. Review upper & lower limb and spinal orthoses and prostheses. Describe the principles and function of each; list indications and contraindications, advantages and disadvantages of each. Demonstrate the fabrication of simple hand and foot splints out of POP.

N. Review the indications and principles of amputations of the upper and lower limbs and describe the PT management and training of amputees before and after prosthetic fitting. Review immediate post-operative prosthetic fitting and list its advantages.

O. Define poliomyelitis and review the etiology, clinical features, staging and medical management. Outline PT assessment during the acute, subacute and chronic stages. Describe PT aims and demonstrate treatment techniques, List the common deformities seen in polio and methods of preventing them. Review common reconstructive tendon transfer operations in polio and its PT management. Review the common orthoses used, and describe the technique of measurement for a KAFO and its check-out along with a detailed home programme including care of the orthosis.

P. Define Cerebral Palsy. Review its causes, signs, symptoms, classification and common deformities. Outline PT assessment, aims and management alongwith a home programme. Review common surgical corrections and its PT management.

Q. Define Rheumatoid Arthritis. Review its signs, symptoms, radiological features, pathology, common deformities, Medical and Surgical management. Describe the PT assessment, aims and management in the acute and chronic stages and a detailed home programme.

R. Define Osteoarthritis. Review its signs, symptoms, radiological features, pathology, common deformities, Medical and Surgical management. Describe the PT assessment, aims and management and a detailed home programme, with special emphasis on osteoarthritis of hip, knee, ankle and shoulder joints.

S. Define leprosy. Review the incidence and mode of transmission of leprosy. Review the clinical features and common deformities and Medical management. Review the common tendon transfer operations and describe PT management before and following tendon transfers. Describe the risks of anaesthetic limbs and outline its care to prevent complications. Review planter ulcers in leprosy and its management (including foot wear.)

T. Describe the different degrees of burns and review relevant first aid measures. Outline the PT assessment of burns as follows: degree and % of burns, presence of oedema and adherent skin, ROM of involved joints, muscle power, contractures, deformities, altered posture and chest movements. Review Medical and Surgical management including skin grafting. Describe the PT aims and management of a patient with burns along with a home programme.

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Physiotherapy in Cardiorespiratory Conditions

Examination at the end of: VI Semester

Instruction hours: 120

COURSE DESCRIPTION

This course serves to intergrate the knowledge gained by the students in clinical cardiorespiratory conditions with skills gained in exercise therapy, electrotherapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to cardiorespiratory pathology.

COURSE OBJECTIVES

The objective of this course is that after 120 hours of lectures, demonstrations, practicals and clinics the student will be able to identify cardiorespiratory dysfunction, set treatment goals and apply their skills in exercise therapy, electrotherapy and massage in clinical situations to restore cardiorespiratory function.

In addition the student will be able to fulfil with 75% accuracy (as measured by written, oral and practical internal evaluation) the following objectives of the course.

COURSE OUTLINE

A. ANATOMY: Review the regional anatomy of thorax; upper respiratory tract - trachea and bronchial tree; lungs and bronchopulmonary segments; muscles of respiration; heart and great vessels; movements of the chest wall and surface anatomy of lung and heart.

B. PHYSIOLOGY: Review the mechanics of respiration - inspiration & expiration, lung volumes, respiratory muscles, compliance of lung and chest wall, work of breathing, dead space, gas exchange in lung and pulmonary circulation.

C. GENERAL OVERVIEW: ASSESSMENT - Describe physical assessment in cardio respiratory dysfunction: Inspection: Posture (recumbent, erect, orthopenic): breathing pattern (rate,

rhythm, use of accessory muscles): Chest movement (symmetry, intercostal and diaphragmatic components); Chest deformity (Barrel chest, Pigeon chest); Spinal deformity (scoliosis, kyphosis, kyphoscoliosis); Sputum (colour, type, volume, consistency); Cough (types, productive / non-productive, presence of a normal cough reflex). Palpation: Tactile and vocal fremitus, mobility of thoracic spine and rib cage. Percussion: dullness and hyperresonance. Auscultation: Normal and abnormal breath sounds.

Measurement: Chest expansion at different levels (axillary, nipple, xiphoid); exercise tolerance (six minute walking test); Post-operative range of motion and muscle assessment.

D. GENERAL OVERVIEW: PHYSICAL TREATMENT

1. Describe indication, goals and procedure of breathing exercises, Describe diaphragmatic breathing, localised basal expansion, apical expansion, specific segmental exercise raising the resting respiratory level.

2. Describe chest mobilisation exercises.

3. Describe relaxation positions for the breathless patient - high side lying forward lean sitting, relaxed sitting, forward lean standing, relaxed standing.

4. Describe controlled breathing during walking and during functional activity.

5. Describe exercise for the breathless patient: exercise tolerance testing and exercise programme.

6. Describe the technique of huffing and coughing, forced expiratory technique, vibratory chest shaking and percussion.

7. Describe techniques of Postural drainage, including indications, general precautions and contraindications, preparation, drainage of individual bronchopulmonary segments, modified postural drainage and continuing postural drainage as a home programme.

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8. Outline the history of mechanical respiration. Define the following terms a) Respirator b) Lung ventilator c) Resuscitators d) Body ventilator e) Electrostimulator f) IPPB g) PEEP h) CPAP i) SIMV f) NEEP. Classify ventilators by their cycling control (volume cycling, pressure cycling, time cycling and mixed cycling). Describe the principles of operation of commonly used ventilators and outline the use of the following types: i) Bear ii) Bennett iii) Emerson iv) Bird.

9. Outline the principles of Aerosol Therapy. Describe the physical properties of aerosols and their deposition in the alveoli. Describe the principles of operation of nebulisers.

10. Outline the principles of humidification therapy and methods of correcting humidity deficits. Describe the principles of operation of pass-over humidifiers and bubble-diffusion humidifiers.

11. Describe techniques of sterile nasopharyngeal and endotracheal suctioning.

E. PHYSIOTHERAPY IN OBSTRUCTIVE LUNG DISEASES:

Assess: Effort of breathing, extent of wheeze, pattern of breathing, sputum production, chest deformity, exercise tolerance (Patients Effort Tolerance.)

Identify problems: Decreased outflow due to bronchospasm, anxiety due to difficulty in ventilation, exhaustion due to increased work of disturbed breathing, Increased secretions which are difficult to remove, decreased exercise tolerance. Demonstrate treatment techniques: Relaxation postures and techniques, reassurance and education about disease, controlled breathing, breathing exercise, postural drainage, vibratory shaking, huffing and coughing graduated exercise programme and posture correction.

F. PHYSIOTHERAPY IN CHEST INFECTIONS:

Assess.: sputum, cough, fever and dyspnoea.

Identify problems: Productive cough with risk hemoptysis, exhaustion due to increased work of breathing, chest deformity, decreased exercise tolerance.

Demonstrate treatment techniques: Postural drainage with use of adjuncts, percussion, vibration, huffing and coughing to expectorate mobilising exercises to thorax and graduated exercises.

G. PHYSIOTHERAPY IN RESTRICTIVE LUNG DISORDERS:

Assess: Chest expansion at different levels, mobility of thorax and spine, posture (Kyphosis or scoliosis) and tests for exercise tolerance (six minutes walking test).

Identify problems: Decreased expansion of lung due to restriction of chest wall movement causing decreased ventilation, defective posture and decreased exercise tolerance. Demonstrate treatment techniques: Vigorous mobilising exercises to thorax and spine, breathing exercises to increase ventilation and drain secretions, exercises for posture correction, graduated exercises to increase tolerance.

H. PRINCIPLES OF INTENSIVE CARE PHYSIOTHERAPY:

Describe the principles of intensive care therapy. Demonstrate knowledge of the following equipment: Endotracheal tubes, Tracheostomy tubes, Humidifier, ventilators: High frequency ventilators, Differential ventilators, CPAP masks, Suction pump, Electrocardiogram, Pressure monitors - arterial, central venous, pulmonary artery and pulmonary wedge; intracranial and temperature monitors.

Assess: Special instructions pertaining to any operation performed, respiration, level of consciousness, colour, blood pressure, pulse, temperature, sputum expectorated (colour and quantity), drugs (time last dose of analgesic given), drains, presence of Pacemaker or Intraaortic balloon pump, ECG and blood gas results. Describe chest radiograph with respect to expansion of lungs, size of heart, presence of secretions and placement of chest tubes.

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I. PHYSIOTHERAPY AFTER PULMONARY SURGERY

Pre operative: Demonstrate treatment techniques: explanation to patient, care of incision, mechanical ventilation, breathing exercise, huffing and coughing, mobilising exercise, posture correction, graduated exercise programme.

Post-operative: Assess: Special instructions pertaining to operative procedure performed, breath sounds, cyanosis, respiratory rate, temperature and pulse, blood pressure, drainage from pleural drain (bubbling or swinging), sputum expectorated, analgesia, movements of chest wall (symmetry) position of patient and effort of breathing, chest radiograph and blood gases.

Identify problems: Pain, intercostal drains in situ, decreased air entry, retained secretions, decreased movement of the shoulder of affected side, decreased mobility and poor posture.

Demonstrate treatment techniques: deep breathing and segmental breathing exercises, vibrations, percussions, huffing and coughing, full range active assisted arm exercises, ankle foot exercises, trunk exercises, posture correction, positioning of patient, IPPB and inhalations.

J. PHYSIOTHERAPY AFTER CARDIAC SURGERY:

Pre operative: Assess patients' medical history, normal breathing pattern of patient, pulse, respiratory rate, BP, thoracic mobility, posture and patients' exercise tolerance.

Identify problems: excess secretions, decreased mobility of thorax, defective posture, decreased exercise tolerance. **Demonstrate treatment techniques:** Explain to the patients about their operation and about the incision, ICU, Endotracheal tube, central lines, nasogastric tube, catheter, ECG leads, drains, peripheral lines, temperature probe etc. Teach breathing exercises, splinting of incision, huffing and coughing, correct posture, range of motion exercises to trunk and shoulders, active exercises to ankle and foot. **Post-operative:** Assess special instructions pertaining to operative procedure performed, type of incision, blood

pressure, pulse rate, respiration, colour, time of last analgesic dose, drains, temperature, ECG, chest X-ray and blood gases.

Identify problems: pain, decreased air entry, retained secretions, reduced arm and leg movements, decreased mobility.

Demonstrate treatment techniques: Deep breathing exercises, suctioning, active / assisted exercises to arm and leg, graduated exercise programme.

K. PHYSIOTHERAPY IN GENERAL SURGERY :

Assess the patients, medical history, past treatment, breathing pattern, ability to cough and pain.

Identify problems: pain, increased secretions, defective posture and decreased exercise tolerance.

Demonstrate treatment techniques: Breathing exercise, huffing and coughing, mobilizing exercise, posture correction and graduated exercise programme.

L. PHYSIOTHERAPY IN REHABILITATION AFTER MYOCARDIAL INFARCTION :

Describe the role of the Physiotherapist in a Coronary Care Unit during the first 48 hours. Describe the principles of formulation of an exercise programme: bed exercises, walking, stair climbing. Describe a home exercise programme and advice on leisure activities. Describe physiotherapy for complications after myocardial infarction: chest infections, cerebral embolism and shoulder hand syndrome.

VALUATION