

**B. VOCATIONAL PROGRAMME IN
SPORTS NUTRITION AND PHYSIOTHERAPY**
Under
COURSE - CREDIT - SEMESTER SYSTEM AND GRADING

CURRICULUM OF PROGRAMME

AIMS AND OBJECTIVES

AIM

The Bachelor of Vocation (**B.Voc.**) Degree programme in **Sports Nutrition and Physiotherapy** is introduced under the University Grants Commission (UGC)'s new scheme of skills development based higher education. The aim of B. Voc. programme is to integrate Government of India's National Skills Qualifications Framework (NSQF) within the undergraduate level of higher education, in order to enhance employability of the graduates and meet industry requirements.

The curriculum of B. Voc. programme in Sports Nutrition and Physiotherapy incorporates the requirements of various health sectors, in an innovative and flexible manner while developing a holistic and well-groomed graduate. This programme equips students to pursue a wide range of career prospects as Dietician Assistant, Assistant Physiotherapist and Junior Physiotherapist. The syllabus of the course is designed in such a way that it provides the skill development required to be a professional therapist.

OBJECTIVES

- To train and develop professionals with expertise in fitness and nutrition management for services in Hospitals, Wellness Centres and Sports Academics.
- To develop capabilities to provide preventive, promote and therapeutic care in health and diseases
- Familiarize with basic concepts nutrient requirements and meal planning throughout the life cycle
- Understand the integrated functions of all systems and the grounding of nutritional science in Physiology.
- Understand the scientific background of exercise and sporting activities
- To enable the students understand the role of exercise in fitness.
- Utilize knowledge of biomechanics
- Enable sportsmen/athletes and individuals who exercise to use optimum energy to maximize performance under normal and stressed conditions while minimizing injury
- Develop professional expertise in weight management, rehabilitation and fitness
- Understand the psychological problems during extreme physical and mental stress
- To enable the students understand the therapeutic benefits of exercise.
- To gain the knowledge and understanding of nutrition required for exercise and sport in order to enhance performance.
- To impart knowledge on the physiological effects of exercise on human body composition.

- To acquire adequate knowledge of the basic medical subjects in the practice of Physiotherapy.
- To develop skills and competence in evaluation of patients, planning of management and carry out the various modalities and techniques in the physiotherapeutic management of the various medical and surgical conditions.
- To develop proper attitudes of compassion and concern for the welfare of the individual patient as well as for the welfare of the physically handicapped in the community.
- To maintain proper moral and ethical standards towards patients and other professional colleagues in the practice of physiotherapy

ELIGIBILITY

A pass in plus two or equivalent examinations recognized by the University, irrespective of the streams/subjects

DURATION OF THE COURSE

B. Voc. Sports Nutrition and Physiotherapy shall be a six semester **full time programme** extending to three academic years consisting of 90 working days of instruction in each semester including examination.

PROGRAMME

B. Voc. Sports Nutrition and Physiotherapy programme is grouped under the Model III - New Generation Courses.

COURSE STRUCTURE

The curriculum in each of the years of the programme is a suitable mix of **General Education** and **Skill Development** components. The General Education components emphasise and offer courses which provide holistic development. The focus of Skill Development components is to equip students with appropriate knowledge, practice and attitude, so as to become work ready. While designing the curriculum of Skill Development components, adequate attention has been given to practical work, hospital visit, internship, clinical posting and project work.

COURSE

The programme gives ample weightage to English as a communication medium. Students must develop the basic skills in English through General Education component courses in the first and second semester. Basic Computer Knowledge is also included the General Education component. Other courses in the General Education components (total 15 courses) are complementing the core trade. Skill Development components includes 16 core courses, which provides all the practical skills and necessary knowledge required to become a professional therapist. The programme lays greater emphasis on interaction with the relevant health sectors.

COURSE SUMMARY

General Education components

- | | |
|------------|--|
| 1. ENCN01 | Communication skills in English |
| 2. ENCN02 | Critical thinking, Academic writing & presentation |
| 3. SPT1G1 | Basic Nutrition |
| 4. SPT2G1 | Information Technology and IT Tools (T+P) |
| 5. SPT3G1 | Therapeutic Nutrition |
| 6. SPT3G2 | Scientific Principles and Practices of Health & Fitness Training |
| 7. SPT3G3 | First Aid & Nursing |
| 8. SPT4G1 | Alternative Medicine |
| 9. SPT4G2 | Psychiatry |
| 10. SPT4G3 | Sports Psychology & Counseling |
| 11. SPT5G1 | Biomechanics |
| 12. SPT5G2 | Weight Management, Rehabilitation and Fitness (T+P) |
| 13. SPT5G3 | Medical Instrumentation & Hospital visit |
| 14. SPT6G1 | Psychology |
| 15. SPT6G2 | Sociology |

Skill Development components

- | | |
|------------|--|
| 1. SPT1S1 | Human Anatomy (T+P) |
| 2. SPT1S2 | Human Physiology (T+P) |
| 3. SPT2S1 | Orientation to Sports Physiotherapy |
| 4. SPT2S2 | Sports & Exercise Therapy (T+P) |
| 5. SPT2S3 | Clinical Orthopedics & Sports Medicine I |
| 6. SPT3S1 | Clinical Orthopedics & Sports Medicine II |
| 7. SPT3S2 | Electrotherapy – I |
| 8. SPT3S3 | Physiology of Sports and Exercise (T+P) |
| 9. SPT4S1 | Physiotherapy in Orthopedics and Sports Medicine (T+P) |
| 10. SPT4S2 | Electrotherapy – II (T+P) |
| 11. SPT5S1 | Physiotherapy in General Medicine and Surgery including cardiothoracic conditions – I |
| 12. SPT5S2 | Physiotherapy in Neurology & Neurosurgery |
| 13. SPT5S3 | Evidence based Physiotherapy |
| 14. SPT5S4 | Nutrition, Safety Education and Health Promotion |
| 15. SPT6S1 | Physiotherapy in General Medicine and Surgery including cardiothoracic conditions - II |
| 16. SPT6S2 | Sports Nutrition (T+P) |

SCHEME OF COURSES

Courses with credits:

The B. Voc. Sports Nutrition and Physiotherapy programme consists of General Education component courses with 68 credits and the Skill Development components with 112 credits. A Project is included in Semester IV. Semester VI includes Clinical Posting and Project work.

(One Credit mean equivalent of 15 periods of 60 minutes each, for theory, workshops/labs and tutorials. For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops. Suggested Credits for General Education components – 12 per semester and for Skill Development components – 18 per semester.)

Course Code:

Every course in the programme should be coded according to the following criteria. The first three letters of the code indicate the programme i.e. SPT for Sports Nutrition and Physiotherapy, One digit to indicate the semester, i.e. SPT1 (Sports Nutrition and Physiotherapy, 1st semester). One letter from the type of courses such as, G for General Education component, S for Skill Development component. The last digit indicates course number of the semester. i.e. SPT1S1 (Sports Nutrition and Physiotherapy, 1st semester, Skill Development course, Course number 1).

B. Voc. Sports Nutrition and Physiotherapy SCHEME & SYLLABUS WITH COURSE CODE, HOURS PER WEEK AND DISTRIBUTION OF CREDIT

| Sem | Course code | Title of course | Hours per week | Credit | Total hrs. | Uty exam dur. (hrs) | Weight Ratio | |
|-----------|-------------|------------------|----------------|-----------|------------|---------------------|-----------------|-----------------|
| | | | | | | | Internal evaul. | External evaul. |
| I | ENCNO1 | English I | 5 | 6 | 90 | 3 | 1 | 4 |
| | SPT1G1 | Basic Nutrition | 5 | 6 | 90 | 3 | 1 | 4 |
| | SPT1S1 | Human Anatomy | 5 | 6 | 90 | 3 | 1 | 4 |
| | | Practical | 3 | 3 | 54 | 3 | 1 | 4 |
| | SPT1S2 | Human Physiology | 5 | 6 | 90 | 3 | 1 | 4 |
| Practical | | 3 | 3 | 54 | 3 | 1 | 4 | |
| | | Total | 26 | 30 | 468 | | | |

| Sem | Course code | Title of course | Hours per week | Credit | Total hrs. | Uty exam dur. (hrs) | Weight Ratio | |
|-----------|--------------|---|----------------|-----------|------------|---------------------|-----------------|-----------------|
| | | | | | | | Internal evaul. | External evaul. |
| II | ENCNO2 | English II - Critical thinking, Academic writing & presentation | 5 | 6 | 90 | 3 | 1 | 4 |
| | SPT2G1 | Information Technology and IT Tools (T+P) | 5 | 6 | 90 | 3 3 | 1 1 | 4 4 |
| | SPT2S1 | Orientation to Sports Physiotherapy | 4 | 4 | 72 | 3 | 1 | 4 |
| | SPT2S2 | Sports & Exercise Therapy Practical | 6 | 7 | 108 | 3 | 1 | 4 |
| | | | 2 | 2 | 36 | 3 | 1 | 4 |
| | SPT2S3 | Clinical Orthopedics & Sports Medicine I | 5 | 6 | 90 | 3 | 1 | 4 |
| | Total | | 27 | 31 | 486 | | | |

| Sem | Course code | Title of course | Hours per week | Credit | Total hrs. | Uty exam dur. (hrs) | Weight Ratio | |
|------------|--------------|--|----------------|-----------|------------|---------------------|----------------|-----------------|
| | | | | | | | Internal evaul | External evaul. |
| III | SPT3G1 | Therapeutic Nutrition | 4 | 4 | 72 | 3 | 1 | 4 |
| | SPT3G2 | Scientific Principles and Practices of Health & Fitness Training | 4 | 4 | 72 | 3 | 1 | 4 |
| | SPT3G3 | First Aid & Nursing | 4 | 4 | 72 | 3 | 1 | 4 |
| | SPT3S1 | Clinical Orthopedics & Sports Medicine II | 5 | 6 | 90 | 3 | 1 | 4 |
| | SPT3S2 | Electrotherapy – I | 5 | 6 | 90 | 3 | 1 | 4 |
| | SPT3S3 | Physiology of Sports and Exercise (T+P) Practical | 5 | 4 | 90 | 3 | 1 | 4 |
| | | | | 2 | | 3 | 1 | 4 |
| | Total | | 26 | 30 | 468 | | | |

| Sem | Course code | Title of course | Hours per week | Credit | Total hrs. | Uty exam dur. (hrs) | Weight Ratio | |
|-----|--------------|---|----------------|-----------|------------|---------------------|----------------|-----------------|
| | | | | | | | Internal evaul | External evaul. |
| IV | SPT4G1 | Alternative Medicine | 3 | 3 | 54 | 3 | 1 | 4 |
| | SPT4G2 | Psychiatry | 5 | 5 | 90 | 3 | 1 | 4 |
| | SPT4G3 | Sports Psychology & Counseling | 4 | 4 | 72 | 3 | 1 | 4 |
| | SPT4S1 | Physiotherapy in Orthopedics and Sports Medicine (T+P) Practical | 5 | 6 | 90 | 3 | 1 | 4 |
| | | | 3 | 3 | 54 | 3 | 1 | 4 |
| | SPT4S2 | Electrotherapy – II (T+P) Practical | 5 | 4 | 90 | 3 | 1 | 4 |
| | | | | 2 | | 3 | 1 | 4 |
| | | School Visit | | | 30 | | | |
| | Project | | 3 | | | | | |
| | Total | | 25 | 30 | 478 | | | |

| Sem | Course code | Title of course | Hours per week | Credit | Total hrs. | Uty exam dur. (hrs) | Weight Ratio | |
|-----|--------------|---|----------------|-----------|------------|---------------------|----------------|-----------------|
| | | | | | | | Internal evaul | External evaul. |
| V | SPT5G1 | Biomechanics | 5 | 6 | 90 | 3 | 1 | 4 |
| | SPT5G2 | Weight Management, Rehabilitation and Fitness Practical | 4 | 2 | 72 | 3 | 1 | 4 |
| | | | | 2 | | 3 | 1 | 4 |
| | SPT5G3 | Medical Instrumentation & Hospital visit | 2 | 2 | 36 | 3 | 1 | 4 |
| | SPT5S1 | Physiotherapy in General Medicine and Surgery including cardiothoracic conditions – I | 5 | 6 | 90 | 3 | 1 | 4 |
| | SPT5S2 | Physiotherapy in Neurology & Neurosurgery | 5 | 6 | 90 | 3 | 1 | 4 |
| | SPT5S3 | Evidence based Physiotherapy | 3 | 3 | 54 | 3 | 1 | 4 |
| | SPT5S4 | Nutrition, Safety Education and Health Promotion | 3 | 3 | 54 | 3 | 1 | 4 |
| | Total | | 27 | 30 | 486 | | | |

| Sem | Course code | Title of course | Hours per week | Credit | Total hrs. | Uty exam dur. (hrs) | Weight Ratio | |
|-----|--------------|--|----------------|-----------|------------|---------------------|----------------|-----------------|
| | | | | | | | Internal evaul | External evaul. |
| VI | SPT6G1 | Psychology | 4 | 4 | 54 | 3 | 1 | 4 |
| | SPT6G2 | Sociology | 4 | 4 | 54 | 3 | 1 | 4 |
| | SPT6S1 | Physiotherapy in General Medicine and Surgery including cardiothoracic conditions - II | 5 | 6 | 90 | 3 | 1 | 4 |
| | SPT6S2 | Sports Nutrition Practical | 4 | 4 | 90 | 3 | 1 | 4 |
| | | | 2 | 2 | | 3 | 1 | 4 |
| | | Clinical Posting | | 5 | 180 | Viva Voce | | |
| | | Project | | 4 | | Viva Voce | | |
| | Total | | 19 | 29 | 468 | | | |

TOTAL CREDIT DISTRIBUTION

| Semester | Total credits |
|--------------------|---------------|
| I | 30 |
| II | 31 |
| III | 30 |
| IV | 30 |
| V | 30 |
| VI | 29 |
| Grand Total | 180 |

COURSE DETAILS

Project

The students are required to do an actual study among school going children, about the lifestyle, fitness level, physical activity and physiological profile, understanding their problems and giving innovative solutions. They have to submit this Project work at end of the fourth semester. A viva based on their presentation will be conducted at the end of the IV semester by an external examiner.

Clinical Posting

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

Case study & Project

Project will be a clinical assignment on given topic or condition (eg. General Medicine, Orthopaedics, or Neurology). This may be done in the form of a literature review along with case study. This will give the student a background on research methods and recent advances.

EXAMINATIONS

The evaluation of each course shall contain two parts such as internal or In-Semester Assessment (ISA) and External or End-Semester Assessment (ESA). The external examination of all semesters shall be conducted by the University at the end of each semester. Internal evaluation is to be done by continuous assessment. The ratio between internal and external examinations shall be 1:4. There shall be a maximum of 80 marks for external evaluation and maximum of **20** marks for internal evaluation. For all courses (theory & practical), grades are given on a 07-point scale based on the total percentage of marks. (*ISA+ESA*) as given below

| Percentage of Marks | Grade | Grade Point |
|---------------------|------------------|-------------|
| 90 and above | A+ - Outstanding | 10 |
| 80-89 | A - Excellent | 9 |
| 70-79 | B - Very Good | 8 |
| 60-69 | C - Good | 7 |
| 50-59 | D - Satisfactory | 6 |
| 40-49 | E - Adequate | 5 |
| Below 40 | F - Failure | 4 |

Note: Decimal are to be rounded to the next whole number

Marks distribution for external and internal assessments and the components for internal evaluation with their marks are shown below:

For all courses without practical

- a) Marks of external Examination : 80
 b) Marks of internal evaluation : 20

| Components of Internal Evaluation | MARKS |
|---|--------------|
| Attendance | 5 |
| Assignment /Seminar/Viva | 5 |
| Test paper(s) (1 or 2) (1x10=10; 2x5=10) | 10 |
| Total | 20 |

For all courses with practical

- a) Marks of theory –External Examination : 60
 b) Marks of theory –Internal Evaluation : 10

| Components of Theory – Internal Evaluation | Marks |
|---|--------------|
| Attendance | 3 |
| Assignment | 2 |
| Test paper(s) (1 or 2) (1x5=5; 2x2.5=5) | 5 |
| Total | 10 |

- c) Marks of Practical –External Examination : 40
 d) Marks of Practical- Internal Evaluation : 20

| Components of Practical- Internal evaluation | Marks |
|---|--------------|
| Attendance | 4 |
| Record | 10 |
| Lab involvement | 6 |
| Total | 20 |

Attendance Evaluation

1) For all courses without practical

| % of attendance | Marks |
|-----------------|-------|
| 90 and above | 5 |
| 85 – 89 | 4 |
| 80-84 | 3 |
| 76-79 | 2 |
| 75 | 1 |

2) For all courses with practical

| % of Attendance | Marks for theory |
|-----------------|------------------|
| 90 and above | 3 |
| 80--89 | 2 |
| 75--79 | 1 |

| % of Attendance | Marks for practical |
|-----------------|---------------------|
| 90 and above | 4 |
| 85--89 | 3 |
| 80--84 | 2 |
| 75--79 | 1 |

Assignments

Assignments are to be done from 1st to 4th Semesters. At least one assignment should be done in each semester.

Project Evaluation: (Max. marks100)

| Components of Project-Evaluation | Marks |
|----------------------------------|------------|
| Internal Evaluation | 20 |
| Dissertation (External) | 50 |
| Viva-Voce (External) | 30 |
| Total | 100 |

Credit point and Credit point average

Grades for the different Semesters and overall Programme are given based on the corresponding CPA, as shown in below

Credit point (**CP**) of a Course is calculated using the formula

$$CP = C \times GP, \text{ where } C = \text{Credit}; GP = \text{Grade Point}$$

Credit Point Average (**CPA**) of a Semester or Programme etc. is calculated using the formula

$$CPA = \frac{TCP}{TC}, \text{ where } TCP = \text{Total Credit Point};$$

TC = Total Credit

| CPA | Grade |
|----------------------|------------------|
| above 9 | A+ - Outstanding |
| above 8 but ≤ 9 | A - Excellent |
| above 7 but ≤ 8 | B - Very Good |
| above 6 but ≤ 7 | C - Good |
| above 5 but ≤ 6 | D - Satisfactory |
| above 4 but ≤ 5 | E - Adequate |
| ≤ 4 | F - Failure |

B. Voc Programme in Sports Nutrition And Dietetics Detailed Syllabus of the Programme

SEMESTER I

**Course code – ENCN01
English –I Communication Skills in English**

Credits: 6

Contact hours: 5 Total Hours: 90

(Existing university syllabus)

**Course code - SPT1G1
Basic Nutrition**

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Introduction to Nutrition, Definitions: Food, nutrition, Health, Nutrients, optimum nutrition, nutritional status, good nutritional status, poor nutritional status, malnutrition, under nutrition, signs of good nutritional status, signs of poor nutritional status, definition and functions of nutrients. Functions of food as a source of nutrients

Module II

Food and Our Body: Food and its functions, digestion, absorption and metabolism of food
Buccal digestion, gastric digestion and intestinal digestion, factors that affect digestion, absorption and metabolism, Five food groups, dietary guidelines and food pyramid

Module III

Energy Metabolism: Introduction, unit of measurement, energy value of food- calorimetry or bi proximate composition; energy needs of the body- reference man and reference woman; basal metabolic rate, factors affecting the BMR

Module IV

Carbohydrates: Introduction, classification of carbohydrates, digestion, absorption and metabolism, functions, deficiency, recommended dietary intake and sources. Role of dietary fibre in prevention and treatment of diseases

Module V

Lipids: Introduction , classification of lipids, functions of fat, digestion, absorption and metabolism of fat, deficiency, food sources and RDA

Module VI

Proteins: Introduction, classifications of proteins, nutritional classification of amino acids protein quality - biological value, net protein utilization, protein efficiency ratio. Function, deficiency, sources and requirements.

Module VII

Vitamins: Classification- fat soluble and water soluble vitamins;

Fat soluble vitamins, A, D, E and K - introduction, function, deficiency, sources, RDA

Water soluble vitamins- B complex and C-introduction, functions, deficiency, sources, RDA

Module VIII

Minerals: General functions of minerals, deficiency, sources and RDA. Deficiency of following minerals: calcium, sodium, potassium, iron and iodine

Module IX

Water: Introduction, functions, water, daily intake of water, daily loss of water, body water, water balance, deficiency of water, retention of water, daily requirements.

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13. C. Gopalan, B.V. Ramasastri and S.C. Balasubramanian (1989)- Nutritive Value of Indian Foods. NIN ICMR Hyderabad 500 007

Course code - SPT1S1 Human Anatomy (Theory)

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Histology: General Histology, study of the basic tissues of the body.

Microscope, Cell, Epithelium, Connective Tissue, Cartilage, Bone, Muscular tissue, Nerve Tissue-TS & LS, Circulatory system-large sized artery, medium sized artery, large sized vein, lymphoid tissue, Skin and its appendages.

Module II

Embryology: Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations. Development of skin, Fascia, blood vessels, lymphatic. Development of bones,

axial and appendicular skeleton and muscles. Neural tube, brain vessels and spinal cord
Development of brain and brain stem structures

Module III

Regional Anatomy

Thorax:

a) Cardio-Vascular System - Mediastinum: Divisions and contents; Pericardium: Thoracic wall- position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart, names of the blood vessels and their distribution in the body-region wise
(b) Respiratory system: Outline of respiratory Passages, Pleura and lungs – position, parts, relations, blood supply and nerve supply; Lungs-emphasize on broncho-pulmonary segments;
Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm
Inter costal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action

Abdomen:

a) Peritoneum: Parietal peritoneum, Visceral peritoneum, folds of peritoneum, functions of peritoneum
b) Large blood vessels of the gut
c) Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, gall bladder

Pelvis:

Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system

Endocrine glands:

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

Module IV

Musculo Skeletal Anatomy

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

drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot, skin of foot

- Joints: Hip Joint, Knee joint, Ankle joint- joints of the foot.

h) Trunk & Pelvis:

- Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs
- Soft tissue: Pre and Para vertebral muscles, intercostals muscles, anterior abdominal wall muscles, Inter-vertebral disc.
- Pelvic girdle and muscles of the pelvic floor.

i) Head and Neck:

- Osteology: Mandible and bones of the skull.
- Soft parts: Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck.
- Gross anatomy of eyeball, nose, ears and tongue

Module V

Neuro Anatomy

a) Organization of Central Nervous system, Spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system

b) Cranial nerves

c) Peripheral nervous system

Peripheral nerve, neuromuscular junction, Sensory end organs

d) Central Nervous System

Spinal cord, Spinal segments and areas, Brain Stem, Cerebellum, Inferior colliculi, Superior Colliculi, Thalamus, Hypothalamus, Corpus striatum, Cerebral hemisphere, Lateral ventricles, Blood supply to brain, Basal Ganglia, The Pyramidal system, Pons, medulla, extra pyramidal systems, Anatomical integration

Human Anatomy (Practical)

Credits: 3

Contact hours: 3

Total Hours: 54

1. Upper extremity including surface Anatomy
2. Lower extremity including surface Anatomy
3. Head, Spinal cord, Neck and Brain including surface Anatomy
4. Thorax including surface anatomy, abdominal muscle joints
5. Histology-Elementary tissue including surface Anatomy
6. Embryology-models, charts & X-rays
 - Demonstration of the muscles of the whole body and organs in thorax and abdomen in a cadaver
 - Demonstration of movements in important joints
 - Surface marking of the lung, pleura, fissures and lobes of lungs, heart, liver, spleen
 - Kidney, cranial nerves, spinal nerves and important blood vessels
 - Identification of body prominences on inspection and by palpation especially of extremities.
 - Points of palpation of nerves and arteries

References

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9. SINGH [Inderbir]. Human Osteology, JP Brothers, New Delhi 1990.

Course code - SPT1S2
Human Physiology (Theory)

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

General Physiology

- Cell Morphology. Organelles: their structure and functions
- Transport Mechanisms across the cell membrane
- Body fluids: Distribution, composition. Tissue fluid-formation

Module II

Blood

- Introduction: Composition and functions of blood
- Plasma: composition, formation, functions, Plasma proteins
- RBC: count and its variations; Erythropoiesis-stages, factors regulating, Reticulo-endothelial system (in brief) Haemoglobin – Anaemia (in detail), types of Jaundice, Blood indices, PCV, ESR.
- WBC: Classification, Morphology, functions, count, its variation of each, immunity
- Platelets: Morphology, functions, count, its variations.
- Haemostatic mechanisms: Blood coagulation factors, mechanisms, their disorders, Anticoagulants.
- Blood Groups: Landsteiner's law. Types, significance, determination, Erythroblastosis foetalis
- Blood Transfusion: Cross matching, Indications and complications.
- Lymph: Composition, formation, circulation and functions.

Module III

Nerve Muscle Physiology

- Introduction: Resting membrane potential. Action potential-ionic basis and properties
- Nerve: Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibres. Nerve injury-degeneration and regeneration.
- Neuroglia: Types and functions.
- Muscle: Classification. Skeletal Muscle: Structure. Neuromuscular junction: Structure, Neuromuscular transmission, Myasthenia gravis. Excitation- Contraction coupling. Rigor mortis, Motor unit, Properties of skeletal muscles, Strength- Duration curve, Length- tension relationship, fatigue, load.
- Smooth muscle: Structure, types, mechanism of contraction, Plasticity.

Module IV

Cardiovascular System

- Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organisation of CVS. cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential, Properties.
- Conducting system: Components. Impulse conduction Cardiac Cycle: Definition, Phases of cardiac cycle, Pressure and Volume curves, Heart sounds-causes, character. ECG: Definition, Different types of leads, Waves and their causes. P-R interval. Heart block.
- Cardiac output: Definition, Normal value, Determinants. Stroke volume and its regulation. Heart rate and its regulation, Their variations.
- Arterial Blood Pressure: Definition, Normal values and its variations. Determinants, Peripheral resistance, Regulation of BP.
- Arterial pulse.
- Shock - Definition. Classification - causes and features
- Regional Circulation : Coronary, Cerebral and Cutaneous circulation.
- Cardiovascular changes during exercise

Module V

Respiratory System

- Introduction: Physiological anatomy - Pleura, trachea – bronchial tree, alveolus, respiratory membrane and their nerve supply, Functions of respiratory system, Respiratory muscles.
- Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration. Chest expansion, Lung compliance: Normal value, pressure-volume Curve, factors affecting compliance and its variations, Surfactant - Composition, production, functions, RDS.
- Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume, Respiratory minute volume.
- Dead Space: - Types and their definition.
- Pulmonary Circulation, ventilation-perfusion ratio and its importance.
- Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport- Different forms, oxygen-hamoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr effect. Carbon dioxide transport: Different forms, Chloride Shift.
- Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control, Chemical Regulation
- Hypoxia: Effects of hypoxia, Types of hypoxia, Hyperbaric oxygen therapy, Acclimatization Hypercapnoea, Asphyxia, Cyanosis-types and features. Dysbarism
- Disorders of Respiration: Dyspnoea, Orthopnoea, Hyperpnoea, hyperventilation, apnoea, tachypnoea, periodic breathing – types
- Artificial respiration
- Respiratory changes during exercise

Module VI

Digestive System

- Introduction: Physiological anatomy and nerve supply of alimentary canal, Enteric nervous system
- Salivary Secretion: Saliva: Composition, Functions, Regulation, Mastication (in brief)
- Swallowing: Definition, Different stages, Functions.

- Stomach: Functions, Gastric juice: Gland, composition, function, regulation, Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility, Gastric emptying, Vomiting.
- Pancreatic Secretion: Composition, production, function, Regulation.
- Liver: Functions of liver. Bile secretion: Composition, functions and regulation. Gall bladder: Functions.
- Intestine: Succus entericus: Composition, function and regulation of secretion, Intestinal motility and its function and regulation
- Mechanism of Defaecation.

Module VII

Renal System

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

Module VIII

Endocrine System

- Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones.
- Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone. Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus, Physiology of growth and development: hormonal and other influences.
- Pituitary-Hypothalamic Relationship.
- Thyroid Gland: Thyroid hormone and calcitonin: Secretory cells, synthesis, storage, action and regulation of secretion, Disorders: Myxoedema, Cretinism, Grave's disease.
- Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism, Hyperthyroidism, Calcium metabolism and its regulation.
- Adrenal Gland: Adrenal cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol, Androgens, Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome. Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline.
- Disorders: Pheochromocytoma.
- Endocrine Pancreas: Secretory cells, action regulation of secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.
- Calcitriol, Thymus and Pineal gland (very brief)
- Local Hormones (briefly)

Module IX

Reproductive System

- Introduction: Physiological anatomy, reproductive organs, sex determination, Sex differentiation, Disorder.
- Male Reproductive System: Functions of testes. Pubertal changes in males. spermatogenesis. Testosterone: action. Regulation of secretion. Semen
- Female Reproductive system: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis, hormones: Oestrogen, progesterone-action. Regulation of secretion. Menstrual Cycle: Phases. Ovarian cycle. Uterine cycle. Hormonal basis. Menarche. Menopause. Pregnancy; Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods.

Module X

Special Senses

- Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor- glaucoma, lens-cataract, vitreous humor, rods and cones. Photopicvision. Scotopicvision.
- Visual Pathway and the effects of lesions. Refractive Errors: myopia, hypermetropia, presbyopia and astigmatism.
- Visual Reflexes: Accomodation, Pupillary and Light. Visual acuity and Visual field. Light adaptation. Dark adaptation. Color vision - color blindness- Nyctalopia.
- Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear. Structure of cochlea and organ of Corti. Auditory pathway. Types of deafness. Tests for hearing. Audiometry.
- Taste: Taste buds. Primary tastes. Gustatory pathway.
- Smell: Olfactory membrane. Olfactory pathway.
- Vestibular Apparatus: Crista ampullaris and macula. Functions. Disorders.

Module XI

Nervous System

- Introduction: Organisation of CNS- central and peripheral nervous system. Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties.
- Sensory Mechanism: Sensory receptors: Function, classification and properties. Sensory pathway: The ascending tracts- Posterior column tracts, Lateral spinothalamic tract and the anterior Spinothalamic tract- Their origin, course, termination and functions. The trigeminal pathway. Sensory cortex. Somatic Sensations: crude touch, fine touch tactile localization, tactile discrimination, stereognosis, vibration sense, kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain - slow and fast pain, hyperalgesia. Deep pain. Visceral pain- referred pain. Gate control theory of pain. Tabes dorsalis, sensory ataxia.
- Motor Mechanism: Motor cortex. Motor pathway: The descending tracts- pyramidal tracts, extra pyramidal tracts- origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.
- Reflex Action: components, Bell-Magendie law, classification and Properties. Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes. Stretch reflex-structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex. Muscle tone - definition and properties hypotonia, atonia and hypertonia. UMNL and LMNL.
- Spinal cord Lesions: Complete transection and Hemisection of the spinal cord.
- Cerebellum: Functions. Cerebellar ataxia.

- Posture and Equilibrium: Postural reflexes - spinal, medullary, midbrain and cerebral reflexes.
- Thalamus and Hypothalamus: Nuclei Functions. Thalamic syndrome.
- Reticular Formation and Limbic System: Components and Functions.
- Basal Ganglia: structures included and functions. Parkinson's disease.
- Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex-learning, memory and speech.
- EEG: Waves and features. Sleep: REM and NREM sleep.
- CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.
- ANS: Features and actions of parasympathetic and sympathetic nervous system.

Module XII

Physiology of Exercise

- Effect of acute and chronic exercise on O₂ transport, muscle strength/power/endurance, BMR/RQ, Hormonal and metabolic effect, Cardiovascular system, Respiratory System, Body fluids and electrolyte
- Effects of gravity/ altitude/ acceleration/ pressure on physical parameters.
- Physiology of age

Human Physiology (Practical)

Credits: 3

Contact hours: 3

Total Hours: 54

I. Haematology

To be done by the students

1. Study of Microscope and its uses
2. Determination of RBC count
3. Determination of WBC count
4. Calculation of blood indices
5. Determination of blood groups

Demonstrations only

1. Determination of ESR
2. Determination of PCV

II. Clinical Examination

1. Examination of Radial Pulse
2. Recording of blood Pressure
3. Examination of CVS
4. Examination of Respiratory system
5. Examination of sensory system
6. Examination of Motor System
7. Examination of reflexes
8. Examination of cranial nerves

III. Amphibian Experiments - Demonstration and Dry charts Explanation.

1. Instruments used for frog experiments. Kymograph, heart, liver, Muscle, trough, stimulator.
2. Simple muscle curve.
3. Effect of increasing the strength of the stimuli
4. Effect of temperature on muscle contraction.
5. Effect of two successive stimuli.
6. Effect of Fatigue
7. Effect of load on muscle contraction

8. Genesis of tetanus and clonus
9. Velocity of impulse transmission.
10. Normal cardiogram of amphibian heart.
11. Properties of Cardiac muscle
12. Effect of temperature on cardiogram.

IV. Recommended Demonstrations

1. Spirometry
2. Artificial Respiration
3. ECG
4. Perimetry
5. Mosso's Ergometry

References

1. Guyton A. C., Hall J. E., Text book of Medical Physiology (1996), 9th Edition, Prism Books Pvt. Ltd, Bangalore.
2. Winwood; Sear's Anatomy and Physiology for Nurses (1988), Edward Arnold, London.
3. Chatterjee C. C., Text book of Medical Physiology (1988) W. B. Saunder's Co., London.
4. Ross and Wilson, Anatomy and Physiology in Health and Illness (2003) Churchill 9th Edition Livingstone, Edinburgh.
5. Tortora G. J., Grabowski RS, Principles of Anatomy and Physiology (2000) 9th edition, John Wiley & Sons Inc.
6. Indge B., Rowland M., Baker M., A new Introduction to Human Biology (2005), Hodder & Stoughton.
7. Weston T., Atlas of Anatomy (1988), Sunrise Books Publishers, London.
8. Creager J. G., Human Anatomy and Physiology (1993), Wadsworth Publishing Co.
9. Brown H. and Kozlowski R. Physiology and Pharmacology of the Heart, (1997), Black well Science.
10. The Encyclopedic Atlas of the Human Body (2005), Global Book Publishing.
11. Glaskar, The Human 3D, An exciting 3D multimedia - Tour through your body, Mega systems software.
12. Understanding Medical Physiology , R.L. Bijlani, (1995) J P Brothers Medical Publishers.
13. Text Book of Medical Physiology, Guyton Hall , (2003)Saunders publishers.
14. Principles of Anatomy and Physiology. Tortora (2003). John Wiley and sons.
15. Human Physiology, by C.C.Chatterjee, (2002)Medical Allied Agency

SEMESTER II

Course code - ENCN02

English II - Critical thinking, Academic writing & presentation

Credits: 6

Contact hours: 5

Total Hours: 90

(Existing university syllabus)

Course code- SPT2G1
Information Technology and IT Tools (T+P)

Credits: 6

Contact hours: 5 Total Hours: 90

Module I

Introduction to Computers – peripheral devices, Hardware, Soft ware – System software, Application Software. Memories – semiconducting, magnetic and optical memory devices. Operating systems – DOS, Windows, UNIX and Linux.

Module II

Microsoft Word- Basics of Word Processing, Opening, Creating, Editing, Formatting, Saving, Printing and Quitting Documents, Merging Document, Using Mail Merge feature for Labels and Envelopes. Microsoft Power Point-Creating a presentation using Auto content wizard, Creating presentation using Design Template, Adding animation in slides. Microsoft Excel - Worksheets Basics, Data Entry in cells, Editing, Saving, Formatting and calculations, Working with Charts and Graphics, Database Management, Functions and Macros

Module III

Introduction to Linux :Shell – Executing commands and command options.
File Utilities (cp, mv, rm, etc.).

Module IV

Learning the Internet-Internet & its scope, connecting to internet, Opening an Email account, sending & receiving Emails, Browsing the WWW

Module V

Page maker Wok Space- Basic tools and applications-Rulers and Guides- Creating, saving and printing new document-Working with text-pointer tools- control palette -importing text, working with layers.

Practical training

References:

1. Fundamentals of Computers, V Rajaraman, Prentice-Hall of India, New Delhi.
2. Computer and Commonsense, Roger Hunt & John Shelley, PHI
3. PageMaker for macintosh and windows, David D Busch, BPB Publications.

Course code – SPT2S1
Orientation to Sports Physiotherapy

Credits: 4

Contact hours: 4

Total Hours: 72

Module I

Patterns of Health care Delivery: National trends and resources, Local trends and resources, Overview of health Science professions, Components of Physiotherapy profession: History of medical therapeutics, History of Physiotherapy, Role of physiotherapy in meeting Health Care Needs in India.

Module II

Meaning of Physiotherapy, Scope and utility of physiotherapy, Physiotherapy in sprain, strain, muscle pull, muscle soreness, Hydrotherapy, meaning, precaution in giving the hydrotherapy, Benefits of hydrotherapy.

Module III

Massage: Meaning and importance in sports, Physical benefits of massage with its utility in sports, Electrotherapy: Meaning & Importance, Danger of using Electrotherapy, Benefits of Electrotherapy

Module IV

Meaning of Thermotherapy, Physiological effects of Thermotherapy. Do's and don'ts in Thermo Therapy, Cryo-Therapy importance of CryoTherapy methods employed in Cryo Therapy.

Module V

Exercise therapy, Meaning of therapeutic exercise, kinds and its utility in sports. Therapeutic exercise for person suffering from back pain and spondylosis.

References

1. Sports Physiotherapy-K. C. Shekhar
2. Preventive & Corrective Physical Education by George Thomas
3. Giving to elderly people –understanding and practical help
4. Physiotherapy in Medical conditions by Joan R. Cash

Course code – SPT2S2 Sports & Exercise Therapy (Theory)

Credits: 7

Contact hours: 6

Total Hours: 108

Module I

Introduction to Exercise Therapy

The aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient's problems, Assessment of patient's condition - Measurements of Vital parameters, Starting Positions - Fundamental positions & derived Positions, Planning of Treatment.

Module II

Methods of Testing

a. Functional tests

b. Measurement of Joint range: ROM-Definition, Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses; Limitations of goniometry Techniques for measurement of ROM for all peripheral joints

c. Tests for neuromuscular efficiency

- Electrical tests
- Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations, Techniques of MMT for group & individual muscles: Techniques of MMT for upper limb/ Techniques of MMT for lower limb/Techniques of MMT for spine.
- Anthropometric Measurements: Muscle girth-biceps, triceps, forearm, quadriceps, calf
- Static power Test, Dynamic power Test, Endurance-test, Speed test

d. Tests for Co-ordination

e. Tests for sensation

f. Pulmonary Function tests

g. Measurement of Limb Length: true limb length, apparent limb length, segmental limb length

h. Measurement of the angle of Pelvic Inclination

Module III

Relaxation

Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indications of relaxation Methods & techniques of relaxation-Principles & uses: General, Local, Jacobson's, Mitchell's additional methods.

Module IV

Passive Movements

Causes of immobility, Classification of Passive movements, Specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses, Techniques of giving passive movements.

Module V

Active Movements

- Definition of strength, power & work, endurance, muscle actions. Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical events during contraction & relaxation muscle fiber type, motor unit, force gradation.
- Causes of decreased muscle performance Physiologic adaptation to training: Strength & Power, Endurance.
- Types of active movements
- Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses.
- Active Assisted Exercise: principles, techniques, indications, contraindications. effects and uses
- Assisted - Resisted Exercise: principles, techniques, indications, contraindications, effects and uses.
- Resisted Exercise: Definition, principles, indications, contraindications, precautions & techniques, effects and uses
- Types of resisted exercises: Manual and Mechanical resistance exercise. Isometric exercise.
- Dynamic exercise: Concentric and Eccentric, constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed - Chain exercise.
- Specific exercise regiments.
- Isotonic: de Lormes, Oxford, Mac Queen, Circuit weight training
- Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics, Isokinetic regiments.

Module VI

Proprioceptive Neuromuscular Facilitation

- Definitions & Goals, Basic neurophysiologic principles of PNF: Muscular activity
- Diagonals patterns of movement: upper limb, lower limb
- Procedure: components of PNF
- Techniques of facilitation
- Mobility: Contract relax, Hold relax, Rhythmic initiation
- Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization.
- Stability: Alternating isometric, rhythmic stabilization.
- Skill: timing for emphasis, resisted progression
- Endurance: Slow reversals, agonist reversal

Module VII

Suspension Therapy

Definition, principles, equipments & accessories. Indications & contraindications. Benefits of suspension therapy. Types of suspension therapy: axial, vertical, pendular. Techniques of suspension therapy for upper limb. Techniques of suspension therapy for lower limb

Module VIII

Functional Re-education

Lying to sitting : Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lowerlimb and Upperlimb activities.

Module IX

Aerobic Exercise

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

Module X

Stretching

Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise, Effects of stretching, Inhibition and relaxation procedures, Precautions and contraindications of stretching, Techniques of stretching.

Module XI

Manual Therapy & Peripheral Joint Mobilization

Schools of Manual Therapy, Principles, Grades, Indications and Contraindications. Effects and Uses - Maitland. Kaltenborn, Mulligan; Biomechanical basis for mobilization. Effects of joint mobilization, Indications and contraindications. Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb, Precautions.

Module XII

Balance

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

Module XIII

Co-ordination Exercise

Anatomy & Physiology of cerebellum with its pathways. Definitions: Co-ordination, Inco-ordination. Causes for Inco-ordination, Test for co-ordination: equilibrium test, non equilibrium test Principles of co-ordination exercise. Frenkel's Exercise: uses of Frenkel's exercise, technique of Frenkel's exercise, Progression, home exercise.

Module XIV

Posture

Definition, Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Principles of re-education: corrective methods and techniques, Patient education.

Module XV

Walking Aids

Types: Crutches, Canes, Frames; Principles and training with walking aids.

Module XVI

Massage

History and Classification of Massage Technique, Principles, Indications and contraindications, Technique of Massage Manipulations, Physiological and Therapeutic uses of specific Manipulations.

Module XVII

Hydrotherapy

Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Use of special equipments, techniques, Effects and uses, merits and demerits

Module XVIII

Individual and Group Exercises

Advantages and Disadvantages, Organisation of Group exercises, Recreational Activities and Sports

Sports & Exercise Therapy (Practical)

Credits: 2

Contact hours: 2

Total Hours: 36

The students of exercise therapy are to be trained in practical Laboratory work for all the topics discussed in theory. The student must be able to evaluate and apply judiciously the different methods of exercise therapy techniques on the patients. They must be able to

1. Demonstrate the technique of measuring using goniometry
2. Demonstrate muscle strength using the principles and technique of MMT
3. Demonstrate the techniques for muscle strengthening based of MMT grading
4. Demonstrate the PNF techniques
5. Demonstrate exercise for training co-ordination – Frenkel’s exercise
6. Demonstrate the techniques of massage manipulations
7. Demonstrate techniques for functional re-education
8. Assess and train for using walking aids
9. Demonstrate mobilization of individual joint regions
10. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles
11. Demonstrate the techniques for muscle stretching
12. Assess and evaluate posture and gait
13. Demonstrate to apply the technique of passive movements
14. Demonstrate various techniques of Active movements
15. Demonstrate techniques of strengthening muscles using resisted exercises
16. Demonstrate techniques for measuring limb length and body circumference.

References

1. Therapeutic exercise by Barbara Bandy
2. Therapeutic exercise by Carolyn Kisner
3. Principles of exercise therapy by M. Dena Gardiner
4. Practical Exercise therapy by Hollis Margaret
5. Therapeutic exercise by Sydney Litch
6. Therapeutic exercise by Hall & Brody
7. Therapeutic exercise by Basmajjian
8. Physical Rehabilitation by o’Sullivan
9. Therapeutic massage by Sinha
10. Principles of muscle testing by Hislop

Course code – SPT2S3
Clinical Orthopaedics & Sports Medicine -I

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Introduction

Introduction to orthopaedics. Clinical examination in an Orthopaedic patient. Common investigative procedures. Radiological and Imaging techniques in Orthopaedics, Inflammation and repair, Soft tissue healing.

Module II

Traumatology

Fracture-Definition, Types, Signs and symptoms. Fracture healing, complications of fractures. Conservative and surgical approaches. Principles of management- reduction (open/closed, immobilization etc.), subluxation/dislocations- definition, signs and symptoms, management (conservative and operative)

Module III

Fractures and dislocations of upper Limb:

Fractures of upper Limb- causes, clinical features, mechanism of injury complications, conservative and surgical management of the following fractures. Fractures of clavicle and scapula. Fractures of greater tuberosity and neck of humerus. Fracture shaft of humerus. Supracondylar fracture of humerus. Fractures of Capitulum, radial head, olecranon, coronoid, and epicondyles. Side swipe injury of elbow. Both bone fractures of ulna and radius. Fracture of forearm- Monteggia, Galeazzi fracture-dislocation. Chauffeur's fracture. Colle's fracture. Smith's fracture, scaphoid fracture. Fracture of the metacarpals. Bennett's fracture. Fracture of phalanges (proximal and middle)

Dislocations of Upper Limb - Anterior dislocation of shoulder - mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver) surgical management (putti plat, bankart's) etc. Recurrent dislocation of shoulder, Posterior dislocation of shoulder-mechanism of injury, clinical features and management. Posterior dislocation of elbow-mechanism of injury, clinical feature, complications & management.

Module IV

Fracture of Spine

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

Module V

Fractures and Dislocations of Lower Limb

Fracture of Pelvis and Lower Limb- causes, clinical features, mechanism of injury, complications conservative and surgical management of the following fractures: Fracture of pelvis. Fracture neck of femur-classification, clinical features, complications, management - conservative and surgical. Fractures of trochanters, Fracture shaft of femur-clinical features, mechanism of injury. Complications, management-conservative and surgical. Supracondylar fracture of femur, Fractures of the condyles of femur. Fracture patella, Fractures of tibial condyles, Both bone fracture of tibia and fibula, Dupuytren's fracture, Maisonneuve's fracture.

Pott's fracture-mechanism of injury, management Bimalleolar fracture, Trimalleolar fracture, Fracture calcaneum mechanism of injury, complications and management, Fracture of talus. Fracture of metatarsals-stress fractures jone's fracture, Fracture of Phalanges. Dislocations of Lower limb- mechanism of injury, clinical features, complications, management of the following dislocations of lower limb. Anterior dislocations of hip. Posterior dislocation of hip. Central dislocation of hip, dislocation of patella, recurrent dislocation of patella.

Module VI

Soft Tissue Injuries

Define terms such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries: Meniscal injuries of knee, Cruciate injuries of knee, Medial and lateral, collateral injuries of knee, Lateral ligament of ankle, Wrist sprains. Strains-quadriceps, hamstrings, calf, biceps, triceps etc. Contusions- quadriceps, gluteal, calf, deltoid etc. Tendon ruptures- Achilles, rotator cuff muscles, biceps, pectorals etc.

Module VII

Hand Injuries

Mechanism of injury, clinical features, and management of the following- crush injuries. Flexor and extensor injuries. Burn injuries of hand.

Module VIII

Amputations

Definition, levels of amputation of both lower and upper limbs, indications, complications.

Module IX

Traumatic Spinal Cord Injuries

Clinical features, complications, medical and surgical management of Paraplegia and quadriplegia.

References:

1. Outline of Fractures - John Crawford Adams.
2. Outline of Orthopedics - John Crawford Adams.
3. Text book of Orthopedics - Maheswari
4. Apley's Orthopedics
5. Textbook of Orthopedics and Traumatology- M.N.Natarajan.

SEMESTER III

Course code – SPT3G1

Therapeutic Nutrition

Credits: 4

Contact hours: 4

Total Hours: 72

Module I

Modification of diet- fever, metabolism in fever, general dietary consideration

Module II

Diet in gastrointestinal diseases- Aeiology, symptoms and dietary management of constipation, diarrhoea and peptic ulcer.

Module III

Diet in cardiovascular diseases- Aetiology, symptoms and dietary management of Atherosclerosis, Hypertension

Module IV

Diet in Diabetes mellitus- Aetiology, symptoms, types and dietary modifications.

Module V

Diet in obesity and Leanness- Types causes, dietary modifications complications.

Module VI

Diet in renal diseases- Nephritis, Nephrosis, acute and chronic renal failure, renal calculi, dialysis. Causes, symptoms and dietary management.

Module VII

Feeding the patient- Psychology of feeding patients

References

1. Robinson C H, Lawler M R, Cheweth W L and Gaswick A E (1986), Normal and Therapeutic Nutrition, 17th Edition, Mac Milan Publishers
2. Mohan K L, Krause M V, (2002), 2nd Edition. Food, Nutrition and Diet Therapy, WS Suder's Co., Philadelphia
3. Antia P, Clinical Dietetics and Nutrition, 2nd Edition, Oxford University Press.
4. Guthrie H A, Picciano M F, (1995), Human Nutrition, Mosby, St. Louis Missionary.
5. Michael Sharon (1994), Complete Nutrition, Avery publishing Group, New York
6. Garrow J S, James W P T, Ralph A, (2000), Human Nutrition and Dietetics, 10th Edition, Churchill, Livingstone, London.

Course code – SPT3G2**Scientific Principles and Practices of Health & Fitness Training**

Credits: 4

Contact hours: 4

Total Hours: 72

Module I

Health & wellness: Concepts of health, wellness, illness, disease. Lifestyle and health. Path Physiology of cardiovascular diseases, obesity, Type 2 diabetes, cancer, osteoporosis, Effect of physical activity on mental health

Module II

Role of physical activity in reducing the risk of : mortality, CVD, obesity, Type 2 diabetes, cancer, osteoporosis, Factors that promote or inhibit behavioral changes towards and engagement in physical activity; Stages of Change

Module III

Components of Fitness: Health related and skill/performance related components of fitness, Principles of overload, progression, specificity, reversibility, placement, adaptation, individual difference and enjoyment, Principles of warm-up and cool-down, Phases of free-movement warm up. Justification of new exercise recommendations. Exercise prescription for the general population,

Module IV

Resistance Training: Local muscular endurance training. Strength training, Safe lifting technique, Safety in the weights room, Types of resistance training, Phases of a resistance training session, Terminology of resistance training, Spotting, Observation and correction.

Reference:

1. David, "Wellness Concepts and Applications" (2nd Edition), Mosby.
2. Thomas. D, "Basic Weight Training for Men and Women" (3rd Edition), Mayfield.
3. Wener Hoeger, Sharon Hoeger, "Fitness and Wellness" (7th Edition), Thomson
4. Daryl. S, "Introduction to Phy. Edu. Fitness and Sports (4th Edition)," MGH
5. Stone.M, "Weight Training A Scientific Approach," B I
6. Fahey.T, "Weight Training Basics A complete Guide for Men and Women," MGH

Course code – SPT3G3
First Aid & Nursing

Credits: 4

Contact hours: 4

Total Hours: 72

Module I

First Aid

1. Importance of First Aid in Physiotherapy
2. Examination of Vital Signs
3. First Aid in cardiac arrest
4. First Aid in Respiratory failure
5. First Aid in Burns
6. First Aid in Electric shock
7. First Aid in Drowning
8. First Aid in Spinal cord injuries
9. First Aid in Hypovolemic Shock
10. First Aid in Poisoning
11. Instrumentation used in First Aid (First Aid kit)
12. First Aid in RTA
13. Indication of CPR
14. Assessment and technique of CPR
15. Artificial ventilation

Module II

Nursing

Nursing Principles. Inter- Personnel relationships: Bandaging: Basic turns; Bandaging extremities; Triangular Bandages and their application.

Nursing Position: Environment safety; Bed making, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, Aids to rest and sleep.

Lifting and Transporting Patients: Lifting Patients up in the bed, Transferring from bed to wheel chair. Transferring from bed to stretcher.

Bed side Management: Giving and taking Bed pan, Urinal: Observation of stools, urine. Observation of sputum, Understand use and care of catheters, enema giving.

Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion.

Care of Rubber Goods: Observation, Reporting and Recording, Temperature, Respiration and Pulse, simple aseptic Technique, Sterilisation and Disinfection.

Surgical Dressing: Observation of dressing

Procedures

References

1. First aid in Emergency, St. John ambulance Association
2. Physiotherapy in Burns & Reconstruction by Glassey
3. Surgical & Medical Procedures for Nurses & Paramedical staff by Nathan
4. First aid & Management of general injuries & common ailments by Gupta & Gupta

Course code – SPT3S1
Clinical Orthopaedics & Sports Medicine-II

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Deformities:

Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities. Congenital Deformities - CTEV, CDH, Torticollis Scoliosis. Flat foot. Vertical talus, Hand anomalies- syndactyly, polydactyly and ectrodactyly. Arthrogryposis multiplex congenita (amyoplasia congenita). Limb deficiencies- Amelia and Phocomelia. Klippel feil syndrome. Osteogenesis imperfecta (fragile ossium). Cervical rib. Acquired deformities- Acquired Torticollis. Scoliosis. Kyphosis. Lordosis. Genu varum. Genu valgum. Genu recurvatum Coxa vara. Pes cavus. Hallux rigidus. Hallux valgus. Hammer toe. Metatarsalgia.

Module II

Disease of Bones and joints:

Causes, Clinical features, Complications, Management- medical and surgical of the following conditions:

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

Module III

Inflammatory and Degenerative Conditions: Causes. Clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions: Osteoarthritis. Rheumatoid arthritis. Ankylosing spondylitis Gouty arthritis. Psoriatic arthritis. Hemophilic arthritis. Still's disease (juvenile rheumatoid arthritis). Charcot's joints.

Connective Tissue Disorders- Systemic Lupus Erythematosus Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)

Module IV

Syndromes:

Causes, clinical feature, complications, management- conservative and surgical of the following: Cervico brachial syndrome. Thoracic outlet syndrome. Vertebrobasilar syndrome. Scalenus syndrome. Costo clavicular syndrome. Levator scapulae syndrome. Piriformis syndrome.

Module V

Neuromuscular Disorders: Definition, causes, clinical feature. complications. management. (Multidisciplinary approach) medical and surgical of the following conditions: Cerebral palsy. Poliomyelitis. Spinal Dysraphism. Leprosy.

Module VI

Cervical and Lumbar pathology:

Causes, clinical features, patho-physiology, investigations, Management- Medical and surgical for the following: Prolapsed intervertebral disc (PID), Spinal canal Stenosis.

Spondylosis (cervical and lumbar) Spondylolysis. Spondylolisthesis. Lumbago/Lumbosacral strain. Sacralisation. Lumbarisation. Coccydynia. Hemivertebra.

Module VII

Orthopedic Surgeries:

Indications, Classification, Types, Principles of management of the following Surgeries: Arthrodesis. Arthroplasty (partial and total replacement). Osteotomy, External fixators. Spinal stabilization surgeries (Harrington's, Luque's, Steffiplating) etc, Limb re-attachments.

Module VIII

Regional conditions:

Definition, Clinical features and management of the following regional conditions

- Shoulder: Periarthritic shoulder (adhesive capsulitis). Rotator. Cuff tendinitis. Supraspinatus Tendinitis. Infraspinatus Tendinitis. Bicipital Tendinitis. Subacromial Bursitis.
- Elbow: Tennis Elbow. Golfer's Elbow. Olecranon Bursitis (student's elbow). Triceps Tendinitis.
- Wrist and Hand: De Quervain's Tenosynovitis. Ganglion, Trigger Finger/ Thumb. Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture.
- Pelvis and Hip: IT Band Syndrome. Piriformis Syndrome. Trochanteric Bursitis.
- Knee: Osteochondritis Dissecans. Prepatellar and Suprapatellar Bursitis. Popliteal Tendinitis. Patellar Tendinitis. Chondromalacia Patella. Plica Syndrome. Fat Pad Syndrome (Hoffa's syndrome).
- Ankle and Foot: Ankle Sprains. Plantar Fasciitis/Calcaneal Spur. Tarsal Tunnel Syndrome. Achilles Tendinitis. Metatarsalgia. Morton's Neuroma.

References:

1. *Outline of Fractures - John Crawford Adams.*
2. *Outline of Orthopedics - John Crawford Adams.*
3. *Text book of Orthopedics - Maheswari*
4. *Apley's Orthopedics*
5. *Textbook of Orthopedics and Traumatology- M.N.Natarajan.*

Course code – SPT3S2 Electrotherapy-I

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Introductory Physics (Familiarisation only)

Electricity definition, types, Static electricity, Current Electricity. Magnetism: Definition, properties, electro-magnetic induction, electro-magnetic spectrum. Valves, transformers, types, principles, construction and working. Ionization: Principles, effects of various technique of medical ionization.

Module II

Therapeutic Electricity: Low frequency Currents

Basic types of current-DirectCurrent: types, physiological & therapeutic effects. Alternating Current. Types of Current used in Therapeutics, Modified DC, Faradic Current, Galvanic Current. Modified AC, Sinusoidal Current, Diadynamic Current. Faradic Current: Definition, Modifications, Techniques of Application of Individual, Muscle and Group Muscle Stimulation, Physiological & Therapeutic effects of Faradic Current, Precautions, Indications

& Contra-Indications, Dangers. Galvanic Current: Definition, Modifications, Physiological & Therapeutic effects of Galvanic Current, Indications & Contra-Indications, Dangers, Effect of interrupted galvanic current on normally innervated and denervated muscles and partially denervated muscles. Sinusoidal Current & Diadynamic Current in Brief. HVPGS- Parameters & its uses. Ionization / Iontophoresis: Techniques of Application of Iontophoresis, Indications, Selection of Current, Commonly used Ions (Drugs) for pain, hyperhydrosis, wound healing. Cathodal /Anodal galvanism. Micro Current & Macro Current. Types of Electrical Stimulators: NMEs-Construction Component, Neuro muscular diagnostic stimulator-construction component, Components and working Principles

Module III

Principles of Application

Electrode tissue interface, Tissue Impedance, Types of Electrode, Size & Placement of Electrode- Waterbath, Unipolar Bi-polar, Electrode coupling, Current flow in tissues, Lowering of Skin Resistance.

Module IV

Nerve Muscle Physiology

Action Potential, Resting membrane potential, Propagation of Action Potential, Motor unit, synapse, Accommodation, Stimulation of Healthy Muscle, Stimulation of Denervated Muscle, Stimulation for Tissue Repair.

Module V

TENS

Define TENS. Types of TENS, conventional TENS, Acupuncture TENS, Burst TENS, Brief & Intense TENS, Modulated TENS, Types of Electrodes & Placement of electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications & Contraindications.

Module VI

Electro-diagnosis

FG Test. SD Curve: Methods of Plotting SD Curve, Apparatus selection, Characters of Normally innervated Muscle, Characters of Partially Denervated Muscle, Characters of Completely denervated Muscle., Chronaxie & Rheobase. Nerve conduction velocity studies. EMG: Construction of EMG equipment. Bio-feed back

Module VII

Medium Frequency

InterferentialTherapy: Define IFT, Principle of Production of IFT, Static Interference System, Dynamic Interference system, Dosage Parameters for IFT, Electrode placement in IFT, Physiological & Therapeutic effects, Indications & Contraindications. Russian Current. Rebox type Current.

References

1. Claytons Electrotherapy by Forster & Plastanges
2. Electrotherapy Explained by Low & Reed
3. Clinical Electrotherapy by Nelson
4. Electrotherapy Evidence based practice by Sheila Kitchen
5. Physical agents by Michile Cameroon
6. Principles of Electrotherapy by Michile Cameroon
7. Thermal agents by Susan Michlovitz

Course code – SPT3S3
Physiology of Sports and Exercise (T+P)

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Body composition: An overview of human body composition, Factors influencing body composition-age, sex, etc... with special emphasis on exercise.

Module II

Energy Expenditure during rest and physical activity: Energy transfer in the body. Energy generating capacity of humans. Respiratory quotient for different nutrients. Energy costs of a variety of sports and physical activities.

Module III

The acute and chronic effects of exercise on the respiratory, muscular, cardiovascular, neurological and endocrine systems. The short and long term physiological adaptations of the main body systems to exercise and training

Module IV

Training the aerobic and anaerobic energy systems: Application of the principles of training to aerobic and anaerobic training. Developing aerobic and anaerobic training programmes. Maintenance of aerobic and anaerobic fitness.

Module V

Training the muscular system for strength and endurance: Measurement of muscular strength and endurance. Gender differences in strength. Types of resistance training. Application of the principles of training to strength training.

Module VI

Exercise & skeletal fitness: Bone physiology-structure of bone, bone formation and remodeling. Types of joints. Bone injuries during exercise training. Exercise and bone health

Exercise Physiology (Practical)

1. Theoretical explanation and demonstration and assessment of cardio respiratory fitness
2. Theoretical explanation and demonstration of Cardio respiratory exercises (VO₂ Max)
3. Assessment of muscular fitness: Muscle strength, endurance and flexibility exercises (Bench press, Jumps, Push ups, Sit and Reach Test)

References

1. Basic Anatomy of Physiology of exercise by Piyush Jain
2. Introduction to anatomy & Physiology of Exercise by Sandhya Tiwari
3. Essential of Physical Education & Sports by Dr. Ajmer Singh & others
4. Essential of Exercise Physiology – Lessy G. Shower
5. Devries, H.A. Physiology of Exercise for Physical Education and Athletics. London: Staoles

Semester IV
Course code – SPT4G1
Alternative Medicine

Credits: 3

Contact hours: 3

Total Hours: 54

Module I

Accupuncture: Definitions, Principles, Techniques, Physiological and Therapeutic effects, Indications and contraindications

Module II

Introduction to Naturotherapy: Principles of application, Indications and uses

Module III

Magnetotherapy: Principles of application, Indications and uses

Module IV

Yogasanas and their scientific studies. Yoga: Introduction, Meaning of Yoga, Aim of Yoga, Types of Yoga, Concept of Hatha Yoga. Asanas: Introduction, Hints/rules for yoga Asanas, Importance of Yoga Asanas, Meditative poses, Cultural poses, Asanas/yogic exercises and the cure of diseases. Pranayama: Meaning of Pranayama, Objectives of Pranayama, Types of pranayama, Physiological values of pranayama. Sudhikriya: Introduction, Objective of Sudhikriya, Types of Sudhikriya, Physiological values.

References

1. Therapies for Medical Professional by Vigneswara
2. Basics in Occupational Therapy and Therapeutic Activities by Punithan
3. Alternative Therapies by Bhagat

Course code – SPT4G2
Psychiatry

Credits: 5

Contact hours: 5

Total Hours: 90

Module I

Mental health: Normal mental health, Criteria of normality or matured personality, Factors contributing to normal mental health, Self-actualising individual.

Module II

Study of abnormal personality: Neurotic, Hysterical, Psychotic, Paranoid, Schizoid, Psychopathic etc.

Module III

General etiological factors: Heredity, genetic, constitutional, acquired-traumatic, infective, tonic, degenerative, social and environmental including pathogenic family patterns, precipitins causes, frustration and conflicts.

Module III

Symptomatology & Treatment of: (a) Psychosis: Functional schizophrenia reaction group, simple, paranoid, catatonic, hebephrenic, paranoid, state, paranoia, juvenile, schizophrenia, autistic. Thinking - dementia. Organic-Tonic confused states, senile psychosis, arteriosclerotic, degenerative GP. (b) Affective Disorders: Dynamics of mania; hypomania, -chronic mania, MDP involuntional depression, senile depression, post partum, depressive reaction. Reactive and Neurotic depression, endogenous, suicide (Egoistic, Altruistic, Anomic). (c) Epileptic Disorders: Epileptic psychosis

Module IV

Neurosis: Symptomatology, diagnosis and treatment and psychodynamics of anxiety state, hysteria, conversion reaction, dissociative reaction, dual personality, obsessional neuroses. Phobias, hypochondriasis, neurasthenia and mental fatigue.

Module V

Mental Retardation: Retardation, Etiological factors, prenatal, postnatal, Infective, hormonal and congenital. Types of mental retardation, clinical types, microcephaly, hydrocephalus, monolian family idiocy, phenyl ketonuria etc. Symptomatology of various grades of retardation, different diagnosis and treatment.

Module VI

Child psychiatry: Behavior disorders, nail biting, enuresis, stealing, truancy, thumb sucking, speech, difficulties, pice, vomiting, anorexia, delinquency.

Module VII

Introduction to the dynamics of psychophysical disorders

Asthma, skin rashes, hypertension, bowel disorders, introduction to treatment in psychiatry. ECT, Insulin comotherapy, Drug therapy- tranquilizers, mood elevators, hypnotics and sedatives, Psychotherapy- deep and superficial individual and group expressive, suppressive, environmental manipulations, re-educative, Psychodrama, Psychoanalysis, Play therapy, Physiotherapy and occupational therapy

References

1. A Short textbook of Psychiatry by Neeraj Ahuja
2. A New Short Text book of Psychiatry by Linford Rees
3. Psychopharmacology-Textbook of Psychiatric disorders by Ananth
4. Textbook of Psychiatry by Hales

Course code – SPT4G3 Sports Psychology & Counselling

Credits: 4

Contact hours: 4

Total Hours: 72

Module I

Sports Psychology: Importance and need of Psychological Training in Sports

Module II

The Emotional Contents of Sports : Intrinsic Pressures, Social Pressures & Personal Pressure.

Module III

Mind- The mechanics of Flight or Fight Response, The Physical Disruptions and the Mental Disruptions.

Module IV

The Sports Emotional – Reaction profile: Factors affecting performance like Desire, Assertiveness, Sensitivity, Tension Control, Personal Accountability, Self discipline, Confidence, Concentration, Consistency, Commitment and Trait Interaction.

Module V

Mental Preparation for the Game and Mental Practice for the play. Rational Emotive Mental Training Programme for sportsman using Mind-Body co-ordination

Module VI

Techniques to Improve Performance: creative Visualisation, Desensitization, Auto-suggestion Therapy, Rational Thinking for specific purpose and Progressive Relaxation procedure

Module VII

Understanding the problems of Sportsman - Lack of adequate motivation and concentration, Fear of Insecurity & Rejection, Fear of Making a wrong move, Not able to make the use of

maximum available resources (Physical & Mental) Psychological Barriers between student & teacher and Drugs

Module VIII

Counselling in sports: Importance & Need of Psychological Counselling, Types of Counselling like Individual, Group, Team etc. Effective Counselling Methods & Techniques, Case studies, Role Plays and Discussion

References

1. Sports Psychology by Yadvinder Singh, Sports Publications
2. Sports Psychology Basics by Andrew Caruso, Reedswain Publications
3. Key Concepts in Sports Psychology by Ellis Cashmore, Routledge foundation
4. A Comparative Study of Sports Psychology by Dharmendra P Bhatt, Sports Publications
5. Basic Aspect of Sport Psychology by D C Lal, Sports Publications
6. Essential Sport Psychology by Murphy Shane, Human Kine Publications
7. Doing Sport Psychology by Andersen Mark, Human Kine Publications
8. Sport Psychology: Contemporary Themes by Lavallee David, Palgrave M Publications
9. Sport Psychology Interventions by Murphy Shane M, Human Kine Publications
10. Sport Psychology (with Infotrac) by Arnold D Leunes, Wadsworth Publishing Company.
11. Coaches Guide To Sport Psychology by Rainer Martens, Human Kinetics Publishers
12. Learning Experiences In Sport Psychology, Human Kine Publications,
13. Sport Psychology: The Key Concepts by Cashmore Ernest, Routledge Publications
14. Applied Sport Psychology: Personal Growth To Peak Performance by 4th Edition Williams, Academic Internet Publishers.

Course code – SPT4S1

Physiotherapy in Orthopaedics & Sports Medicine (Theory)

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

PT assessment for Orthopaedic conditions

SOAP format. Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation-tenderness, grades, muscle spasm, swelling-methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination - ROM-active and passive, resisted isometric tests, limb length apparent, true and segmental, girth measurement, muscle length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination -dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program, Documentation of case records and follow-up.

Module II

Fractures

Types, classification, signs and symptoms, complications, Fracture healing - factors affecting fracture healing. Principles of fracture management- reduction - open and closed, immobilization- sling, cast, brace, slab, traction - manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing. PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed

and mal union, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases. Aims of PT management in fracture cases-short and long term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.

Module III

Specific fractures and dislocations

PT assessment and management of upper limb fractures and dislocations. PT assessment and management of lower limb fractures and dislocations including pelvis. PT assessment and management spinal fractures.

Module IV

Selections and application of physiotherapeutic techniques

Maneuver's modalities for preventive, curative and rehabilitative means in all conditions.

Module V

Principles of various schools of thought in manual therapy.

(Briefly Maitland and McKenzie).

Module VI

Degenerative and Inflammatory conditions

Definition, signs and symptoms, clinical features, pathophysiology, radiological features, deformities, medical, surgical management. Describe the PT assessment and management and home program for the following conditions - Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease. Periarthritic shoulder.

Module VII

Infective conditions

Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. Describe PT assessment and management for following conditions- Osteomyelitis- acute and chronic, Septic arthritis, Pyogenic arthritis, TB spine and major joints-Knee and hip.

Module VIII

Define, review the postural abnormalities of spinal column, clinical features, deformities, medical and surgical management. Describe PT assessment and management and home program.

Module IX

Deformities

Review in detail, the causes, signs and symptoms, radiological features, medical and surgical management. Describe the PT assessment and management of the following conditions: Congenital: CTEV, CDH, Torticollis; pes planus, pes cavus and other common deformities. Acquired: scoliosis, kyphosis, coxa vara; genu varum, valgum and recurvatum.

Module X

Amputations

Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging, Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management.

Module XI

Spinal conditions

Review the causes, signs and symptoms, investigations; radiological features, neurological signs. PT assessment, aims and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta.

Module XII

Effects of spinal traction

Types of traction, modes of application, indications for spinal traction, contraindications, precautions, Limitations of traction.

Module XIII

Osteoporosis

causes, predisposing factors, investigations and treatment.

Module XIV

Orthopaedic surgeries

Pre and post operative PT assessment, goals, precautions and PT management of following surgeries such as: Arthrodesis, Osteotomy, Arthroplasty-partial and total - Excision arthroplasty, excision arthroplasty with implant, inter-positional arthroplasty and total replacement: Tendon transplant, Soft tissue release-tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.

Module XV

Shoulder joint

Shoulder instabilities, TOS, RSD, Impingement syndrome-conservative and Post operative PT management. Total shoulder replacement and Hemi replacement. Post operative PT management. AC joint injuries - rehabilitation. Rotator cuff tears – conservative and surgical repair. Subacromial decompression-post operative PT management.

Module XVI

Elbow and forearm

Excision of radial head-post operative PT management. Total elbow arthroplasty-Post operative PT management.

Module XVII

Wrist and Hand

Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations-Post operative PT management.

Module XVIII

Hip

Joint surgeries- hemi and total hip replacement-post operative PT management Tendonitis and bursitis-management.

Module XIX

Knee

Lateral retinacular release, chondroplasty-post operative management. Realignment of extensor mechanism. ACL and PCL reconstruction surgeries - Post operative rehabilitation. Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome – conservative management. TKR-rehabilitation protocol. Patellar tendon ruptures and Patellectomy-rehabilitation.

Module XX

Ankle and foot

Ankle instability, Ligamentous tears-post operative management.

Module XXI

Introduction to Bio-Engineering

Classification of Orthoses and prostheses; Biomechanical principles of orthotic and prosthetic application; Designing of upper extremity, lower extremity and spinal orthosis, indications and check out; Designing of upper extremity and lower extremity prostheses, indications and check out; Psychological aspects of orthotic and prosthetic application; prescription and designing of footwear and modifications: Designing and construction of adaptive devices.

Module XXII

Sports Physiotherapy

Physical fitness. Stages of soft tissues healing. Treatment guidelines for soft tissue injuries- Acute, Sub-acute and chronic stages. Repair of soft tissues-rupture of muscle, tendon and Ligamentous tears, soft tissue injuries-prevention and rehabilitation of Lateral ligament, sprain of ankle. Rotator cuff injuries- collateral and Cruciate injuries of knee. Meniscal injuries of knee. Supraspinatus and Bicipital tendonitis, prepatellar and Subacromial bursitis. Tennis and Golfer's elbow. Hamstring strains, Quadriceps contusion, TA rupture. Dequervain's tenosynovitis., Trigger and Mallet finger, Plantar fasciitis. Wrist sprains.

Module XXIII

Applied Yoga in orthopedic conditions.

Physiotherapy in Orthopaedics & Sports Medicine (Practical)

Credits: 3

Contact hours: 3

Total Hours: 54

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

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

References

1. Tidy's Physiotherapy
2. Textbook of orthopedics by Cash
3. Clinical Orthopedic rehabilitation by Brotzman
4. Orthopedic Physiotherapy by Jayant Joshi
5. Physical Rehabilitation Assessment and Treatment by O' Sullivan Schmitz
6. Sports Physiotherapy by Maria Zuluaga

Course code – SPT4S2

Electrotherapy-II

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Thermo & Actinotherapy (High Frequency Currents)

Electromagnetic Spectrum. SWD: Define short wave, Frequency & Wavelength of SWD, Principles of Production of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning, Testing of SWD Apparatus; Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters.

Module II

Pulsed Electro Magnetic Energy

Principles, Production & Parameters of PEME, Uses of PEME.

Module III

UltraSound

Define Ultrasound, Frequency, Piezo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous & Pulsed mode. Intensity, US Fields: Near field,

Far field, Half value distance, Attenuation, Coupling Media, Thermal effects, Non-thermal effects, Principles & Application of US: Direct contact, Water bag, Water bath. Solid sterile gel-pack method for wound. Uses of US, Indications & Contraindications, Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, Commonly used drugs, Uses, Dosages of US.

Module IV

IRR

Define IRR, wavelength & Parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & Frequency of treatment, Indication & Contraindication.

Module V

UVR

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

Module VI

LASER

Define LASER, Types of LASER. Principles of Production, Production of LASER by various methods, Methods of application of LASER, Dosage of LASER, Physiological & Therapeutic effects of LASER, Safety precautions of LASER, Classification of LASER. Energy density & power density.

Module VII

Superficial heating Modalities

- (1) **Wax Therapy:** Principle of Wax therapy, application, latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers.
- (2) **Contrast Bath:** Methods of application, Therapeutic uses, Indications & contraindications.
- (3) **Molst Heat Therapy:** Hydro collator packs-in brief, Methods of applications, Therapeutic uses, Indications & Contraindications.
- (4) **Cyclotherm:** Principles of production, Therapeutic uses, Indication & Contraindications.
- (5) **Fluidotherapy:** Construction, Method of application, Therapeutic uses, Indications & Contraindications.
- (6) **Whirl Pool Bath:** Construction, Method of Application, Therapeutic Uses, Indications & Contraindications.
- (7) **Magnetic Stimulation:** Principles, Therapeutic uses, Indications & Contraindications.
- (8) **Cryotherapy:** Define-Cryotherapy, Principle Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, Methods of application with dosages.

Electrotherapy (Practical)

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

1. Demonstrate the technique for patient evaluation, receiving the patient and positioning the patient for treatment using electrotherapy.
2. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.

3. Demonstrate placement of electrodes for various electrotherapy modalities.
4. Electrical stimulation for the muscles supplied by the peripheral nerves
5. Faradism under pressure for UL and LL
6. Plotting of SD curve with chronaxie and rheobase
7. Demonstrate FG test
8. Application of Ultrasound for different regions-various methods of application
9. Demonstrate treatment techniques using SWD, IRR and Microwave diathermy
10. Demonstrate treatment method using IFT for various regions.
11. Calculation of dosage and technique of application of LASER
12. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath, wax therapy.
13. Demonstrate the treatment method using whirl pool bath
14. Winding up procedure after any electrotherapy treatment method.

References

1. Claytons Electrotherapy by Forster & Plastanges
2. Electrotherapy Explained by Low & Reed
3. Clinical Electrotherapy by Nelson
4. Electrotherapy Evidence based practice by Sheila Kitchen
5. Physical agents by Michile Cameroon
6. Principles of Electrotherapy by Michile Cameroon
7. Thermal agents by Susan Michlovitz

School Visit

Total Hours: 30

Project

Credits: 3

Semester V

Course code – SPT5G1

Biomechanics

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Basic Concepts in Biomechanics: Kinematics and Kinetics

Types of Motion, Location of Motion, Direction of Motion, Magnitude of Motion. Definition of Forces, Force of Gravity, Reaction forces, Equilibrium, Objects in Motion, Force of friction, Concurrent force systems, Parallel force systems, Work, Moment arm of force, Force components, Equilibrium of levers.

Module II

Joint structure and Function

Joint design, Materials used in human joints, General properties of connective tissues, Human joint design, Joint function, Joint motion, General effects of disease, injury and immobilization.

Module III

Muscle structure and function

Mobility and stability functions of muscles, Elements of muscle structure, Muscle function, Effects of immobilization, injury and aging

Module IV

Biomechanics of the Thorax and Chest wall

General structure and function, Rib cage and the muscles associated with the rib cage, Ventilatory motions: its coordination and integration, Developmental aspects of structure and function, Changes in normal structure and function in relation to pregnancy, scoliosis and COPD

Module V

The Temporomandibular Joint

General features, structure, function and dysfunction

Module VI

Biomechanics of the vertebral column, General structure and function, Regional structure and function- Cervical region, thoracic region, lumbar region, sacral region, Muscles of the vertebral column, General effects of injury and aging

Module VII

Biomechanics of the peripheral joints

The shoulder complex: Structure and components of the shoulder, complex and their integrated function. The elbow complex: Structure and function of the elbow joint - humeroulnar and humeroradial articulations, superior and inferior radioulnar joints: mobility and stability of the elbow complex, the effects of immobilization and injury. The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; prehension; functional position of the wrist and hand. The hip complex: structure and function of the hip joint: hip joint pathology - arthrosis, fracture, bony abnormalities of the femur. The knee complex: structure and function of the knee joint - tibiofemoral joint and patellofemoral joint; effects of injury and disease. The ankle and foot complex: structure and function of the ankle joint, subtalar joint, talocalcaneonavicular joint, transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints, structure and function of the plantar arches, muscles of the ankle and foot, deviations from normal structure and function - Pes Planus and Pes Cavus.

Module VIII

Analysis of Posture and Gait

Static and dynamic posture, postural control, kinetics and kinematics of posture, ideal posture, analysis of posture, effects of posture on age, pregnancy, occupation and recreation; general features of gait, gait initiation, kinematics and kinetics of gait, energy requirements, kinematics and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running, effects of age, gender assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities. injuries and malalignments in gait; Movement Analysis: ADL activities like sitting to standing, lifting, various grips, pinches.

References

1. Joint Structure and Function: A comprehensive Analysis. JP Bros Medical publishers, New Delhi
2. Brunnstrom, Clinical Kinesiology, . JP Bros Medical publishers, Bangalore. 5th Ed 1996, 1st Indian Ed 1997.
3. Clinical Kinesiology for Physical Therapist Assistants,. JP Bros Medical publishers, Bangalore. 1st Indian Ed 1996.

Course code – SPT5G2
Weight Management, Rehabilitation and Fitness

Credits: 4

Contact hours: 4

Total Hours: 72

Module I

Adult and Childhood obesity, Prevalence, Types, etiology, Theories of obesity, Factors affecting, Comorbidity. Management through- Long term and short term measures, Nutrition, Exercise, pharmaceutical, Surgical, Stress Management & Lifestyle modification.

Module II

Critical evaluation of standard weight loss diet commonly followed by weight watchers.

Module III

Care and cure in rehabilitation, precaution. Necessity of continuous monitoring and necessary emergency procedures.

Module IV

Components of fitness- Total Fitness (health related fitness) and Athletic fitness. Body Composition and types, Cardiorespiratory Fitness, Muscular endurance and power, Flexibility. Athletic Fitness- Balance, Coordination, Agility, reaction Time etc.

Weight Management, Rehabilitation and Fitness (Practical)

1. Types of Exercise including Aerobics, spinning, Tai Chi, Yoga, Power Yoga, Pillati, weight training, strength training, Circuit training, etc
2. Equipments commonly used in Fitness Industry, their advantages and limitation.
3. Exercise for weight gain / muscle development and improving muscle tone
4. Exercise for weight loss
5. Exercise for Cardio-respiratory fitness
6. Strengthening the joints and bones and increasing flexibility
7. Therapeutic exercise and program designing for specific demands including specific joint problems, osteoporosis, arthritis, blood pressure, PCO, Diabetes and CVD. Precaution and indicators for stopping exercise and necessary emergency procedures.

References

1. Edward L. fox and Donald K Mathews (1985). CBS College Publishing. Japan
2. Present Knowledge in Nutrition; Ed, Myrtle L. Brown, ILSI Press.
3. David C. Nieman , Fitness and Sports Medicine, A Health related Approach, 3rd edition, 1995
4. Bases of fitness- Edward L. fox , Timothy E. Kirby and Ann Roberts Fox (1987)
5. Measurement and evaluation for Physical Educators - Don Kirkendall, Joseph J Gruber and Robert E. Johnson. 1987. Human kinatics Publishers Inc.
6. The Physiological Basis of Physical Education and Athletics, by E.L.Fox and D.K.Mathews, Holt-Saunders, 1981.

Course code – SPT5G3
Medical Instrumentation & Hoispital Visit

Credits: 2

Contact hours: 2

Total Hours: 36

1. Calorimeter & Spectrophotometer
2. pH Meter
3. Laser applications in Medicine
4. Ultrasound, Cathode Ray, Oscilloscope
5. ECG Equipment & Technique

6. Micro & Macro shock. Sources of shock, monitoring & interrupting circuit from shock
7. Maintenance of equipments-Preventive Maintenance, break down
8. Maintenance
9. Short wave diathermy
10. Microwave diathermy
11. Muscle and nerve stimulator
12. UV Rays
13. IFT (Interferential Therapy)

References

1. Handbook of Analytical Instruments by R S Khandpur
2. Handbook of Biomedical Instrumentation by R S Khandpur
3. Biomedical Instrumentation and Measurements by Cromwell

Course code – SPT5S1

Physiotherapy in General Medicine & Surgery Including Cardiothoracic Conditions (Theory) - I

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Anatomical and physiological differences between the Adult and Pediatric lung.

Module II

Bedside assessment of the patient-Adult & Pediatric

Module III

Investigations and tests - Exercise tolerance Testing - Cardiac & Pulmonary, Radiographs, PFT, ABG ECG, Haematological and Biochemical Tests

Module IV

Physiotherapy techniques to increase lung volume, controlled mobilization, positioning, breathing exercises, Neurophysiological Facilitation of Respiration, Mechanical aids - incentive Spirometry, CPAP, IPPB

Module V

Physiotherapy techniques to decrease the work of breathing, Measures to optimize the balance between energy supply and demand positioning, Breathing re-education, Breathing control techniques, mechanical aids -IPPB, CPAP, BiPAP

Module VI

Physiotherapy techniques to clear secretions-Hydration, Humidification & Nebulisation Mobilisation and Breathing exercises, Postural Drainage, Manual techniques - Percussion, Vibration and Shaking, Rib Springing, ACBT Autogenic Drainage, Mechanical Aid - PEP, Flutter, IPPB, Facilitation of Cough and Huff Nasopharyngeal Suctioning.

Module VII

Drug therapy - Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, inhalers and Nebulisers.

Module VIII

Management of wound ulcers - Care of ulcers and wounds – Care of surgical scars -U.V.R and other electro therapeutics for healing of wounds, prevention of Hyper granulated Scars, Keoloids, Electrotherapeutics measure for relief of pain during mobilization of scars tissues.

Module IX

Physiotherapy in dermatology - Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; pigmentation; infected wounds, ulcers, Faradic foot bath for Hyperhidrosis, Massage maneuvers for cosmetic purpose of skin; use of specific oil as medium; Care of anaesthetic hand and foot; Evaluation; planning and management of leprosy-prescription, fitting and training with prosthetic and orthotic devices.

Module X

Neonatal and Pediatric Physiotherapy - Chest physiotherapy for children, The neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit.

Module XI

Physiotherapy in Obstructive lung conditions, Physiotherapy in Restrictive lung conditions, Management of breathlessness, Pulmonary Rehabilitation, Physiotherapy following Lung surgeries, Respiratory failure - Oxygen Therapy and Mechanical Ventilation

References

1. Tidy's physiotherapy
2. Cash's Text Book of Chest, Heart, Vascular Disorders for Physiotherapists
3. The Brompton Guide to chest physiotherapy DU Gasket (Completed)
4. Physical Rehabilitation Assessment and Treatment - O'Sullivan Schmitz
5. Elements in Pediatric Physiotherapy - Pamela M Eckersley
6. Essentials of Cardio Pulmonary physical therapy by Hillegass and Sadowsky
7. Cardio pulmonary Symptoms in physical Therapy practice by Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash's Text book of General Medicine and Surgical conditions for Physiotherapists
10. Physiotherapy in Psychiatry
11. Physical Therapy for the Cancer patient by M.C Garvey
12. Physiotherapy in Obstetrics and Gynecology by Polden

Course code – SPT5S2

Physiotherapy in Neurology & Neurosurgery

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Neurological Assessment

Required materials for examination, Chief complaints. History taking - Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function - Consciousness, Orientation, Wakefulness, memory, Speech, Reading, Language, Writing, Calculations, Perception, Left right confusion, Reasoning and judgement, Motor Examination – Muscle power, Muscle tone, Spasticity, Flaccidity, Reflexes – Developmental reflexes, deep tendon reflexes, Superficial reflexes sensory examination, Superficial, Deep and Cortical sensations, Special tests - Romberg's Kernig's sign, Brudzki sign, Tinels's sign, Slum test, Lehdrmitte's sign. Bells Phenomenon. Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign etc, Balance examination, coordination examination, Gait analysis - Kinetics & Kinematics, (Quantitative & Qualitative analysis), Functional Analysis, Assessment tools & Scales- Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading, Differential diagnosis.

Module II

Neuro physiological Techniques

Concepts, principles, Techniques, Effects of following Neurophysiological techniques: NDT, PNN, Vojta therapy, Rood's Sensory motor Approach, Sensory Integration Approach, Brunnstorm movement therapy, motor relearning programme, Contemporary task oriented approach, Muscle re-education approach and Constraint induced movement therapy.

Module III

Paediatric Neurology

Paediatric Examination, Developmental milestones, developmental reflexes, Neuro developmental screening tests. Evaluation & Management- History, observation, Palpation, Milestone Examination, developmental reflex Examination, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Risk babies, minimum brain damage, Developmental disorders, Cerebral palsy, Autism, Down's Syndrome, Hydrocephalus, Chorea, Spina bifida and Syringomyelia.

Module IV

Evaluation and Management of Brain and Spinal Cord Disorders

History, observation, Palpation, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Cerebro vascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumors, Perceptual disorders, Amyotrophic lateral sclerosis and Multiple sclerosis.

Module V

Evaluation and Management of Cerebellar Spinal Cord and Muscle Disorders

History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, Short & Long Term goals, Management of systemic complications. Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Ataxia, Sensory Ataxia, Parkinson's disease, Muscular dystrophy (DMD), Myasthenia Gravis, Eaton-Lambert Syndrome, spinal tumors, Spinal cord injury, Transvers myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post Polio Syndrome.

Module VI

Evaluation and Management of Peripheral Nerve Injuries and Disorders

History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical complications, Use of various Neurophysiological approaches & Modalities in Hereditary motor sensory neuropathy, Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome. Lumbosacral plexus lesions, Phrenic & intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudental nerve palsy.

Module VII

Assessment and Management of Neurological gaits

Quantitative and Qualitative (Kinetic & kinematics) analysis, List of Problems, short & Long Term goals, Management of following Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Choreaform Gait, Diplegic Gait and Myopathic Gait.

Module VIII

Pre and Post surgical assessment and treatment of following conditions - Spinal disc herniation, Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine, Spinal cord and peripheral nerves, Cerebral aneurysms, Subarachnoid haemorrhages, epilepsy, Parkinson's disease. Chorea, Haemiballism, Psychiatric disorders, Malformations of the nervous system, Carotid artery stenosis, Arteriovenous malformations and Spina bifida.

Module IX

Applied Yoga in Neurological conditions.

Module X

Cerebral palsy

Definition, etiology, classification, clinical features, complications, deformities, medical and surgical management and home program with special emphasis on carrying techniques. PT management after surgical corrections.

Module XI

Poliomyelitis

Definition, etiology, types, pathophysiology clinical features, deformities, medical and surgical management. PT assessment and management after Surgical corrections and reconstructive surgeries- emphasis on tendon transfer and home program.

References

1. Tidy's Physiotherapy.
2. Cash's Textbook of Neurology for Physiotherapists
3. Neurological Rehabilitation by D Umphred
4. Physical Rehabilitation Assessment and Treatment – O'sullivan Schmitz
5. Elements of paediatric Physiotherapy:Eckersley

Course code – SPT5S3

Evidence Based Physiotherapy

Credits: 3

Contact hours: 3

Total Hours: 54

Module I

Introduction to Evidence Based practice: Definitions, Evidence Based Practice, Evidence Based physiotherapy practice

Module II

Concepts of Evidence based physiotherapy: Awareness, Consultation, Judgement, Creativity.

Module III

Development of Evidence based knowledge, The individual Professional, Professionals within a discipline, professionals across disciplines

Module IV

Evidence Based practitioner: The reflective practitioner, The E-Model, Using the E Model

Module V

Finding the Evidence: Measuring outcomes in Evidence Based Practice, Measuring Health Outcomes, measuring clinical outcomes, Inferential statistics and Causation.

Module VI

Searching for the Evidence

Asking Questions, Identifying different sources of evidence, Electronic Bibliographic databases and World Wide Web, Conducting a literature search. Step-by-step search for evidence

Module VII

Assessing the Evidence

Evaluating the evidence; Levels of evidence in research using quantitative methods, Levels of evidence classification system, Outcome Measurements, Biostatistics, critical review of research using qualitative methods.

Module VIII

Systematically reviewing the evidence

Stages of systematic reviews, Meta analysis, The Cochrane collaboration

Module IX

Economic evaluation of the evidence

Types of economic evaluation, Conducting economic evaluation, Critically reviewing economic evaluation, Locating economic evaluation in the literature.

Module X

Using the evidence

Building evidence in practice; Critically Appraised Topics (CATs), CAT format, Using CATs, Drawbacks of CATs.

Module XI

Practice guidelines, algorithms and clinical pathways

Recent trends in health care, Clinical Practice Guidelines (CPG), Algorithms, Clinical pathways, Legal implication in clinical pathways and CPG, Comparison of CPGs, Algorithms and Clinical Pathways.

Module XII

Communicating evidence to clients, managers and funders

Effectively communicating evidence, Evidence based communication in the face of uncertainty, Evidence based communication opportunities in everyday practice.

Module XIII

Research dissemination and transfer of knowledge

Models of research transfer, Concrete research transfer strategies, Evidence based policy

References

1. Evidence-Based Practice in Nursing and Health Care: A Guide to Best Practice, by Bernadette Melnyk (Editor), Ellen Fineout-Overholt (Editor)
2. Evidence-Based Rehabilitation: A Guide to Practice, by Mary Law
3. Achieving Evidence-Based Practice, by Susan Hamer
4. The Evidence-Based Practice by Stout, Randy A Hayes

Course code – SPT5S4

Nutrition, Safety Education and Health Promotion

Credits: 3

Contact hours: 3

Total Hours: 54

Module I

Principles of Accident Prevention: Safety Education, Efficient Reporting System, Elimination of causative factors, Legalising safety measures, Law enforcement, Alcohol and Drugs

Module II

Health and Safety in Daily Life: Home Safety, Safety outside home. Air, Water, Noise. Crime Prevention

Module III

Health and Safety at work, Worker and physical, chemical and biological agents. Worker and machine. Worker and Worker

Module IV

First Aid and Emergency Care, Common emergencies and their management, Choking, Shock, Heart Attack, Fainting, Electric Shock

Module V

Common Injuries and their Management: Muscle cramps, Abrasion, Contusions, Laceration / cuts, Bleeding, Fracture, Sprain and Strain

Module VI

Modern Life Style and Hypo-Kinetic diseases – Prevention and Management: Innovation, Purchasing power, Media, Pleasure seeking Nature, Hypo-kinetic Diseases- Coronary Heart Disease, Hypertension, Diabetes Mellitus, Obesity, Nutrition and Bone health (preventive aspects)

Semester VI

Course code – SPT6G1

Psychology

Credits: 4

Contact hours: 4

Total Hours: 54

Module I

Introduction to Psychology: Schools: Structuralism, Functionalism, behaviourism, psychoanalysis. Methods: Introspection, observation, inventory and experimental method. Branches: pure psychology and applied psychology. Psychology and physiotherapy

Module II

Growth and Development: Life span: different stage of development (Infancy, childhood, adolescence. adulthood, middle age, old age), Heredity and environment: role of heredity and environment in physical and psychological development, "Nature v/s Nature controversy"

Module III

Sensation, attention and perception. Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense. Attention: Types of attention, Determinants of attention (Subjective determinants and objective determinants). Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context). Illusion and hallucination: different types

Module IV

Motivation: Motivation cycle (need, drive, incentive, reward), Classification of motives, Abraham Maslow's theory of need hierarchy. Emotions: Three levels of analysis of emotion (physiological level, subjective state, and overt behaviour). Theories of emotion. Stress and management of stress

Module V

Intelligence: Theories of intelligence, Distribution of intelligence, Assessment of intelligence
Thinking: Reasoning: deductive and inductive reasoning. Problem solving: rules in problem solving (algorithm and heuristic). Creative thinking: steps in creative thinking, traits of creative people.

Module VI

Learning: Factors affecting learning. Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory. The effective

ways to learn: Massed / Spaced, Whole/Part, Recitation / Reading, Serial/Free recall, Incidental / Intentional learning, Knowledge of results, association, organization and mnemonic methods.

Module VII

Personality: Approaches to personality: type & trait, behaviouristic, psychoanalytic and humanistic approach. Personality assessment: observation, situational test, questionnaire, rating scale, interview and projective techniques. Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjections, acting out.

Module VIII

Social psychology: Leadership: Different types of leaders. Different theoretical approaches to leadership. Attitude: development of attitude. change of attitude

References

1. Feldman.RH (1996). Understanding Psychology, New Delhi. Tata Mc Graw hill
2. Morgan et al (2003), Introduction to Psychology, Tata Mc Graw hill
3. Lefton, Psychology: Boston: Alwin & Bacot Company
4. Mangal, S.K. (2002). Advanced Educational Psychology, New Delhi: prentice hall.
5. Atkinson (1996). Dictionary of Psychology

Course code – SPT6G2

Sociology

Credits: 4

Contact hours: 4

Total Hours: 54

Module I

Introduction: Meaning - Definition and scope of sociology, Its relation to Anthropology, Psychology, Social Psychology. Methods of Sociological investigations, Case study, social survey, questionnaire, Interview and opinion poll methods. Importance of its study with special reference to Health Care Professionals.

Module II

Social Factors in Health and disease situations: Meaning of social factors, Role of social factors in health and illness. Socialization: Meaning and nature of socialization, Primary, Secondary and Anticipatory socialization, Agencies of socialization. Sports and Socialisation, Sports and character building, Sports – emotional adjustment

Module III

Social Groups: Concepts of social groups, influence of formal and informal groups on health and sickness, The role of primary groups and secondary groups in the hospital and rehabilitation setup.

Module IV

Family: Meaning and definitions, Functions of types of family, Changing family Patterns, Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy

Module V

Community: Rural community: Meaning and features- Health hazards of ruralities, health hazards to tribal community. Urban community: Meaning and features- Health hazards of urbanities.

Module VI

Culture and Health: Concept of Health, Concept of Culture, Culture and Health, Culture and Health Disorders

Module VII

Social change: Meaning of social changes. Factors of social changes, Human adaptation and social change, Social change and stress, Social change and deviance, Social change and health programme The role of social planning in the improvement of health and rehabilitation.

Module VIII

Social Problems of disabled: consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems. Population explosion, Poverty and unemployment Beggary, Juvenile delinquency, Prostitution, Alcoholism, Problems of women in employment, Geriatric problems, Problems of under Privileged. Social Security: Social security and social legislation in relation to the disabled.

Module IX

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

References

1. Sachdeva and vidyabushan, Introduction to the study of sociology
2. INDRANI T.K. Text Books of sociology for Graduates Nurses and Physiotherapy Students, JP Brothers, New Delhi, 10.

Course code – SPT6S1**Physiotherapy in General Medicine & Surgery Including Cardiothoracic Conditions - II
(Theory)**

Credits: 6

Contact hours: 5

Total Hours: 90

Module I

Introduction to ICU : ICU monitoring - Apparatus, Airways and Tubes used in the ICU- Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary. Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS Shock; Dealing with an Emergency Situation in the ICU.

Module II

Burns management - Role of physiotherapy in the management of burns, post grafted cases Mobilization and Musculo-skeletal restorative exercises following burns.

Module III

Physiotherapy management following cardiac surgeries. Cardiac Rehabilitation. Physiotherapy management following PVD

Module IV

Abdominal Surgeries - Management of Pulmonary Restorative Dysfunction following surgical procedures on Abdomen and Thorax

Module V

Management of Amputations following Diabetes, PVD- Prosthesis in amputations of lower limbs following ulcers and gangrenes.

Module VI

Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases. Home program and education of family members in patient care

Module VII

Physiotherapy in Obstetrics - Antenatal Care, Antenatal Education, Postnatal Care. Electrotherapy and Exercise Therapy measures for the re-education of Ano-Urethral sphincters

Module VIII

Physiotherapy in Geriatrics - Approach to the treatment - Interview, examination, aims of intervention, Role of physiotherapist

Module IX

Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions : Hypertension, Diabetes, Renal Failure and Obesity

Module X

Health Fitness and Promotion : Fitness Evaluation, Analysis of Body composition, Evaluation and prescription of Exercise, Factors affecting exercise Performance, Exercise Prescription for Specific groups : Elderly, Women and children. Applied Yoga in Cardio-respiratory conditions

PRACTICAL

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

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

References

1. Tidy's physiotherapy
2. Cash's Text Book of Chest, Heart, Vascular Disorders for Physiotherapists
3. The Brompton Guide to chest physiotherapy DU Gasket (Completed)
4. Physical Rehabilitation Assessment and Treatment - O'Sullivan Schmitz
5. Elements in Pediatric Physiotherapy - Pamela M Eckersley
6. Essentials of Cardio Pulmonary physical therapy by Hillegass and Sadowsky
7. Cardio pulmonary Symptoms in physical Therapy practice by Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash's Text book of General Medicine and Surgical conditions for Physiotherapists
10. Physiotherapy in Psychiatry
11. Physical Therapy for the Cancer patient by M.C Garvey
12. Physiotherapy in Obstetrics and Gynecology by Polden

Course code – SPT6S2 Sports Nutrition

Credits: 4

Contact hours: 4

Total Hours: 72

Module I

Introduction to sports nutrition: Historical approaches to exercise and nutrition, Role of macronutrients, Reference sports person - dietary recommendations.

Module II

Carbohydrates intake and exercise: Pre exercise diet, Carbohydrate supplementation during exercise, Post exercise diet, Carbohydrate utilization during exercise, Type of exercise: light, moderate static and heavy, Gluconeogenesis as an energy source, Lactate metabolism - fuel for muscular work, Carbohydrate metabolism and fatigue

Module III

Lipids: Fat metabolism and utilization during exercise, Contribution to energy production during exercise, Training adaptations and fat utilization

Module IV

Proteins: Amino acid metabolism associated with exercise, Protein turnover associated with exercise, Physical activity and protein requirement, Use of specialized protein supplements - whey protein; BCAA

Module V

Water: Significance of hydration and consequences of dehydration, Practical indexes of hydration status, Replacement strategies for sports person- types of fluids, fluid volume, composition, Sports drinks

Module VI

Vitamins and minerals and exercise performance: Fat and water-soluble vitamins, Minerals with special reference to iron-requirements and deficiency in athletes, negative iron balance, iron supplementation and toxicity, zinc-intake, depletion and supplementation, copper, chromium status and exercise, phosphorus (phosphate loading), fat loading. Antioxidant and exercise performance

Module VII

Training diet, pre exercise meals - intake during exercise, Feeding after exercise - liquid v/s solid meals

Module VIII

Ergogenic aids and sports supplements - classification, types - drugs, nutritional ergogenic aids - effects and safety concerns

Module IX

Nutritional, health and psychological concerns of sports women, Nutritional needs and bone health of athletes and female athlete triad

Module X Sports injury and effects of over training - nutritional significance

Sports Nutrition (Practical)

1. Principles of diet planning for sports persons with special reference to nutrients and water needs
2. Concept of energy expenditure and calculation of EE
3. Planning a day's diet for the following sports activities for different age groups and sexes: Gymnastics, Athletics, Swimming, Cricket, Football, Diet considerations for female sports persons
4. Fitness assessment - height, weight and body composition. Body fat determinations by different methods
5. Determination of aerobic capacity - pulse rate, blood pressure, THR zone for exercise and VO₂max (demonstration)
6. Determination of muscle strength and endurance (demonstration)
7. Exercise Management: Importance of warming up / cool down / stretching, Work out - aerobic and strength training /cross training, Sports injury

References

1. Bernadot dan (1999) *Nutrition for Serious Athletes*, Human Kinetics USA.
2. Brouns Fred and Caustan – Cargill (2002) *Essentials of Sports Nutrition – 2nd edition* John Wiley and Sons, England.
3. Burke Louse and Deakin Vicky (2006) *Clinical Sports Nutrition*, McGraw – Hill Pvt. Ltd. Australia.
4. Summerfield Lianne M (2001), *Nutrition Exercise and Behavior An integrated approach to weight management*, Belmont (USA). Wadsworth/Thompson Learning
5. Wolinsky Ira (1998) *Nutrition in Exercise and Sports* CRC press Boca Raton
6. Wolinsky Ira, Drishill Judy (1997) *Sports and Nutrition Vitamins and Trace elements*, CRC Press BY.
7. Wolinsky Ira, Driskell J. (2004) *Nutritional Ergogenic Aids*, CRC Press NY.

Clinical Posting