Faculty of Sports Medicine & Physiotherapy

SYLLABUS

FOR

MPT SPORTS PHYSIOTHERAPY
(SEMESTER: I – IV)
(Credit Based Evaluation and Grading System)

Session: 2019-20

GURU NANAK DEV UNIVERSITY
AMRITSAR

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(ii) Subject to change in the syllabi at any time.
 Please visit the University website time to time.
MPT (Sports Physiotherapy) (SEMESTER SYSTEM)  
(Credit Based Evaluation and Grading System)

Semester – I:

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* C.F. (carried forward to 4th semester)

* List of Elective Courses:
  1. Evidence Based Practice in Allied Health Sciences- SPL590
  2. Women Health and Exercise- SPL591

Note:
PSL-053 ID Course Human Rights & Constitutional Duties (Compulsory Paper) Students can opt. in any semester except Semester 1st. This ID Paper is one of the total ID Papers of this course.
MPT (Sports Physiotherapy) (SEMESTER SYSTEM)
(Credit Based Evaluation and Grading System)

Semester – III:

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Core Courses

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*Total marks from I to IV semesters
MPT (Sports Physiotherapy) (SEMESTER SYSTEM)
(Credit Based Evaluation and Grading System)

Theory Examination:
Instructions to Paper Setters:
The paper setters should set 8 questions (of equal marks), two in each of the four sections (Section A to D, corresponding to the distribution in the syllabi). Further, the paper setters shall be instructed to make sub-sections (not exceeding 4) of the questions and allocate appropriate marks to each section. The candidates shall be asked to attempt five questions by selecting one question from each section and the fifth question may be attempted from any section.
* 1 hr of theory and dissertation is counted as 1 credit. 2 hr of practical /clinical training is counted as 1 credit.

A. Practical Examination
A single final practical examination for all clinical training subjects (SPE511, SPE561, SPE611, SPE 661) will be conducted at the end of 4th semester for which includes patient evaluation and management, viva–voce etc.

C. Dissertation
The topic of dissertation will be allocated in first Semester and candidate will work for all four semesters and submit a written thesis in 4th semester. The final dissertation will be evaluated at the end of fourth semester for the total work done in all four semesters (SPD 512, SPD562, SPD 612 and SPD 662) and grades will be awarded at the end of fourth semester.

Practical Attachments for clinical training will include the following work. The credit hours are reflected in each semester scheme.
To enable the students to acquire practicing in hand on skills, maximum emphasis will be laid on regular practical classes, demonstration and clinical practice. The students will undergo Clinical / Field training in GNDU Campus/Sports Authority of India (Various Centres), National Institutes of Physiotherapy, Government Medical College Amritsar, other sporting centers and to the coverage of various tournaments as and when required and decided by BOC. The students will attend on field training which consists of early morning hours and evening late hours inclusive of weekends.

Dissertation will include the following work. The credit hours are reflected in each semester scheme.
At the end of first semester students are expected to have a research proposal ready. At the end of second semester the students are expected to be familiar with equipment handling and pilot study. At the end of third semester data collection, analysis and results should be completed. In fourth semester the work should be presented in the form of final dissertation and manuscripts should be ready for communication.
* A candidate shall be required to maintain minimum of 5 SGPA at the end of each semester. A student getting ‘C’ or lower grade in any course in this discipline will be treated as having failed in that course and shall have to repeat the core/elective courses/or repeat/opt. another course in lieu of interdisciplinary/outside department course with approval of Board of Control, and will have to obtain at least ‘B’ grade in that course within specified period as per the prevailing rules. The weights of ‘C’ and lower Grades will not be counted in SGPA or CGPA (according to syndicate proceeding, dated: 24.5.2010, Para No. 34).
** Interdisciplinary/Optional Course: to be offered from outside the department.
MPT (Sports Physiotherapy) (SEMESTER-I)
(Credit Based Evaluation and Grading System)

SPL501: APPLIED BASIC MEDICAL SCIENCES

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Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A: Applied General Clinical Anatomy

1. Anatomy of the Nerve Injuries
   a. Anatomical and Physiological loss resulting from nerve injury.
   b. Relaxation of nerves
   c. Peripheral nerve entrapment

2. Anatomical Angles and stiff joints
   a. Anatomical Angles
   b. Optimal attitude for stiff joints
   c. Snapping joints

3. The pathology of bones in terms of anatomy
   a. Anatomical facts regarding bones
   b. Anatomical disturbances in various bone pathologies

Section-B

1. Pathophysiology of certain diseases
   a. Infections of the hand
   b. Lesions of supraspinatous, subdeltoid bursae and Bicipital Tendinitis
   c. Low back pain
   d. Sciatica
   e. Lesions of inter–vertebral disk

2. Neuromuscular System
   a. Basic physics of membrane potentials
   b. Mechanism of muscle contraction
   c. Sources of energy for muscle contraction
   d. Neural control of movement

3. Temperature regulation
   Regulation of body temperature
Section-C

Applied General Physiology

1. Blood
   a. The various components of blood
   b. Viscosity correlation
   c. Oxyhemoglobin Dissociation curves
   d. Interrelationship between pressure flow and resistance
   e. Pressure volume curves
   f. Stress relaxation of vessels

2. Cardiovascular system
   a. Physical characteristics of systemic circulation
   b. Pressure pulses
   c. Oxygen demand theory of local blood flow circulation
   d. Nervous control of blood circulation
   e. Humorous control of blood circulation
   f. Mechanisms of arterial pulse regulation
   g. Hypertension
   h. Cardiac output and its regulation
   i. Methods of measuring cardiac output
   j. Normal coronary blood flow along with variations
   k. Physiological basis of ischemic heart disease
   l. The cardiac reserve
   m. Physiological causes of shock

Section-D: Applied General Physiology

1. Respiratory System:
   a. Review of mechanics of respiration
   b. Pulmonary volumes and capacities
   c. Transport of oxygen in blood
   d. Carbon dioxide in blood
   e. Regulation of respiration
   f. Methods of studying respiratory abnormalities

2. Endocrine System:
   a. Pituitary hormones and their functions
   b. Thyroid hormones
   c. Adrenocortical hormones
   d. Insulin Glucagon hormones
   e. Parathyroid hormones
References:
1. Synopsis of Surgical Anatomy – John Wright & Sons, Bristol
2. Gray’s Anatomy – Williams & Warwick – Churchill Livingstone.
SPL502: KINESIOLOGY & BIOMECHANICS

L T P Max Marks: 100
4 0 0 Mid Term: 20

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

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Section-A

Introduction to Kinematics
a) Definition, aims, objectives and role of Kinesiology in sports physiotherapy.
b) Review of fundamental concepts (applied aspect), Centre of gravity, Line of gravity, Planes, Lever system in Body, Fundamental starting positions.
c) Review of linear and angular kinematics

Section-B

Mechanics of Musculoskeletal System
a) Tissue loads, response of tissues to forces- Stress, Strain, Stiffness and mechanical strength, visco elasticity
b) Physical Properties of bone, cartilage, tendon and ligaments, functional adaptation under pathological conditions.
c) Impaired neuromuscular control, muscular force regulation in Frame work and joints of the body: Influence of trauma and classification of the muscles, Relation of structure, functions, role of muscles, types of Muscle, contractions (Static, Concentric and Eccentric), Two joint Muscles, Angle of pull, Role of Gravity affecting muscular action.

Section-C

Introduction
a) Nature and importance of Biomechanics in Physiotherapy
b) Principle of Biomechanics

Movement Analysis
a) Biomechanics of shoulder and shoulder complex, elbow complex, wrist and hand complex
b) Biomechanics of pelvic, hip, knee, ankle & foot complex
c) Biomechanics of spine
MPT (Sports Physiotherapy) (SEMESTER-I)
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Section-D

Movement Analysis

a) Neuro biomechanics
b) Posture and Gait analysis
c) Biomechanical Analysis & Techniques – Force platforms

References:
MPT (Sports Physiotherapy) (SEMESTER-I)
(Credit Based Evaluation and Grading System)

SPL503: ASSESSMENT & EVALUATION IN SPORTS PHYSIOTHERAPY

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Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
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Section-A
1. Importance of assessment & evaluation, Methods of evaluation – Interview, Clinical Examination, Reliability & Validity of the tests, Investigative Procedures, Field Tests.
2. Evaluation of Physical Fitness.

Section-B
1. Musculoskeletal screening
2. Assessment of upper limb complex: Shoulder girdle, shoulder, arm, elbow, forearm, wrist and hand.

Section-C
1. Assessment of lower limb complex: Pelvis, hip, thigh, knee, leg, ankle and foot

Section-D
1. Assessment of Gait deviations
2. EMG evaluation, diagnostic and kinesiological

Practicals: The Students will undergo clinical training in different training centres for assessment and diagnosis of different injuries of sports persons.

References:
3. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
SPL504: RESEARCH & EDUCATIONAL METHODOLOGY

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Section-A

1. **Basic concepts**-Importance of research in clinical practice, Problem identification, Ethical issues in research, Literature review, meta-analysis
2. **Types of Research**-Qualitative & Quantitative, Descriptive & Experimental, Longitudinal & Cross-sectional, Survey Research.
3. **Sample Designs**-Types of sampling, Reliability, Validity, Variables, sample size.

Section-B

1. **Processing and analysis of data**-Central tendency, Dispersion, Correlation, regression analysis, multiple correlation and regression.
2. **Sampling and testing of hypothesis**-Concept of probability, Standard deviation, confidence intervals, null and alternate hypothesis, level of significance, correlation coefficients, ANOVA, Tukey's HSD.
3. **Non parametric tests**-Fisher Irwin test, Mc Nemar test, Wilcoxon Mali test, Mann Whitney test, Kruskal Walis test, Spearman's rank correlation.

Section-C

2. **Presenting Research**-Strategies of paper writing, Design of paper writing, Tactics of paper writing, Reasons for rejection, Where to publish, Poster presentation (Poster space, Standard format), Plagiarism.
3. **Oral Presentations at Conferences/Seminars**-Preparing presentation, Duration of presentation, What to present
MPT (Sports Physiotherapy) (SEMESTER-I)  
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**Section-D**

**Educational Methodology**-Principles and methods of teaching with respect to physiotherapy students and client: Strategies and planning of teaching, curriculum development, formation of course objective, time management, role of Audio – visual aids, method of knowledge dissemination.

**Practicals:**

The student will be required to review the literature thoroughly and prepare a research proposal for dissertation in consultation with his/her supervisor by the end of the semester.

**References:**

5. Hicks: Research for Physiotherapists, Churchill Livingstone
MPT (Sports Physiotherapy) (SEMESTER-II)
(Credit Based Evaluation and Grading System)

*SPL551: APPLIED PARA CLINICAL SCIENCES*

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**Section-A**

*Pathology:*
1. Inflammation and repair
2. “Failed” healing responses
3. Regional considerations of Inflammation & repair of soft tissue injuries.

**Section-B**

*Pharmacology:*
2. Basic pharmacokinetics and Pharmacodynamics.
3. The use of drugs in various musculoskeletal disorders.

**Section-C**

*Radiology:*
1. Basics of radiology including ultrasonography CT & MRI scanning
2. Imaging of the head and neck.
3. Imaging of spine.
4. Imaging of upper limb (shoulder, elbow, wrist)
Section-D

Radiology:

1. Imaging of pelvis, hip and thigh.
2. Imaging of Patello Femoral Joint & Knee joint.
3. Imaging of the lower leg, foot and ankle.

References:

MPT (Sports Physiotherapy) (SEMESTER-II)
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SPL552: SPORTS BIOMECHANICS AND KINANTHROPOMETRY

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Section-A

1. Aspects of biomechanical analysis of sports movements
   a. Movement descriptors
   b. Structural analysis of movements, temporal and phase analysis

2. Principles and Application in Sports
   a. Biomechanics of running: Kinematic and kinetic phases, mechanical principles to study running mechanics, pathomechanical errors etc.
   b. Biomechanics of rowing: Phases of rowing, mechanical factors to improve rowing performance, rowing as exercise for fitness etc.
   c. Biomechanics of throwing and swimming: Kinematic and kinetic phases of throwing, mechanical factors to improve throwing performance, pathomechanical errors etc. basic principles of fluid mechanics, phases of swimming mechanics, pathomechanical errors etc.
   d. Biomechanics of jumping: Biomechanical components of jumping, factors to improve jump performance etc.
   e. Biomechanics of cycling
MPT (Sports Physiotherapy) (SEMESTER-II)  
(Credit Based Evaluation and Grading System)

Section-B

1. Introduction
   Significance of kinanthropometric knowledge in sports medicine.

2. Age determination
   a. Skeletal age
   b. Dental age

3. Body measurements
   a. Gross size and mass
   b. Lengths or heights of body parts
   c. Circumstances of body parts
   d. Skinfold thickness

4. Kinanthropometric study group measurements
   a. Planes of the body
   b. Axes of the body
   c. Landmarks on the body

Section-C

1. Body proportions
   a. Body mass index
   b. The phantom stratagem
   c. The Z – scores
   d. The O – scale system

2. Body composition
   a. Different Body composition
   b. Various methods to estimate body composition
      i. Water displacement method
      ii. Under water weighing methods
      iii. Kinanthropometric determination of the body composition (skinfold thickness)
      iv. Application of surface anthropometry (the body profile)
      v. Bioelectrical impedance analysis
      vi. Ultrasound assessment of fat
      vii. Arm X–ray assessment of fat
      viii. Computed tomography (CT) assessment of fat
Section-D

1. Somatotyping
   a. Sheldon’s method of somatotyping
      i. Critical evaluation of Sheldon’s method of somatotyping
   b. Heath – Carter method of somatotyping
      ii. The rating scales
      iii. Kinanthropometric measurements
      iv. First, Second and Third Components
      v. Somatotyping
      vi. Somatotype distribution

2. Growth, maturation and physical performance

Practicals:
The students will undergo hands on training on various Kinanthropometry equipment for body composition analysis, somatotyping and age determination.

References:
1. Singh and Malhotra: Kinanthropometry, Lunar Publications
3. Verma and Mokha: Nutrition, Exercise and Weight Reduction, Exercise Science Publication Society
4. Ostym, Beunen and Simons: Kinanthropometry II, University Park Press, Baltimore
   L.S. Sidhu et. al: Trends in Sports Sciences, IASSPE

References:
2. Brunnstrom – Clinical Kinesiology, F.A. Davis.
MPT (Sports Physiotherapy) (SEMESTER-II)  
(Credit Based Evaluation and Grading System)

**SPL553: PHYSIOTHERAPY METHODS**

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**Mid Semester Examination: 20% weightage**  
**End Semester Examination: 80% weightage**

**Instructions for the Paper Setters:**
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section-A**

1. Define Rehabilitation, Goals and Objectives of Rehabilitation in Sports, Clinical Evaluation phases of rehabilitation. (multidisciplinary approach)
2. Prehabilitation
3. Modern concepts in rehabilitation.
4. Factors affecting the joint range of motion prevention of stiffness, methods of joint mobilization.
   a. Testing for tightness and contracture of soft–tissue structures.
   b. Techniques of mobilizing the various joints of the body.

**Section-B**

1. Definition, details of effects and uses of therapeutic exercises.
   c. Dynamic Exercises  
   d. Plyometric Exercises  
   e. Isokinetic Exercises  
   f. Manipulative Techniques  
   g. Kinetic chain exercises  

**Section-C**

1. Types of Muscle Contractions and Muscle work, Strength of Muscle Contraction in terms of Motor units, Group action of muscles and its implication in designing an exercise program.
   b. Techniques of strengthening with respect to regional consideration.
   c. Various methods of progressive resisted exercise.
   d. Aquatic therapy in sports.
MPT (Sports Physiotherapy) (SEMESTER-II)
(Credit Based Evaluation and Grading System)

Section-D
1. Neuromuscular Training: Neuromuscular control, methods for improving neuromuscular control, proprioception and Kinesthetic sensation following different sport injuries.
2. Principles and application of neuromuscular facilitation techniques including PNF in sports.
3. Health club & fitness: Concept, group therapy
4. Physical Therapy and law: Medico legal aspects of physiotherapy, liability, negligence, malpractice, licensure, work man compensation
5. Morale and Ethics: Ethical Analysis of moral problem, ethical issues in physiotherapy

Practicals:
1. The students will undergo clinical training in the Health Centre on various apparatus of physical medicine. This training will constitute major part of the practical examination.
2. Clinical attachments will also be provided in different sports training centres all over India.

References:
13. Andrea Bates and Norm Hanson: Aquatic Exercise Therapy, W.B. Saunders.
SPL554: SPORTS TRAUMATOLOGY

L T P Max Marks: 100
4 0 0 Mid Term: 20

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A
1. Pre-participation examination
2. Causes & Mechanism of Sports Injuries, prevention of sports injuries
3. Common acute and overuse injuries of:
   a. Shoulder girdle, Shoulder, Arm
   b. Elbow, Forearm
   c. Wrist & hand

Section-B
Common acute and overuse injuries of:
   a. Pelvis, hip, thigh, knee, leg, ankle & foot
   d. Spine
   e. Head

Section-C
1. Sporting emergencies & first aid
2. Cardio pulmonary Resuscitation; Shock management, Internal and External bleeding, Splinting, Stretcher use—Handling and transfer, Management of Cardiac arrest, Acute asthma, epilepsy, drowning, burn, Medical management of mass participation. Heat stroke and Heat illness.

Section-D
Sports specific injuries, with special emphasis on the specific risk factor, nature of sports, kind of medical intervention anticipated and prevention with respect to individual sports
   a. Individual events: Track & Field
   b. Team events: Hockey, Cricket, Football etc.
   c. Contact and Non–contact sports
   d. Water sports
MPT (Sports Physiotherapy) (SEMESTER-II)
(Credit Based Evaluation and Grading System)

Clinical Training

1. Students will undergo Field Training with Sportsmen of the University.
2. They will attend physiotherapy clinic in the Health Centre.
3. The students will accompany sports teams for National sporting competitions.
4. No student will refuse clinical attachment even during the vacations.

References:

6. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.


Mosby.
MPT (Sports Physiotherapy) (SEMESTER-II)  
(Credit Based Evaluation and Grading System)  

**SPL590: EVIDENCE BASED PRACTICE IN ALLIED HEALTH SCIENCES (ELECTIVE)**

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Mid Semester Examination: 20% weightage  
End Semester Examination: 80% weightage  

Instructions for the Paper Setters:  
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

**Section-A**  
1. Introduction to evidence-based complementary medicine  
2. Evidence-based health care  
3. Evidence-based practices  
4. Evidence-based decision making and management

**Section-B**  
Types of evidence  
   a. Definition of evidence  
   b. Forms of evidence  
   c. Randomized controlled trials

**Section-C**  
Types of evidence  
   a. Case-control studies  
   b. Cohort studies

**Section-D**  
1. Applying the evidence  
   a. Pathways, guidelines and protocols  
   b. Future directions for clinical effectiveness  
2. Evaluation of effectiveness and efficiency of the process
MPT (Sports Physiotherapy) (SEMESTER-II)
(Credit Based Evaluation and Grading System)

References:
1. Martin Dawes, Philip Davies, and Alistair Gray, Evidence–Based Practice: A Primer for Health Care Professionals. Elsevier Publication.
MPT (Sports Physiotherapy) (SEMESTER-II)
(Credit Based Evaluation and Grading System)

SPL591: WOMEN HEALTH AND EXERCISE (ELECTIVE)

L T P Max Marks: 100
3 0 0 Mid Term: 20

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A
1. Gender difference in muscle morphology
2. Diagnosis and Treatment of Urinary Incontinence and Prolapse

Section-B
1. Anemia
2. Hypertension in Women

Section-C
1. Bone health: assessment and treatment of osteopenia and osteoporosis
2. Evaluation and Treatment of Common Musculoskeletal Complaints

Section-D
1. Exercise for the childbearing year
2. Exercise for adolescence
3. Exercise for the older woman

References:
MPT (Sports Physiotherapy) (SEMESTER-III)
(Credit Based Evaluation and Grading System)

SPL601: SPORTS PHYSIOTHERAPY METHODS

L   T   P      Max Marks: 100
4   0   0      Mid Term: 20

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

Massage:
Historical development. Definition and classification of massage techniques, Physiological effects of massage, Description of the techniques of the classical massage. Connective tissue massage, hysiological basis of sports massage and various categories, underwater massage, mechanical devices of massage, therapeutic applications and contraindications of massage.

Heat Therapy:
1. Production, Physiological effects, indications, contraindications and specific uses in sports of the following:

Section-B

Hydrotherapy:
History & introduction, Effects of simple baths, raising temperature baths, baths with additives, Aromatic baths, Mineral baths, physical baths, Hydroelectric baths, Stammer baths, whirl pool bath, showers and steam showers.

Functional Bandages & Orthotic Aids:
History and uses of functional bandages, classification according to the time of application, types of bandages, Bandaging techniques and bandaging material, Indications, contraindications athletic shoes and modifications, common orthotic aid and appliances in Sports
Section-C

Electrotherapy:
1. Principles underlying the application of following modalities with reference to their production, biophysical and therapeutic effects, indications and contraindications and the specific uses in Sports Physiotherapy.
   b. Medium Frequency Current: IFT, Russian Currents.
   c. High Frequency Currents: SWD, MWD, Ultrasound, Pulsed Electromagnetic Energy.
   d. Radiations: LASER, UVR
2. Recent Advancement in Electrotherapy, Electrodiagnosis and its implications to Sports Physiotherapy.

Section-D

Cryotherapy:
Physiological effects, Use of cold therapy in acute phase, rehabilitative phase, preventive phase of athletic injury, Methods of application, Indications and contraindications.

Manual Therapy:
Introduction to manual therapy techniques, joint techniques, manual joint therapy, traction, basic principles of manipulation for various disorders of the spine and extremities. Muscle energy techniques (MET)-definition, elements of MET procedures, clinical utilization of MET.

Practicals:
1. The students will undergo clinical training in the Health Centre on various apparatus of physical medicine. This training will constitute major part of the practical examination.
2. Clinical attachments will also be provided to the students in different sports centres.

References:
5. John Low & Reed: Electrotherapy Explained, Butterworth.
6. Meryl Roth Gersh: Electrotherapy in Rehabilitation, FA Davis.
MPT (Sports Physiotherapy) (SEMESTER-III)  
(Credit Based Evaluation and Grading System)

SPL602: MEDICAL ASPECTS OF SPORTS MEDICINE

L T P Max Marks: 100
4 0 0 Mid Term: 20

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A
1. Exercise and Common Pulmonary Conditions
   a. Exercise induced bronchial obstruction
   b. Exercise in chronic airway obstruction
   c. Air pollution and exercise
2. Exercise and Cardiac Conditions
   a. Exercise prescription for heart disease
   b. Exercise in primary prevention in ischemic heart disease
   c. Exercise for secondary prevention of ischemic heart disease

Section-B
1. Doping in Sports
   a. Banned drugs
   b. Procedure of dope testing
   c. Control of doping abuse
2. Diabetes and Exercise
   a. Exercise in diabetic patients
   b. Exercise as a method of control of diabetes

Section-C
Exercises for special categories:
   a. Child and adolescent athlete's problems
   b. Special problems of older athletes
   c. Special concerns for differently abled athletes
MPT (Sports Physiotherapy) (SEMESTER-III)
(Credit Based Evaluation and Grading System)

Section-D

Misc. Conditions
a. Hazards of cold water
b. Exercise for mood enhancement
c. Vitamins and exercise
d. Spinal deformity and sports
e. Time zone shift and sleep deprivation problems
f. Exercise in pregnancy and post partum

References:
6. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
a. Mosby.
MPT (Sports Physiotherapy) (SEMESTER-III)  
(Credit Based Evaluation and Grading System)  

*SPL603: EXERCISE PHYSIOLOGY & NUTRITION*  

L T P  
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Max Marks: 100  
Mid Term: 20  
Major Exam: 80  
Mid Semester Examination: 20% weightage  
End Semester Examination: 80% weightage  

**Instructions for the Paper Setters:**  
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.  

**Section-A**  

1. *Nutrition*  
   a. Carbohydrates, Fats, Proteins.  
   b. Vitamins, Minerals and Water.  
   c. Optimal Nutrition for exercise.  
   e. Pre–Game meal, Carbohydrate loading.  
   f. Alcohol, Mega Vitamin Therapy.  
   g. Food for various athletes of different disciplines.  
   h. Fluid and energy replacement in prolonged exercise.  

**Section-B**  

1. *Energy Transfer for Physical Activity:*  
   b. Energy transfer in exercise.  
   c. Energy expenditure during various activities.  
   d. Fatigue.  
   e. Biochemical responses to endurance training.  

2. *Cardio Vascular System and Exercise:*  
   a. Athletes Heart.  
   b. Cardio Vascular adaptations to sustained aerobic exercises.  
   c. Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.  
   d. Sudden cardiac death in sports.  
      Regulation of circulation during exercise.
MPT (Sports Physiotherapy) (SEMESTER-III)
(Credit Based Evaluation and Grading System)

**Section-C**

1. **Exercise and Respiratory System:**
   a. Second Wind.
   b. Oxygen Debt.
   d. Regulation of Respiration during exercise.

2. **Skeletal System:**
   a. Growth and Exercise.
   b. Repair and adaptation during exercise.
   c. Exercise prescription for chronic low back pain
   d. Training for Muscular Strength and Endurance.

**Section-D**

3. **Gastrointestinal Tract and Endocrine system:**
   a. Effect of Sports on GIT and Liver.
   b. Hormone regulation of fluid and electrolytes during exercise.
   c. Exercise and Menstrual Cycle.
   d. Stress Hormones in Exercise.
   e. Effects of exercise on various Hormones in the body.
   f. Opiods, Runners High.

**Practicals:**
The student will undergo laboratory and on–field training in exercise physiology.

**References:**
1. Mc Ardle, Katch, Katch: Exercise Physiology Edition IV.
SPL604: NON–TRAUMATIC MEDICAL CONDITIONS OF ATHLETES

L T P Max Marks: 100
4 0 0 Mid Term: 20

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A
Illness, Infections, Hypertension, Urine abnormalities; Venereal Diseases; Exercise induced Asthma; Anemia, Delayed Onset Muscle Soreness (DOMS), Runner’s high & exercise addiction. G.I.T. Diseases, Exercises and congestive heart failure, exercise for post coronary & bypass patients, exercise for diabetics. Diagnosis and management of skin conditions of Athletes, Bacterial infections, Fungal infections, Viral infections, boils and cellulitis.

Section-B
Female Specific Problems:
2. Injury to female reproductive tract.
4. Sex determination.
5. Exercise and pregnancy.

Section-C
1. Common Diseases: Common Cold, Diarrhoea, Dysentery, Typhoid, Cholera, Amoebiasis, Food Poisoning, Tuberculosis, Malaria, Hepatitis etc.
2. AIDS in sports people.
MPT (Sports Physiotherapy) (SEMESTER-III)
(Credit Based Evaluation and Grading System)

Section-D

**Rheumatology & Geriatric Disorder:**
1. Rheumatoid arthritis, SLE and Juvenile Rheumatoid Arthritis.
2. Ankylosing Spondylitis.
3. Rheumatology out patient clinic.
4. Osteoarthrosis and other geriatric conditions.

**Practicals:**
Students will attend the morning and evening O.P.D. in the University health center to acquaint himself/herself of various medical problems.

**References:**
5. Brukner and Khan: Clinical Sports Medicine, Mcgraw Hill.
6. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
10. Nicholas Hershman:
MPT (Sports Physiotherapy) (SEMESTER-IV)  
(Credit Based Evaluation and Grading System)  

SYL551: SPORTS PSYCHOLOGY  

L T P Max Marks: 100  
4 0 0 Mid Term: 20  

Mid Semester Examination: 20% weightage  
End Semester Examination: 80% weightage  

Instructions for the Paper Setters:  
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.  

Section-A  
1. History and current status of Sports Psychology.  
2. Personality Assessment and Sports Personality:  
   a. Theories of personality  
   b. Personality assessment  
3. Attention and Perception in Sports:  
   a. Attention  
   b. Perception  
4. Concentration Training in Sports:  
   a. Basic principles of concentration  
   b. Concentration training  
   c. Concentration awareness exercises  
5. Motivational Orientation in Sports:  
   a. Athlete’s needs of motivation  
   b. Motivational inhibitors  
   c. Motivational techniques  

Section-B  
1. Pre-competitive Anxiety:  
   a. Source of PCA  
   b. Effect of PCA on performance  
2. Relaxation Training:  
   a. Definition  
   b. Types of relaxation trainings  
      i) Progressive muscle relaxation  
      ii) Breathing exercises  
      iii) Yognidra  
      iv) Transcendental meditation
3. **Aggression in Sports:**
   a. Theories of aggression
   b. Management of aggression

4. **Role of Psychology in Dealing with Injuries.**

5. **Eating Disorders:**
   a. Etiology of eating disorders
   b. Types of eating disorders
   c. Complications of eating disorders

6. **Goal setting**
   a. Principles
   b. Strategy

---

**Section-C**

**Doping & Stress Management**
1. Psychological aspect of doping
2. Psychological preparation of elite athletes
   a. Concept of psychological preparation
3. Biofeedback training
4. Mental imagery
5. Stress management
   a. Principles of Stress Management
   b. Stress Management techniques

**Section-D**

1. **Group Behaviour and Leadership:**
   a. Nature of group behaviour and group.
   b. Types of group.
   c. Educational implication of group behaviour.
   d. Meaning of leadership, types of leadership quality of leadership, training and functioning of leadership.

2. **Emotion:**
   a. Meaning of emotion.
   b. Characteristics of emotion.
   c. Meaning of controlling and training of emotions and its importance.
   d. Contribution of sports to emotional health.
   e. Meaning of sentiment, its type, importance and formation.

**Practicals:**
1. Students will undergo practical training at Sports Psychology Lab at GNDU Campus, Amritsar.
2. Students will also undergo practical training in Sports Psychology at other Sports Institutes all over India.

**References:**
MPT (Sports Physiotherapy) (SEMESTER-IV)
(Credit Based Evaluation and Grading System)

**SPL652: APPLIED EXERCISE PHYSIOLOGY**

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Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

**Instructions for the Paper Setters:**
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

### Section-A

**Aging and Exercise**

a. Aging and Physiological function.
b. Exercise and Longevity.
c. Coronary Heart Disease and Exercise.
d. Exercise Stress Testing for Diagnosis of CHD.
e. Exercise prescription for healthy aged.
f. Exercise prescription for sedentary adults.
g. Cost and benefits of exercise prescription in Osteoporosis.

### Section-B

**Temperature Regulation**

c. Effects of Climate.
d. Effects of Exercise on Temperature Regulation.
e. Limit of Tolerance of Heat.
f. Acclimatisation.
g. Avoidance in Heat illness during exercise.
h. Exercises in cold.
Physiological Basis and Principles of Training and Conditioning

Part A. Principles of endurance and strength training

i. Recovery training intensities in heart rate
ii. Manipulation of training principles
iii. Training sub-phases

Part B. Fundamentals that aid training and performance

i. Warm up and Cool down
ii. Flexibility and stretching
iii. Missing workouts
iv. Overtraining

Part C. Analysis of Training

Section-D

1. Misc. Topics

i. High Altitude Training.
k. Special Aids to Athletic Performance:– MORA, Oxygen Inhalation, Sleep.
l. Sex and performance.
m. Assessment of Age.
n. Muscle tissue fibre typing and its significance.

2. Exercise for mood enhancement & anxiety.

Practicals:
Students will undergo laboratory and on field training in exercise physiology.

References:
1. Mc Ardle, Katch, Katch: Exercise Physiology Edition IV.
SPL653: Life Style Medicine

L T P Max Marks: 100
4 0 0 Mid Term: 20

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A

1. Introduction to lifestyle medicine
   a. Definition and importance
   b. contribution of healthy lifestyle to the prevention and treatment of diseases
   c. Definition of health and the foundations for good health
   d. Physiotherapist’s health – self -evaluation, personal goals, the importance of being a role model

2. Importance of Physical activity
   a. Relationship between physical activity and health
   b. Prescription of physical activity, according to age and gender in different medical conditions.
   c. Evaluating fitness, evaluating and approving physical activity

Section-B

1. Tools for promoting health change
   a. The challenge of change
      i. Factors that promote change and factors that impede processes of change
      ii. The emotional aspects of change processes
      iii. Creating a new balance in processes of change
   b. The trans-theoretical model / the theory of the 6 stages of change
   c. Patient compliance
   d. Health coaching

2. Obesity and related problems
   a. Dietary recommendation for healthy individual.
   c. Paediatric obesity- Regulation of food consumption, complications and prevention.
MPT (Sports Physiotherapy) (SEMESTER-IV)
(Credit Based Evaluation and Grading System)

Section-C

1. Stress Management
   a. Introduction
      i. The history and definition of "stress"
      ii. The characteristics of stressors
      iii. Clinical implications of stress
      iv. Coping with stress – styles of coping, recruiting resources for coping
   b. Self management
   c. Tools for stress management

2. Hazards of Smoking
   a. The physiological, psychological and behavioral impact of cigarette smoking
   b. Evidence based possibilities for treatment
   c. Treatment for smoking cessation

Section-D

1. Sleep Medicine
   a. Acquaintance with basic concepts in sleep medicine, the structure and physiology of sleep
   b. Classification of sleep disorders
   c. Clinical implications of sleep disturbance
   d. Physiotherapeutic measures for sleep deprivation

2. Lifestyle Medicine for Geriatric population

3. Yoga
   a. Important Pranayamas and strengthening and rejuvenating asnas.
   b. Methods, advantages and contraindications.

References:
1. Pediatric Obesity, IIInd edition
2. Illuminating lives with yoga, Geeta Iyer, 2017
MPT (Sports Physiotherapy) (SEMESTER-IV)
(Credit Based Evaluation and Grading System)

SPL654: Current Concepts in Sports Medicine

L T P Max Marks: 100
4 0 0 Mid Term: 20

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section-A
1. Segmental Stabilization Concepts of Spine
   a. Muscle function in spinal stabilization
   b. Contribution of various muscles to spinal stabilization
   c. Local Muscle dysfunction in Low back pain
   d. Principles of clinical management of deep muscle system for segmental stabilization

Section-B
1. Precision heart rate training
   a. Heart rate monitoring and training
   b. Training in heart zones
   c. Precision heart rate training for specific sports
   d. Multi Activity training
   e. Monitoring of training effects
2. Current concepts in obesity management
   a. Childhood obesity etiology and role of exercise
   b. Obesity correlation with lipidogram
   c. Intra-abdominal obesity hazards
   d. Management of obesity

Section-C
Electromyography and Rehabilitation
   a. Principles of EMG Rehab
   b. Muscular tone, fatigue and neural influences
   c. EMG in the evaluation of Sports Trauma
MPT (Sports Physiotherapy) (SEMESTER-IV)
(Credit Based Evaluation and Grading System)

Section-D

1. Emergency Medical Planning and cover for Sports Events
2. Exercise for growing bones
   - Effect of Physical activity intervention in youth
3. Current concepts in comprehensive physical examination for the instabilities of knee.
5. Current concepts in plasma rich platelet therapy and stem cells in sports.

Seminars and Groups Discussions:
It will be mandatory for the students to conduct seminars on the latest trends in sports medicine & sports physiotherapy.

References:
1. Mallarkey: Managing Obesity, Adis Publications
2. Burke: Precision Heart rate training, Human Kinetics Jull: Segmental Stabilization of Spine