

PAPER-I	
General Theory and Methods of Training.....	1
PAPER-II	
Kinesiology and Biomechanics.....	3
PAPER-III	
Sports Medicine and Sports Anthropometry.....	6
PAPER-IV	
Sports Physiology, Sports Biochemistry & Sports Nutrition.....	9
PAPER-V	
Sports Psychology.....	12
Teaching hours, marks allotted and Scheme of examination.....	14

SPORTS AUTHORITY OF INDIA
NETAJI SUBHAS NATIONAL INSTITUTE OF SPORTS : PATIALA

ONE YEAR SYLLABUS FOR DIPLOMA IN SPORTS COACHING

GENERAL THEORY AND METHODS OF TRAINING (GTMT)

MID SEMESTER

Chapter	Topics	Teaching hours
I	UNIT-I Introduction: Definition, aims and characteristics of sports training, Training means, Physical Exercises, Classification of Physical Exercises	06
II	Sports performance: Definition of sports performance, Performance capacity and Training structure, Model of sports performance.	04
III	UNIT-II Training load and recovery: Definition and types of Training Load, Factors of Load, classification of training loads, load and adaptation, adaptation models, Judgement of load, overtraining, causes and remedy of overtraining. Definition of Recovery, factors effecting recovery, means of recovery, selection of recovery means	10
IV	UNIT-III Principles of sports training Principle of Overload, progression, specificity, reversibility, individualisation, variation, diminishing return, regulation and its application in training	04
V	UNIT-IV Motor abilities 1. STRENGTH ABILITY: Definition, types and factors determining strength, programme designing, Methods of strength training 2. SPEED ABILITY: Definition, types of speed abilities, factors determining speed, programme designing, Methods of speed development 3. ENDURANCE ABILITY: Definition, types of endurance and factors determining endurance, programme designing, Methods for the development of endurance. 4. FLEXIBILITY: Definition, types and factors affecting flexibility, programme designing, Methods of flexibility development. 5. COORDINATION: Types of coordinative abilities, Importance and development of coordinative abilities.	05 04 05 03 03
Total Teaching Hrs		44

FINAL SEMESTER

KINESIOLOGY AND BIOMECHANICS MID SEMESTER

Chapter	Topics	Teaching hours
I	UNIT-V Skill Teaching and Skill Learning process Definition of Technique, Skill and style, types of skills, teaching of motor skills, skill learning stages, methods of teaching skills, methods of correction, feedback, importance, types of feedback.	06
II	UNIT-VI Planning Definition, importance, types of plan, principles of planning, planning of competitions, training sessions, one day plan, micro cycles and meso cycles.	06
III	UNIT-VII Periodization Definition, importance, macro cycle and annual plan, periods, types, aims and contents of different periods, steps in formulation of annual plan.	06
IV	Control and regulation of training process Importance, types of control, different motor tests for monitoring of training process.	06
Total Teaching Hrs		24

Practical	Teaching Hours
<ul style="list-style-type: none"> • Strength training • Endurance training • Speed training • Flexibility training • Coordinative abilities • Motor tests 	32
Total Teaching Hrs	32

(2)

Sr. No.	Topics	Teaching hours
1.	UNIT-I Introduction i. Definition of Kinesiology ii. Its importance in the field of sports coaching Reference System for Movement Analysis i. Concept of reference system and its significance ii. Various references, CG, Mechanical axis, anatomical and standard standing position iii. Types of Planes and Axes Fundamental and auxiliary movements in Kinesiology i. Importance of description of movements ii. Definition and explanation of various fundamental and auxiliary movements flexion, hyper flexion, extension, hyperextension, adduction, hyper adduction, abduction, hyper abduction, rotation, circumduction, dorsiflexion, plantarflexion, supination, pronation, eversion, inversion.	08
2.	UNIT-II Major muscles of the body and their action Involvement of various muscles during different fundamental and auxiliary movements of hip, knee, shoulder, elbow joint, shoulder, girdle and trunk region.	04
3.	UNIT-III Posture i. Definition of posture ii. Importance of good Posture iii. Characteristics of good posture iv. Factors affecting posture/causes of poor posture Structure of motor action i. Definition of motor action ii. Classification: types of movements i.e. acyclic, cyclic and movement combination iii. Phases of movement and their importance iv. Functional relationship among various phases of movement v. Structure of acyclic, cyclic and movement combination with examples and functions of various phases.	10

(3)

FINAL SEMESTER

Sr. No.	Topics	Teaching hours
UNIT-I		
1.	<p>Newtons Laws of Motion:</p> <p>i. Law of Inertia ii. Law of Acceleration iii. Law of Action and Reaction</p> <p>Principles related to:</p> <p>i. Law of Inertia ii. Law of Acceleration iii. Law of Action and Reaction</p> <p>Projectile motion and its implication in sports</p> <p>i. Fundamental definition of Projectile, trajectory, range, angle of release, point of release, velocity of release, point of landing, height of projectile, time of descent, time of ascent, time of flight, relative height of release. ii. Various situations of projectile motion and their characteristics and Implications in sports.</p>	10
UNIT-II		
2.	<p>Lever</p> <p>i. Types of levers ii. Anatomical levers of body iii. Principle of leverage</p> <p>Equilibrium and Stability</p> <p>i. Definition and explanation ii. Centre of gravity and its importance iii. Factors affecting stability and Equilibrium and their implication.</p>	5
UNIT-III		
3.	<p>Concept of Force</p> <p>i. Definition and explanation ii. Effect of characteristics of force iii. Types of forces: Internal and external forces iv. Summation of forces v. Centripetal and centrifugal force vi. Friction-its cause, types and factors affecting different. vii. Gravitational force.</p>	20
Total Teaching Hrs		Teaching hours
		32
Practical		
<p>i. Analysis of fundamental and auxiliary movements ii. Analysis of sports movements into fundamental and auxiliary movements iii. Muscular analysis of fundamental movements by Palpation method iv. Demonstration of Newton's Laws of Motion v. Demonstration of Conservation of Angular momentum vi. Spin on Ball-its causes and effects</p>		32
Total Practical Hrs.		32

(5)

Sr. No.	Topics	Teaching hours
UNIT-IV		
4.	<p>Movement qualities</p> <p>i. Movement coupling ii. Movement rhythm iii. Movement amplitude iv. Movement precision v. Movement flow</p> <p>Kinesiological analysis of basic movements Walking, running (differences between walking and running), jumping, throwing and catching</p>	10
UNIT-V		
5.	<p>Introduction to Sports Biomechanics</p> <p>i. Introduction and definition of sports Biomechanics ii. Role of Sports Biomechanics and its contribution in the field of sports</p> <p>Forms of Motion</p> <p>i. Linear motion ii. Rotatory or angular motion iii. General motion</p> <p>Linear Motion</p> <p>Definition, units and explanation of different values in linear motion viz. distance, displacement, speed, velocity, acceleration, acceleration due to gravity, inertia, mass, force, weight, momentum, impulse, pressure and relationship between pressure and area implication between their relationship</p> <p>Angular Motion</p> <p>Definition, units and explanation of different values in angular motion like angular distance, angular displacement, angular velocity, angular acceleration, relationship between angular and linear motion; eccentric force, couple, torque, moment of inertia and interrelationship between moment of inertia, angular momentum and angular velocity.</p>	10
Total Teaching Hrs		42

(4)

SPORTS MEDICINE AND SPORTS ANTHROPOMETRY

MID SEMESTER

Sr. No.	Topics	Teaching hours
	UNIT-I	
1.	i. Introduction to Sports Medicine ii. Basic Anatomy of Musculo skeletal system	04 04
	UNIT-II	
1.	iii. Prevention of Sports injuries - Risk factors - Preventive measures	04
2.	iv. Injuries in Sports - Classification of injuries - Skin injuries - Muscular injuries - Ligament injuries - Bone injuries - Common site specific injuries in sports	05
	UNIT-III	
3.	v. Sports Emergencies and first aid	04
	UNIT-IV	
	vi. Sports Physiotherapy - General principles of Physiotherapy - Exercise therapy - Manual therapy - Electrotherapy	06
4.	vii. Sports Rehabilitation - Principles of rehabilitation - Phases of Rehabilitation	04
	viii. Recovery in Sports - Medico biological means of recovery - Ice bath - Massage - Sauna bath - Steam bath	06
	ix. Ergogenic aids in sports	02
	Doping - Definition - Classification - Hazards of Doping: Short and Long term - IOC rules: role of Coach and Athlete - TUE	05
	Total Teaching Hours	44

(6)

FINAL SEMESTER

Sr. No.	Topics	Teaching hours
	UNIT-I	
1.	Kinanthropometry i. Introduction and Application of Kinanthropometry in sports	04
	UNIT-II	
2.	Human Growth and development i. Meaning, Application of Growth and Development in the field of sports ii. Stages of human growth iii. Difference between human growth and development iv. Concept of Maturity v. Determination of Velocity and Distance Curve vi. Prediction of Adult Height, Growth Curve, Peak Height Velocity, Canalization	06
	UNIT-III	
3.	Body Composition i. Body composition and its role in sports participation ii. Body Composition: Various methods (direct and indirect techniques) to Estimate of Human Body Composition. iii. Determination of body composition: Muscle, mass, bone mass and fat mass	06
	UNIT-IV	
4.	Concepts of Physique and Somatotype Physique: (A) Definition and Role of Physique in Sports (B) Physique in Different Sports and games Somatotype: (A) Different components, importance & scope in sports (B) Classification of somatotype Health and Carter method of somatotyping (D) Somatochart	08
	Total Teaching Hrs	24

(7)

Practical	Teaching hours
First aid.	32
Sports Injuries BLS - CPR	
Bandaging, Strapping, taping	
Massage	
Exercise therapy (Post traumatic rehabilitation)	
Dope sampling	
Definition and role of Anthropometry in sports	
Important Anthropometric measurements and handling of Instrument	
Important body landmark	
Total Practical Hrs.	

SPORTS PHYSIOLOGY, SPORTS BIOCHEMISTRY & SPORTS NUTRITION		
MID SEMESTER SPORTS PHYSIOLOGY		
Sr. No.	Topics	Teaching hours
	UNIT-I	
1.	INTRODUCTION i) Brief history and scope of exercise physiology ii) An overview of the system of organization in the human body iii) Role of Exercise Physiology in high performance sports	03
	UNIT-II	
2.	BLOOD & CARDIOVASCULAR SYSTEM i) Structure and functions of human heart ii) Cardiac cycle at rest and during exercise iii) Changes in cardiovascular parameters due to exercise - Structural of heart - Heart rate - Stroke volume - Cardiac output - Blood pressure iv) Blood circulation to skeletal muscle in rest and during exercise	11
	UNIT-III	
3.	RESPIRATORY SYSTEM i) Functional anatomy of respiratory system ii) Respiratory muscles iii) Mechanism of breathing iv) Lung volumes and capacities v) Gaseous transportation (Oxygen and Carbon dioxide) vi) O ₂ Dissociation curve in various circumstances vii) Ventilatory responses during rest and exercise viii) Regulation of respiratory system ix) Factors controlling respiration x) Hypoxic response of respiratory system	10
	UNIT-IV	
4.	NEURO MUSCULAR SYSTEM i) Functional anatomy of muscles and motor unit ii) Types of skeletal muscles iii) Excitation contraction coupling iv) Metabolism of muscle in aerobic and anaerobic circumstances v) Adaptation in neuro-muscular system to long term training vi) Muscle fatigue and recovery	10

SPORTS BIOCHEMISTRY & SPORTS NUTRITION

FINAL SEMESTER

Sr. No.	Topics	Teaching Hours
UNIT I		
1	I. Introduction to Sports Biochemistry: Definition, Aim, Importance II. Exercise Metabolism: Energy Systems, Energy Substrate and integration of exercise metabolism III. Biochemical basis of fatigue & recovery.	6
UNIT II		
	I. Factors Determining energy metabolism: volume, intensity, nutrition, heredity and hormones II. Oxygen carriers: Hemoglobin and myoglobin III. Biochemical monitoring of sports training: The blood, iron status, metabolites, enzymes and hormones	6
UNIT III		
1	i. Components of food, their classification, functions and sources: Carbohydrates, Proteins, Fats, Vitamins and Minerals. ii. Nutritional requirements for various sports disciplines: Power events, endurance events, Team Events, Events of light weight categories, Skill games.	7
UNIT IV		
2	i. Nutritional recommendations for pre competition, during competition and post competition phase ii. Hydration in sports: Importance of hydration, Symptoms of dehydration, Guidelines for fluid and Nutrient intake to maintain hydration. iii. Nutritional supplementation for performance enhancement: Nutrition and body weight control.	5
Total Teaching Hours		24

Practical	Teaching hours
1. Estimation of heart rate by different methods during rest and exercise	
2. Estimation of PFI by modified Harvard Step test	
3. Indirect measurement of VO2 Max through Queens College test	
4. Dynamometry: Determination of grip strength and relative back strength	32
5. Estimations of hemoglobin percentage	
6. Household measurements of cooked food and their conversion to raw food items.	
Total Practical Hrs.	32

UNIT-V

1. ENVIRONMENT AND PHYSICAL PERFORMANCE	07
i) Body temperature regulation in hot and cold environment ii) General aspects of Homeostatic balance in different environment iii) Regulation of blood volume, osmolarity and pH during exercise iv) Short and long term systemic adaptations due to exercise	
2. AGE, HORMONES, GENDER AND PERFORMANCE	07
i) Changes in physiological profile during growth and development ii) Exercise and hormones iii) Women and sports performance. Gender differences and athletic abilities. iv) Actions and side effects of steroids in sports population	
Total Teaching Hrs	48

SPORTS PSYCHOLOGY

MID SEMESTER

S. No.	Topics	Teaching Hours
1	Introduction to Sport Psychology	07
	I. Meaning and importance of sport psychology II. History of sports psychology in India III. Research Methods in Sport psychology Cognitive processes I. Introduction to cognitive processes II. Role of cognitive processes in sports III. Strategies to improve cognitive functions	
2	UNIT-II	07
	Emotional processes and sports performance I. Definition and theories of Emotion and their implication in sports II. Stress and Anxiety III. Arousal-performance relationship in sports IV. Stress management techniques V. Aggression in sports and control	
3	UNIT-III	07
	Personality and Sports performance I. Personality and its conceptualizations II. Personality assessment III. Meaning and concept of athletic personality IV. Personality profile of athletes and the indicators of performance	
4	UNIT-IV	08
	Motivation in sports I. Definition and theories of motivation II. Types of motivation and their implication in sports III. Techniques of motivation enhancement IV. Goal setting	
5	UNIT-V	08
	Psychological preparation in sports I. Meaning and importance of psychological preparation II. Short term psychological preparation III. Long term psychological preparation IV. Application in sports	
Total Teaching Hrs		44

SPORTS PSYCHOLOGY

FINAL SEMESTER

S. No.	Topics	Teaching Hours
6	UNIT-VI	08
	Optimizing team behavior and performance a) Difference between team and group b) Process of team formation c) Building team cohesiveness d) Leadership styles and its implication in Sports e) Communication in team	
7	UNIT-VII	08
	Athletic injuries and psychology a) Psychological factors in athletic injuries b) Role of sports psychology in injury prevention c) Role of sports psychology in injury rehabilitation	
8	UNIT-VIII	08
	Burn out and overtraining a) Definition and meaning of burn out b) Factors leading to burn out and symptoms of burn out c) Conceptualization of overtraining d) Treating and preventing burn out	
Total Teaching Hrs		24

S. No.	Topics	Teaching Hours
1	PRACTICAL	32
	Psycho-regulative procedures: I. Cognitive techniques, autogenic training, systematic desensitization, progressive muscle relaxation and biofeedback II. Anticipation tasks	
Total Teaching Hrs		32

**Teaching hours, marks allotted and
Scheme of examination for
Sports science subjects for
Diploma Course in Sports Coaching
2015-2016**

Theory

Sports Science Subject	Teaching Hours	Max. Marks	1 st Trimester Exam. 3 rd /4 th week of Dec. Marks	Duration of Paper	2 nd Trimester Exam. 2 nd week of April. Marks	Duration of Paper
GTMT	68	60	30	2 hours	30	2 hours
Kinesiology & Biomechanics	62	60	30	-do-	30	-do-
Sports Medicine & Anthropometry	68	60	30	-do-	30	-do-
Sports Physiology	72	60	30	-do-	30	-do-
Sports Psychology	68	60	30	-do-	30	-do-

Practical

Sports Science Subject	Teaching Hours	Max. Marks=20			Date of Exam.
		For Internal Assessment (10)	For Examination (10)	Total Marks (20)	
GTMT	32	10	10	20	First week of February
Kinesiology & Biomechanics	32	10	10	20	-do-
Sports Medicine & Anthropometry	32	10	10	20	-do-
Sports Physiology	32	10	10	20	-do-
Sports Psychology	32	10	10	20	-do-



**ANNUAL SYLLABUS
Of
Sports Sciences**

**For
Diploma Course in Sports Coaching
(Revised in 2015)**



SPORTS AUTHORITY OF INDIA
Netaji Subhas National Institute of Sports
PATIALA