

# Syllabus

## PAPER 1

# EXERCISE PHYSIOLOGY FOR SPORTS AND FITNESS

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### Unit 1

Physiology of Exercise - Fuels for Exercise - Carbohydrates -Fats - Proteins - High-Energy Phosphates Bioenergetics - Anaerobic ATP Production - Aerobic ATP Production - Aerobic ATP Tally - Physical Fitness - Efficiency of Oxidative Phosphorylation - Control of Bioenergetics - Control of ATP-PC System - Control of Glycolysis - Control of Krebs Cycle and Electron Transport Chain - Interaction Between Aerobic/Anaerobic ATP Production - Exercise Metabolism - Energy Requirements at Rest - Rest-to-Exercise Transitions - Recovery from Exercise: Metabolic Responses - Metabolic Responses to Exercise: Influence of Physiology of Exercise - Professional Societies and Research Journals - Translation of Exercise Physiology to the Consumer

### Unit 2

Control of the Internal Environment Homeostasis: Dynamic Constancy Control Systems of the Body - Nature of the Control Systems - Negative Feedback - Positive Feedback - Gain of a Control System - Duration and Intensity - Short-Term, Intense Exercise - Prolonged Exercise - Incremental Exercise - Examples of Homeostatic Control - Regulation of Body Temperature - Regulation of Blood Glucose - Stress Proteins Assist in the Regulation of Cellular Estimation of Fuel Utilization During Exercise - Factors Governing Fuel Selection - Exercise Intensity and Fuel Selection - Exercise Duration and Fuel Selection - Interaction of Fat/Carbohydrate Metabolism - Body Fuel Sources - Hormonal Responses to Exercise Neuroendocrinology - Blood Hormone Concentration - Hormone-Receptor Interaction - Homeostasis - Exercise and Homeostatic Control - Bioenergetics - Cell Structure - Biological Energy Transformation - Cellular Chemical Reactions - Oxidation-Reduction Reactions Enzymes

### Unit 3

Skeletal Muscle: Structure and Function - Structure of Skeletal Muscle - Neuromuscular Junction - Muscular Contraction - Overview of the Sliding Filament Model - Energy for Contraction - Regulation of Excitation-Contraction Coupling - Fiber Types - Biochemical and Contractile Characteristics of Skeletal Muscle - Characteristics of Individual Fiber Types - Fiber Types and Performance - Alterations in Skeletal Muscle Due to Exercise, Inactivity, and Aging - Exercise-Induced Changes in Skeletal Muscles - Muscle Atrophy Due to Inactivity - Age-Related Changes in Skeletal Muscle - Muscle Actions - Speed of Muscle Action and Relaxation - Force Regulation in Muscle - Force-Velocity/Power-Velocity Relationships

The Nervous System: Structure and Control of Movement - General Nervous System Functions Organisation of the Nervous System - Structure of the Neuron - Electrical Activity in Neurons - Sensory Information and Reflexes - Joint Proprioceptors - Muscle Proprioceptors - Muscle Chemoreceptors - Reflexes - Somatic Motor Function - Vestibular Apparatus and Equilibrium - Motor Control Functions of the Brain BrainStem - Cerebrum - Cerebellum - Motor Functions of the Spinal Cord - Control of Motor Functions - Autonomic Nervous System - Exercise Enhances Brain Health - intermittent Exercise - Prolonged Exercise - Regulation of Cardiovascular Adjustments to Exercise -

#### Unit 4

Circulatory Responses to Exercise - Organization of the Circulatory System - Structure of the Heart - Pulmonary and Systemic Circuits - Heart: Myocardium and Cardiac Cycle - Myocardium - Cardiac Cycle - Arterial Blood Pressure - Factors That Influence Arterial Blood Pressure - Electrical Activity of the Heart - Cardiac Output - Regulation of Heart Rate - Regulation of Stroke Volume - Hemodynamics - Physical Characteristics of Blood - Relationships Among Pressure, Resistance, and Flow - Sources of Vascular Resistance - Changes in Oxygen Delivery to Muscle During Exercise - Changes in Cardiac Output During Exercise - Changes in Arterial-Mixed Venous O<sub>2</sub> Content - During Exercise - Redistribution of Blood Flow During Exercise - Regulation of Local Blood Flow During Exercise - Circulatory Responses to Exercise - Emotional influence - Transition from Rest to Exercise - Recovery from Exercise - Incremental Exercise Control of Ventilation - Ventilatory Regulation at Rest - Respiratory Control Center - Ventilatory Control During Submaximal Exercise - Ventilatory Control During Heavy Exercise - Lungs Adaptation to Exercise Training - Pulmonary System Limiting Maximal Exercise Performance - Acid-Base Balance During Exercise - Acids, Bases, and pH - Hydrogen Ion Production During

Exercise - Importance of Acid-Base Regulation - During Exercise - Acid-Base Buffer Systems - Intracellular Buffers - Extracellular Buffers - Respiratory Influence on Acid-Base Balance - Regulation of Acid-Base Balance via the Kidneys - Regulation of Acid-Base Balance During Exercise

## Unit 5

Hormones: Regulation and Action - Hypothalamus and the Pituitary Gland - Thyroid Gland - Parathyroid Gland - Adrenal Gland - Pancreas - Testes and Ovaries - Hormonal Control of Substrate Mobilisation During Exercise - Muscle-Glycogen Utilisation - Blood Glucose Homeostasis During Exercise - Hormone-Substrate Interaction - Temperature Regulation - Overview of Heat Balance During Exercise - Temperature Measurement - During Exercise - Overview of Heat Production/Heat Loss - Heat Production - Heat Loss - Heat Storage in the Body During Exercise - Body's Thermostat-Hypothalamus - Shift in the Hypothalamic Thermostat Set Point - Due to Fever - Thermal Events During Exercise - Heat Index-A Measure of How Hot It Feels - Exercise in the Heat - Sweat Rates During Exercise - Exercise Performance in a Hot Environment - Gender and Age Differences in Thermoregulation - Exercise in a Cold Environment - Cold Acclimatization

## Unit 6

The Physiology of Training: Effect on V<sub>O2</sub> Max. Performance, Homeostasis. and Strength - Principles of Training - Overload - Specificity - Research Designs to Study Training - Endurance Training and V<sub>O2</sub> Max - Training Programs and Changes In V<sub>O2</sub> Max - V<sub>O2</sub> Max: Cardiac Output and the Arteriovenous O<sub>2</sub> Difference - Stroke Volume - Arteriovenous O<sub>2</sub> Difference - Detraining and V<sub>O2</sub> Max - Endurance Training: Effects on Performance and Homeostasis - Biochemical Adaptations and the Oxygen Deficit - Biochemical Adaptations and the Plasma Glucose Concentration - Biochemical Adaptations and Blood pH - Biochemical Adaptations and Lactate Removal - Endurance Training: Links Between Muscle and Systemic Physiology - Peripheral Feedback - Central Command - Physiological Effects of Strength Training - Physiological Mechanisms Causing Increased Strength - Neural Factors - Muscular Enlargement - Concurrent Strength and Endurance Training - Respiration During Exercise Function of the Lung Structure of the Respiratory System - Conducting Zone - Respiratory Zone - Mechanics of Breathing - Inspiration - Expiration - Airway Resistance - Pulmonary Ventilation - Pulmonary Volumes and Capacities - Diffusion of Gases - Blood Flow to the Lung -

Ventilation-Perfusion Relationships - O<sub>2</sub> and CO<sub>2</sub> Transport in Blood - Hemoglobin and O<sub>2</sub> Transport - Oxyhemoglobin Dissociation Curve - O<sub>2</sub> Transport in Muscle - CO<sub>2</sub> Transport in Blood - Ventilation and Acid-Base Balance - Ventilatory and Blood-Gas Responses to Exercise - Rest-to-Work Transitions - Prolonged Exercise in a Hot Environment.

## PAPER 2

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# SPORTS NUTRITION FOR PERFORMANCE EXCELLENCE

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## Unit 1

Introduction to Sports Nutrition- definition and scope of Sports Nutrition - Diet and Performance - Importance of Sports Nutrition -Digestion, Absorption and Energy Metabolism Intro / refresher on Digestion, Absorption & Assimilation – Definition of Energy and ATP - - Energy systems ATP-PC system, Anaerobic Glycolytic system, Aerobic system - Fuel for energy metabolism in exercise - Effect of Intensity and duration of exercise/sport - Measuring energy expenditure - Measuring Physical activity - METs Metabolic Equivalent – Fatigue. Macronutrients- Carbohydrate, Protein, Fats - Biochemistry, metabolism - Types of Competition/ event/ sport - Athletics - Track & Field - Team Sports - Individual Sports

## Unit 2

Carbohydrates types - Simple sugars - complex carbohydrates - Glycemic index - Glycemic load - food sources - Muscle glycogen & performance - Consumption of carb (what, when & how much?) - The glycaemic index and glycaemic load - carb loading - Carbohydrate & Recovery, Carbohydrates in sports:- during training, during different phases of Preparation, General preparatory phase, Specific preparatory phase, Competition phase, Transition phase , Injury and rehabilitation phase - Pre competition Nutrition - Post competition nutrition

Protein Biochemistry, metabolism - Amino acids, essential, non essential - Types and quality of protein - Protein intake and performance - Daily protein requirement - Type of exercise and Protein requirements in sport - different type of sports and their protein requirement - Protein sparing - Protein intake (what, when and how much) - Protein in sports :- during training, during different phases of Preparation, General preparatory phase, Specific preparatory phase, Competition phase, Transition phase , Injury and rehabilitation phase - Pre competition Nutrition - Post competition nutrition

Fat - Biochemistry, metabolism, types, Saturated and Unsaturated fats, Trans fatty acids? - Essential Fats - Fat Intake (what, when and how much) - Cholesterol - Fats in sports :- during training, during different phases of Preparation, General preparatory phase, Specific preparatory phase, Competition phase, Transition phase , Injury and rehabilitation phase Energy intake and energy expenditure - thermogenesis - SDA of foods - Pre competition Nutrition - Post competition nutrition - body fat and dietary fat - Weight loss.

## Unit 3

Hydration - Pre competition Hydration, The Week before, the day before, on the day. Ergogenic aids Definition of Ergogenic aids - Popular and famous Ergogenic aids - Anti doping agency - list of banned drugs/substances - The truth behind supplements - Nutraceuticals - Efficacy - safety & adverse effects - ethical/ legitimate? Quality assurance & dangers of testing positive - Cost effectiveness - Caffeine – Creatine - Homeostasis Fluid & Electrolyte Fluid loss - Sweat - Thermoregulation Core & Shell

temperature - Effect of Climate & Environment - Dehydration & Performance - Assessing Fluid loss - Proper Pre-Hydration, Rehydration / fluid replacement (what, when & how much?) - Electrolytes - Role of electrolytes in Muscular contraction- Electrolyte loss & exercise - Maintaining / Restoring electrolyte Balance - Sports & Energy drinks - Osmolality & osmolarity - Hypotonic, Isotonic, Hypertonic - Acclimatization - Non Alcoholic Beverages – Alcohol

#### Unit 4

Micronutrients- vitamins and minerals, Antioxidants, electrolytes - Definition of vitamins, Minerals - Fat soluble, Water soluble vitamins - Role of Vitamins - RDA - Deficiency - Vitamins and Performance - Minerals - Iron, calcium - RDA - Minerals role in Performance - deficiency - Iron deficiency - role of electrolytes in Sport & performance - Antioxidants - free radicals and exercise - Sports supplements - Hydration - Competition nutrition - Your personal nutrition programme - The recipes - Weight gain - nutrition for preventing weight gain - nutrition for preventing muscle loss - nutrition for making weight

#### Unit 5

The vegetarian athlete - The female athlete - female athlete triad - eating disorders - amenorrhea - Geriatric Sports nutrition - Veteran athletes - Masters  
The young athlete - Paediatric sports nutrition :- Age categorised sports, growth and nutrition, making weight, maintaining weight in young athlete - puberty & sports - changes during puberty and nutrition  
nutrition for the differentially abled involved in sports & fitness including wheel chair athletes - orthopaedic disabilities - nutrition for sports in down's syndrome, nutrition for Autism in sports & fitness,

#### Unit 6

Nutrition for performance enhancement: Endurance sports - Nutrition for Ironman, Triathlon and Ultrathon - Nutrition for Intermittent sports, Nutrition for Strength & Power sports, Nutrition for winter sports, Nutrition for Weight conscious sports, nutrition for martial artists in the Olympics - Judo, Wrestling, Wushu, Taekwondo, Nutrition for adventure sports, Kayaking, Canoeing, and other water sports.  
Nutrition in swimming.

Sports Nutrition research - Latest advancements

## PAPER 3

# FITNESS NUTRITION FOR LIFESTYLE MODIFICATION

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#### Unit 1

Introduction to Fitness Nutrition- definition and scope of Fitness Nutrition - Diet and Exercise - Importance of Fitness Nutrition -Digestion, Absorption and Energy Metabolism Intro / refresher on Digestion, Absorption & Assimilation – Definition of Energy and ATP - Energy systems ATP-PC system, Anaerobic Glycolytic system, Aerobic system - Fuel for energy metabolism in exercise - Effect of Intensity and duration of exercise/sport - Measuring energy expenditure - Measuring Physical activity - METs Metabolic Equivalent – Fatigue. Macronutrients- Carbohydrate, Protein, Fats - Biochemistry, metabolism - Types of exercises - Aerobic training - Anaerobic training - Strength training - Flexibility training.

## Unit 2

Nutrition in individuals who exercise - Carbohydrates and exercises - Proteins and exercises - Fats and exercises - Hydration in Fitness & exercise - electrolytes in exercise - Vitamins, Minerals & exercise - Antioxidants role in fitness and health - Fuelling before during and after exercise - Protein requirements for health & exercise - Energy for exercise - Fitness Nutrition for various non clinical population :- the exercising homemaker, the exercising sedentary worker, the labourers, skilled and wage labourers, the weekend warriors, recreational athletes & sportspeople (team sports, individual sports, adventure sports, parkour etc.)

B Vitamins important in energy metabolism - exercise related functions and dietary requirements - rationale for increased need for active individuals - assessment of vitamin status - exerts and vitamin requirements - Nutrition for bone health - bone metabolism - calcium - phosphorus - magnesium - vitamin D - other nutrients in bone metabolism - exercise bone health - micronutrients important in blood formation

## Unit 3

Body Composition:-Assessment - Body composition & performance - Body Fat percentage - Distribution of fat - Attaining Ideal Body Composition - Fat Loss - Gaining lean bodyweight - Low body fat percentage - Body fat percentage and Hormonal imbalance - Energy intake energy expenditure, Obesity, theories of obesity, Fat cell theory, set point theory, Heredity, metabolism, Dieting and weight cycling, Reliable weight loss programme, Life time weight management programme for success, culture and weight, Eating disorders, Bulimia, Anorexia Nervosa, Binge eating, Size 0, Kinanthropometry. Achieving healthy body weight - role of diet & exercise in achieving a healthy body weight - weight loss interventions - adding exercise weight loss programmes - recommendations for maintaining or gaining weight - weight concerns - fat blockers - thermogenics - lipolytic nutrition - garcena cambogia - carnitine - betaine - calcium pyruvate - chromium - CLA (conjugated linoleic acid) - diuretics.

Eating disorders - health effects of eating disorders - Eating Disorder, estrogen & Amenorrhea - iron deficiency

## Unit 4

Nutrition in Endocrinology - Pathology of Diabetes mellitus - Type 1 & type 2 DM - Exercise intervention/rehabilitation in Diabetics, Nutrition for Diabetics under Exercise Rehabilitation - Pathology of Cardiovascular diseases - Coronary Heart Disease, Myocardial Infarction - CABG, Re-vascularisation procedures - Stroke- Exercise intervention/rehabilitation in Cardiac patients & cardiovascular patients, Nutrition in Cardiac patients in Exercise Rehabilitation - Pathology of Osteoporosis - Exercise intervention/rehabilitation in Osteoporosis, Nutrition in Osteoporosis - Other Lifestyle disorders & diseases and role of

nutrition - Hyperlipidemias - Hypercholesterolemia - Cancer Nutrition for hyperuricemia and gout.

Fitness Nutrition in Rheumatoid arthritis and inflammatory arthritis

Nutrition & mental Health Life cycle concerns - child & adolescent - factors affecting nutritional needs - energy requirements - food habits - adolescent body image and weight control - nutritional imbalance nutrition for geriatric health - bloating & indigestion and food allergies

## Unit 5

Different Diets - Atkins, GM diet, Paleo diet, Keto diet, Diet based on Metabolic typing

Alternative nutrition - Ayurveda, Naturopathy etc.

Nutrition for dance - indigenous dance forms, western dance forms, nutrition for martial artists - martial artists & non olympic martial arts including Kalaripayattu, Kung fu, Karate, Brazilian Jujitsu, Mixed martial arts

Nutrition for dance - indigenous dance forms like Bharathanatyam, Kathakali etc., western dance forms like Jazz, Ballet, contemporary , Hip hop etc.

Nutrition for Uniform services - Army, Police, and others like Firefighters, Security guards, personal bodyguards, etc.

## Unit 6

Nutrition for Yoga Practitioners :-

Yoga - Introduction, Definition of Yoga, Origin of the word Yoga -Yuj', Meaning of the word Hatha, Stages of Yoga, Types of Yoga, Karma yoga, Gnana Yoga, Bhakti Yoga, Kriya Yoga, Buddhism and Yoga, Yoga as a Universally accepted term, Tibetan forms of Yoga, Schools of Yoga, KYM, Iyengar, Ashtanga Yoga, Thitumoolar Yoga, Shivananda Yoga, Kaivalyadham Yoga, Bihar School, Bikram Yoga, - Ashtanga yoga as 8 stages of Yoga, Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana, Samadhi, Ancient Texts and Yoga Scriptures, Thirumantiram, Patanjali Yoga Sutra, Hatha Yoga Pradhipika, Surya Namaskara Kriya, Bhandas, Jalandhara Bhandha, Uddhiyana Bhandha, Muladhara Bhandha, and Kriyas, Hatha Yoga, Movement & Posture  
The Neuro-Musculo Skeletal System — The Nervous system— Reflexes — The Vestibular System, Sight and Touch — Connective Tissue Restraints — Stretching — Three Postures, Breathing, The design of the Respiratory System — the muscles of Respiration — How Breathing affects Posture — the Somatic and Autonomic Nervous system — the Physiology of Respiration — Thoracic Breathing — Paradoxical Breathing —Supine Abdominal Breathing — Abdominal Breathing in Sitting Postures — Diaphragmatic Breathing, Postures targeting Abdominopelvic Region Foundation of the body — Sitting Boat Postures — The Peacock — The Pelvis and The Anatomical Perineum — Ashwini Mudra —Mula Bandha — Agni Sara — Uddiyana Bandha — Nauli — Contraindications & Benefits, Uddhiyana Bandha in Pilates as TA activation, difference between yoga and Tantra, Chakras and their anatomical sites and counterparts, Pineal gland, Pituitary, Thyroid, Heart and thymus, Cardiac plexus, Coeliac Ganglion and Coeliac Plexus, or Solar plexus, Superior mesenteric plexus, Inferior mesenteric plexus, Perineal body and Pubococxcegues, Postures, Sugam-comfort and Sthiram, Standing  
The Skeletal system and movement — Anatomy of the Spine — Symmetry and Asymmetry — Standing Postures — Backward Bending — forward bending — Side bending — the triangle postures — balancing Postures —Benefits, Postures :- Back bending The Anatomy of Flexion and Extension — Breathing and Back bending — The Cobra Postures — The Locust Postures — the Prone Boat Postures — the Bow Postures — the knee joint — Supine Back Bending Postures —Kneeling Backbend- the camel — Contradictions — benefits, Vinyasas, Forward Bending , Head, Neck and Chest — Lumbar and Lumbosacral Forward bending — Sacroiliac Nutation and Counter Nutation — Forward bending at the Hip Joints — Forward bending at the Ankle and in the Feet — Clinical matters and caution — The posterior stretch — The Down- Facing Dog — The Child's Pose —Breathing and Forward bending — Sacroiliac



Flexibility — Hip Flexibility — Benefits, Twisting Postures, The Fundamentals of Twisting — The skull, the Atlas, and The Axis — Movements of the Head & Neck — Thoracic Twisting — Lumbar Twisting — The lower extremities — Supine Twists — Standing twists — Inverted twists — Sitting Spinal Twists — Benefits, - Headstand and its implication, Variations in Head stand, Shoulder stand Postures, Relaxation and Dhyana- meditataion, Pranayama, Introduction & Theory- Prana and Pranayama — Pranayama and the Respiratory system — Nadis and Chakras — Guru and Sisya — Food — Obstacles and Aids — The effect of Pranayama, the art of sitting in Pranayama — The Art of Preparing the mind for Pranayama — Mudras and Bandhas — The art of Inhalation (Puraka) and Exhalation (Rechaka) — the art of Retention (Kumbhaka) - Grades of Sadhaka in Pranayama — Bija Pranayama — Vritti Pranayama, Ujjayi Pranayama — Viloma Pranayama — Bhramari, Murchha and Plavini Pranayama — Digital Pranayama and the art of placing the fingers on the nose — Bhastrika and Kapalabhati Pranayama— Sitali and Sitakari Pranayama — Anuloma Pranayama — Pratiloma Pranayama — Surya Bhedana and Chandra Bedhana Pranayama — Nadi Sodhana Pranayama, Contribution by Patanjali, Thirumularand18 Siddhars.

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# Internal Theory Paper 1

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## Biostatistics and Research

### Epidemiology, Biostatistics and Medical Ethics

#### UNIT I:

Epidemiology Introduction: Historical aspects and evolution of epidemiology, definitions and concepts in Epidemiology. Approaches in epidemiology: Descriptive and analytical epidemiology, disease burden, natural history of diseases and measures of risk and death. Study design and sampling: Sample size estimation and introduction to study design in epidemiological investigations.

#### UNIT II:

Biostatistics Fundamentals of biostatistics: Introduction, types of data, tabular and graphical presentation of data. Measures of location, dispersion and correlation: Measures of central tendency. Mean, mode, median, GM, HM, quartiles Measures of dispersion—range, standard deviation, variance, coefficient of variation. Probability and statistical inference: Concept and probability distribution. Normal distribution— density curves, applications and statistical tables. Concept of significance tests, parametric and nonparametric tests, standard error and confidence intervals. Inferential statistics: Probability and distributions – Poisson, Binomial and Normal distribution – Chi-square test – Hypothesis test - Student's t-test – Correlation and Regression – ANOVA.

### UNIT III:

Medical Ethics Bioethics and Medical ethics: Historical perspectives & Introduction to Bioethics, Nuremberg Code, Declaration of Helsinki, Principle of essentiality, informed consent, confidentiality, minimisation of risk, accountability and responsibility. Ethics of clinical trials: Drug trials, vaccine trials, Clinical trials with medical devices/surgical procedures/radioactive materials, Research in transplantation and stem cell therapy. Regulatory framework and guidelines for conduction of human research: Review processes, Institutional ethical committees, composition of committees, review procedures, WHO, UNESCO and ICMR guidelines.

#### References :

- 1) Epidemiology: An Introduction. Kenneth J. J. Rothman. Latest edition / Pub. Date: May 2002. Publisher: Oxford University Press.
- 2) Epidemiology. Leon Gordis. Latest edition / Pub. Date: November 2004. Publisher: Elsevier Health Sciences.
- 3) Diseases and Human Evolution. Ethne Barnes. Latest edition / Latest edition / Pub. Date: March 2005. Publisher: University of New Mexico Press.
- 4) Epidemiology: Beyond the Basics. F. Javier Nieto, Moyses Szklo. Latest edition / Pub. Date: November 2003. Publisher: Jones & Bartlett Publishers, Inc.
- 5) Basic and Clinical Biostatistics. Beth Dawson, Robert G. Trapp, Robert Trapp. Latest edition / Pub. Date: March 2004.
- 6) Discovering Statistics Using SPSS. Andy Field. Latest edition / Pub. Date: April 2005. Publisher: SAGE Publications.
- 7) Arora PN & Malhon PK (1996). Biostatistics Imalaya Publishing House, Mumbai.
- 8) Sokal & Rohif (1973). Introduction to Biostatistics, Toppan Co. Japan.
- 9) Stanton A & Clantz, Primer of Biostatistics — T he McGraw Hill Inc., New York.
- 10) Government of India. Good Clinical Practices for Clinical Research in India. New Delhi: 2001
- 11) Indian Council of Medical Research. Ethical Guidelines for Biomedical Research on Human Subjects. New Delhi: 2000
12. United Nations Educational, Scientific and Cultural Organisation (UNESCO). Universal Declaration on Bioethics and Human Rights. Paris; 2005

# PRACTICAL 1

## SPORTS NUTRITION FOR PERFORMANCE EXCELLENCE

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Nutritional Assessment, Management & Counselling of Athletes & Sportspeople :-

1. Track & field events
2. Team sports
3. Individual sports
4. Differently abled
5. Martial Artists
6. Strength and Power sports
7. Water Sports
8. Winter Sports
9. Swimmers
10. Other athletic pursuits.

# PRACTICAL 2

## FITNESS NUTRITION FOR LIFESTYLE MODIFICATION

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Nutritional Assessment, Management & Counselling of people under the following categories:-

- 1 General Fitness
  11. Paediatric fitness
  12. Geriatric fitness
  13. Martial artists
  14. Yoga
  15. Dance
  16. Vocal athletes

17. Fitness medicine - where Exercise intervention/rehabilitation programs have been prescribed:- viz.
1. Pregnancy - Prenatal/Antenatal, Postnatal
  2. Obesity
  3. Diabetes Mellitus
  4. Cardiovascular diseases :- CHD, Hypertension, post CABG, post Re-canalisation etc.
  5. Cancer
  6. Osteoporosis
  7. Hyperlipidemias
  8. other Lifestyle diseases
  9. Mental health - Depression, Anxiety etc.

## INTERNAL PRACTICAL 1

# SPORTS KINANTHROPOMETRY & FITNESS ASSESSMENT

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Body Composition, Anthropometry, Bioelectrical Impedance Analysis, BIA, Body Mass Index, BMI, Body fat percentage, Methods of Body Composition Assessment, Skin Fold measurements, Validity, and reliability of the tests, Experience and skill of the measure , type of caliper, equation chosen, Compressibility of the skin fold, appropriate reference method used. DEXA.

Indirect calorimetry, Resting Metabolic Rate, Basal Metabolic Rate.

Pre-exercise Fitness Assessment, safety, Risk factors, Health behaviours, PARQ+ and coronary artery risk factor, Pre-participation Risk assessment, Sudden Cardiac death Health related factors affecting exercise, Sub-maximal exercise testing, and pretest Screening, and fixed test protocols, Field tests, Cycle test Treadmill test.

**THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI -600 032**  
**REGULATIONS OF THE UNIVERSITY M.Sc. SPORTS & FITNESS NUTRITION**  
**(Post-graduate Degree course under Allied Health Science)**

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

**1. SHORT TITLE AND COMMENCEMENT:-**

These regulations shall be called as “**M.Sc. SPORTS AND FITNESS NUTRITION**” of the Tamil Nadu Dr. MGR Medical University, Chennai.

They shall come into force from the academic year “**M.Sc. SPORTS AND FITNESS NUTRITION**”

The regulations and the Syllabus framed are subject to modification by the Standing Academic board from time to time.

**2. OVERALL OBJECTIVES:**

- o To provide the course that enables, Graduate with updated exposure in terms of Knowledge and practice in the fields of “**M.Sc. SPORTS AND FITNESS NUTRITION**” especially having relevance on medical importance.
- o To enable graduates to learn in a highly productive environment that gives them the core and comprehensive skills to deal with diagnostics applied and basic research in the fields of “**M.Sc. SPORTS AND FITNESS NUTRITION**” .

**3. ELIGIBILITY FOR ADMISSION:**

The candidates who possess Degree of B.Sc. Nutrition, B.Sc. Clinical Nutrition and B.Sc. Courses with Nutrition as Allied Subjects to get admitted into the course of “**M.Sc. SPORTS & FITNESS NUTRITION**”

**4. AGE LIMIT:**

No upper age limit for Admission

**5. ELIGIBILITY CERTIFICATE:**

Candidates who have passed any qualifying examination as stated in (3) other than the Tamil Nadu Dr. M.G.R. Medical University shall obtain an “Eligibility Certificate” from this University by remitting the prescribed fees along with the application form and required documents before seeking admission to any one of the affiliated institutions. The application form is available in the

University website: [web.tnmgrmu.ac.in](http://web.tnmgrmu.ac.in).

#### **6. REGISTRATION:**

A Candidate admitted to “**M.Sc. SPORTS AND FITNESS NUTRITION**” in any one of the affiliated institutions of this University shall register his / her name with this university by submitting the prescribed application form for registration duly filled in along with the prescribed fee and a declaration in the format to the Controller of Examinations of this University through the affiliated institution within 3 Months from the cut off date prescribed for the course for admission. The applications should bear the date of admission to the said course.

#### **7. MIGRATION/TRANSFER OF CANDIDATE:**

(a) A student studying in “**M.Sc. SPORTS AND FITNESS NUTRITION**” can be allowed to migrate / transfer to another institution of Allied Health Science under the same University.

(b) Migration / Transfer can be allowed to another affiliated institutions under extraordinary circumstances. The Vice - Chancellor has the power to issue Migration / Transfer order.

#### **8. COMMENCEMENT OF THE COURSE:**

The course shall commence from **1<sup>st</sup> September** of the academic year. Cut off date for Admission is **30<sup>th</sup> September** every year.

#### **9. MEDIUM OF INSTRUCTION:**

**English** shall be the Medium of Instruction for all the Subjects of study and for examinations of the “**M.Sc. SPORTS AND FITNESS NUTRITION**”

#### **10. CURRICULUM:**

The Curriculum and the syllabus for the course shall be as prescribed in these regulations and are subject to modifications by the Standing Academic Board from time to time.

#### **11. DURATION OF THE COURSE:**

The duration of certified study for the “**M.Sc. SPORTS AND FITNESS NUTRITION**” shall be **TWO** years. The admitted candidates should complete this course within 6 years (double the duration) from the date of joining the course.

#### **12. RE-ADMISSION AFTER BREAK OF STUDY:**

The regulations for re-admission are as per the University Common Regulation for Re-admission after break of study for all courses.

#### **13. . WORKING DAYS IN THE ACADEMIC YEAR:**

Each academic year shall consist of not less than 270 working days Total No. of working days including (Term day 270 days 85% Attendance) Examination period

#### **14. ATTENDANCE REQUIRED FOR ADMISSION / EXAMINATION:**

(a) No candidate shall be permitted to appear in any one of the parts of “**M.Sc. SPORTS AND FITNESS NUTRITION**” Course in Examinations unless he/she has attended the course in the subject for the prescribed period in an affiliated institution recognized by this University and produce the necessary certificate of study, attendance and satisfactory conduct from the Head of the institution.

(b) A candidate is required to put in a minimum of 85% of attendance in both theory and practical separately in each subject before admission to the examinations.

**15. CONDONATION OF LACK OF ATTENDANCE:**

There shall be no condonation of lack of attendance.

**16. INTERNAL ASSESSMENT MARKS:**

The Internal Assessment should consist of the following points for evaluation:-

- i) Theory
- ii) Practical

(a) A minimum of three written examinations shall be conducted in each subject during a year and the average marks of the three performances shall be taken into consideration for the award of Internal Assessment marks.

**17. CUT-OFF DATES FOR ADMISSION TO EXAMINATIONS:**

- 1. **30<sup>th</sup> September** of the academic year concerned for Admission.
- The candidates admitted up to **30<sup>th</sup> September** of the academic year shall be registered to take up the **1<sup>st</sup> year examination during October of the next year.**

**18. COMMENCEMENT OF THE EXAMINATIONS:**

15th October / 15 April

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

**19. MARKS QUALIFYING FOR PASS:**

50% of marks in the University Theory Examinations

50% of marks in the Practical with Viva

50% of marks in aggregate in Theory, I.A & oral taken together.

**20. REVALUATION / RETOTALLING OF ANSWER PAPERS:**

Re - totalling / Revaluation of answer papers is not permitted.

**21. VACATION:**

There is no vacation

**22. SCHEME OF EXAMINATIONS:**

**Examination Pattern – First Year**

Paper	Subjects	Internal Assessment (IA)		Theory		Practical		Viva Voice	
		Max	Min	Max	Min	Max	Min	Max	Min

I.	Bio-Statistics and Research: Epidemiology, Bio-Statistics & Medical Ethics	50	25	100	50
II.	Exercise Physiology For Sports & Fitness	50	25	100	50

### Examination Pattern – Second Year

Paper	Subjects	Internal Assessment (IA)		Theory		Practical		Viva Voice	
		Max	Min	Max	Min	Max	Min	Max	Min
I.	Sports Nutrition for Performance Excellence	50	25	100	50	100	50	50	25
III	Fitness Nutrition for Lifestyle Modification	50	25	100	50	100	50	50	25

#### Theory Examination Pattern

**Duration: 3 hrs Max. Marks: 100**

**Part – A ( 2 x 20 = 40) Marks**

**Part – B (10 X 6 = 60) Marks**

	Max.	Min.
Project*	100	50
Viva / Practical	100	50
I. A	50	25

#### Practical's should include the following:

Case Discussion / Flash Card / Spotters / Instruments / Specimens (Where ever it is applicable)

#### **Practicals**

- There are 2 practical papers (corresponding to theory paper 2 & 3) with each paper having an exam with a total of 100 marks with a minimum pass of 50.

#### Submission of Project:

1. Project with Compulsory \_\_\_\_\_ should be in a bound volume of a minimum of 30 - 50 pages of typed in Double line spacing and on one side only.



2. It is mandatory to have the “\_\_\_\_\_” in the final research project
3. The Project should be submitted to the Institution 3 months before the Third Year Examination.
4. The student should prepare a PPT presentation of the project at the time of Viva – Voce Examination.

### **Internal Assessment**

- The **Logbook, Records** and other **Assignments**, would have a total of 100 marks would be evaluated throughout the Course. A minimum of 50 % in each is required to pass.
- The students have to take up a research project that would be submitted at the end of the program
- The students have an internal theory paper on Biostatistics & Research
- There is a internal practical paper on Sports Kinantropometry & fitness Assessment.

### **24. Log Book:**

Based on the curriculum Log Book to be maintained and the same are periodically, assessed by the HOD and presented at the time of discussion of project in Practical Examination.

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