Semester-I
THEORY COURSE
IMTC-103 -BASIC ANATOMY& PHYSIOLOGY

ESSENCE OF THE COURSE

This course will enable students to understand the structural and functional aspect of human body.

COURSE LEARNING OUTCOME

After completing this course, the students will be able to

- Understand the different systems of human body.
- Identify and describe the different organs of the human body and its regulation.
- Understand the effects of the exercise on different systems of human body.
- Measure the bodily functions such as blood pressure, pulse/heart rate, different lung volume, gaseous exchange, capacity, amount of lactic acid etc.

COURSE CONTENTS

Unit 1. Meaning and Definition of Anatomy, Definition and Description of Cell, Tissue, Organ and System, Bones and Joints – Structure & Classification, Brief description of Skeletal System, Muscular System, Respiratory System, Cardiovascular System, Nervous System, Digestive System, Excretory System, Endocrine System and Reproductive System, Effect of Exercise on Cardio-Respiratory and Muscular Systems

Unit 2 Skeletal Muscle and Exercise: Structure of the Skeletal Muscle, Chemical Composition. Sliding Filament THEORY OF Muscular Contraction.Types of Muscle Fiber. Muscle Tone, Chemistry of Muscular Contraction – Heat Production in the Muscle, Effect of exercises and training on the muscular system.

Unit 3 Cardiovascular System and Exercise: Heart Valves and Direction of the Blood Flow – Conduction System of the Heart – Blood Supply to the Heart – Cardiac Cycle – Stroke Volume – Cardiac Output – Heart Rate – Factors Affecting HeartRate – Cardiac Hypertrophy – Effect of exercises and training on the Cardio vascular system. Respiratory System and Exercise: Mechanics of Breathing – Respiratory Muscles and Training Minute Ventilation – Ventilation at Rest and During Exercise. Diffusion of Gases – Exchange of Gases in the Lungs – Exchange of Gases in the Tissues – Control of Ventilation – Ventilation and the Anaerobic Threshold. Oxygen Debt – Lung Volumes and Capacities – Effect of exercises and training on the respiratory system. Metabolism and Energy Transfer: Metabolism – ATP – PC or Phosphagen System – Anaerobic Metabolism – Aerobic Metabolism – Aerobic and Anaerobic Systems During Rest and Exercise. Short Duration High Intensity Exercises – High Intensity Exercise Lasting Several Minutes – Long Duration Exercises.

Unit 4 Climatic conditions and sports performance and ergogenic aids: Variation in Temperature and Humidity – Thermoregulation – Sports performance in hot climate, Cool Climate, high altitude. Influence of: Amphetamine, Anabolic steroids, Androstenedione, Beta Blocker, Choline, Creatine, Human growth hormone on sports performance. Narcotic, Stimulants: Amphetamines, Caffeine, Ephedrine, Sympathomimetic amines. Stimulants and sports performance.

TEACHING LEARNING STRATEGIES

- The content of the syllabus may be taught by using lecture method, discussion method, quiz method, educational videos (3D anatomy and 3D physiology software and virtual Video), human skeleton/system model, charts and assignment method depending upon the resources and facilities available at the University/Institute/ Department/Colleges.

MODE OF TRANSACTION

- Laboratory Work/Project Work/Viva/Seminars/Term Papers/Presentations/Self- Learning Instructional Material etc.

ASSESSMENT RUBRICS **Marks: 100**

- End Semester Exam **Marks: 70**
  - Theory paper **(Marks:50)**
  - Practicum **(Marks: 20)**
- Classroom Test, Project Work, Assignments, Presentations **Marks: 30**
  - ClassroomTests: Best one out of two unit tests **(Marks: 10)**
  - Project Work, Assignments, Presentations **(Marks: 20)**

REFERENCES:

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