

**Semester V**  
**Theory Course**  
**IMTC 502 Applied Exercise Physiology**

**ESSENCE OF THE COURSE**

This course offers an introduction of Exercise Physiology. It aims to develop understanding about Applied Exercise Physiology, its aim and objectives, philosophical foundation, historical developments, structure / functions of different human organic systems.

**COURSE LEARNING OUTCOMES**

**After completing this course, the students will be able to**

- ) Understand the concept of Exercise Physiology.
- ) Understand the historical development of Exercise Physiology in India and abroad.
- ) Describe the different organs and their effects on Sports.

**COURSE CONTENT**

**22.1 UNIT-I**

Meaning, Definition of Exercise & Exercise Physiology. Role & Importance of exercise physiology in the field of Physical Education & Sports. Impact of Exercise on work at cellular level. Sliding filament theory. Various changes during Muscular Contraction. Fiber types their characteristics and athletic performance.

**22.2 UNIT-II**

The basic energy systems (carbohydrate metabolism), ATP- PC system, Glycolytic system, Oxidative system, Metabolism of fat & protein and carbohydrate. Neuro physiology, Role of membrane ion channels, Membrane potential, Bio-electric potential, Electrolyte balance & Water balance

**22.3 UNIT-III**

Pulmonary ventilation, Ventilation during exercise & Rest. Alveolar ventilation & second wind. Respiratory responses to high altitude. Physiological aspects of development of strength, endurance, speed, agility & coordination. Cardiovascular response to exercise.

**22.4 UNIT-IV**

Cardiovascular enhancers, Blood doping, Beta blockers, Effect of drugs & doping on athletic performances. Diet, supplements & performance, Diet & fluids, Supplements & their effects, Exercise and training in females

**PRACTICALS**

1. Estimation of Target Heart Rate
2. Measurement of heart rate
3. Blood Pressure measurement (Sphygmomanometer)
4. Anthropometric equipment's
5. Measurement of various lung volumes through spirometer, peak flow meter.

**TEACHING LEARNING STRATEGIES**

- ) The content of the syllabus may be taught by using lecture method, discussion method, quiz method, educational videos, charts and assignment method depending upon the resources and facilities available at the University/Institute/ Department/Colleges.

## MODE OF TRANSACTION

) Laboratory Work/Field Work/Outreach Activities/Project Work/ Vocational Training/Viva/ Seminars/ Term Papers/Presentations/Self- Learning Instructional Material etc.

## ASSESSMENT RUBRICS

**Marks: 100 (70+30)**

) End Semester Exam

**Marks: 70**

) Classroom Test, Project Work, Assignments, Presentations

**Marks: 30 (10+20)**

o Classroom Tests: Best one out of two unit tests

**(Marks: 10)**

Project Work, Assignments, Presentations

**(Marks: 20)**

## REFERENCES

1. Edward L Fox, Richard W. Bowers and Merle L. Foss, **The Physiological Basis of Physical Education and Athletics**. William C Brown Pub., Hardcover.
2. William D. Mc. Ardle, Frank I. Katch Victor L. Katch, **Exercise Physiology: Energy, Nutrition, and Human Performance**. Fifth Edition, Lippincott Williams and Wilkins, Philadelphia.
3. Jack H. Wilmore, David L. Costill and W. Larry Kenney, **Physiology of Sport and Exercise**. Fourth Edition, Human Kinetics, Campaign.
4. W. Larry Kenney, Jack H. Wilmore and David L. Costill, **Physiology of Sport and Exercise**, Fifth Edition, Human Kinetics, Campaign.
5. Robert A. Robergs and Scott O. Roberts, **Fundamental Principles of Exercise Physiology: For Fitness, Performance, and Health**. McGraw-Hill College, New York.
6. Scott O. Roberts, Robert A. Robergs, and Peter Hanson, **Clinical Exercise Testing and Prescription Theory and Application**. William C Brown Pub., Hardcover.
7. Frank C. Mooren, Klaus Volker, Editors, **Molecular and Cellular Exercise Physiology**. Human Kinetics, Champaign.
8. Frank J. Cerny, Harold W. Burton, **Exercise Physiology for Health Care Professionals**. Human Kinetics, Champaign.
9. Stanley P Brown, [Exercise Physiology: Basis of Human Movement in Health and Disease](#). Lippincott Williams & Wilkins, Philadelphia.
10. [Scott K. Powers, Exercise Physiology: Theory and Application to Fitness and Performance](#). McGraw-Hill Higher Education, New York.
11. Sharon A. Plowman, **Exercise Physiology for Health, Fitness, and Performance**. Lippincott Williams & Wilkins, Philadelphia.
12. Gene M. Adams, **Exercise Physiology: Laboratory Manual**. McGraw-Hill Higher Education, New York.
13. Jie Kang, **Bioenergetics Primer for Exercise Science**. Human Kinetics, Campaign.
14. Stephen S. Cheung, **Advanced Environmental Exercise Physiology**. Human Kinetics, Champaign.
15. Thomas Reilly, **Sport, Exercise and Environmental Physiology**. Elsevier Churchill, Livingstone.
16. Jay Hoffman, **Physiological Aspects of Sport Training and Performance**. Human Kinetics, Champaign.
17. Tommy Boone, **Ethical Standards and Professional Credentials in the Practice of Exercise Physiology**. Edwin Mellen Press, Hardcover.

18. Tommy Boone, **Is Sports Nutrition for Sale? Ethical Issues and Professional Concerns for Exercise Physiologists**. Nova Science Pub Inc., Hardcover.
19. Tommy Boone, **Exercise Physiology: Professional Issues, Organizational Concerns, and Ethical Trends**. Edwin Mellen Press, Hardcover.
20. Tommy Boone, **Professional Development of Exercise Physiology**. Edwin Mellen Pr., Hardcover.