

RESEARCH PROCESS AND STATISTICAL TECHNIQUES IN PHYSICAL EDUCATION

UNIT-I

INTRODUCTION TO RESEARCH

- 1.1 Meaning, need and nature
- 1.2 Types of research : Basic (fundamental), Applied and Action research
- 1.3 Identifying a research problem
- 1.4 Criteria in selecting a research problem
- 1.5 Stating the research problem
- 1.6 Formulating, presenting and listing hypothesis
- 1.7 Delimitation and limitation of a problem

UNIT-II

LITERATURE SEARCH

- 2.1 Reason for surveying related literature
- 2.2 Major literature resources
- 2.3 Documentation over-view
- 2.4 Library sources
- 2.5 Research reviews
- 2.6 Card catalogue indices – physical education indices
- 2.7 Abstracting material

UNIT-III

DESCRIPTIVE METHODS OF RESEARCH

- 3.1 Historical research
 - Meaning, nature and scope of historical research
 - Sources of historical materials (primary and secondary)
 - Evaluation of historical material – internal and external criticism – general principles of criticism
 - Historical hypothesis
 - Pitfalls in historical research
- 3.2 Philosophical Research
 - Need, nature and techniques of thinking process
 - Methods of philosophy
 - Analyzing philosophical research problem
 - Inductive and deductive reasoning
- 3.3 Survey and case study
 - Meaning, need and scope of survey and case study in physical education
 - Types of survey
 - Survey techniques – by questionnaire, interviews, case study
 - Qualitative and quantitative research data
 - Procedure for developing a questionnaire, a checklist, a schedule, a score card

UNIT-IV

INTRODUCTION TO STATISTICS

- 4.1 Meaning, need and importance of statistics in physical education
- 4.2 Types of statistics – descriptive, comparative, relationship, inferential and predictive
- 4.3 Characteristics of data
 - Raw scores
 - Single scores
 - Attribute and variable
 - Types of data
 - Population and sample
 - Parameters and statistics
 - Frequency distribution
 - Discrete and continuous class intervals
 - Measures of central tendency
 - Measures of variability

UNIT-V

NON-PARAMETRIC STATISTIC

- 5.1 Uses and application of non-parametric statistic
- 5.2 Computation of chi-square, rank order correlation and tetrachoric correlation

RESEARCH PROCESS AND STATISTICAL TECHNIQUES IN PHYSICAL EDUCATION

UNIT-I EXPERIMENTAL RESEARCH

- 1.1 Scientific method and experimental research
- 1.2 Characteristics of experimental method
- 1.3 Experimental control
- 1.4 Experimental design
 - Single group design
 - Repeated measure design
 - Static group comparison
 - Random groups design
 - Post-test only random group design
 - Related groups design
 - Rotation group design
 - Factorial design

UNIT-II AREAS OF RESEARCH

- 2.1 Research in exercise and sport physiology
- 2.2 Motor learning and motor control
- 2.3 Psychological studies
- 2.4 Bio mechanical research
- 2.5 Growth and development research

UNIT-III PREPARATION OF RESEARCH REPORT

- 3.1 Formulating and submitting research proposal
- 3.2 Organization of thesis report
- 3.3 Technical aspects of writing research report
- 3.4 Use of illustrative material
- 3.5 Considerations in writing report and abstract

UNIT-IV PROBABILITY CURVE

- 4.1 Meaning and principles of normal curve
- 4.2 Binominal expansion and properties of normal curve
- 4.3 Comparison of various scales

UNIT-V RELATIONSHIP AND COMPARATIVE STATISTICS

- 5.1 Principles of relationship
- 5.2 Coefficient of correlation
- 5.3 Product moment correlation
- 5.4 t-ratio – independent and paired
- 5.5 ANOVA – one way and two way

FUNDAMENTALS OF SPORT SOCIOLOGY

UNIT-I INTRODUCTION TO SPORT SOCIOLOGY

- 1.1 Meaning and concept of sport sociology
- 1.2 Importance of its study
- 1.3 Current status of sport sociology in India and abroad.
- 1.4 Trends in sport sociology.
- 1.5 Theories in sociology
- 1.6 Theories about sports and society (structured and functionalism;
- 1.7 Critical, conflict, gender and interactionism theories)
- 1.8 A comparative analysis of sociological theories in sports

UNIT-II SOCIETY AND CULTURE

- 2.1 Definition and concept of society
- 2.2 Sports in human societies (ancient, feudal, capitalistic and socialistic).
- 2.3 Sport as a part of social, structural and functional system
- 2.4 Sociological differences in ancient and modern sports.
- 2.5 Meaning and concept of culture-sub-culture (Material and immaterial)
- 2.6 Sport as a cultural phenomenon
- 2.7 Cultural symbols in sport

UNIT-III STRATIFICATION AND SOCIALIZATION

- 3.1 Definition of stratification (classes, caste, age, gender in sports)
- 3.2 Stratification and social mobility
- 3.3 Stratification and popularity of sport
- 3.4 Theories of socialization and sport
- 3.5 Facilitation and debilitation of sport socialization in genders.
- 3.6 Desocialization from sport

UNIT-IV SPORT AND GENDER

- 4.1 Definition and theories of gender
- 4.2 Gender disparity and discrimination, and equity
- 4.3 Gender involvement in sports and masculinity
- 4.4 Deviance & aggregation in players
- 4.5 Spectator, fans and violence
- 4.6 Influence of spectators in dynamics of sports

UNIT-V COMMUNICATION AND RESEARCH METHODOLOGY

- 5.1 Mass communication and its implication in sports
- 5.2 Commercialization in sports
- 5.3 Amateurism versus professionalism
- 5.4 Recent social research methodologies (phenomenology, Hermeneutics, semiotics)
- 5.5 Qualitative and quantitative research
- 5.6 Participant observation and interview method in research
- 5.7 Impact of privatization and globalization on sports

FUNDAMENTALS OF SPORT PSYCHOLOGY

COURSE OBJECTIVE: - Provide concrete understanding of techniques for overall behavioral development of an individual so that the physical help in solving the problems of an individual.

- UNIT-I**
1. **INTRODUCTION TO SPORT PSYCHOLOGY**
 - 1.1 Meaning and scope of sport psychology
 - 1.2 Divisions of sport psychology
 - 1.3 Place of sports psychology in sports sciences heirachy.
 - 1.4 Importance of sport psychology
 2. **SENSORY PERCEPTUAL PROCESS**
 - 2.1 Meaning, mechanism and stages of sensory perceptual process
 - 2.2 Classification of senses and sensory perceptual process.
 - 2.3 Factors in perception
 - 2.4 Implication of sensory-perceptual process in exercise and sport
- UNIT-II**
1. **MOTOR DEVELOPMENT AND LEARNING**
 - 1.1 Understanding motor development and motor learning
 - 1.2 Motor development and learning in infants and children.
 - 1.3 Factors affecting motor development and motor learning
 2. **PSYCHOLOGICAL SKILLS AND THEIR INFLUENCE ON SPORTS PERFORMANCE**
 - 2.1 Attention
 - 2.2 Concentration
 - 2.3 Confidence
 - 2.4 Imagery
- UNIT-III**
1. **PERSONALITY**
 - 1.1 Concept and definition of personality
 - 1.2 Modern perspective, trait, humanistic, social cognitive and biological theories)
 - 1.3 Dynamics of personality in activity and sport
 2. **ANXIETY IN SPORT**
 - 2.1 Concept, definition and types of anxiety
 - 2.2 Anxiety and arousal
 - 2.3 Effect of anxiety on physical performance
- UNIT-IV**
1. **MOTIVATION IN ACTIVITY AND SPORT**
 - 1.1 Concept, definition and types of motivation
 - 1.2 Theories of motivation (drive, need and instinct theories)
 - 1.3 Motivation in activity and sports

2. PSYCHOLOGICAL PREPARATION AND COMPETITION

- 2.1 Phenomenon of competition sport
- 2.2 Psychological preparation for competition

UNIT-V

SOCIO-PSYCHOLOGICAL ASPECTS OF ACTIVITY AND SPORT

2 SOCIO-CULTURE FACTORS AFFECTING PERFORMANCE

- 1.1 Social ethics and sport
- 1.2 Attitude towards activity and sport
- 1.3 Team (group) cohesion

3 SPECTATORS AND PERFORMANCE

- 2.1 Types of spectators- crowd, fans
- 2.2 Facilitation and debilitating effects of spectators on performance.

FUNDAMENTALS OF SPORT BIO-MECHANICS

UNIT - I

THE STUDY AND ANALYSIS OF HUMAN MOVEMENT

Kinesiology and Biomechanics:

Areas of study,

Approaches for studying movement,

Importance of biomechanics in Physical Education and Sports

Research in and out of the Laboratory

INTRODUCTION TO BIOMECHANICS INSTRUMENTATION

Overview of instrumentation and its uses

Clocks and times

Stroboscopy

Cinematography and computer assisted analysis

Videography and computer assisted analysis

Force measuring instrumentation

Accelerometry

Electrogoniometry

Electromyography

Using micro computers for collecting and analyzing data

UNIT-II

LOOKING AT MOVEMENT: SOME MECHANICAL CONCEPTS

Types of motion

Distance and Displacement

Speed, Velocity and uniform acceleration

Acceleration and uniform acceleration

Force and momentum

Pressure

Mass and weight

Gravity

Center of gravity

Work

Power

Energy

Forces and Movement

Forces acting on a system

Reaction forces

Friction force

Centripetal and centripetal forces

Elastic force

Internal and external forces

Motive and Resistive forces

Force diagrams and Vectors

Torque and moment of inertia

The effect of two or more torques on a system

Vector Composition of torque

Torque and the body's center of gravity location

Other Kinetics

Lever, types of levers and their mechanical advantage and disadvantage with special reference to physical education and sports application.

Friction, types of friction and their mechanical advantage and disadvantage with special reference to physical education and sports application.

UNIT-III

BODY BALANCE AND STABILITY CONTROL

Balance
Equilibrium and stability
Controlling balance in static positions
Controlling balance during movement

NEWTONS LAWS OF MOTION

Law of Inertia (Linear Motion)
Law of moment of Inertia (Angular Motion)
Law of Momentum (Linear Motion)
Law of Angular Momentum (Angular Motion)
Law of Action and Reaction (Linear Motion)
Law of Action and Reaction (Angular Motion)

UNIT-IV

OBSERVING AND ANALYZING PERFORMANCE

The Nature of skills
Overall performance objective of skill
The analysis process

Projectile – Related Activities

Properties of motion related to projecting for vertical distance
Projecting for vertical distance with a horizontal component
Projecting for horizontal distance
Projecting for accuracy
Principles derived from Projectile Motion

FLUID FORCES

Fluid drag force
Fluid lift force

Application of Arrangement in Sport

Effective of drag on the body and objects in sport
Effects of lift in sport
Lift force produced by spin: The Magnus effect.

Application of Hydrodynamics in Swimming

Buoyancy & flotation

Resistive forces in swimming skills

Propulsive forces in swimming skills

Swimming speed & efficiency

UNIT-V

STRUCTURE OF MOTOR ACTION

Structure of cyclic & aperiodic motor action and movement combination

Functional relationship of different phases of motor action

Qualities of Motor Movements

Movement rhythm

Movement coupling

Movement flow

Movement precision

Movement amplitude

Biomechanical principles:

Principles of initial force

Principles of optimum path of acceleration

Principles of conservation of momentum.

Principles of Action and Reaction

FUNDAMENTALS OF EXERCISE PHYSIOLOGY

COURSE DESCRIPTION: This course provides an introduction to the fundamentals of exercise physiology. Emphasis is placed on physiology of muscle action, training for fitness and performance, nutrition and body composition aspects, health disorder and physical activity and fundamentals of exercise prescription and sports fitness testing.

COURSE OBJECTIVES:

1. Becoming familiar with the mechanism that explains the physiology of muscle action.
2. Examining the significance of physical activity and training for fitness and health promotion.
3. Understanding the fundamentals of nutrition and body composition for fitness and performance.
4. Role of physical activity in prevention and treatment of health disorders

UNIT-1 PHYSIOLOGY OF MUSCLE ACTION

1.1 Neuromuscular Concepts Of Muscle Action.

- Structure and function of Skeletal muscle
- Contractile mechanism
- Neural transmission and Motor response
- Muscular adaptation to training

1.2 Metabolic and Hormonal Control:

- Energy systems during rest and exercise
- Measuring energy expenditure
- Nature of hormone action
- Metabolic adaptation to training

UNIT-2 EXERCISE AND TRAINING FOR FITNESS AND PERFORMANCE

2.1 Physical Activity and Health and Fitness

- Role of physical activity in disease prevention
- Behavior supporting fitness and health
- Elements of total fitness (wellness)

2.2 Training for Sport and Fitness:

- Principles of Training
- Overtraining, under training/ optimum training
- Benefits of resistance training
- Adaptation to aerobic and anaerobic training

UNIT-3 NUTRITION, BODY COMPOSITION FOR FITNESS AND PERFORMANCE

3.1 Nutritional Aspect of Fitness And Performance:

- Balance diet
- Water and electrolyte balance
- Athlete's diet
- Physiological basis of diet for sedentary, physically active and sports person.

3.2 Optimal Body Composition For Fitness And Performance:

- Concepts of body composition
- Assessment of body composition
- Body composition for optimal health and fitness
- Body composition and sports performance

UNIT-4

HEALTH DISORDERS AND PHYSICAL ACTIVITY

4.1 Cardiovascular Disease And Physical Activity:

- Concepts of cardiovascular disease
- Cardiovascular disease risk factors
- Reducing risks through physical activity

4.2 Obesity, Diabetes and Physical Activity:

- Obesity and its causes
- Etiology of diabetes
- Role of exercise in prevention and treatment of obesity and diabetes.

UNIT-V

FUNDAMENTALS OF EXERCISE PRESCRIPTION AND PHYSIOLOGICAL TESTING OF SPORTSMEN

5.1 Prerequisites of Exercise Prescription:

- Medical clearance
- Consent form
- Readiness to exercise (PAR-Q)
- Stop test indicators, pre exercise session preparations
- Monitoring exercise intensity

5.2 Sport Specific Physiological Testing Prerequisites:

- Pretest preparation checklist
- Medical examination
- Consent form
- Quality assurance and implementation
- Protocols for physiological assessment of players.

FUNDAMENTALS OF SPORT MANAGEMENT AND ADMINISTRATION

UNIT-I **MANAGEMENT AND ADMINISTRATION**

- 1.1 Definition, meaning and concept of sports management and administration
- 1.2 Nature, scope and principles
- 1.3 Functions of sports management
- 1.4 Profile of a successful administrator/manager

UNIT-II **FACILITIES AND FINANCE MANAGEMENT**

- 2.1 Planning and development of facilities
- 2.2 Developing multi purpose sports facilities
- 2.3 Management of safety measures
- 2.4 Fundraising, accounting and budgeting

UNIT-III **LEADERSHIP**

- 3.1 Leadership types and traits of a successful leader
- 3.2 Time management
- 3.3 Managing meetings
- 3.4 Personnel management and voluntary management

UNIT-IV **SPECIAL SERVICES**

- 1.1 Types of sports events
- 1.2 Formation of committees
- 1.3 Draw of fixtures, schedules and ceremonies
- 1.4 Reporting and evaluation

UNIT-V **OFFICE MANAGEMENT**

- 1.1 Meaning and definition of office management
- 1.2 Elements and functions of office management
- 1.3 Layout of physical education department
- 1.4 Office correspondence