

DEPARTMENT OF PHYSICAL EDUCATION & SPORT SCIENCE
Vinaya Bhavana, Visva-Bharati

Syllabus for
Doctor of Philosophy in Physical Education Course Work
(Ph.D. in Physical Education Course Work)

2020-2021

As per UGC Minimum Standards and Procedure for Award of PhD Degree Regulations 2016, a PhD scholar shall be required to undertake course work for a minimum period of one semester which is compulsory pre-requisite for both full time and part time candidates. As per guidelines of the University Grants Commission, each student has to register for the Ph.D. course work programme, whose objective is the up gradation of knowledge among students. Special emphasis is laid on the methodologies that are required for research. In addition, students are made aware of science ethics and safe practices. Apart from satisfying mandatory requirements, the course work attempts to create a sense of excitement about scientific research.

The Programme objectives of the Ph.D. course work are

- ▲ Students will acquire the critical thinking and research skills to become independent scholars, at a level comparable to those who obtain faculty positions at universities.
- ▲ Students will learn research methods ranging from quantitative and deductive methods to qualitative and inductive methods.
- ▲ Students will master a specific set of methods appropriate to their dissertation, with the depth needed to produce methodologically rigorous research.
- ▲ Students will master the theories that underpin their dissertation research, usually drawn from the social sciences or humanities, with the depth needed to produce advanced, theoretically informed research.

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Courses Marks and Credits Structure

Name of the Subjects	Course	Marks	Distribution of Marks	Credits
Research Methodology	I	100	80 + 20	08
Specialization (any one)				
I. Exercise and Sports Physiology				
II. Exercise and Sports Psychology	II	100	80 + 20	08
III. Exercise and Sports Biomechanics				
Review of Related Literature	III	100	--	08

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Course C-I

Research Methodology, Statistics and Computer Application

Credit Points: 08

Full Marks: 100(80+20)

This course deals with the principles of research, research methodology and significant phases of research. Students are taught the realistic guidelines to be followed in the choice of field of research, topic of research and formulation of research problem. Key and careful considerations in the choice of tools for the solution of research problem are covered in this module. The module emphasizes the desirable close knit relation between innovation and concept of out of the box thinking. The principles of effective research and the need for a Proactive approach in a successful research programme are also explained. Students will get an insight into the privilege, honour and the associated responsibilities of a researcher. Further Statistics helps students to design data collection plans, analyze data appropriately and interpret and draw conclusions from those analyses. The aims of Computer Application is to provide students with an opportunity to develop understanding of the basic operations of a computer system and computer applications software. Meanwhile, they also develop the skill of using computer applications software for solving problems.

Intended Learning Outcomes of this course are

- ▲ To identify and apply appropriate research methodology in order to plan, conduct and evaluate basic research. The Course will furthermore enable scholars to distinguish between the scientific method and common sense knowledge while laying the foundation for research skills at higher levels.
- ▲ Describe the value, scope, relevance and mandatory steps of research as well as principles of effective research.
- ▲ Discuss the guidelines to progress from the choice of broad field of research to specific topic of research.
- ▲ Demonstrate the application and utility of the Systematic approach and out of box thinking concepts for research to be effective.
- ▲ Adapt and demonstrate the procedures outlined for a systematic Literature Review
- ▲ Analyze and prepare well-structured research proposal and research paper invoking clearly outlined principles.
- ▲ To completely describe a data set, using appropriate descriptive statistics.
- ▲ To understand a set of descriptive statistics and know the limitations of each measure.

- ▲ Students shall be able to use and apply a wide variety of specific statistical methods.
- ▲ Students shall identify how to organize, manage, and present data.
- ▲ Show ability to explore and organize data for analysis.
- ▲ To develop the students ability to deal with numerical and quantitative issues in business
- ▲ To enable the use of statistical, graphical and algebraic techniques wherever relevant.

A. Research Methodology (40+10)

Unit-I

1. Introduction

- 1.1 Meaning, Nature and importance of Research
- 1.2 Location and Selection of a problem
- 1.3 Ethics in Research

Unit-II

2. Research Methods, Assessment and Evaluation

- 1.1 Analytical Research: Historical and Philosophical Research
- 1.2 Descriptive Research: The Survey and Case Study
- 1.3 Experimental and Quasi-Experimental Research
- 1.4 Qualitative Research

Unit-III

3. Tools and Techniques of Research

- 3.1 Sampling
- 3.2 Research Tools
- 3.3 Research Proposal
- 3.4 Research Reporting

B. Statistical Techniques (20+5)

Unit-IV

4. Data Analysis and Interpretation

- 4.1 Descriptive and Inferential Data Analysis
- 4.2 Measuring Research Variables
 - 4.2.1 Parametric techniques
 - 4.2.2 Nonparametric techniques

c. Computer Application (20+5)

Unit- V

5. Computer Application and Scholarly Writing

- 5.1 Microsoft Word, Excel and PowerPoint
- 5.3 Internet Access - forms and documentation
- 5.2 Statistical Packages for Social Sciences

Course C: II (A)

Specialization: Exercise and Sports Physiology

Credit Points: 08

Full Marks: 100(80+20)

The course includes the energy systems, neuromuscular concepts as applied to sports and functions of the cardiovascular and respiratory systems during rest, steady state and exhaustive physical activity. Aspects of chemistry, biology, and physics are integrated to explain biological events and their sites of occurrence in the human body as they affect exercise and training. This course satisfies a general education "distribution" requirement in Science and is required for Applied Sport & Exercise Science majors. Includes an in-depth survey of the neuromuscular, metabolic, cardiorespiratory and hormonal responses to acute exercise and the physiological adaptations to chronic exercise.

Intended Learning Outcomes of this course are

- ▲ Demonstrate knowledge of general overall physiological principles associated with metabolic processes; musculoskeletal system; cardiovascular system; aerobic and anaerobic program design.
- ▲ Demonstrate knowledge of pathophysiology and risk factors associated with exercise and disease.
- ▲ Demonstrate the ability to administer and interpret health appraisals, fitness, and clinical exercise testing.
- ▲ Demonstrate the ability to administer and interpret electrocardiography and other diagnostic techniques associated with physiological processes.
- ▲ Describe and understand issues involved with patient management and medications.
- ▲ Design and monitor exercise prescriptions and fitness programming.
- ▲ Assess and evaluate nutritional intake and demonstrate the ability to design weight management programs.
- ▲ Demonstrate knowledge of safety, injury prevention, and emergency procedures associated with laboratory activities and general exercise.
- ▲ Demonstrate knowledge of cardiovascular physiology, pulmonary physiology, metabolic processes and associated pathology and risk factors for disease.
- ▲ Demonstrate knowledge of orthopedic/musculoskeletal issues including pathophysiology and risk factors for injury.
- ▲ Demonstrate proficiency in performing laboratory techniques and subsequent analysis of data commonly used in Human Performance Laboratory.
- ▲ Demonstrate knowledge of and show ability to carry out the research process in a collaborative environment.

Unit-I

1. Muscular Adaptations

- 1.1 Physiological Implications of exercise related to
 - 1.1.1 Bone Health
 - 1.1.2 Joint Health
 - 1.1.3 Muscle Health

Unit-II

2. Circulo-respiratory Adaptations:

- 2.1 Regulation of Cardio-vascular adjustments to exercise
- 2.2 Cardiac Health and exercise
- 2.3 Pulmonary Health and exercise
- 2.4 Blood Composition and exercise

Unit-III

3. Bio-Energetics and Exercise Metabolism

- 3.1 Fuels to exercise and energy production
- 3.2 Metabolic responses to exercise
 - 3.2.1 Short-term exercise effects
 - 3.2.2 Prolonged exercise effects
 - 3.2.3 Incremental exercise effects
 - 3.2.4 Lactate Threshold

Unit-IV

4. Motor Control and Neuroendocrinological Adaptations

- 4.1 Implications of exercise related to
 - 4.1.1 Brain health
 - 4.1.2 Neural transmission
 - 4.1.3 Blood Hormone concentration
 - 4.1.4 Regulation and Action of Hormones

Unit-V

5. Laboratory Assessment of Physical Performance

- 5.1 Theory and Ethics of Physiological Testing
- 5.2 Components of effective Physiological testing
- 5.3 Exercise Test Protocol
- 5.4 Recent Researches on Physiology of Performance

Course: II (B)

Specialization: Exercise and Sports Psychology

Credit Points: 08

Full Marks: 100 (80 + 20)

This course will examine relevant issues in the field of applied sport psychology and the application of psychological theories and research to performance in sport, exercise, and non-sport contexts. The course is designed to teach students the basics of psychological skills training and intervention development by exploring the application of cognitive strategies, such as goal setting, imagery, positive self-talk, and teambuilding. Students will have the opportunity to develop mental training programs for athletes, exercisers, groups/teams, coaches, and/or non-sport performers. Students will also have the opportunity to develop their understanding of the practice of sport psychology by observing the design and application of evidence-based mental training techniques and interventions.

Intended Learning Outcomes of this course are

- ^ Demonstrate understanding of theoretical foundation of the psychological processes that influence human performance in athletic settings.
- ^ Identify and apply psychological techniques and strategies to enhance performance in sport and other domains.
- ^ Evaluate research in sport psychology and psychological factors related to performance and participation in sport and exercise settings.
- ^ Evaluate the needs of clients and plan interventions based on this evaluation.
- ^ Choose and apply sport psychology theories and research that best fit different performance and exercise psychology cases.

Unit-I

1. Sports Psychology in Global Perspective

- 1.1 Need, Importance and Scope of Research in Sports Psychology
- 1.2 Status of Research studies in Sports Psychology in India and abroad

Unit-II

2. Applied Theories in Sports Psychological Research

- 2.1, Domains in Psychology
- 2.2 Theories of Psychology
 - 1.2.1 Traditional Theories
 - 1.2.2 Biological Theories
 - 1.2.3 Psycho-Analytical Theories
 - 1.2.4 Behaviouristic Theories
 - 1.2.5 Cognitive Theories
- 2.3 Psychological Well Being and Research trends

Unit-UI

3. Research on Personality

- 3.1 Different Personality traits of athletes and non-athletes
- 3.2 Inventories in personality
- 3.3 Different personality Questionnaires
 - 3.3.1 Cattell 16 PF Questionnaire
 - 3.3.2 Eysenck PF Questionnaire
 - 3.3.3 Big Five Personality Questionnaire
- 3.4 Research reviews related to Personality and Physical Activity

Unit-IV

4. Research on Motivation in Sports

- 4.1 Theories and Types of Motivation
- 4.2 Factors influencing Motivation
- 4.3 Testing criteria for Motivation
- 4.4 Research reviews related to Motivation and Sports performance

Unit-V

5. Psychological Parameters for improving Sports Performance

- 5.1 Attitude
- 5.2 Attention
- 5.3 Emotion
- 5.4 Anxiety and Aggression
- 5.5 Intelligence
- 5.6 Goal setting
- 5.7 Concentration
- 5.8 Imagery

Course C: II (c)

Specialization: Exercise and Sports Biomechanics

Credit Points: 08

Full Marks: 100 (80 + 20)

This course deals with the introduction of students to concepts of mechanics as they apply to human movement, particularly those pertaining to exercise, sport, and physical activity. The student should gain an understanding of the mechanical principles that govern human motion and develop the ability to link the structure of the human body with its function from a mechanical perspective. An understanding of the biomechanical principles underpinning human movement is a basic requirement for the coach / teacher, performer, therapist and sport and exercise scientist. This module will develop biomechanical laboratory skills and an understanding of biomechanical concepts relating to human movement.

Intended Learning Outcomes of this course are

- ▲ Demonstrate basic understanding of human movement biomechanics.
- ▲ Demonstrate basic understanding of linear biomechanical principles and Newtonian mechanics.
- ▲ Review and interpret biomechanical data.
- ▲ Correctly apply fundamental human movement principles in sports skills.
- ▲ Demonstrate an applied understanding of the form and function of the human body.
- ▲ Critically evaluate human movement research in order to design and implement sports training activities.
 - ▲ Use qualitative and quantitative reasoning and evidence, synthesizing information from a variety of origins to methodically and systematically solve problems and develop interventions in the human movement domain.

Unit-I

1. Basics of Biomechanical Research

1.1 Scope of Biomechanical research

1.2 Understanding of Basic Mathematical theorem applied in Biomechanical research.

1.3 Steps of Mechanical Analysis.

1.3.1 Determination of objective

1.3.2 Characteristics of the technique

1.3.3 Study of top-flight performance of the technique

1.3.4 Phases of the technique

1.3.5 Division of phases into key elements

1.3.6 Understanding of mechanical reasons each element is performed

Unit-II

2. Essential Mechanics and Movement Foundation

- 2.1 Kinematics
 - 2.1.1 Linear Kinematics
 - 2.1.2 Angular Kinematics
- 2.2 Kinetics
 - 2.2.1 Linear Kinetics
 - 2.2.2 Angular Kinetics

Unit-III

3. Types of Analysis

- 3.1 Qualitative analysis
 - 3.1.1. Application
 - 3.1.2 Sample analysis
- 3.2 Quantitative analysis
 - 3.2.1. Measurement issues,
 - 3.2.2 Laboratory data collection,
 - 3.2.3 Field data collection.

Unit-IV

4. Tools for Measuring Kinematic Variables

- 4.1 Timing devices
 - 4.1.1 Manually operated device
 - 4.1.2 Fully Automated device
- 4.2 Velocity measuring devices
 - 4.2.1 Radar guns,
 - 4.2.2 Laser Devices (Power Time Tester)
- 4.3 Accelerometer
- 4.4 Optical imaging system
 - 4.4.1 Imaging measurement technique
 - 4.4.2 Photo Instrumentation
 - 4.4.3 Filming fundamental
- 4.5 Methods of determination of CG in Human Body
- 4.6 Electro goniometry

Unit-V

5. Tools for Measuring Kinetic variables

- 5.1 Force platform
- 5.2 Force transducers
- 5.3 Pressure Sensors
- 5.4 Electromyography

Course C.: III
Review of Related Literature

Credit Points: 08

Full Marks: 100 (80 + 20)

This module deals with survey, review and critical analysis of literature pertaining to the specific field of research identified by the research student in consultation with the supervisory team. This module is a first step in the search, identification and formulation of a research problem of doctoral thesis. Through the initial process of literature review, this module facilitates the student a broader exposure to the status of research work related to the identified specific field of research. This module emphasizes the student to apply good practices and guidelines of a systematic and structured literature review to collect, comprehend, sort and document the available information in open literature. In the context of reviewed contemporary research work, student acquires wider breadth of knowledge in the chosen specific field of research. The outcome of this module enables the research student to progress from the specific field of research to potential specific topic of research confirming the research progress to be on a desirable research trajectory.

Intended Learning Outcomes of this course are

- ^ Describe the scope and context of the Literature Review through identification of the broad parameters of the chosen specific field of research in Physical Education and Sport Science and discuss the strategies for search of information related to field of research.
- ^ Identify numerous sub topics in critical and allied sport science discipline and sort the collected information on respective sub topics.
- ^ Assess the nature, quantum and pace of progress of past research in Physical Education and Sport Science to predict the possible future research trajectories of sub topics related to science of sports and fitness.

Prepare a document highlighting the successful literature search by short listing it to handful of ranked sub topics potentially leading to the choice of specific topic of research.

Unit-I

1.1 Introduction to the parts of Thesis

- 1.1. Preliminaries
- 1.2 Main Body/Text
- 1.3 Appendices

1.2 Sources of Information

- 1.2.1 Primary, Secondary and Tertiary Sources
- 1.2.2 Subscribed and Perpetual Print, Digital and Electronic Resources (Books, Journals, Databases, etc.)
- 1.2.3 Open Access Resources (Books, Journals, Databases, Theses, etc.) [DOAB, DOAJ, ShodhGanga, ShodhGangotri, etc. etc.]

1.3 Literature Review

1.3.1 Overview and Importance of Literature Review in Research in Physical Education.

1.3.2 Types of Literature Review (Historical, Traditional, Scientific).

1.3.3 Qualities of Good Literature Review.

Unit –II

2. 1 Resource Sharing

2.1.1 Inter Library Loan

2.1.2 Developing Library Network (DELNET); INFLIBNET (Information and Library Network)

2.1.3 British Council Library, American Library, etc.

2.2 Resource Discovery

2.2.1 Through Google (simply, easily and quickly)

2.2.2 Through Discovery Search Engine

Unit – III

3. Referencing:

3.1 Concept of Referencing, Bibliography, End Note and Foot Note

3.2 Use of Citation Styles (APA, Chicago, MLA, etc. etc.)

3.3 Referencing and citing by using MS Office

3.4 Referencing and citing by using Reference Management Software (Zotero, Mendeley, EndNote, etc.)

Unit - IV

4. Research Ethics:

4.1 Handling Plagiarism Issues - UGC Mandate, Checking significance through

USC approved Software (now URKUND)

4.2 Indexing and Impact Factor of Journals, Refereed and Non-refereed Journals.

Unit-V

5. Guide for Writing and Presentation:

5.1 Writing of Research Report, Research Proposal, Thesis, etc.

5.2 Review Types & Process for journal publications

5.3 IJMR guide line for paper publication

5.4 Preparation for Pre-submission and Seminar Presentation
