

**राष्ट्रीय खेल विश्वविद्यालय**

(केंद्रीय विश्वविद्यालय)

(युवा कार्यक्रम एवं खेल मंत्रालय, भारत सरकार)

**NATIONAL SPORTS UNIVERSITY**

(Central University)

(Ministry of Youth Affairs and Sports, Government of India)



**ADMISSION INFORMATION FOR  
DEGREE OF DOCTOR OF PHILOSOPHY (Ph.D.)**

**Session: 2023-24**

## NATIONAL SPORTS UNIVERSITY

The National Sports University (NSU) is the first of its kind in the country, founded in 2018 with an aim to promote sports science research and sports education to support the development of a sporting ecosystem favorable to athletic training, recovery, and performance. Being situated in the Sporting Powerhouse of the Nation, the University is dedicated to develop teaching, education, and research in sports with the state-of-the-art laboratory and sporting facilities catering to the genetically compelling sporting population of Manipur as well as that across the country. To pave the way for this growth and to translate this vision into reality, the University with its young and dynamic faculty, having tremendous knowledge and experience in this super specialization is opening the opportunity for interested and eligible candidates to attain the degree of doctor of philosophy in different areas of sports science.



## VICE-CHANCELLORS NOTE

Dear Ph.D. Scholars,

It is with great pleasure and optimism that I welcome you to the National Sports University. In these hallowed corridors of learning, we believe in the transformative power of education to shape individuals and, in turn, the world.

As you consider joining our vibrant and dynamic university, I am reminded of the timeless words of Dr. A.P.J. Abdul Kalam, India's beloved scientist and statesman: "Dream, dream, dream. Dreams transform into thoughts, and thoughts result in action." These words encapsulate our ethos and our commitment to nurturing dreamers, thinkers, and doers.



At NSU, we are more than just an academic institution; we are a crucible of dreams, where your aspirations are forged into realities. Our mission extends beyond the boundaries of classrooms and campuses. We are dedicated to cultivating leaders, innovators, and changemakers who will shape the future of sports, fitness, and holistic well-being.

Our world-class faculty, state-of-the-art facilities, and a diverse community of students from across the nation create an environment that fosters excellence, curiosity, and collaboration. Here, you will find not just an education but an experience that will challenge you to push boundaries and discover your true potential.

We understand that education is not confined to textbooks alone. It involves holistic growth – intellectual, physical, and emotional. That's why we place a strong emphasis on physical fitness, sportsmanship, and the development of life skills that go beyond the classroom.

As you embark on your journey with NSU, you are not merely enrolling in an institution; you are becoming a part of a legacy, a community that celebrates diversity, cherishes inclusivity, and thrives on the pursuit of knowledge.

Together, we will dream, think, and act to create a brighter future, not just for ourselves but for our nation and the world. Your dreams, aspirations, and actions will shape the destiny of sports and well-being in India.

I welcome you to the National Sports University, where dreams are nurtured, thoughts are ignited, and actions are celebrated. Your journey of transformation begins here.

With warm regards,

Officiating Vice Chancellor

National Sports University

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**GENERAL INSTRUCTIONS**

**The Ph.D. programme at the National Sports University is governed by the Ph.D. Ordinance No. XXVII.**

1. The Ph.D. programme is offered by the National Sports University (NSU) through its departments under two Schools for this session, namely the School of Sports Education and the School of Sports Science and Medicine.
2. Applications shall be invited twice in a year with one session during November-January and another session during June-August.
3. All Applications for Ph.D. programme are to be submitted via online mode only through the university's portal <https://www.nsu.ac.in> and all updates related to Ph.D. Admission will be provided in the University's website <https://www.nsu.ac.in> .
4. The candidate intake in each department, shall be based on the availability of seats as per the University norms.
5. Candidates seeking admission in the Ph.D. programme must meet the eligibility criteria laid down by the Departments under the respective schools, apart from suitability to specific subject specialization.
6. At the time of admission, the candidate will be required to be present physically at the respective department for verification of the original documents.
7. Candidates upon selection will be guided by research supervisors in their respective subject specialization.
8. The admission of students by each department, seat allotment, and progress of research work will be governed by the Departmental Research Committee (DRC). The progress of work of selected candidates will be assessed annually by the DRC and bi-annually by the research advisory committee (RAC).
9. The University reserves the right to not fill up vacant seats due to non-availability of suitable candidate and to cancel the admission of a candidate, at any stage of the Ph.D. programme and even after awarding the degree, if the candidate is found to have produced documents that are fake/fabricated/non-genuine or defective in any manner and if the candidate was found to be non-compliant with the university Ph.D. Regulations for conduct of Research.

**ADMISSION DETAILS**

The department wise seat matrix and eligibility criteria is listed below for the total vacancy. For the December-January session, 50% of the total seats will be filled based on central reservation policy.

**SCHOOL OF SPORTS EDUCATION**

<b>Department of Physical Education</b>				
<b>Doctor of Philosophy in Physical Education</b>				
<b>Eligibility Criteria</b>	<b>A minimum of 55% marks (or equivalent CGPA) in post-graduate degree in Physical Education (MPES/ M.P.Ed.) from a recognized University with 5% Relaxation to reserved categories (SC/ST/OBC (Non-Creamy Layer)/ Differentially Abled/ EWS)</b>			
<b>Research Emphasis</b>	Health Education, Sports Psychology, Sports Biomechanics, Yoga, Sports Sociology, Exercise Physiology, Sports Nutrition, Sports Management.			
<b>Seat Matrix</b>	UR	OBC	SC/ST	Supernumerary
				Foreign Nationals
	6	3	3	3

<b>Department of Sports Coaching</b>				
<b>Doctor of Philosophy in Sports Coaching (Specialized Sport*)</b>				
<i>*The Doctor of Philosophy in Sports Coaching will be specific to specialized sports (Athletics, Football, Swimming, Boxing, Badminton, Weightlifting, Archery, Shooting, etc.). For example, a candidate with specialized sports in "Athletics" at the master-level, upon selection will be enrolled for the Doctor of Philosophy in Sports Coaching (Athletics).</i>				
<b>Eligibility Criteria</b>	<b>A minimum of 55% Marks (or Equivalent CGPA) in Master of Sports Coaching [OR] Master of Physical Education with Diploma in Sports Coaching from a recognized University with 5% Relaxation to reserved categories (SC/ST/OBC (Non-Creamy Layer)/ Differentially Abled/ EWS)</b>			
<b>Research Emphasis</b>	Sports Training, Coaching Techniques, Sports Biomechanics, Yoga, Sports Sociology, Sports Psychology, Exercise Physiology, Sports Nutrition, Sports management.			
<b>Seat Matrix</b>	UR	OBC	SC/ST	Supernumerary
				Foreign Nationals
	3	2	1	1

## SCHOOL OF SPORTS SCIENCE AND MEDICINE

## Department of Sports Psychology

## Doctor of Philosophy in Sports Psychology

<b>Eligibility Criteria</b>	A minimum of 55% Marks (or Equivalent CGPA) in Master's Degree in Sports Psychology from a recognized University <b>with 5% Relaxation to reserved categories (SC/ST/OBC (Non-Creamy Layer)/ Differentially Abled/ EWS)</b>			
<b>Research Emphasis</b>	Psychological Skill Training, Mental Training, Clinical Sports Psychology, Psychological Well-Being, Motivation.			
<b>Seat Matrix</b>	UR	OBC	SC/ST	Supernumerary
				Foreign
	2	1	1	1

## Department of Sports Physiology and Nutrition

## Doctor of Philosophy in Sports and Exercise Physiology

<b>Eligibility Criteria</b>	A minimum of 55% Marks (or Equivalent CGPA) in Master of Science Degree in <b>with 5% Relaxation to reserved categories (SC/ST/OBC (Non-Creamy Layer)/ Differentially Abled/ EWS)</b> : <ul style="list-style-type: none"> <li>Sports Physiology/ Exercise Physiology/ Human Physiology/ Sports Science</li> </ul>			
<b>Research Emphasis</b>	Physiological Exercise Testing, Sports Injury, Development of Tools for Sports Testing.			
<b>Seat Matrix</b>	UR	OBC	SC/ST	Supernumerary
				Foreign
	2	1	1	1

  

<b>Doctor of Philosophy in Sports Nutrition</b>				
<b>Eligibility Criteria</b>	A minimum of 55% Marks (or Equivalent CGPA) in Master of Science Degree in <b>with 5% Relaxation to reserved categories (SC/ST/OBC (Non-Creamy Layer)/ Differentially Abled/ EWS)</b> : <ul style="list-style-type: none"> <li>Sports Nutrition [OR] Food and Nutrition/Nutrition with certification or diploma in Sports Nutrition.</li> </ul>			
<b>Research Emphasis</b>	Sports/Exercise Intervention, Recovery Nutrition, Energy Expenditure and Consequences of Energy Deficiency			
<b>Seat Matrix</b>	UR	OBC	SC/ST	Supernumerary
				Foreign
	2	1	1	1

### ADMISSION PROCEDURE

1. All candidates are required to submit a duly-filled online application form and necessary enclosures of documents including proof of age, eligibility, JRF award letter/NET Qualification (wherever applicable), and other supporting documents.
2. Followed by online payment of Registration Fees towards processing of the Applications (A fees of Rs. 1000/- per subject is payable for Ph.D. application for all categories, except SC/ST/PwD and Women candidates having to pay Rs. 500/- for one Ph.D. Application). A copy of the receipt of payment needs to be maintained by the candidate.
3. The candidates holding a National Junior Research Fellowship (JRF) under the UGC/ CSIR/ ICMR/ DBT/ ICAR/ AYUSH/ DST-INSPIRE/ Teacher Fellowship/ NET/ GATE Qualification and M.Phil. programme with course work recognized by the U.G.C. as per UGC Regulations (Minimum Standards and Procedure for award of M.Phil./Ph.D. Degree, 2009 and 2016), will be exempted from the written test and will be required to appear for the personal Interview conducted by the Research Cell/ Departmental Research Committee of the National Sports University (NSU). The weightage of the interview scores will be as below:

<b>Sub-Category</b>	<b>Marks Directly Allotted in lieu of written exam</b>	<b>Marks for Interview/ Viva-voce</b>
Candidates qualifying National-level Junior Research Fellowships (JRF) offered by govt. agencies.	70%	30%
Candidates with NET/GATE/ M.Phil. Qualification		

4. All other candidates are required to appear for the NSU Ph.D. Entrance Examination. The examination will carry 100 marks and will include Objective and Subjective type questions, based on the subject. The detailed syllabus is provided as Annexure I-III. The weightage of marks for the written test and interview will be 70% and 30%, respectively.
5. The candidates who have secured 55% marks (a relaxation of 5% of marks to be allowed for those belonging to the SC/ST/OBC (non-creamy layer)/ Differently-abled and other categories of candidates as per the decision of the



UGC/Govt. of India from time to time) in the entrance test are eligible to be called for the interview.

6. The candidates shortlisted for the interview will have to be physically present in the concerned department and they will be assessed for their research interest and their presentation of the area of research by the DRC.
7. The declaration of results will be made for the selected candidates based on their ranking in the overall merit list, availability of seats based on reservation under various departments in the university and the suitability of candidate's research interest to subject at National Sports University. There will be candidates placed in waiting list as well and they will be considered only in case the selected candidate(s) fail(s) to join within the stipulated timeline, or any additional vacancy arises.
8. The candidate will be required to appear in person for re-verification of original documents at the time of joining the Ph.D. programme.
9. Post verification of the submitted document, an enrollment letter will be issued by the Research Cell.

#### **IMPORTANT DATES FOR ADMISSIONS**

<b>PARTICULARS</b>	<b>IMPORTANT DATES</b>
Ph.D. Admission Notification	<b>11<sup>th</sup> December, 2023</b> [Monday]
Last Date for Submission of Online Application	<b>05<sup>th</sup> January, 2024</b> [Friday]
Entrance Examination at NSU	<b>20<sup>th</sup> January, 2024</b> [Saturday]
Declaration of Result of Entrance Examination	<b>27<sup>th</sup> January, 2024</b> [Saturday]
Interview	<b>02<sup>nd</sup> February, 2024</b> [Friday]
Declaration of Results for Selected Candidates	<b>10<sup>th</sup> February, 2024</b> [Saturday]
Joining Date	<b>On or Before 9<sup>th</sup> March, 2024</b> [Saturday]

**Note:** The above date may be subject to change and request the candidates to monitor the University website from time-to-time.

**FEES STRUCTURE**

SL.NO.	PARTICULARS	FEES (IN RS.)
<b>I.</b>	<b>Fee Payable Once at the Time of Admission</b>	
1	Admission Fees (Payable at the time of admission one time)	₹ 300.00
2	PhD Enrolment Fee	₹ 2,500.00
3	Library Caution Money (Refundable)	₹ 1,000.00
4	Laboratory Caution Money (Refundable)	₹ 1,000.00
6	Identity Card	₹ 250.00
	<b><i>TOTAL FOR ADMISSIONS (Rs.)</i></b>	<b>₹ 5,050.00</b>
<b>II.</b>	<b>Fee Payable Annually</b>	
1	Research Fee	₹ 6,000.00
2	Library Fee	₹ 500.00
3	Laboratory Fee (For students using Laboratory services)	₹ 6,000.00
4	Sports Fund	₹ 1,000.00
5	Medical Fund	₹ 500.00
	<b><i>ANNUAL TOTAL PAYMENT (With Laboratory Fee)</i></b>	<b>₹ 14,000.00</b>
	<b><i>ANNUAL TOTAL PAYMENT (Without Laboratory Fee)</i></b>	<b>₹ 8000.00</b>
<b>III.</b>	<b>Fee Payable for Ph.D. Course Work Exam Includes fee for Admit card and mark sheet generation</b>	
1	With Practical	₹ 5,500.00
2	Without Practical	₹ 5,000.00
<b>IV.</b>	<b>Fee Payable at the time of Thesis Submission</b>	<b>₹ 6,000.00</b>

*Note: The late fees beyond the last date of fee payment for any of the above particulars are fixed at Rs. 1000.00.*

**STEPS FOR ONLINE REGISTRATION**

**Step 1:** The first step for online registration is signing up, with login details like email ID, password, and mobile number. The basic details such as name, date of birth, category, gender, nationality, and details of parents or guardians need to be entered.

**Step 2:** This step includes entering personal information such as photo, identity card details, postal address, and age proof. All documents in support needs to be self-attested and uploaded.

**Step 3:** This includes filling in the details about education, employment, and scholarship, if any.

**Step 4:** The payment of the application fee will be at this step and the candidate must select the appropriate payment gateway and pay the amount. The payment is a mandatory step to be completed for considering the application as submitted. Once this step is completed, no further changes can be made to the previous entries.

**Step 5:** In this step, you can print your duly filled application form for your reference, and it needs to be produced at the time of examination, interview, and admission.

### **HELP DESK**

For any **technical queries** related to **filling of application form**, contact the following:

1. Write an email to [researchcell.nsu@gmail.com](mailto:researchcell.nsu@gmail.com)
2. Contact: **Ms. Th Roshini (IT)**, Administrative Block, National Sports University, Phone: +91-9513125239 (between 10.00 am to 5.30 pm) on all working days except Saturday, Sunday, and Government Holidays).

For any **subject specific queries** related to **the Ph.D. programme**, contact the concerned departments:

#### **Department of Physical Education and Sport**

1. Dr. N Amitrasen Singh - +91-8928326712
2. Dr. M Surchand Singh - +91-9691055066
3. Dr. S Premananda Singh - +91-7627965707

#### **Department of Sports Coaching**

1. Dr. Shyam Sundar Rath - +91-7008564825

#### **Department of Sports Psychology**

1. Dr. Kuldeep Singh - +91-9876435569

#### **Department of Sports Physiology and Nutrition**

1. Dr. Arijit Chakraborty (Sports and Exercise Physiology) - +91-9874321916
2. Dr. Keren Harish Tiwari (Sports Nutrition) - +91-9121001280

## Annexure- I

## National Sports University Ph.D. Admission Test

### I. Marks Distribution for Ph.D. Admission Test

Sl. No.	Components of Admission Test	Marks	Remarks
1.	<b>Entrance Examination</b> <ul style="list-style-type: none"> <li>• Research Methodology and Statistics - 50 marks</li> <li>• Subject Specific – 50 marks</li> </ul>	100 Marks	<b>Multiple Choice Questions: 50 Questions (1 mark each)</b> <ul style="list-style-type: none"> <li>• Research Methodology and Statistics – 30 Questions</li> <li>• Subject Specific – 20 Questions</li> </ul> <b>Subjective-type Questions: 5 Questions</b> <ul style="list-style-type: none"> <li>• Research Methodology and Statistics – 2 questions of 10 marks each.</li> <li>• Subject Specific – 3 questions of 10 marks each.</li> </ul>
2.	<b>Interview</b> <ul style="list-style-type: none"> <li>• Presentation on Proposed Research– 10 marks</li> <li>• Competencies for executing the proposed research – 10 marks</li> <li>• Novelty of the Proposed Research – 10 marks</li> </ul>	30 Marks	<ul style="list-style-type: none"> <li>• The candidate shall make a power-point presentation on the proposed research. The presentation will be of 20 mins max.</li> </ul>

*Note: Subjects Specific Questions for the Department of Sports Coaching will include questions from the respective specialisation sport of the applicant as well.*

## **II. Syllabus for Ph.D. Entrance Examination**

### **Research Methods and Statistics (COMMON FOR ALL SUBJECTS)**

#### **1: Introduction**

- 1.1. Nature and Characteristics of Research Process
- 1.2. Types of Research: Basic & Applied, Quantitative & Qualitative Research,
- 1.3. Ethical Issues in Research
- 1.4. Plagiarism and Copyright violations, Plagiarism Software

#### **2: Process of Thesis Writing**

- 2.1. Identifying the Research Problem, Meaning and Formulation of Research
- 2.2. Hypothesis, Delimitations and Limitations, Needs of Significance of the Study, Kinds and Steps of Literature Review
- 2.3. Methods of Data Collection: Participants, Variables & Instruments Selection, Research Design
- 2.4. Writing of Research Proposal, Thesis Format (Citation APA 7th Edition Style)

#### **3: Introduction to Statistics**

- 3.1. Statistics – Definition, Types. Measures of Central Tendency & Measures of Dispersion, Graphical Representation of Data
- 3.2. Basic Definitions and rules for probability, Probability distributions
- 3.3. Introduction to sampling distributions, sampling techniques
- 3.4. Determining the sample size, Parameters of large sample and small samples

#### **4: Hypothesis testing, Parametric and Non-Parametric Methods**

- 4.1. Hypothesis testing: one sample and two sample tests for means of small samples (t- test), large samples (z-test), Mann Whitney U test.
- 4.2. One-way and Two-way ANOVA
- 4.3. Chi-square test, Sign test for paired data.
- 4.4. Correlation analysis, estimation of regression line.

## **Subject Specific Syllabus for Ph.D. Entrance Examination**

### **Doctor of Philosophy (Ph.D.) in Physical Education & Sports**

#### **1. Exercise Physiology**

- 1.1. Physiology of Exercise and Sport: Muscular System.
- 1.2. Introduction to Cardiovascular and Bioenergetics System.
- 1.3. Respiratory System and Recovery Process.
- 1.4. Environmental Issues during Exercise and Sports.

#### **2. Sports Biomechanics**

- 2.1. Kinematics and Kinetics of Motion.
- 2.2. External Forces Influencing Human Movement.
- 2.3. Fundamentals of Biomechanical Analysis of Human Movement.
- 2.4. Mechanical Analysis of Sports Movements.

#### **3. Sports Psychology**

- 3.1. Intervention Psychological Strategies.
- 3.2. Emotion and Performance.
- 3.3. Energy Management among Athletes.
- 3.4. Psychology of Peak Performance.

#### **4. Sports Training**

- 4.1. Training Theory.
- 4.2. Planning and periodization.
- 4.3. Training methods.
- 4.4. Peaking for Competition.

#### **5. Test, Measurement, and Evaluation in physical education**

- 5.1. Introduction to Test, Measurement and Evaluation.
- 5.2. Reliability and Validity Theory.
- 5.3. Physical Fitness and Activity Assessment in Youth and Adults.
- 5.4. Assessment of Motor Abilities and Sport Skills.

#### **6. Sports Management**

- 6.1. Sports management and planning in sports, Brief introduction of Sports Management, Management of Intramural and Extramural Competition, Types of Planning, Principle of Planning, Importance of Effective Planning.

- 6.2. Introduction of Controlling, Definition and Nature of Controlling, Steps of Controlling, Principle of Effective Control, Importance of Controlling in Physical Education and Sports.
- 6.3. Budgeting and Stocking in Sports, Introduction, Definition of Budget and Stocking, Principles of Effective Budget, Steps in Constructing/ Preparation of Budget in Physical Education and Sports, Presentation of Budget Maintenance of Stocks, Financial Management.
- 6.4. Managerial skills, technical, human, conceptual, Qualities, and qualifications of sports manager, Event management, public relations, Mass Media-communication, and publicity.

**Doctor of Philosophy (Ph.D.) in Sports Coaching****1. Coaching Philosophy and dynamics**

- 1.1. Philosophy of sports coaching, Understanding different approaches to Coaching
- 1.2. Coaching objectives, Athletes first, winning second, current issue in sports coaching (Indian Context)
- 1.3. Planning and management, Ethics and the coach, leadership and coaching style. different learning styles, Talent Identification and development.
- 1.4. Long term Athletes development programme (LTAD), Development team cohesion.

**2. Exercise Physiology**

- 2.1. Physiology of Exercise and Sport: Muscular System.
- 2.2. Introduction to Cardiovascular and Bioenergetics System.
- 2.3. Respiratory System and Recovery Process, - Physiological aspects of fatigue.
- 2.4. Environmental Issues during Exercise and Sports.

**3. Kinesiology and Biomechanics:**

- 3.1. Joints and their movements. Muscle attachments - Origin, insertion, action, principal muscles used in different movements in sports.
- 3.2. Motion: its laws and their application in sports. Projectile and principles of projections, Linear and angular kinematics and kinetics.
- 3.3. Friction, Spin, impact, and elasticity. Air and water dynamics. Mechanical advantage and applications of Levers in sports.
- 3.4. Kinesiological and Mechanical analyses of major sports skills.

**4. Sports psychology:**

- 4.1. Intervention strategies in Sports.
- 4.2. Motivation and Goal setting, Emotion and Performance.
- 4.3. Anxiety, Stress, Energy Management among Athletes.
- 4.4. Motor learning and skill acquisition, Psychology of Peak Performance.

**5. Sports Training:**

- 5.1. Training theory, load, principles, and methods
- 5.2. Planning and Periodization
- 5.3. Techniques and tactical training
- 5.4. High performance coaching, Peaking, and tapering.

**6. Sports Pedagogy:**

- 6.1. Advance pedagogy in sports training, technology in teaching and coaching.



6.2. Transforming education through Technology, personal learning environment, learning beyond class room.

6.3. Coach education framework, teaching and coaching

6.4. Effecting coaching, learning and performing, learning and evaluation

**7. Sports Performance Analysis:**

7.1. Introduction and need of Performance analysis,

7.2. Notational analysis and modelling sensor technology

7.3. Meaning definition and types of feedback

7.4. Filming equipment's, Sports analysis software

**8. Test, Measurement, and Evaluation in physical education**

8.1. Introduction to Test, Measurement and Evaluation.

8.2. Reliability and Validity Theory.

8.3. Physical Fitness and Activity Assessment in Youth and Adults.

8.4. Assessment of Motor Abilities and Sport Skills.

**9. Sports Management and Planning:**

9.1. Brief introduction of Sports Management, Types of Planning, Principle of Planning, Importance of Effective Planning.

9.2. Introduction, Definition and Nature of Controlling, Steps of Controlling, Principle of Effective Control, Importance of Controlling in Sports.

9.3. Budgeting and Stocking in Sports, Introduction, Definition of Budget and Stocking, Principles of Effective Budget, Steps in Constructing/ Preparation of Budget in Sports, Presentation of Budget Maintenance of Stocks, Financial Management.

9.4. Managerial skills, technical, human, conceptual, Qualities, and qualifications of sports manager, Event management, public relations, Mass Media- communication, and publicity.

**10. Advanced Strength and Conditioning:**

10.1. Concept of designing strength and conditioning programme for advanced Athletes

10.2. Assessment and exercise prescription of different motor abilities

10.3. Resistance training protocol, Own body weight, free weights and machines.

10.4. Psychological, physiological, and anatomical consideration of designing resistance training.

**Doctor of Philosophy (Ph.D.) in Sports Psychology**

1. Definition, Historical Development need and scope of sports psychology, History of Sports Psychology in India.
2. Motivation and Goal Setting, Theories of motivation.
3. Anxiety and Stress, Theories of Anxiety and Stress.
4. Motor Learning and Skill Acquisition, Theories of Motor Learning.
5. Neuropsychological approach to Motor Learning.
6. Cognitive Processes: Sensation, Perception, Imagination and Memory, Information Processing, Decision Making and Problem Solving.
7. Attention and Concentration: Theories and Types.
8. Principles of Exercise Programme, Means of Fitness development – aerobic and anaerobic exercises, Exercises and Heart rate Zones for various aerobic exercise intensities.
9. Neuroanatomy and Neurophysiology, Cardiovascular Psychophysiology.
10. Intervention strategies in Sports.
11. Basics of Counselling skills.
12. Basics of Measurement and Ethics in Sports Psychology.
13. Test Construction in Sport Psychology.
14. Qualitative Psychological Measurement.
15. Therapeutic Applications of Yoga.
16. First Aid, Hydrotherapy & Thermotherapy.
17. Mental Training in Sport.
18. Sport and Aggression.

**Doctor of Philosophy (Ph.D.) in Sports and Exercise Physiology**

1. Cellular & Molecular Physiology: Cellular organization, cell to cell communication and signalling.
2. Chronobiology and biological rhythms.
3. Carbohydrate metabolism; Lipid Metabolism; Amino Acid Metabolism; Aerobic and anaerobic exercises and their metabolism
4. Systems Physiology: Blood and Hemodynamics; Cardiovascular Physiology, Respiratory Physiology, Neurophysiology, Physiology of special senses, Gastrointestinal Physiology, Renal Physiology, Endocrinology and Reproductive Physiology.
5. Classification of physical exercise, sports, workloads.
6. Haematological changes during graded muscular exercise.
7. Heart rate, blood pressure, pulmonary ventilation, ventilation equivalent, VE Max, VO<sub>2</sub>Max; Alveolar ventilation at different state of breathing.
8. Lactic acid concentration and O<sub>2</sub> debt.
9. Nutrition in sports and exercise.
10. Concept of Physical fitness. Physiological effects of doping / drug abuse.
11. Management of Illness and Injury sustained in Exercise Activities.
12. Application of Anthropometry in sports and physical activity.
13. Effects of exercise on temperature regulation.
14. High altitude training physiology.
15. Biochemical responses to training and exercise; concept of fatigue.

**Doctor of Philosophy (Ph.D.) in Sports Nutrition**

1. Human Body System Functioning: Cardiovascular System, Respiratory System, Nervous System, Gastrointestinal System, Renal System, Endocrinology and Reproductive System.
2. Biochemical concepts and processes related to Macronutrient Metabolism and Micronutrient Estimations.
3. Energy: Energy Balance; Energy Availability; RED-S; FAT; Energy Expenditure: Methods of assessment; Physical activity monitoring. Energy Intake: Methods of assessment.
4. Carbohydrate, Protein, Fat: Classification; Recommendations of Type, timing, and quantity of macronutrients and food source across different exercise intensities (Strength, Endurance, Intermittent)
5. Micronutrient and Hydration: Classification. Research update on micronutrient types, requires, mode of action/function in exercise performance and recovery, Assessment of Hydration
6. Nutrient periodization: Concept, definition, and applications
7. Nutrition for special sporting groups: Nutrition and/or Dietary considerations for adolescent, female and paralympic athletes; Traveling Athletes, weight dependent sport athletes; dietary guidelines during extreme environmental alterations.
8. Nutrition during injury: Common Injuries in Sports. Food Related Adverse Reactions (FRAR) in Sport and its assessment.
9. Ergogenic Aids and Dietary Supplements in Sports
10. Body composition: Definition, Factors influencing body composition, Applications, Methods of body composition assessment.
11. Biological markers: Lab-based and field based assessment of Cardio-respiratory, Strength/Power and Speed fitness components.
12. Clinical Assessment: Signs and symptoms of various nutritional deficiencies.
13. Food Safety and National Nutrition Monitoring Services/ Nutrition Policies.