

Scheme of subjects (with Course ID)

Scheme of B.Sc. Sports Science

(Scheme UG A4: Undergraduate Programmes (Interdisciplinary))

Semester V

Course Code	Course Title	Course ID	L	T	P	L	T	P	Total Credits	MARKS				
			(Hrs)			Credits			TI	TE	PI	PE	Total	
			Core Course(s)											
CC-ID1	Sports Technology and Performance Analytics	240/ SS/CC5ID1	3	-	2	3	-	1	4	25	50	5	20	100
CC-ID2	Games and Sports: Techniques, Tactics and Officiating	240/ SS/CC5ID2	3	-	2	3	-	1	4	25	50	5	20	100
CC-ID3	Sports Governance and Policy	240/ SS/CC5ID3	3		1	3		2	4	25	50	5	20	100
Minor/ Vocational Course(s)														
VOC-2	Field Experience in Sports Coaching		3		1	3		2	4	25	50	5	20	100
Internship														
									4					100

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Semester-5

Name of Subject: Sports Technology and Performance Analytics	Maximum Theory Marks: (25+50)
Subject Code: 240/ SS/CC5ID1	Maximum Practical Marks: (5+20)

Objective: - To introduce students to the role of technology in sports performance assessment and enhancement. The course aims to develop competencies in the use of modern tools, digital systems, and analytical techniques for monitoring, evaluating, and improving athletic performance.

Overall Learning Outcomes: By the end of this course, students will be able to:

- Understand the role of technology in sports science and performance
- Identify and use basic sports technology tools and devices
- Analyze performance using video and digital platforms
- Interpret data for improving training and competition outcomes
- Apply technology for monitoring fitness, load, and recovery
- Demonstrate awareness of emerging trends in sports analytics

Course Contents:

UNIT-I (Introduction to Sports Technology)	
• Meaning, Scope, and Importance of Technology in Sports • Evolution of Sports Technology • Types of Sports Technology: ◦ Wearable technology ◦ Performance monitoring devices ◦ Equipment technology • Role of Technology in Training, Coaching, and Officiating • Technology in Sports Facilities and Infrastructure • Ethical and Legal Issues in Use of Technology (data privacy, fairness)	
UNIT-II (Performance Monitoring and Data Collection)	
• Concepts of Performance Analysis • Key Performance Indicators (KPIs) in Sports • Use of Wearable Devices: ◦ Heart Rate Monitors ◦ GPS Trackers ◦ Accelerometers	

◦ Fitness Bands/Smartwatches • Monitoring Training Load and Recovery (basic concepts) • Data Collection Methods in Sports (manual and digital) • Reliability and Accuracy of Technological Devices (introductory concept)	
UNIT-III (Video Analysis and Performance Evaluation)	
• Introduction to Video Analysis in Sports • Techniques of Motion and Skill Analysis • Basic Use of Video Analysis Software (conceptual understanding) • Notational Analysis (recording game events and actions) • Match Analysis: Offensive and Defensive Patterns • Performance Feedback and Decision Making • Use of Technology in Officiating (VAR, Hawk-Eye – basic overview)	
UNIT-IV (Sports Analytics and Emerging Trends)	
• Introduction to Data Analytics in Sports • Basic Concepts of Data Interpretation in Performance Analysis • Talent Identification using Technology • Use of Technology in Injury Prevention and Rehabilitation (overview) • Artificial Intelligence and Machine Learning in Sports (introductory concepts) • Virtual Reality (VR) and Augmented Reality (AR) in Training • E-sports and Digital Sports Ecosystem (overview) • Future Trends in Sports Technology	
Practical	
Students will gain hands-on experience in the following: 1. Video-Based Performance Analysis • Recording and analyzing a basic sports skill • Identification of errors and feedback 2. Use of Wearable Devices (Demonstration/Practice) • Heart rate monitoring during exercise • Basic data recording from fitness devices	

Instruction for Examiners/ Paper Setters: The question paper will be divided into two parts: **Part-A and Part-B**. Part-A (Compulsory – 10 Marks). Question 1 shall be compulsory. It will consist of **4 short-answer type questions (2.5 marks each)**, with **one question from each unit**, ensuring coverage of the entire syllabus. Part-B (40 Marks). Part-B shall contain **8 long-answer type questions (10 marks each)**. Two questions must be set from each unit, ensuring equal representation of all units. Students are required to **attempt one question from each unit** (total 4 questions).

SUGGESTED READINGS:

1. Bansal, S. K. (2012). *Sports science and technology*. Friends Publications.
2. Sharma, V. K. (2016). *Khel vigyan evam takniki* (खेल विज्ञान एवं तकनीकी). Khel Sahitya Kendra.
3. Singh, A. (2015). *Sports training and performance analysis*. Friends Publications.
4. बंसल, एस. के. (2014). *खेल प्रशिक्षण एवं परीक्षण*. फ्रेंड्स पब्लिकेशन।
5. Hughes, M., & Franks, I. (2015). *Essentials of performance analysis in sport* (2nd ed.). Routledge.
6. O'Donoghue, P. (2010). *Research methods for sports performance analysis*. Routledge.
7. Carling, C., Williams, A. M., & Reilly, T. (2005). *Handbook of soccer match analysis: A systematic approach to improving performance*. Routledge.
8. Zatsiorsky, V. M., & Kraemer, W. J. (2006). *Science and practice of strength training* (2nd ed.). Human Kinetics.
9. Bartlett, R. (2007). *Introduction to sports biomechanics: Analysing human movement patterns* (2nd ed.). Routledge.
10. Alamar, B. C. (2013). *Sports analytics: A guide for coaches, managers, and other decision makers*. Columbia University Press.
11. Baca, A. (Ed.). (2014). *Computer science in sport: Research and practice*. Routledge.
12. Fédération Internationale de Football Association. (2021). *Video assistant referee (VAR) handbook*. FIFA.
13. International Tennis Federation. (2020). *Hawk-Eye technology in tennis: Officiating guidelines*. ITF.
14. Dartfish. (Various versions). *Performance analysis software*.
15. Kinovea. (Open-source). *Video analysis software*.
16. Garmin Ltd. (Various models). *Wearable fitness and GPS tracking devices*.
17. Polar Electro Oy. (Various models). *Heart rate monitoring systems*.

Name of Subject: Theory of Games	Maximum Theory Marks: (25+50)
Subject Code: 240/ SS/CC4ID2	Maximum Practical Marks: (5+20)

Objective: - To provide students with advanced theoretical and practical knowledge of four additional major games—**Basketball, Cricket, Badminton, and Wrestling**. The course focuses on historical development, rules, skills, tactics, officiating, and teaching methodologies to enhance coaching and performance capabilities.

Overall Learning Outcomes: After completing this course, students will be able to:

- Understand the history, development, and structure of different games.
- Demonstrate knowledge of fundamental and advanced skills in various games.
- Apply rules, regulations, and officiating techniques effectively.
- Analyze game strategies and performance.
- Prepare lesson plans and coaching programs for different games.

Course Contents:

UNIT-I (Advanced Concepts of Team and Combat Games)	
• Role of Major Games in Physical Education and Competitive Sports • Psychological Aspects of Team and Individual Games • Principles of Conditioning and Fitness Specific to Games • Tactical Approaches in Offensive and Defensive Play • Duties and Responsibilities of Coaches, Captains, and Officials	
UNIT-II (Basketball and Cricket)	
Basketball • History and Development of Basketball in India and Internationally • Fundamental Skills: Dribbling, Passing, Shooting, Pivoting, Rebounding, Lay-up Shot • Rules, Violations, Fouls, and Officiating Signals • Court Dimensions, Equipment, and Player Positions • Basic Offensive and Defensive Systems Cricket • History and Development of Cricket in India	

• Basic Skills: Batting, Bowling, Fielding, Wicket Keeping • Rules of the Game and Methods of Dismissal • Pitch Measurement, Equipment, and Umpiring Signals • Types of Cricket Formats: Test, ODI, and T-20	
UNIT-III (Badminton and Wrestling)	
Badminton • Origin and Growth of Badminton in India and World • Fundamental Skills: Grip, Service, Lob, Drop, Smash, Net Play, Footwork • Rules and Scoring Pattern • Court Measurements, Equipment, and Officiating • Singles and Doubles Strategies Wrestling • History and Development of Wrestling in India and International Arena • Fundamental Skills: Stance, Holds, Takedowns, Escapes, Reversals, Pinning Techniques • Rules, Weight Categories, and Scoring System • Mat Dimensions, Equipment, and Duties of Officials • Safety Measures and Conditioning for Wrestlers	
UNIT-IV (Game Strategies, Officiating and Training)	
• Advanced Offensive and Defensive Strategies in Basketball, Cricket, Badminton, and Wrestling • Match Analysis and Performance Evaluation Techniques • Tournament Planning and Management of Game Competitions • Preparation of Lesson Plans and Coaching Sessions • Talent Identification and Training Programmes for Competitive Performance	
Practical	
Students must demonstrate competency in all games. Evaluation will include: • Execution of fundamental and advanced skills in all games • Participation in modified and full-game situations • Practical officiating (Referee/Umpire role) • Use of signals and rule enforcement	

Instruction for Examiners/ Paper Setters: The question paper will be divided into **two parts: Part-A and Part-B**. Part-A (Compulsory – 10 Marks). Question 1 shall be compulsory. It will consist of **4 short-answer type questions (2.5 marks each)**, with **one question from each unit**, ensuring coverage of the entire syllabus. Part-B (40 Marks). Part-B shall contain **8 long-answer type questions (10 marks each)**. **Two questions must be set from each unit**, ensuring equal representation of all units. Students are required to **attempt one question from each unit** (total 4 questions).

SUGGESTED READINGS:

- Bansal, S. K. (2010). *Theory of games*. Friends Publications.
- Singh, H. (2013). *Science of sports training*. DVS Publications.
- Sharma, K. K. (2012). *Physical education and sports*. Khel Sahitya Kendra.
- Yadav, S. (2016). *Teaching methods in physical education*. Friends Publications.
- बंसल, एस. के. (2012). *खेलों का सिद्धांत*. फ्रेंड्स पब्लिकेशन।
- शर्मा, वी. के. (2015). *शारीरिक शिक्षा के शिक्षण विधि*. खेल साहित्य केंद्र।
- सिंह, एच. (2014). *खेल प्रशिक्षण का विज्ञान*. डी.वी.एस. पब्लिकेशन।
- Martens, R. (2012). *Successful coaching* (4th ed.). Human Kinetics.
- FIBA. (2022). *Official basketball rules*. FIBA.
- Wissel, H. (2011). *Basketball: Steps to success* (3rd ed.). Human Kinetics.
- International Cricket Council. (2019). *Laws of cricket*. ICC.
- Woolmer, B., Noakes, T., & Moffett, H. (2008). *Bob Woolmer's art and science of cricket*. Struik Publishers.
- Badminton World Federation. (2021). *Laws of badminton*. BWF.
- Grice, T. (2008). *Badminton: Steps to success* (2nd ed.). Human Kinetics.
- United World Wrestling. (2022). *International wrestling rules*. UWW.
- Kraemer, W. J., & Fleck, S. J. (2004). *Strength training for young athletes*. Human Kinetics.

Name of Subject: Sports Governance and Policy	Maximum Theory Marks: (25+50)
Subject Code: 240/ SS/CC5ID1	Maximum Practical Marks: (5+20)

Objective: - To develop understanding of governance structures in sports.

- To analyze national and international sports policies.
- To examine ethical, legal, and administrative challenges in sports.
- To build critical insight into transparency, accountability, and reforms in sports governance.

Overall Learning Outcomes: Upon successful completion of this course, students will be able to:

1. Understand the scope and importance of sports medicine in physical education and sports.
2. Identify common sports injuries and describe their causes and classifications.
3. Apply appropriate first-aid and injury prevention strategies.
4. Understand rehabilitation methods and medical support systems in sport.
5. Promote safe participation in physical activity through health education and injury management.

Course Contents:

UNIT-I (Introduction to Sports Governance)	
• Concept, meaning, and scope of sports governance • Principles of good governance: transparency, accountability, equity • Structure of sports governance in India • Role and functions of: • Ministry of Youth Affairs and Sports • Sports Authority of India • Stakeholders in sports governance: athletes, federations, media, sponsors • Models of governance: centralized vs decentralized systems	
UNIT-II (Sports Policy – National and Global Perspectives)	
• Evolution of sports policy in India • National Sports Policy: objectives and implementation • Role of:	

• Indian Olympic Association • International governance bodies: • International Olympic Committee • FIFA • Comparative analysis of sports policies (India vs developed nations) • Policy-making process in sports	
UNIT-III (Legal and Ethical Dimensions)	
• Introduction to sports law • Governance issues: corruption, match-fixing, conflict of interest • Anti-doping policies and regulations • Role of World Anti-Doping Agency • Gender equality and inclusion in sports • Athlete rights, welfare, and safeguarding • Ethics and integrity in sports administration	
UNIT-IV (Contemporary Issues and Reforms)	
• Governance challenges in sports federations • Role of judiciary in sports governance (case studies) • Good governance practices and reforms in India • Corporate governance in professional sports leagues • Public-private partnerships in sports development • Emerging trends: • E-governance in sports • Digital transformation and data governance	
Practical :	
• Case study analysis • Policy review assignments • Group presentations	

Instruction for Examiners/ Paper Setters:

The question paper will be divided into **two parts: Part-A and Part-B**. Part-A (Compulsory – 10 Marks). Question 1 shall be compulsory. It will consist of **4 short-answer type questions (2.5 marks each)**, with **one question from each unit**, ensuring coverage of the entire syllabus. Part-B (40 Marks). Part-B shall contain **8 long-answer type questions (10 marks each)**. **Two**

questions must be set from each unit, ensuring equal representation of all units. Students are required to attempt one question from each unit (total 4 questions).

SUGGESTED READINGS:

1. Bansal, S. K. (2010). *Sports administration and management*. Friends Publications.
2. Majumdar, B., & Mehta, N. (Eds.). (2010). *India and the Olympics*. Routledge.
3. Sekhri, D. G. (2015). *Not out! The incredible story of the Indian Premier League*. HarperCollins India.
4. Sharma, K. K. (2012). *Sports management in India*. Khel Sahitya Kendra.
5. Singh, A. (2013). *Sports management*. Friends Publications.
6. अग्रवाल, आर. सी. (2015). *खेल प्रबंधन*. मित्र प्रकाशन।
7. बंसल, एस. के. (2012). *शारीरिक शिक्षा एवं खेल प्रबंधन*. फ्रेंड्स पब्लिकेशन।
8. शर्मा, वी. के. (2014). *खेल प्रबंधन एवं प्रशासन*. खेल साहित्य केंद्र।
9. शर्मा, जे. पी. (2011). *खेल संगठन एवं प्रशासन*. मित्र प्रकाशन।
10. Hoye, R., & Cuskelly, G. (2020). *Sport governance* (2nd ed.). Routledge.
11. Hums, M. A., MacLean, J. C., & Wolohan, J. T. (2018). *Governance and policy in sport organizations* (4th ed.). Routledge.
12. Shilbury, D., & Ferkins, L. (Eds.). (2020). *Routledge handbook of sport governance*. Routledge.
13. Bayle, E. (2017). *Governance and performance of international sport organizations*. Routledge.
14. Geeraert, A. (Ed.). (2019). *The EU in international sports governance*. Palgrave Macmillan.
15. Greenfield, S., & Osborn, G. (Eds.). (2016). *Law and sport in contemporary society*. Routledge.
16. Government of India, Ministry of Youth Affairs and Sports. (2001). *National sports policy 2001*. Government of India.
17. Government of India, Ministry of Youth Affairs and Sports. (2011). *National sports development code of India*. Government of India.
18. Sports Authority of India. (Various years). *Annual reports*. Government of India.
19. International Olympic Committee. (2021). *Basic universal principles of good governance of the Olympic and sports movement*. IOC.

Name of Subject: Field Experience in Sport Coaching	Maximum Theory Marks: (25+50)
Subject Code:240/SS/VOC/3ID1	Maximum Practical Marks: (5+20)

Learning objective:

To provide structured field-based coaching experience enabling students to independently plan, execute, evaluate, and reflect on coaching practices in real sports environments.

Learning outcomes:

1. Student will able to conduct independent coaching sessions in real se
2. Student will able to apply interdisciplinary knowledge (training, psychology, biomechanics)
3. Student will able to analyse athlete performance using field-based tools
4. Student will able to Maintain coaching records, reports, and reflective journals
5. Students will be able to integrate advanced coaching techniques, including the use of sports science, data analytics, and mental skills training, to optimize athlete performance and address emerging trends in the field of coaching.
6. Students will be able to demonstrate effective communication and leadership skills, fostering positive relationships and a supportive environment for athletes, while promoting teamwork and motivation.

Unit – 1 (Foundations of Sports Coaching)	
• Meaning and Importance of Sports Coaching • Roles and Responsibilities of a Coach • Qualities and Ethics of a Good Coach • Coaching Philosophy and Leadership • Communication Skills in Coaching • Safety and Risk Management during Training	
Unit – 2(Planning and Conducting of Coaching Sessions)	
• Preparation of Coaching Lesson Plans • Organization of Warm-up, Conditioning, and Cool-down Activities • Methods of Teaching Skills and Techniques in Sports • Demonstration, Explanation, and Correction of Skills • Use of Training Aids and Modern Coaching Equipment	
Unit – 3 (Practical Coaching Experience and Athlete Management)	
• Conducting Practical Coaching Sessions in Selected Sports/Games • Observation and Analysis of Player Performance • Communication and Motivation Techniques for Athletes • Talent Identification and Team Selection Procedures • Maintenance of Coaching Records, Attendance, and Performance Reports	
Unit - 4 (Event Participation, Evaluation and Internship)	
• Assisting in Organization of Tournaments and Sports Events • Officiating and Match Management During Competitions • Internship/Field Training Under Qualified Coaches • Preparation of Coaching Diary and Field Experience Report • Evaluation of Coaching Performance and Reflective Practices	

Practical / Field Work

- Conduct **minimum 20 coaching sessions**
- Prepare lesson plans for each session
- Coaching diary
- Attendance record
- Performance analysis sheets

Instruction for Examiners/ Paper Setters:

The question paper will be divided into two parts: Part-A and Part-B. Part-A: (Compulsory – 10 Marks) Question 1 shall be compulsory and consist of short-answer type questions (2.5 marks each) from all four units, covering 5 sub-questions in total. Part-B: (40 Marks) Part-B shall contain 8 long-answer type questions (10 marks each).

Two questions must be set from each unit, ensuring representation from all four units. Students must attempt one question from each unit (total 4 questions) in Part-B. It is mandatory for examiners to set two versions of the question paper: one in English and one in Hindi.

Suggested Readings:

1. Cassidy, T., Jones, R. L., & Potrac, P. (2009). *Understanding sports coaching: The social, cultural and pedagogical foundations of coaching practice* (2nd ed.). Routledge.
2. Potrac, P., Gilbert, W., & Denison, J. (Eds.). (2013). *Routledge handbook of sports coaching*. Routledge.
3. Jones, R. L., Kingston, K., & Edwards, M. (2018). *An introduction to sports coaching: Connecting theory to practice* (2nd ed.). Routledge.
4. Nash, C. (2015). *Practical sports coaching*. Routledge.
5. Robinson, P. E. (2010). *Foundations of sports coaching*. Routledge.
6. Armour, K. M. (2011). *Sport pedagogy: An introduction for teaching and coaching*. Pearson Education.
7. Woodburn, A., Allison-Abaunza, A., Couture-Légaré, J., & Thompson, M. (2021). Mentor requirements in the student-coach practicum: An analysis using the critical incident technique. *Sports Coaching Review*.
8. Thacker, M. (2023). *Department of sports & exercise science practicum manual*. Cameron University.
9. Baird, B. N., & Mollen, D. (2018). *Internship, practicum, and field placement handbook: A guide for the helping professions* (8th ed.). Routledge.
10. Alberts, C. L. (2003). *Coaching issues and dilemmas*. American Sport Education Program.
11. Morelli, J. A., & Velez, O. D. (2011). *Coaching and management techniques in athletics*. Nova Science Publishers.
12. Davis, P. A. (2015). *The psychology of effective coaching and management*. Nova Science Publishers.

Scheme of subjects (with Course ID)

Scheme of B.Sc.Sports Science

[Scheme UG A4: Undergraduate Programmes (Interdisciplinary)]

Semester VI

Semester VI															
Course Code	Course Title	Course ID	L	T	P	L	T	P	Total Credits	MARKS					
			(Hrs)			Credits					TI	TE	PI	PE	Total
Core Course(s)															
CC-ID1	Test, Measurement and Evaluation in Sports Sciences	240/ SS/CC6ID1	3	-	2	3	-	1	4	25	50	5	20	100	
CC-ID2	Research and Statistics in Physical education	240/SS/CC6ID3	3	-	2	3	-	1	4	25	50	5	20	100	
CC-ID2	Sports Nutrition and Ergogenic Aids	240/ SS/CC6ID4	3	-	2	3	-	1	4	25	50	5	20	100	
Minor/ Vocational Course(s)															
MIC-6	Science of Training		3	-	2	3	-	1	4	25	50	5	20	100	
VOC 3	Field Experience in exercise Prescription		3	-	2	3	-	1	4	25	50	5	20	100	
Skill Enhancement Course															
SEC-3	Sports Event Management	240/ SS/SEC/3ID1	2	-	2	2	-	1	3	15	35	5	20	75	
Total Credits									20					575	

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SYLLABUS of Course Undergraduate B.Sc. Sports Science

Semester-VI

Name of Subject: Test, Measurement and Evaluation in Sports Sciences	Maximum Theory Marks: (25+50)
Subject Code: 240/ SS/CC6ID1	Maximum Practical Marks: (5+20)

Objective: -To provide students with comprehensive knowledge of measurement and evaluation techniques in sports sciences, enabling them to assess physical fitness, performance, and skill proficiency using scientific methods. The course emphasizes test selection, administration, interpretation, and application for improving performance and decision-making in sports and physical education.

Course Contents: After completing this course, the students will be able to:

- Understand the concepts and importance of test, measurement, and evaluation
- Select and administer appropriate fitness and skill tests
- Interpret test results using norms and grading systems
- Evaluate individual and team performance scientifically
- Utilize modern tools and technologies in sports assessment
- Apply testing outcomes in training, selection, and talent identification

UNIT-I(Foundations of Test, Measurement and Evaluation)	
• Meaning, Need, and Importance of Test, Measurement, and Evaluation • Concepts of Measurement Scales: Nominal, Ordinal, Interval, Ratio • Principles of Good Testing: Objectivity, Reliability, Validity, Norms • Criteria for Selection of Tests • Classification of Tests: Fitness, Skill, Motor Ability, Psychological • Norms and Grading: Percentile norms, standard norms, grading systems • Ethical Considerations in Testing: fairness, confidentiality, inclusivity	
UNIT-II (Physical Fitness and Health Assessment)	
• Components of Physical Fitness: Strength, Endurance, Speed, Flexibility, Agility • Health-related vs Skill-related Fitness • Standard Fitness Test Batteries:	

○ AAHPER Youth Fitness Test ○ Eurofit Test ○ Brockport Physical Fitness Test • Field Tests: ○ Cooper 12-minute run ○ Harvard Step Test ○ Illinois Agility Test ○ Sit and Reach Test ○ Vertical Jump Test • Anthropometric Measurements: Height, Weight, BMI • Body Composition: Skinfold method (basic concept), limitations of BMI	
UNIT-III(Skill Testing and Performance Evaluation)	
• Skill Tests for Selected Sports (concept and examples) • Motor Ability Tests and Talent Identification • Movement Screening and Functional Assessment (basic concepts) • Test Administration Procedures and Precautions • Recording and Reporting of Scores • Interpretation of Results using Norms and Performance Profiles • Use of Evaluation in Selection, Classification, and Training Planning	
UNIT-IV (Modern Trends in Evaluation and Performance Analysis)	
• Digital and Computer-Based Testing • Use of Wearable Devices: heart rate monitors, GPS trackers, fitness bands • Introduction to Video Analysis in Sports • Basics of Performance Analysis Software • Monitoring Training Load and Recovery (introductory concepts) • Talent Identification Models and Long-Term Athlete Development (LTAD) • Inclusive and Adaptive Testing for Diverse Populations • Role of Evaluation in Coaching and Performance Enhancement	
Practical	
Students will undergo hands-on training and assessments in the following areas: Administration of Fitness Tests • Cooper 12-minute run / Beep Test • Sit and Reach Test • Vertical Jump Test • Illinois Agility Test	

2. Anthropometric Measurements

- Measurement of height and weight
- BMI calculation
- Skinfold measurement (demonstration/basic practice)

Instruction for Examiners/ Paper Setters: The question paper will be divided into **two parts: Part-A and Part-B**. Part-A (Compulsory – 10 Marks). Question 1 shall be compulsory. It will consist of **4 short-answer type questions (2.5 marks each)**, with **one question from each unit**, ensuring coverage of the entire syllabus. Part-B (40 Marks). Part-B shall contain **8 long-answer type questions (10 marks each)**. **Two questions must be set from each unit**, ensuring equal representation of all units. Students are required to **attempt one question from each unit** (total 4 questions).

Suggested Readings:

1. Baumgartner, T. A., Jackson, A. S., Mahar, M. T., & Rowe, D. A. (2006). *Measurement for evaluation in physical education and exercise science* (8th ed.). McGraw-Hill.
2. Lacy, A. C. (2011). *Measurement and evaluation in physical education and exercise science* (6th ed.). Pearson Benjamin Cummings.
3. Lacy, A. C., & Hastad, D. N. (2007). *Measurement and evaluation in physical education and exercise science* (5th ed.). Benjamin Cummings.
4. Phillips, D. A., & Hornak, J. E. *Measurement and evaluation in physical education*. John Wiley & Sons.
5. McCloy, C. H. (n.d.). *Tests and measurements in health and physical education*. Friends Publication.
6. Clarke, H. H. (1961). *Application of measurement to health and physical education* (3rd ed.). Prentice Hall.
7. Morrow, J. R., Jackson, A. W., Disch, J. G., & Mood, D. P. (2005). *Measurement and evaluation in human performance* (4th ed.). Friends Publication.

Name of Subject: Research and Statistics in Physical Education	Maximum Theory Marks: (25+50)
Subject Code: 240/ SS/CC6ID3	Maximum Practical Marks: (5+20)

Objective: -To develop understanding of research methods and statistical techniques in Physical Education and Sports. To acquaint students with scientific methods of data collection and analysis. To enable students to interpret research findings and prepare research reports. To develop competency in the application of statistics in sports sciences and performance analysis.

Overall Learning Outcomes: By the end of this course, students will be able to:

- Demonstrate knowledge of various teaching methods and pedagogical theories.
- Design and implement effective lesson plans in physical education and sports.
- Apply classroom management and communication skills in teaching situations.
- Evaluate teaching-learning processes and adopt reflective practices.
- Conduct practical teaching sessions with confidence and competence.

Course Contents:

UNIT-I (Introduction to Research)	
• Meaning, Nature, Scope, and Importance of Research in Physical Education and Sports • Types of Research: Basic, Applied, Historical, Descriptive, Experimental • Research Problem: Meaning, Identification, and Selection • Review of Related Literature: Need and Sources • Hypothesis: Meaning, Types, and Formulation • Variables: Meaning and Types • Research Proposal and Research Design: Meaning and Components • Ethical Considerations in Sports Research	
UNIT-II (Methods and Tools of Data Collection)	
• Sampling: Meaning, Need, and Types • Random Sampling • Stratified Sampling • Systematic Sampling • Cluster Sampling	

• Methods of Data Collection • Observation Method • Questionnaire Method • Interview Method • Survey Method • Test and Measurement Technique • Reliability, Validity, and Objectivity: Meaning and Importance • Preparation of Data Collection Tools • Classification and Tabulation of Data	
UNIT-III (Fundamentals of Statistics)	
• Meaning, Importance, and Functions of Statistics in Physical Education • Measures of Central Tendency • Mean • Median • Mode • Measures of Variability • Range • Quartile Deviation • Mean Deviation • Standard Deviation • Normal Probability Curve: Meaning and Properties • Percentile and Percentile Rank • Correlation: Meaning and Types • Product Moment Method • Rank Difference Method • Graphical Representation of Data • Bar Diagram • Histogram • Frequency Polygon • Pie Diagram	
UNIT-IV (Statistical Techniques & Report Writing)	
• Parametric and Non-Parametric Statistics • Test of Significance • t-test	

• Chi-square Test • Analysis of Variance (ANOVA): One-way ANOVA • Interpretation of Statistical Results • Use of Computer Applications in Research and Statistics • Research Report Writing • Format of Thesis/Dissertation • Citation and References • Bibliography Preparation • Presentation of Research Findings	
Practical Component	
• Preparation of Research Proposal • Calculation of Mean, Median, Mode, and Standard Deviation • Graphical Presentation of Data • Conducting Small Survey/Research Study • Preparation of Research Report	

Instruction for Examiners/ Paper Setters: The question paper will be divided into **two parts: Part-A and Part-B**. Part-A (Compulsory – 10 Marks). Question 1 shall be compulsory. It will consist of **4 short-answer type questions (2.5 marks each)**, with **one question from each unit**, ensuring coverage of the entire syllabus. Part-B (40 Marks). Part-B shall contain **8 long-answer type questions (10 marks each)**. **Two questions must be set from each unit**, ensuring equal representation of all units. Students are required to **attempt one question from each unit** (total 4 questions).

SUGGESTED READINGS:

1. Best, J. W.. & Kahn. J. V. (2006). *Research in education* (10th ed.). Pearson Education.
2. Clarke, D. H., & Clarke, H. H. (1984). *Research processes in physical education, recreation and health*. Prentice Hall.
3. Garrett, H. E. (2008). *Statistics in psychology and education*. Paragon International Publishers.
4. Kamlesh, M. L. (2015). *Research methodology in physical education and sports*. Friends Publications (India).
5. Kansal, D. K. (2012). *Applied measurement, evaluation and sports selection*. Sports and Spiritual Science Publications.
6. Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.

7. Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2015). *Research methods in physical activity* (7th ed.). Human Kinetics.
8. Verma, J. P. (2013). *Data analysis in management with SPSS software*. Springer.
9. Vincent, W. J., & Weir, J. P. (2020). *Statistics in kinesiology* (5th ed.). Human Kinetics.
10. Morrow, J. R., Jr., Mood, D. P., Disch, J. G., & Kang, M. (2015). *Measurement and evaluation in human performance* (5th ed.). Human Kinetics.
11. Baumgartner, T. A., Jackson, A. S., Mahar, M. T., & Rowe, D. A. (2015). *Measurement for evaluation in kinesiology* (9th ed.). Jones & Bartlett Learning.

Name of Subject: Sports Nutrition and Ergogenic Aids	Maximum Theory Marks: (25+50)
Subject Code: 240/ SS/CC6ID4	Maximum Practical Marks: (5+20)

Objective: -To provide students with scientific knowledge of nutrition in sports and exercise, focusing on dietary requirements, nutrient timing, and the role of ergogenic aids in enhancing performance. The course aims to enable learners to plan balanced diets, evaluate supplements, and apply nutritional strategies for athletes.

Overall Learning Outcomes: Upon successful completion of this course, students will be able to:

- Understand basic and applied concepts of sports nutrition
- Identify nutritional requirements for different sports and populations
- Plan balanced diets for athletes based on training demands
- Evaluate the role, benefits, and risks of ergogenic aids
- Apply nutrition strategies for performance, recovery, and health
- Demonstrate awareness of anti-doping regulations related to supplements

Course Contents:

UNIT-I(Fundamentals of Sports Nutrition)	
• Meaning, Scope, and Importance of Sports Nutrition • Basic Concepts of Nutrition: Macronutrients and Micronutrients • Functions and Sources of Carbohydrates, Proteins, and Fats • Vitamins and Minerals: Role in Energy Metabolism and Performance • Water and Electrolyte Balance in Sports • Digestion, Absorption, and Energy Metabolism (overview) • Energy Systems in Exercise (aerobic and anaerobic linkage with nutrition)	
UNIT-II (Nutrition for Performance and Health)	
• Energy Requirements of Athletes (factors affecting energy needs) • Balanced Diet and Dietary Guidelines for Athletes • Pre-competition, During Competition, and Post-competition Nutrition • Nutrient Timing and Meal Planning • Hydration Strategies and Fluid Replacement • Nutrition for Different Sports: Endurance, Strength, Team Sports	

• Nutrition for Special Populations: Children, Women, Aging Athletes	
UNIT-III(Ergogenic Aids in Sports)	
• Meaning and Classification of Ergogenic Aids: ◦ Nutritional ◦ Physiological ◦ Psychological ◦ Mechanical • Common Ergogenic Aids: ◦ Carbohydrate loading ◦ Protein supplements ◦ Creatine ◦ Caffeine ◦ Electrolyte drinks • Benefits and Risks of Ergogenic Aids • Myths and Misconceptions about Supplements • Natural vs Synthetic Supplements	
UNIT-IV (Supplements, Doping and Contemporary Issues)	
• Dietary Supplements: Types, Regulation, and Safety • Anti-Doping Concepts and Awareness • Overview of World Anti-Doping Agency (WADA) guidelines • Banned Substances and Methods (introductory understanding) • Ethical Issues in Use of Ergogenic Aids • Nutritional Strategies for Recovery and Injury Prevention • Emerging Trends in Sports Nutrition (functional foods, nutrigenomics – basic concept) • Role of Nutrition in Long-Term Athlete Development	
PRACTICAL	
Diet Planning • Preparation of balanced diet charts for: ◦ Endurance athlete ◦ Strength athlete • Calorie estimation (basic level) 2. Nutritional Assessment • 24-hour dietary recall method • Food frequency questionnaire (basic) 3. Hydration Assessment	

- Monitoring fluid intake
- Estimation of sweat loss (basic concept/demo)

4. Case Study / Assignment

- Nutrition plan for a specific sport or athlete profile
- Analysis of diet vs performance needs

Instruction for Examiners/ Paper Setters: The question paper will be divided into **two parts: Part-A and Part-B**. Part-A (Compulsory – 10 Marks). Question 1 shall be compulsory. It will consist of **4 short-answer type questions (2.5 marks each)**, with **one question from each unit**, ensuring coverage of the entire syllabus. Part-B (40 Marks). Part-B shall contain **8 long-answer type questions (10 marks each)**. **Two questions must be set from each unit**, ensuring equal representation of all units. Students are required to **attempt one question from each unit** (total 4 questions).

SUGGESTED READINGS:

1. Antonio, J., & Stout, J. R. (Eds.). (2001). *Sports supplements*. Lippincott Williams & Wilkins.
2. Bean, A. (2017). *The complete guide to sports nutrition* (8th ed.). Bloomsbury Sport.
3. Burke, L., & Deakin, V. (2015). *Clinical sports nutrition* (5th ed.). McGraw-Hill Education.
4. Clark, N. (2019). *Nancy Clark's sports nutrition guidebook* (6th ed.). Human Kinetics.
5. Dunford, M., & Doyle, J. A. (2018). *Nutrition for sport and exercise* (4th ed.). Cengage Learning.
6. Jeukendrup, A., & Gleeson, M. (2019). *Sport nutrition: An introduction to energy production and performance* (3rd ed.). Human Kinetics.
7. Maughan, R. J. (Ed.). (2005). *Sports nutrition: Basic principles and practical strategies*. CRC Press.
8. Williams, M. H. (2013). *Nutrition for health, fitness and sport* (10th ed.). McGraw-Hill Education.
9. Williams, M. H. (2017). *Dietary supplements and sports performance: Ergogenic aids* (Vol. 1). Routledge.
10. Kreider, R. B., Ziegenfuss, T., Antonio, J., & Wildman, R. (2010). *Essentials of sports nutrition and supplements*. Humana Press.

Name of Subject: Science of Sports Training	Maximum Theory Marks: (25+50)
Subject Code: 240/ SS/VOC/5ID1	Maximum Practical Marks: (5+20)

Objective: The students will be able to apply advanced principles of sports training in competitive sports. Design scientific training programmes for different sports and age groups. Use testing, monitoring, and recovery techniques in training. Analyze performance using modern sports science tools. Develop sport-specific conditioning and periodized training plans.

Course Outcomes:

After completion of the course, students will be able to:

- Prepare advanced training schedules for athletes.
- Conduct physical fitness and performance assessments.
- Apply recovery and monitoring methods scientifically.
- Integrate technology in sports training.
- Plan sport-specific conditioning and competition strategies.

UNIT 1 (Advanced Training Load Management and Monitoring)	
• Advanced concepts of training load: External load and Internal load • Monitoring training adaptation and overtraining • Fatigue management and recovery optimization • Training impulse (TRIMP), workload ratio and readiness assessment • Scientific principles of tapering and peaking	
UNIT-II (Sport-Specific Conditioning and Performance Enhancement)	
• Advanced strength and conditioning for various sports • Plyometric, functional and circuit training methods • Agility, coordination and reaction training • Speed endurance and repeated sprint ability • Neuromuscular adaptations in athletic performance	

UNIT-III (Applied Periodization and Competition Planning)	
• . Advanced models of periodization: • Linear • Undulating • Block periodization • Microcycle, Mesocycle and Macrocycle planning • Competition phase management • Psychological preparation before competition • Training modifications during injury and return-to-play protocols	
UNIT-IV: (Sports Technology, Testing and Performance Analysis)	
• Role of sports technology in training • Performance analysis techniques in sports • GPS, heart rate monitors and wearable devices • Video analysis and biomechanical feedback • Data interpretation for athlete performance improvement	
Practical	
• Designing annual training plan for a selected sport • Conducting agility and speed tests • Monitoring athlete workload • Video analysis of technical skills • Recovery and regeneration sessions • Athlete profiling and performance tracking • Preparation of sport-specific warm-up and cool-down • Training session leadership	

Instruction for Examiners/ Paper Setters:

The question paper will be divided into **two parts: Part-A and Part-B. Part-A: (Compulsory – 10 Marks)** Question 1 shall be compulsory and consist of **short-answer type questions (2.5 marks each)** from all four units, covering **4 sub-questions in total. Part-B: (40 Marks)** Part-B shall contain **8 long-answer type questions (10 marks each).** **Two questions must be set from each unit, ensuring representation from all four units.** Students must attempt **one question from each unit (total 4 questions)** in Part-B. **It is mandatory** for examiners to set **two versions** of the question paper: one in **English** and one in **Hindi**.

Suggested Readings:

1. American College of Sports Medicine. (2022). *ACSM's guidelines for exercise testing and prescription* (11th ed.). Wolters Kluwer.
2. American College of Sports Medicine. (2023). *ACSM's exercise testing and prescription* (2nd ed.). Wolters Kluwer.
3. Jonas, S., & Phillips, E. M. (2009). *ACSM's exercise is medicine: A clinician's guide to exercise prescription*. Lippincott Williams & Wilkins.
4. Swain, D. P., & Leutholtz, B. C. (2007). *Exercise prescription: A case study approach to the ACSM guidelines* (2nd ed.). Human Kinetics.
5. Heyward, V. H. (2014). *Advanced fitness assessment and exercise prescription* (7th ed.). Human Kinetics.
6. Thompson, W. R., Gordon, N. F., & Pescatello, L. S. (Eds.). (2010). *ACSM's guidelines for exercise testing and prescription* (8th ed.). Lippincott Williams & Wilkins.
7. Kisner, C., Colby, L. A., & Borstad, J. (2017). *Therapeutic exercise: Foundations and techniques* (7th ed.). F. A. Davis.
8. Powers, S. K., & Howley, E. T. (2021). *Exercise physiology: Theory and application to fitness and performance* (11th ed.). McGraw-Hill Education.
9. Garber, C. E., Blissmer, B., Deschenes, M. R., Franklin, B. A., Lamonte, M. J., Lee, I. M., Nieman, D. C., & Swain, D. P. (2011). Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Medicine & Science in Sports & Exercise*, 43(7), 1334–1359.
10. Kenney, W. L., Wilmore, J. H., & Costill, D. L. (2021). *Physiology of sport and exercise* (8th ed.). Human Kinetics.

Name of Subject: Field Experience in Exercise Prescription	Maximum Theory Marks: (25+50)
Subject Code: 240/ SS/VOC/5ID1	Maximum Practical Marks: (5+20)

Objective:The main objective of this course is to help students learn how to **design and apply exercise programs for different people** (students, adults, athletes, beginners, and special populations). The course focuses on **real-life practice**, so that students can work as fitness trainers, gym instructors, or health coaches.

Upon successful completion, students will be able to:

- Understand how to prescribe exercise safely
- Design simple fitness programs for different individuals
- Conduct basic fitness assessments
- Guide people during exercise sessions
- Modify exercises according to age, health, and fitness level

UNIT 1 (Foundations of Exercise Prescription)	
• Meaning and Importance of Exercise Prescription • Principles of Exercise Prescription • Components of Physical Fitness • FITT Principle • Exercise Guidelines for Health and Fitness • Safety Precautions during Exercise	
UNIT-II (Fitness Assessment and Exercise Planning)	
• Pre-Exercise Screening and Health Evaluation • Assessment of: Cardiovascular Endurance, Muscular Strength and Endurance, Flexibility, Body Composition • Goal Setting in Exercise Programmes • Designing Individualized Exercise Plans • Exercise Progression and Monitoring	
UNIT-III(Exercise Planning for Different Populations)	

• Exercise Prescription for: Children and Adolescents, Adults, Elderly Population • Exercise for Weight Management • Exercise for Sedentary Individuals • Exercise Considerations for Women • Contraindications and Exercise Limitations	
UNIT-IV: (Modern Trends and Practical Applications)	
• Functional Fitness Training • Aerobic and Anaerobic Exercise Prescription • Strength and Resistance Training Prescription • Yoga and Flexibility Exercises • Use of Technology and Fitness Apps • Record Keeping and Client Monitoring	
Practical	
• Measurement of BMI • Resting Heart Rate and Blood Pressure • Sit and Reach Test • Push-up and Sit-up Tests • Cooper Run/Walk Test • Preparation of exercise prescription for: ◦ Beginners ◦ Weight loss clients ◦ Senior citizens ◦ Sportspersons • Designing weekly fitness schedules • Warm-up and cool-down exercises • Aerobic exercise session • Resistance training exercises • Core strengthening exercises • Flexibility and mobility drills • Exercise log maintenance • Heart rate monitoring • Fitness progress chart preparation • Practical file submission	

Instruction for Examiners/ Paper Setters:

The question paper will be divided into two parts: **Part-A** and **Part-B**. **Part-A: (Compulsory – 10 Marks)** Question 1 shall be compulsory and consist of short-answer type questions (2.5 marks each) from all four units, covering 4 sub-questions in total.

Part-B: (40 Marks)Part-B shall contain 8 long-answer type questions (10 marks each).Two questions must be set from each unit, ensuring representation from all four units. Students must attempt one question from each unit (total 4 questions) in Part-B. It is mandatory for examiners to set two versions of the question paper: one in English and one in Hindi.

Suggested Readings:

1. American College of Sports Medicine. (2022). *ACSM's guidelines for exercise testing and prescription* (11th ed.). Wolters Kluwer.
2. American College of Sports Medicine. (2023). *ACSM's exercise testing and prescription* (2nd ed.). Wolters Kluwer.
3. Jonas, S., & Phillips, E. M. (2009). *ACSM's exercise is medicine: A clinician's guide to exercise prescription*. Lippincott Williams & Wilkins.
4. Swain, D. P., & Leutholtz, B. C. (2007). *Exercise prescription: A case study approach to the ACSM guidelines* (2nd ed.). Human Kinetics.
5. Heyward, V. H. (2014). *Advanced fitness assessment and exercise prescription* (7th ed.). Human Kinetics.
6. Thompson, W. R., Gordon, N. F., & Pescatello, L. S. (Eds.). (2010). *ACSM's guidelines for exercise testing and prescription* (8th ed.). Lippincott Williams & Wilkins.
7. Kisner, C., Colby, L. A., & Borstad, J. (2017). *Therapeutic exercise: Foundations and techniques* (7th ed.). F. A. Davis.
8. Powers, S. K., & Howley, E. T. (2021). *Exercise physiology: Theory and application to fitness and performance* (11th ed.). McGraw-Hill Education.
9. Garber, C. E., Blissmer, B., Deschenes, M. R., Franklin, B. A., Lamonte, M. J., Lee, I. M., Nieman, D. C., & Swain, D. P. (2011). Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. *Medicine & Science in Sports & Exercise*, 43(7), 1334–1359.
10. Kenney, W. L., Wilmore, J. H., & Costill, D. L. (2021). *Physiology of sport and exercise* (8th ed.). Human Kinetics.

Name of Subject: Sports Event Management	Maximum Theory Marks: 50 (15+35)
Subject Code: 240/ SS/SEC/3ID1	Maximum Practical Marks: 25 (5+20)

Objective: The course aims to provide structured, field-based experiential learning in sports event management by engaging students in real event settings. It focuses on developing professional competencies in event planning, stakeholder coordination, operations management and event evaluation, enabling students to function effectively as entry level sports event managers.

Upon successful completion, students will be able to:

- Plan and organize sports events effectively
- Manage stakeholders and event operations
- Apply safety, legal and risk management practices
- Use digital tools for event promotion and management
- Demonstrate leadership, communication and professional skills

UNIT-I (Introduction to Sports Event Management)	
• Meaning, concept, and scope of sports event management • Types of sports events: intramural, extramural, national, and international • Functions and qualities of a sports event manager • Planning and organization of sports events • Formation of committees and duties • Budgeting and financial management • Risk management and legal considerations • Event management software • Data-driven event planning	
UNIT II: (Technology, Media and Marketing in Sports Events)	
• Digital ticketing and accreditation systems • Social media marketing and digital promotion • Sports broadcasting and live streaming • Fan engagement strategies • Sponsorship and sponsorship activation • Branding and merchandising • Media management and press relations	

• AI in sports event operations • Influencer marketing in sports • Hybrid and virtual sports events	
UNIT III: (Event Operations and Contemporary Issues)	
• Venue management and logistics • Fixture preparation and scheduling • Volunteer and workforce management • Security and crowd management • Sustainable sports event management • Emergency and crisis management • Case studies of major sporting events • Entrepreneurship opportunities in sports event management • Green sporting events • Smart stadiums • Esports event management	
Practical	
• Preparation of event proposal • Preparation of invitation letters, notices, and certificates • Preparation of registration forms and score sheets • Designing social media promotional content • Preparation of press release and event brochure • Digital promotion of sports events • Preparation of sponsorship proposal • Branding and merchandising ideas • Conduct of intramural sports competition • Submission of event management project report	

Instruction for Examiners/ Paper Setters: Question Paper will be divided into two parts A and B. The Examiner is required to set 5 questions for Part-A and 6 questions for Part-B ensuring equal representation from each unit of the syllabus. The questions of Part-A shall carry 2 marks each and questions for Part-B shall carry 5 marks each. A student is required to attempt any 5 questions from Part-A and 5 questions from Part-B. It is mandatory for an examiner to set two sets of question papers (English Version as well as Hindi Version).

Suggestive Readings:

1. Parent, M. M., & Chappelet, J. L. (2015). *The Routledge handbook of sports event management*. Routledge.
2. Allen, J., O'Toole, W., Harris, R., & McDonnell, I. (2022). *Festival and special event management* (7th ed.). Wiley.

3. Shone, A., & Parry, B. (2019). *Successful event management: A practical handbook* (5th ed.). Cengage Learning.
4. Goldblatt, J. (2017). *Special events: Creating and sustaining a new world for celebration* (8th ed.). Wiley.
5. Pedersen, P. M., & Thibault, L. (2018). *Contemporary sport management* (6th ed.). Human Kinetics.
6. Watt, D. C. (2004). *Sports management and administration* (3rd ed.). Routledge.