CENTRAL UNIVERSITY OF PUNJAB BATHINDA

Ph.D. Physical Education

Batch: 2025-26

Department of Physical Education

Graduate Attributes:

The graduate will comprehend the research innovatively from an interdisciplinary approach and focuses on knowledge of the literature, comprehensive understanding of scientific methods, research techniques to show originality in critical evaluation and application of research.

PROGRAMME LEARNING OUTCOMES

- The Ph.D. program in Physical Education is designed to develop highly competent, research-oriented, and reflective scholars who can address the dynamic and interdisciplinary demands of contemporary society.
- The program integrates advanced knowledge with statistics in physical education to support scholarly inquiry, and facilitate the critical analysis of emerging issues, diverse perspectives, and complex challenges within the field of Physical Education.
- Through rigorous coursework and research training, scholars will deepen their scientific understanding and acquire advanced practical knowledge across various disciplines of sports and physical education.
- Doctoral candidates will engage in independent and collaborative research, formulating scientific hypotheses, designing and conducting experiments, analyzing data using advanced methodologies, and disseminating their original research findings at national and international platforms.

Course Structure

Course Code	Course Title	Course Type	L	T	P	Credits
PPE 701	Research in Physical Education	Core Course	4	0	0	4
PPE 702	Statistical Methods and Sport Instrumentation	Core Course	4	0	0	4
PPE 703	Teaching Assistantship	Core Course	0	0	2	1
PPE 751	Research and Publication Ethics	Core Course	2	0	0	2
UNI 753	Curriculum, Pedagogy and Evaluation	Core Course	1	0	0	1
Elective Courses: Choose any one Course						
PPE 704	Exercise Physiology	Core Course	3	0	0	3
PPE 705	Sport Psychology					
PPE 706	Sport Biomechanics					
PPE 707	Sport Management					
PPE 708	Sport Medicine					
PPE 709	Sport Training					
Total			**14**		**4**	**16**

Course Name: Research in Physical Education

L	T	P	Credit
4	0	0	4

Course Code: PPE701

Course type: Core Course

Total Hours: 60

Course Learning Outcomes:

On completion of this course, students shall be able to:

CLO1: Explore different approaches to research
CLO2: Review the related literature
CLO3: Develop a research proposal
CLO4: Develop understanding about different types of research
CLO5: Select an appropriate sampling design for a research study
CLO6: Document and disseminate research findings in physical education
CLO7: Explain the significance of intellectual property rights in the field of research

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Units/Hours	Contents	Mapping with Course Learning Outcome
I 20Hours	**Introduction to Research:** Basic concept of Research and its scope in physical education, Types/Classification of Researches	CLO1
	Review of Literature: Importance, location of the research material – index, books, bibliography, reviews, and abstract, critical and allied literature, Steps in reviewing literature and critically writing of review of literature	CLO2
	Identification of area for research in Physical Education: Selection of problem & variables, writing of title and objectives, Hypothesis and its form, limitation and delimitation of research problem, rationale of research study	CLO3
	Learning Activities: Peer Discussion, Brain Storming and Problem Solving	
II 10 Hours	**Methods of Research:** Analytical Research- Philosophical, Historical and Meta-Analyses, Descriptive Research –Case Study and Survey (Cross-sectional, Longitudinal and Correlational),Qualitative and Quantitative Research, Experimental Designs: Pre-experimental Designs, True Experimental Designs and Quasi Experimental Designs	CLO4

	Learning Activities: Peer Discussion, Brain Storming and Problem Solving	
III 15 Hours	**Sampling and Tools in Research:** Sampling: Population, Sample, Frame, Probability and Non- Probability Sampling Techniques, Sample size and sampling error,Characteristics of a good research tools, Types of tools for data collection – standardised and non-standardised, Questionnaire, Interview, Observation, Psychological Test, Sociometric Techniques, Scales, and Inventories, Procedure of development and standardization of tools, Methods for establishing reliability and validity, Primary and secondary sources for data collection	CLO5
	Learning Activities: Peer Discussion, Brain Storming and Problem Solving	
IV 15 Hours	**Academic Writing:** Different formats for reference and bibliography- APA, MLA, Chicago and Harvard, Silent features of writing research proposal/report - Language & style, Precision, Consistency, Continuity, Use of third person, Use of tense, Use of headings, Table, Graph and Front page of thesis, Research Proposal Writing, Method of writing research papers for seminars and publication in journals, Introduction to Poster Presentation, Writing of research dissertation and thesis, Writing of research Project	CLO6 CLO7
	Learning Activities: Peer Discussion, Brain Storming and Problem Solving	

Transaction Mode: Lecture, Demonstration, Group Discussion, Project Method, Seminar, Dialogue

Suggested Reading:

- Anderson, J. (2001). Thesis and assignment writing (4th ed.). Wiley.
- Babbie, E. R. (2007). The basics of social research (4th ed.). Thomson/Wadsworth.
- Berg, B. L. (2008). Qualitative research methods for the social sciences (7th ed.). Allyn & Bacon.
- Bhaumik, S. K. (2007). Methodological issues in field surveys. In K. K. Bagchi (Ed.), [Book title not provided]. [Publisher not specified].
- Bryman, A. (2004). Social research methods (2nd ed.). Oxford University Press.
- Clarke, D. H., & Clarke, H. H. (1984). Research process in physical education. Prentice Hall.
- DeMarrais, K. B., & Lapan, S. D. (2004). Foundations for research: Methods of inquiry in education and the social sciences. L. Erlbaum Associates.
- Best, J. W. (1981). Research in education. Prentice Hall.
- Dooley, D. (2001). Social research methods (4th ed.). Prentice Hall.
- Fink, A., & Kosecoff, J. (1998). How to conduct surveys: A step by step guide. Sage.
- Glicken, M. D. (2002). Social research: A simple guide. Allyn & Bacon.
- Good, C. V., & Scates, D. E. (1954). Methods in social research. McGraw-Hill.
- Gray, D. E. (2004). Doing research in the real world. Sage Publications.
- Kemple, M. (2000). Review of the Good research guide for small-scale social research projects, by

M. Denscombe. Journal of Advanced Nursing, 31(3), 733.
- Koul, L. (1988). Methodology of research. Vikas Publishing.
- Miller, D. C., & Salkind, N. J. (2002). Handbook of research design and social measurement (6th ed.). Sage Publications.
- Mouly, A. J. (1963). The science of educational research. Eurosia Publishing.
- Neuman, W. L. (2006). Social research methods: Qualitative and quantitative approaches (6th ed.). Allyn & Bacon.
- Outhwaite, W., & Turner, S. P. (Eds.). (2007). The SAGE handbook of social science methodology. Sage Publications.
- Sansanwal, D. N. (2020). Research methodology and applied statistics. Shipra Publications.
- Seale, C. (2004). Social research methods: A reader. Routledge.
- Somekh, B., & Lewin, C. (2012). Theory and methods in social research (2nd ed.). Sage Publications.
- Todd, R. (1999). Review of the Good research guide for small-scale social research projects, by M. Denscombe. Sociology, 33(4), 839.

Course Name : Statistical Methods and Sport Instrumentation
Course Code : PPE702
Course Type : Core course
Total Hours : 60

L	T	P	Cr
4	0	0	4

Course Learning Outcomes:

After completion of the course, students shall be able to
CLO1: Comprehend the measurements scales of data and Testing of Normality Assumptions
CLO2: Testing for Homogeneity of Variance and Hypothesis Testing
CLO3: Develop understanding of factorial experiment, Comparison of means of two and more than two groups and Post-hoc test
CLO4: Learn data analysis with Multiple Correlation, Regression Techniques
CLO5: Multivariate analysis and Non-Parametric Statistics
CLO6 : Apply E- learning tools in data analysis and research

Units/Hours	Contents	Mapping with Course Learning Outcomes
I 10 Hours	**Nature of Data and Normality Assumptions:** Data Measurements Scales: Nominal, Ordinal, Interval and Ratio. Normal Distribution and its Properties. Testing of Normality: Skewness, Kurtosis, Shapiro Wilk Smirnov test, Q-Q and Box plots for identifying Outliers.	CLO1
	Homogeneity and Hypothesis Testing: Testing for Homogeneity of Variance- Levene's test and Developing Profiles. Concept in Hypothesis Testing: Type I and II error, Power of the test, Theory of Estimation- Point Estimation and Interval Estimation. Criteria in Selecting Sample Size.	CLO2
	Nature of Data and Normality Assumptions: Data Measurements Scales: Nominal, Ordinal, Interval and Ratio. Normal Distribution and its Properties. Testing of Normality: Skewness, Kurtosis, Shapiro Wilk Smirnov test, Q-Q and Box plots for identifying Outliers.	
	Learning Activities : Peer Discussion, Brain Storming and Problem Solving.	

II 15 ours	**Analysis of Variance and Design of Experiments:** Factorial Experiment: Experimental Unit, Factor & Treatment, Variation & Variance, Experimental Error. Principles of Design of Experiment: Randomization, Replication and Blocking. Considerations in designing an experiment: Systematic Variance. Extraneous Variance: Randomization Method, Elimination Method, Matching Group method, Error Variance. Quantitative Data Analysis: Comparing two means with dependent and independent t-test and their assumptions, One Way ANOVA & Factorial ANOVA and their Assumptions. Post-hoc analysis Test: LSD, Scheffe's, Tukey- HSD. Correction for Inflating Type I error due to multiple comparisons. One Way and Two Way Repeated Measures ANOVA and their Assumptions Effects size and its significance.	CLO3
	Learning Activities : Real Data Analysis and Problem Solving, Peer Discussion, Brain Storming, Application in Sports	
III 15Hours	**Correlation and Regression Analysis:** Correlation- Partial and multiple, limitations, Testing of significance. Regression Analysis- Simple and multiple regressions. Estimating intercept and slope. Least square methods, analyzing residuals, Residual Plot: Testing assumptions in the regression model, Standard error of estimate, Testing significance of slope and model, Coefficient of Determination (R2). The Multiple Regression Model- Developing a Multiple Regression Model, Standardized regression coefficients. Different ways of testing a regression model, Testing the significance of overall model and regression coefficient's. Analyzing residuals, standard Error of the Estimate, The coefficient of determination (R2). Adjusted R2, Testing the significant of R2. Different approaches in developing multiple regression model: Stepwise, Forward, Backward and Enter. Logistic Regression and its Assumptions. Developing Logistic Model and application in Sports Research	CLO4
	Learning Activities : Real Data Analysis and Problem Solving, Peer Discussion, Brain Storming, Application in Sports and Model Development	
	Multivariate analysis and Non-Parametric Statistics: Analysis of Covariance (ANCOVA) and its Assumptions. Factor analysis: Exploratory and Confirmatory, Multivariate Analysis of Variance (MANOVA) Model and its	CLO5 CLO6

IV 20Hours	Assumptions. Non-parametric Test: Wilcoxon rank-sum test, Mann–Whitney test, Kruskal–Wallis test, Chi-Square Test and their Assumptions. Use of SPSS for data analysis. Reference Manager Software	
	Learning Activities : Real Data Analysis and Problem Solving, Peer Discussion, Brain Storming, Application in Sports and Model Development	

Transaction Mode: Lecture, Case Study, Blended Learning, Problem Solving, Discussion & Demonstration, Self-Study.

Suggested Reading:

- Garrett, H. E. (1973). Statistics in psychology and education. Vakils, Feffer and Simon.
- Sansanwal, D. N. (2020). Research methodology and applied statistics. Shipra Publishers.
- Verma, J. P. (2012). Data analysis in management with SPSS software. Springer Science & Business Media.
- Verma, J. P. (2012). Statistics for psychology. Tata McGraw-Hill Education Private Limited.
- Verma, J. P. (2014). Statistics for exercise science and health with Microsoft Excel. John Wiley & Sons.
- Verma, J. P. (2015). Repeated measures design for empirical researchers. John Wiley & Sons.
- Verma, J. P. (2019). Statistics and research methods in psychology with Excel. Springer Nature Singapore Pte Ltd.
- Field, A. (2024). Discovering statistics using IBM SPSS statistics (4th ed.). Sage Publications.

Course Code: PPE703
Course Name: Teaching Assistantship
Course type: Core Course
Total Hours: 30

L	T	P	Credit
0	0	2	1

Course Learning Outcomes:

On completion of this course, students shall be able to:

CLO1: Familiarize themselves with the pedagogical practices of effective class room delivery and knowledge evaluation system

CLO2: Manage large and small classes using appropriate pedagogical techniques for different Types of content

Mapping with Learning Outcomes: CLO1, CLO2

- The scholars shall attend Master degree classes of his/her supervisor to observe the various transaction modes that the supervisor follows in the class room delivery or transaction process one period per week.
- The scholars shall be assigned one period per week under the direct supervision of his/her supervisor to teach the Master degree students adopting appropriate teaching strategy(s).
- The scholars shall be involved in examination and evaluation system of the Master degree students such as preparation of questions, conduct of examination and preparation of results under the direction of the supervisor.

- At the end of the semester, the supervisor shall conduct an examination of teaching skills learned by the scholar as per the following evaluation criteria:
    - The scholars shall be given a topic relevant to the Master degree course of the current semester as his/her specialization to prepare lessons and deliver in the class room before the master degree students for one hour (45 minutes teaching + 15 minutes interaction).
    - The scholars shall be evaluated for a total of 50 marks comprising *content knowledge* (10 marks), *explanation and demonstration skills* (10 marks), *communication skills* (10 marks), *teaching techniques employed* (10 marks), and classroom interactions (10).

Course Name : Research and Publication Ethics
Course Code : **PPE751**
Course Type : Core course
Total Hours : 30

L	T	P	Cr
2	0	0	2

Course Learning Outcomes:
After completion of the course, students shall be able to
CLO1: Explain concept of philosophy and ethics in research
CLO2: Develop understanding about academic cheating
CLO3: Develop understanding about publication ethics
CLO4: Analyze online publication
CLO5: Examine about Indexing and Citation Databases.

Units/Hours	Contents	Mapping with Course Learning Outcomes
I 5 Hours	**Philosophy & Ethics**: Introduction to Philosophy: Definition, Nature & Scope, Concept, Branches. Ethics: Definition, Moral Philosophy, Nature of Moral Judgements & Reactions	CLO1
	Learning Activities : Peer Discussion, Brain Storming and Problem Solving.	
II 5Hours	**Scientific Conduct:** Ethics with regard to science & Research, Intellectual Honesty & Research Integrity, Scientific Misconducts : Falsification, Fabrication & Plagiarism (FFP), Redundant Publications, Duplicate & Overlapping Publications, Salami Slicing, Selective Reporting & Misrepresentation of Data	CLO2
	Learning Activities : Peer Discussion, Brain Storming and Problem Solving.	
III 10Hours	**Publication Ethics & Open Access Publishing:** Publication Ethics: Definition, Introduction& Importance, Best Practices/Standards Setting Initiatives &Guidelines: COPE, WAME etc. Conflicts of Interest, Publication Misconduct:	CLO3 CLO4

	Definition, Concept, Problems that lead to unethical behaviour & vice versa, types. Violation of Publication Ethics, Authorship & Contributorship, Identification of Publication Misconduct, Complaints & Appeals, Predatory Publishers & Journals, Open Access Publications & Initiatives, SHERPA/ROMEO Online Resource to check publisher copyright &self-archiving policies. Software tools to identify predatory publications developed by SPPU, Journal Finder/Journal Suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester etc.	
	Learning Activities : Peer Discussion, Brain Storming and Problem Solving.	
IV 10 Hours	**Publication Misconduct & Research Metrics**: Subject Specific Ethical Issues, FFP, Authorship, Conflicts of Interest, Complaints & Appeals: Examples and Fraud from India & Abroad, Indexing Databases, Citation Databases: Web of Science, Scopus etc., Impact Factor of Journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score. Metrics: h-index, g index, i10 index, altmetrics.	CLO5
	Learning Activities : Peer Discussion, Brain Storming and Problem Solving.	

Transaction Mode: Lecture, Case Study, Blended Learning, Problem Solving, Discussion & Demonstration, Self-Study.

Suggested Reading:

- Loue, S. (2019). Textbook of research ethics: Theory & practice. Springer.
- Bryman, A., & Bell, E. (2018). Business research methods. Oxford University Press.
- Miller, T., Birch, M., Mauthner, M., & Jessop, J. (2012). Ethics in qualitative research. Sage Publications.
- Scott-Jones, J. (2015). Research ethics: Context and practice. Sage Publications.
- Resnik, D. B. (2018). The ethics of research with human subjects: Protecting people, advancing science, promoting trust. Springer.

Course Code: UNI 753
Course Name: Curriculum, Pedagogy and Evaluation
Course type: Core Course
Total Hours: 15

L	T	P	Credit
1	0	0	1

Course Learning Outcomes:
On completion of this course, students shall be able to:
CLO1: Analyze the principles and bases of curriculum design and development
CLO2: Examine the processes involved in curriculum development
CLO3: Develop the skills of adopting innovative pedagogies and conducting students' assessment
CLO4: Develop curriculum of a specific course/programme

Units/Hours	Contents	Mapping with Course Learning Outcome
I 5 Hours	**Curriculum:** Concept and Principles of curriculum development, Foundations of Curriculum Development. Types of Curriculum Designs- Subject centered, learner centered, experience centered and core curriculum. Designing local, national, regional and global specific curriculum. Choice Based Credit System and its implementation.	CLO1
	Learning Activities: Foundation, principles and types of curriculum Development.	
II 5 Hours	**Process of Curriculum Development:** Formulation of graduate attributes, course/learning outcomes, content selection, organization of content and learning experiences, transaction process. Comparison among Interdisciplinary, multidisciplinary and trans-disciplinary approaches to curriculum.	CLO2
	Learning Activities: Formation, attributes and approaches in curriculum development.	
III 5 Hours	**Conceptual understanding of Pedagogy:** Pedagogies: Peeragogy, Cybergogy and Heutagogy with special emphasis on Blended learning, Flipped learning, Dialogue, cooperative and collaborative learning. Three e- techniques: Moodle, Edmodo, Google classroom **Assessment Preparation:** Concept, purpose, and principles of preparing objective and subjective questions. Conducting	CLO3 CLO4

	Assessment: Modes of conducting assessment – offline and online; use of ICT in conducting assessments. Evaluation: Formative and Summative assessments, Outcome based assessment, and scoring criteria.	
	Learning Activities: concept of pedagogy, various techniques in teaching methods, evaluation process summation and formative methods.	

Transaction Mode: Lecture, Demonstration, Group Discussion, Project Method, Seminar, Dialogue

Evaluation criteria

There shall be an end term evaluation of the course for 50 marks for duration of 2 hours. The course coordinator shall conduct the evaluation.

Suggested Reading

- Allyn, B., Beane, J. A., Conrad, E. P., & Samuel J. A., (1986). Curriculum Planning and Development. Boston: Allyn & Bacon.
- Brady, L. (1995). Curriculum Development. Prentice Hall: Delhi. National Council of Educational Research and Training.
- Deng, Z. (2007). Knowing the subject matter of science curriculum, Journal of Curriculum Studies, 39(5), 503-535. https://doi.org/10.1080/00220270701305362
- Gronlund, N. E. & Linn, R. L. (2003). Measurement and Assessment in teaching. Singapore: Pearson Education
- McNeil, J. D. (1990). Curriculum: A Comprehensive Introduction, London: Scott, Foreman/Little
- Nehru, R. S. S. (2015). Principles of Curriculum. New Delhi: APH Publishing Corporation.
- Oliva, P. F. (2001). Developing the curriculum (Fifth Ed.). New York, NY: Longman
- Stein, J. and Graham, C. (2014). Essentials for Blended Learning: A Standards-Based Guide. New York, NY: Routledge.

Web Resources

1. https://www.westernsydney.edu.au/__data/assets/pdf_file/0004/467095/Fundamentals_of_Blended_Learning.pdf
2. https://www.uhd.edu/academics/university-college/centers-offices/teaching-learning-excellence/Pages/Principles-of-a-Flipped-Classroom.aspx
3. http://leerwegdialoog.nl/wp-content/uploads/2018/06/180621-Article-The-Basic-Principles-of-Dialogue-by-Renate-van-der-Veen-and-Olga-Plokhooij.pdf

Elective Courses (Part II)

Course Code: PPE704
Course Name: Exercise Physiology
Course type: Elective Course
Total Hours: 45

L	T	P	Credit
3	0	0	3

Course Learning Outcomes:
On completion of this course, students shall be able to:
CLO1: Describe the physiological effects of exercise on various body systems and the body as a whole.
CLO2: Illustrate the principles of bioenergetics and distinguish the roles of energy systems in different sports activities.
CLO3: Examine the role of nutrition and justify its importance in energy production during physical activity.
CLO4: Investigate the physiological foundations of athletic performance and propose suitable methods for performance measurement.

Units/Hours	Contents	Mapping with Course Learning Outcome
I 10 Hours	**Introduction to Exercise Physiology** 1. New Trends in Exercise Physiology 2. Effect of Exercise on Different Systems. 3. Transportation of CO2 in system circulation pulmonary circulation 4. Bohr's effect and Chloride exchange shift 5. Haldane Effect, Regulation of A-aDO2 and PaO2 during exchange	CLO1
	Learning Activities: Peer discussion, real world application, brain storming and Problem Solving.	
II 10 Hours	**Essentials and Energy for Movement** 1. Energy System and its impact on exercises, Measurement of energy cost of physical activity 2. Hormonal Regulation of Exercise, Muscular and Neurological Control of Movement 3. Cardiovascular Control and Respiratory Regulation during Exercise 4. Sources of Energy System 5. Metabolism of Carbohydrate and Fat 6. Concept of glut-4, Regulation of glycolysis and Electron transport chain	CLO2
	Learning Activities: Peer discussion, real world application, brain storming and Problem Solving.	

III 10 Hours	**Environmental Influences Optimizing Performance in Sport and Neuromuscular Aspects of Physical Activity** 1. Thermal Regulation and Exercise Quantifying Sport Training Exercise Hypobaric, Hyperbaric and Microgravity Environments 2. Nutrition and Nutritional Ergogenics, Optimal Body Weight for Performance 3. Physical Activity for Health and Fitness, Effect of Altitude on Performance 4. Bioelectric potential - Action potential & Graded Potential 5. Neuromuscular Junction and Neuromuscular fatigue 6. EMG and it's applications in exercise science	CLO3
	Learning Activities: Peer discussion, real world application, brain storming and Problem Solving.	
IV 15 Hours	**Research Reviews Related to** 1. Effect of Different Training Program on Different Systems. 2. Effect of Altitude Training on Performance 3. Effect of Environmental Training on Performance 4. Effect of Ergogenic Aids on Different Systems	CLO4
	Learning Activities: Peer discussion, real world application, brain storming and Problem Solving.	

Transaction Mode: Lecture, case study, blended learning, problem solving, discussion & demonstration, self-study.

Suggested Readings:

- American College of Sports Medicine (2018). ACSM's guidelines for exercise testing and prescription (10th ed.). Lippincott Williams & Wilkins.
- American College of Sports Medicine (2012). ACSM's Advanced Exercise Physiology (2nd ed.). Lippincott Williams & Wilkins.
- Best-Martini, E., & Jones-DiGenova, K. (2014). Exercise for Frail Elders (2nd ed.). Human Kinetics.
- Driskell, J. A., & Wolinsky, I. (2007). Sports Nutrition: Energy Metabolism and Exercise. CRC Press.
- Haff, G. G., & Triplett, N. T. (2015). Essentials of strength training and conditioning (4th ed.). Human Kinetics.
- Kenney, W. L., Wilmore, J., & Costill, D. (2015). Physiology of Sport and Exercise (6th ed). Human Kinetics.
- Koeppen, B. M., & Stanton, B. A. (2017). Berne and levy physiology. Elsevier.
- Kraemer, W. J., Fleck, S. J., & Deschenes, M. R. (2011). Exercise physiology: Integrating Theory and Application. Lippincott Williams & Wilkins.
- Kraemer, W. J., & Rogol, A. D. (Eds.). (2005). The Endocrine System in Sports and Exercise (11th ed.). Blackwell Publishing Ltd.

- McArdle, W. D., Katch, F. I., & Katch, V. L. (2010). Exercise physiology: Nutrition, Energy, and Human Performance (7th ed.). Lippincott Williams & Wilkins.
- Porcari, J. P., Bryant, C. X., & Comana, F. (2015). Exercise physiology. F. A. Davis Company.
- Ratey, J. J. (2013). Spark: The Revolutionary New Science of Exercise and the Brain. Little, Brown.
- Sembulingam, K., & Sembulingam, P. (2012). Essentials of medical physiology. JP Medical Ltd.
- Wuest, D., & Fisette, J. (2012). Foundations of physical education, exercise science, and sport (17th ed.). McGraw-Hill Humanities/Social Sciences/Languages.
- Winter, E. M., Jones, A. M., Davison, R. R., Bromley, P. D., & Mercer, T. (2007). Sport and Exercise Physiology testing Guidelines: Volume II – Exercise and Clinical testing: The British Association of Sport and Exercise Sciences Guide. Routledge.

Journals

- Computer Methods in Biomechanics and Biomedical Engineering (ISSN: 1476-8259)
- European Journal of Sport Science (ISSN: 1536-7290)
- Frontiers in Physiology (ISSN: 1664-042X)
- Frontiers in Sports and Active Living (ISSN: 2624-9367)
- International Journal of Sport and Exercise Psychology (ISSN: 1557-251X)
- Journal of Exercise Physiology Online (ISSN:1097-9751)
- Journal of Sport and Exercise Psychology (ISSN: 1543-2904)
- Journal of Sports Sciences (ISSN: 1466-447X)
- Nature (ISSN 1476-4687)

Website

- https://www.acsm.org/ (ACSM Official Website)
- https://drmattdrmike.com.au/ (Dr. Matt and Dr. Mike Medical Education)
- https://www.nextgenrehab.ca/ (NextGen Rehab)
- http://www.johnratey.com/ (John Ratey Official Site)
- https://www.hubermanlab.com/ (Huberman Lab)
- https://www.bobandbrad.com/ (Bob and Brad Physical Therapy)

YouTube Channels

- https://www.youtube.com/@VivoPhys
- https://www.youtube.com/@DrMattDrMike

Course Code: PPE705
Course Name: Sport Psychology
Course type: Elective Course
Total Hours: 45

L	T	P	Credit
3	0	0	3

Course Learning Outcomes:
On completion of this course, students shall be able to:
CLO1: Summarize the importance and relationship of sports Psychology with other sciences.
CLO2: Contrast psychological profiles of sportsmen with psychological variables.
CLO3: Clarify the role of personality and anxiety in the performance.
CLO4: Describe about the concept of Motivation and Learning.
CLO5: Explain about the concept of Psychological Skill Training.
CLO6: Analyze Mental Skill Training and Psychological Skill Training.

Units/Hours	Contents	Mapping with Course Learning Outcome
I 10 Hours	1. Meaning, scope & importance of sport psychology 2. Relationship of sport psychology with other sport sciences	CLO1
	3. Psychological Profiling of Sportsmen/Athletes 4. Management and Assessment to various psychological variables.	CLO2
	Learning Activities: Get acquainted with the meaning, nature, and scope of sports Psychology.	
II 15 Hours	1. Personality traits of Sportsmen and Theories of Personality and Personality Test 2. Anxiety – Types, Theories and Effect of Anxiety on performance	CLO3
	3. Motivation: Scale, Types, Theories and Techniques. 4. Learning & Learning Theories, Aptitude, Intelligence, etc.	CLO4
	Learning Activities: Understand the role of sports psychology in the performance.	
III 10 Hours	1. PST : Meaning, Scope, and Sports Performance 2. Designing and Implementing PST Programme, Common problems in Implementing PST Programme 3. Importance of Psychological Skill Training Programme. 4. Myths regarding Psychological Skill Training Programme.	CLO5

	Learning Activities: Know the various psychological problems and its coping techniques for better sports performance.	
IV 10 Hours	1. Imagery, Types of Imagery, Guided Imager 2. VMBR Training and Improvement of Sports Performance, 3. PMR, Autogenic Training, Deep Breathing, Cognitive Technique for Building Confidence, Concentration and Attention Control Training. 4. Concept of Mental Skill Training and Psychological Skill Training.	CLO6
	Learning Activities: Introduce the Psychological Tests and be able to conduct these tests on subjects.	

Transaction Mode: Lecture, Demonstration, Group Discussion, Project Method, Seminar, Dialogue, and self-study.

Suggested Readings:

- Binket, L. K., Ratella, R. J., & Ann, S. (1972). Really sports, psychology, psychological consideration maximizing sports performance. Dubuque, IA: C. Brown Publishers.
- Butt, D. S. (1976). The psychology of sport: The behavior, motivation, personality, and performance of athletes. Van Nostrand Reinhold Company.
- Cox, R. H. (2007). Sport psychology: Concepts and applications (6th ed.). McGraw-Hill.
- Cratty, B. J. (1983). Psychology in contemporary sport: Guidelines for coaches and athletes (2nd ed.). Prentice-Hall.
- Cratty, B. J. (1973). Movement behavior and motor learning. Philadelphia, PA: Lea and Febiger.
- Gill, D. L., Williams, L., & Reifsteck, E. J. (2017). Psychological dynamics of sport and exercise (4th ed.). Human Kinetics.
- Kamlesh, M. L. (2011). Psychology in physical education and sport. Khel Sahitya Kendra.
- Silva, J. M., & Weinberg, R. S. (1984). Psychological foundations of sport. Human Kinetics.
- Suinn, R. M., & Clayton, R. D. (1980). Psychology in sports: Methods and applications. Burgess Publishing Company.

Course Name: Sport Biomechanics
Course Code: PPE 706
Course type: Elective Course
Total Hours: 45

L	T	P	Credit
3	0	0	3

Course Learning Outcomes:
On completion of this course, students shall be able to:
CLO1: Explain the science of Biomechanics and kinesiology in relation to human performance.
CLO2: Analyze various fundamental movements and understanding the relevance of analysis.
CLO3: Explain the body structure and apply the knowledge in analysis of movements.
CLO4: Develop an understanding of analyzing sports performance.

Units/Hours	Contents	Mapping with Course Learning Outcome
I 10 Hours	Current Trends and Importance of Biomechanics, Description of Human movement. Classification of force systems: Linear force system, Parallel force system, Concurrent force system, General force system, Composition, and resolution of force.	CLO1
	Learning Activities: Understand the science of Biomechanics and kinesiology in relation to human performance	
II 15 Hours	Methods of analysis of sports skills: Qualitative Methods, Quantitative Method Methods of investigation: Photo instrumentation; Camera, Films, Exposure Meters, Calibration of Camera Speed, Filming Fundamentals, Films Analysis, Fundamentals of film analysis. Other methods of investigation: Goniometry, Accelerometers, Dynamometry, Electro-myography Location of Center of Gravity – Segmentation method.	CLO2
	Learning Activities: Detailed understanding of qualitative and quantitative methods.	

III 10 Hours	Analysis of static positions of the body: Sitting, Standing, Lying Analysis of Locomotion: Walking, Running, Jumping, Hopping or Leaping; Basic steps of Analysis Sport Technique: Development of Model, Observation, Identification of Faults, Evaluation of Faults, Instruction to the Performer. Analysis of Techniques of Track and Field Event: Sprinting Event, Jumping Event, Throwing Event; Analysis of Techniques of other Sport Event: Basketball: Lay-up Shot, Volleyball: Spiking & Blocking, Football: Kicking & Throwing, Gymnastics: Forward and Backward Somersault, Swimming: Front Crawl and Back Crawl, Cricket: Drive.	CLO3
	Learning Activities: Analysing the techniques in track and field and major games.	
IV 10 Hours	Analysis of Techniques and Skills , Analysing Methods in Sports. Sports Equipment's and Surfaces, Video graphic analysis in sports	CLO4
	Learning Activities: Explains the analysis of techniques and skills with video technology.	

Transaction Mode: Lecture, Demonstration, Group Discussion, Project Method, Seminar, Dialogue, and self-study.

Suggested Readings:

- Hay, J. G. (1981). The biomechanics of sports techniques. Prentice Hall.
- Bunn, J. W. (1981). Scientific principles of coaching. Prentice Hall.
- McGinnis, P. M. (2005). Biomechanics of sport and exercise. Human Kinetics.
- Sunderrajan, G. S. (n.d.). Biomechanics of sports and games. Tondon Publication.
- Hall, S. J. (2003). Basic biomechanics (4th ed.). McGraw-Hill.
- Raj Lakshmi, D. (2007). Biomechanics for sports and games. Sports Educational Technologies.
- Hoffman, S. J. (2005). Introduction to kinesiology. Human Kinetics.
- Uppal, A. K., & Lawrence, M. P. (n.d.). Kinesiology. Friends Publication.

L	T	P	Cr
3	0	0	3

Course Code: PPE707
Course Name: Sport Management Course
type: Elective
Total Hours: 45

Course Learning Outcomes:

On completion of this course, students shall be able to:
CLO1: Explain the scope and significance of management in physical education.
CLO2: Describe the concepts and principles of management in physical education.
CLO3: Organize and implement programmes for competitions and intramurals at the basic level.
CLO4: Analyze budget management and design school-level physical education and sports programmes.
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Units/Hours	Contents	Mapping with Course Learning Outcome
I 10 Hours	Modern concept of sport Management, Process of sport Management, Structure of sport Management, New trends in sport Management, Elements of Leadership, Forms of Leadership	CLO1
	Learning Activities: Process of sport Management, concept and new trends.	
II 15 ours	Scope and Importance of Management, Principles of Management Major faction of Management, Formal and informal Organization, Planning and Controlling a School or College Sports programme	, CLO2
	Learning Activities: Various level of Sports programme organization and its management.	
III 10 Hours	Facility, Fiscal, Equipment and office Management, Meaning & importance of change process and Factor Associated with Successful Change, Concept of Marketing and Factors Affecting Marketing programme, Principles of marketing in physical education and sports, Concept of sponsorship, Expectations & Responsibilities, Concept of media, Role & responsibility of media in sports	CLO3
	Learning Activities: Equipment facility and its utilization, responsibility of media in sports**.**	

IV 10 Hours	Facilities in Physical Education, Sports competition, Spots marketing, Physical Education program, Media impact on sports.	CLO4
	Learning Activities: Facilities for physical education in competition, and other programmes	

Transaction Mode: Lecture, Demonstration, Group Discussion, Project Method, Seminar, Dialogue

Suggested Learning:

- Bucher, C. A.& Krotee, M. L. (2002). Management of Physical Education of Sports, (12th Edn.). New Yark: McGraw Hill.
- Voltmer, E.F. (1979).The organization and administration of Physical Education (5th Edn). New Jersy: Prentice Hall.
- Parkhouse, B. L. (1991). The Management of Sports Foundation & Application St. Loup: Mosby Year Book.
- Kamlesh, M. L. (2000). Management Concepts in Physical Education & Sports, New Delhi: Metropolitan Book Co. Pvt. Ltd.

Course Code: PPE708
Course Name: Sport Medicine
Course type: Elective
Total Hours: 45

L	T	P	Cr
3	0	0	3

Course Learning Outcomes:
On completion of this course, students shall be able to:

CLO1: Explain principles of injury management and types of sports injuries
CLO2: Analyze athletic injuries management and treatment of back disorders, deformities
CLO3: Explain role of exercise in the prevention of various injuries and disorders
CLO4: Demonstrate therapeutic exercises and massage for injury management and prevention

Units/Hours	Contents	Mapping with Course Learning Outcome
I 10 Hours	Sports Medicine – definition – meaning, preventive – curative methods. Rehabilitation aspects –physical examination. Types of sports injuries – general principles of injury management.	CLO1

	Management of soft-tissue injuries, hard tissue injuries, nerve injuries.	
	Learning Activities: Sports Medicine Aim, Need and Importance in Sports, types of injuries in various sports and games.	
II 15 Hours	Regional Athletic injuries and management – Upper extremities and Lower Extremities. Evaluation and management of specific disorders – traumatic lesions of the spinal cord, after care of fracture. Treatment of back disorders, and deformities – low back pain and scoliosis.	CLO2
	Learning Activities: Upper and lower extremities sports injuries and its management via various therapies**.**	
III 10 Hours	Applied sports medicine: Role of exercise in the prevention of various injuries and disorders: Therapeutic modalities and procedure - principles of therapeutic modalities and procedures Hydrotherapy - Diathermy -ultrasound- electrical muscle stimulation – transculanor electrical nerve stimulation (TENS) cry kinetic,	CLO3
	Learning Activities: Exercise role in disorders and injury rehabilitation, therapeutic modalities and its uses towards injury management and prevention.	
IV 10 Hours	Cold compress and therapeutic exercises, cold spray – paraffin bath, ultraviolet- therapeutic exercises and massage. Meaning and definition of physical rehabilitation. Rehabilitation – goal of rehabilitation. Rehabilitation programme – types of exercises – isometric – isotonic – isokinetic. Manual resistance – proprioceptive neuromuscular facilitation programme for Sports injuries.	CLO4
	Learning Activities: Hydro therapy for various sports injuries, PNF programme for injury rehabilitation.	

Transaction Mode: Lecture, Demonstration, Group Discussion, Project Method, Seminar, Dialogue

Suggested Learning:

- Fox, E. L., & Mathews, D. K. (1981). The physiological basis of physical education and athletics. Philadelphia: Saunders College Publishing.
- Millar, A. P. (1994). Sports injuries and their management. Australia: Williams & Wilkins.
- Krusen, F. H., Kottke, F. J., & Ellwood, P. M. (1971). Handbook of physical medicine and rehabilitation. Philadelphia: W.B. Saunders Company.
- Gould, J. A., & Davies, G. J. (1985). Orthopaedic and sports physical therapy. Toronto: C.V. Mosby Company.
- Schneider, R. C., Kennedy, J. C., & Plant, M. L. (1985). Sports injuries: Mechanisms, prevention, and treatment. Baltimore: Williams & Wilkins.
- Singer, R. N. (1975). Motor learning and human performance: An application to physical education skills. New York: Macmillan.
- Vaněk, M., & Cratty, B. J. (1970). Psychology and the superior athlete. London: Macmillan Company.
- Norris, C. M. (1993). Sports injuries: Diagnosis and management for physiotherapists. East Kilbride: Thomson Litho Ltd.
- Mellion, M. B. (1984). Sports injuries and athletic problems. New Delhi: Surjeet Publications.
- Pande, P. K. (1998). Sports medicine. New Delhi: Khel Sahitya Kendra.
- Dirix, A., Knuttgen, H. G., & Tittel, K. (Eds.). (1988). The Olympic book of sports medicine. Australia: Blackwell Scientific Publications.

Course Code: PPE709
Course Name: Sport Training
Course type: Elective Course
Total Hours: 45

L	T	P	Cr
3	0	0	3

Course Learning Outcomes:
On completion of this course, students shall be able to:

CLO1: Explain about Sports Training and training load.
CLO2: Analyze current trends of Sports Training and supercompensation.
CLO3: Examine principles of load and its adaptation in sports training.
CLO4: Periodization and development of training models.
CLO5: Predict of Peaking and Taper in Sports.
CLO6: Evaluate various training program.
CLO7: Importance of training methods in research
CLO8: Analyze of training program and plans in research

Units/Hours	Contents	Mapping with Course Learning Outcome
I 10 Hours	Sports Training: Meaning, Importance and Scope of Sports Training, Current Trends in Sports Training	CLO1
	Relationship between Volume and Intensity, Density and Complexity, Supercompensation Cycle and Anatomical Adaptation, Talent Identification	CLO2

	Learning Activities: Role and scope of Sports Training and its current trends.	
II 15 Hours	Principles of Sports Training, Load, Adaptation, Recovery Interventions and Modalities, Sports Fitness Training Methods Multilateral Development Versus Specialization, Development of the Training Model, Periodization of Bio motor Abilities. **Learning Activities**: Principles of sports training loads and the development of training models.	CLO3 CLO4
III 10 Hours	Concept of Peaking and Taper, Long Term and Short-Term Training Plans Technique, Skill, and Psychological Training, Design Training Program, Evaluation of Training Program **Learning Activities**: Concept of peaking and taper and the evolution of training program.	CLO5 CLO6
IV 10 Hours	Training Methods, Bio motor abilities Training Program and Plans, Training Duration **Learning Activities**: Develop and implement sports training programme to various sports and games.	CLO7 CL08

Transaction Mode: Lecture, Demonstration, Group Discussion, Project Method, Seminar, Dialogue, and self-study.

Suggested Readings:

- Singh, H. (1991). Science of sports training. New Delhi: DVS Publication.
- Martens, R. (2005). Successful coaching (3rd ed.). Human Kinetics.
- Baechle, T. R., & Earle, R. W. (Eds.). (2006). Essentials of strength training and conditioning (2nd ed.). Human Kinetics.
- Beotra, A. (2000). Drug education handbook on drug abuse in sports. Delhi: Sports Authority of India.
- Bunn, J. N. (1998). Scientific principles of coaching. Englewood Cliffs, NJ: Prentice Hall.
- Cart, E., & Daniel, D. (1999). Modern principles of athletic training. St. Louis: C. V. Mosby Company.
- Daniel, D. (1991). Principles of athletic training. St. Louis: Mosby-Year Book.
- David, R. (1996). Drugs in sport. Liverpool: School of Pharmacy, John Moores University.
- Moran, G. T. (1997). Cross training for sports. Canada: Human Kinetics.
- Jensen, C. R., & Fisher, A. G. (2000). Scientific basis of athletic conditioning. Philadelphia: Lea & Febiger.
- Ronald, P. (1998). Concepts of athletic training (2nd ed.). London: Jones and Bartlett Publishers.