

CENTRAL UNIVERSITY OF TAMIL NADU

Ph.D. in Physical Education

(w.e.f. 2023-24)



School of Education and Training
Department of Physical Education and Sports
Central University of Tamil Nadu
Tiruvarur-610005

Introduction

The Department of Physical Education and Sports, Central University of Tamil Nadu proposes to start Ph.D. programme from the academic year 2023-2024 to meet the increased need and demand for knowledge generation and application in Physical Education and Sports Sciences in particular.

A brief outline about the Ph.D. programme; its Programme objectives, Programme structure, course work syllabus with course objectives & learning outcomes and Programme outcomes are given below.

A.VISION

To generate and endure conditions that consent scholars to experience transformative learning in becoming an independent and quality researcher through universal standard. This would be accomplished by maintaining high academic standards, upholding the quality of scientific research in PE, with an intellectual, personal, multidisciplinary approach, and transforming experience in the form of research to fulfil the research gap with suitable solutions to enrich the field of Physical Education and Sports.

B. Mission

- M1 : To equip the scholars to work as self-governing, high-calibre researchers who can
Resolve current issues in physical education and sports
- M2 : Graduates of this doctoral program can pursue jobs as university professors, research scientists, Sports administrators, Experts in the fields of sports and its allied sciences.
- M3 : By providing the opt eco research system, scholars pursue the research in a competitive manner, to optimize their leadership, intellect of morality, and innovative practice and approaches in Physical Education.
- M4 : Quality research in sports industry and institute collaboration provides a strong platform to elevate the domestic and international sports.
- M5 : To provide a quality and competent learning environment with scientific and systematic approach to support research in par with elite standards.

C. Programme Educational Objectives (PEO's)

PEO1: the research scholars are able to analyse and solve the research problem with strong background of literature and research method's instinct, which furnish the scholar to be fit in research domain.

PEO2: Accomplish with existing statistical tools and software packages available in the trend and project them in to apply the statistical technical for the research problems.

PEO3: Foster with philosophy and scientific code of conduct in line with Research publication and Ethics.

PEO4: Develop the innovative practices in his/her own area of research.

PEO5: Scholars are motivated to act independently and develop Professional Excellency along with the specialisation which inculcate the ethical and professional behaviour over life-long learning.

D. Graduate Attributes for Physical Education (Ph.D)

❖ **Knowledge:**

Apply the knowledge various fundamentals theories, and existing ideas related to sports

❖ **Problem Analysis:**

Identify, formulate, review research literature, and analyse Sports related problems.

❖ **Design/Development of Solutions:**

Explore research methods in Physical Education for public health considerations.

❖ **Conduct Investigations of Complex Problems:**

Use research-based knowledge and research analysis in the field of physical education and sports.

❖ **Modern Equipment Usage:**

Develop and implement effective research methods in Sports Science.

❖ **The sports and Society:**

Apply societal, health, safety, legal, cultural issues in professional sports practice using contextual knowledge.

❖ **Environment and Sustainability:**

Understand professional solutions and environmental impacts and emphasize sustainable development.

❖ **Ethics:**

Adhere to ethical principles and professional responsibilities in physical education practice.

❖ **Individual and Team Work:**

Function effectively as an individual, and as a different group of Athletes, and in multidisciplinary settings via sports.

❖ **Communication:**

Communicate effectively on physical activities with the sports community and with society at large scale.

❖ **Finance and Project Management:**

Understand physical education and sports to manage projects and multidisciplinary environments effectively.

❖ **Life-long Learning:**

Acquire lifelong learning skills for health wellness and awareness in society.

E. PEO TO Mission Statement Mapping

	PEO1	PEO2	PEO3	PEO4	PEO5
M1	2	3	2	3	3
M2	3	3	2	3	2
M3	3	2	3	3	2
M4	3	3	3	2	3
M5	3	3	2	2	2

F. Programme Outcomes (PO's)

PO1: Become professional in the subject of PE and apply principles of same.

PO2: Gain analytical skills in the field of Physical Education to solve problems.

PO3: Able to identify, analyse, interpret sports related data in multiple prospective.

PO4: Ability to skills with modern technical tools in the field of sports.

PO5: Able to work as an individual and as team with interdisciplinary prospective with potentially become leader with practical skills.

PO6: Able to identify, formulate, research literature, and analyse complex problems reaching quality solutions

G. PO to PEO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6
PEO1	3	3	2	3	2	3
PEO 2	2	3	3	2	2	2
PEO 3	3	2	3	2	3	2
PEO 4	2	2	1	2	2	2
PEO 5	2	2	3	3	2	3

H. Eligibility for Admission to Ph.D. Programme:

The student intake in Department, shall be as per the availability of seats. Admission to the Ph.D. programme shall be made twice a year, preferably in the beginning of each semester. All the available seats shall be notified 'category-wise' by the University, in advance. Reservation of seats shall be notified in accordance with the latest guidelines, amended from time to time. Eligibility: A candidate shall be eligible for admission to the Ph.D. programme, if he/she possesses:

Degree and Subject	Essential Qualification
Ph.D. (Physical Education)	A consistently good academic record possessing a Master's Degree (MPED/MPES/MPE) or any equivalent degree, obtained from a recognized University/Institute or Foreign University equivalent (approved by AIU).

- ❖ A Master's degree or a professional degree declared equivalent to the Master's degree by the corresponding statutory regulatory body, with at least 55% marks in aggregate or its equivalent grade 'B' in the UGC's 7-point scale (or an equivalent grade in a point scale wherever the grading system is followed), or an equivalent degree from a foreign educational Institution accredited by an Assessment and Accreditation Agency which is approved, recognized or authorised by an authority, established or incorporated under a law in its home country, or any other statutory authority in that country for the purpose of assessing, accrediting or assuring quality and standards of educational institutions.

- ❖ A relaxation of 5% of marks, from 55% to 50%, or an equivalent relaxation of grade, may be allowed for the candidates belonging to SC/ST/OBC (non-creamy layer)/Differently abled and other categories of candidates as per the decision of the University Grants Commission from time to time, or for those who had obtained their Master's degree prior to 19th September, 1991. The eligibility marks of 55% (or an equivalent grade in a point scale wherever the grading system is followed) and the relaxation of 5% to the categories mentioned above are permissible only on the basis of the qualifying marks without including the grace mark procedures.
- ❖ The cases of candidates who have passed an examination outside the Indian Universities system and those who may not have obtained a Master's degree may be considered for admission to the programme subject to the condition that each case shall be examined on its own merit by the Admissions Committee and in accordance with the recommendations of the Equivalence Committee.
- ❖ The candidates who have qualified the UGC/CSIR-JRF/NET/SLET, or are Teacher Fellowship-holders or have passed M. Phil. programme with course work recognised by the U.G.C., as per the UGC Regulations (Minimum Standards and Procedure for award of M.Phil./Ph.D. Degree, 2009), shall be exempted from appearing at the written test.

H1. Procedure for Admission:

- ❖ The University shall conduct an Entrance Test with qualifying marks as 50% (a relaxation of 5% of marks to be allowed for those belonging to the SC/ST/OBC (non creamy layer)/Differently-abled and other categories of candidates as per the decision of the Commission from time to time). The syllabus for the Entrance Test shall consist of: (a). research methodology (50%) and (b). subject-specific (50%). The Entrance test shall be conducted at the Centre(s) notified in advance by the University.
- ❖ The admission shall be based on the performance of the qualified candidates in the interview/viva-voce to be organised by the Department concerned where the candidates shall be required to discuss their research interest/area through a presentation before a duly constituted Departmental Research Committee.
- ❖ The candidates who have qualified UGC/CSIR-JRF/NET/SLET/GATE, or are Teacher Fellowship holders, or have passed the M. Phil. programme with course work recognised

by the U.G.C., as per the UGC Regulations (Minimum Standards and Procedure for award of M.Phil./Ph.D. Degree, 2009), shall be exempted from the written test.

I. Departmental Research Committee (DRC):

In each Department of the University, academic matters related to the Ph.D. programme shall be supervised by a Departmental Research Committee consisting of the following:

- ❖ Head of the Department: Chairman (ex-officio)
- ❖ All the Professors of the Department: (ex-officio)
- ❖ Associate Professors in the Department, subject to a maximum of two, by rotation according to seniority;
- ❖ Two Assistant Professors in the Department, qualified to be Research (Ph.D.) Supervisor(s), by rotation according to seniority; and Page 94 of 111
- ❖ One external expert to be called by the Head of Department out of the panel drawn by the BoS.

Where a Department has a strength of less than ten teachers, all faculty members eligible to be Research (Ph.D.) Supervisors shall be members of the Departmental Research Committee. The term of the members of the Departmental Research Committee, except the ex-officio members, shall be for two years.

At least, 50% of the members shall be required to be present in the meeting to form the quorum, with the presence of the Chairman or his/her representative as mandatory. Where no teacher in the Department is eligible to be the Head, the Teacher-in-charge, if eligible to be Research (Ph.D.) Supervisor, shall convene the meetings of the DRC, failing which the members of the DRC may elect one of the members present at the meeting as the Chairperson of the Committee for the said meeting.

*** As per CUTN Ordinance.**

J. Duration of Ph.D. Programme:

- ❖ The Ph.D. programme shall be for a minimum duration of three years, including course work and a maximum of six years.
- ❖ The women candidates and Persons with Disability (more than 40% disability) may be allowed a relaxation of two years for the Ph.D. in the maximum duration. In addition, the women candidates may be provided Maternity Leave/Child-Care Leave once in the entire duration of the Ph.D. programme for up to 240 days.
- ❖ In case of exceptional circumstances like, but not limited to, illness/hospitalisation, etc. the Vice-Chancellor may grant extension initially for a period of six months, but not exceeding a total of one year, in addition to the maximum duration of the programme.

** As per CUTN Ordinance.*

J1. Minimum Duration for the Completion of Ph.D., Programme

Sl.No	Degree	Category	Minimum Period (in Years)
1	M.Phil	Full Time	2
		Part-Time	3
2	M.P.Ed	Full Time	3
		Part-Time	4

K. Research Advisory Committee (RAC):

There shall be a Research Advisory Committee or an equivalent body for similar purpose for each Ph.D. scholar. The Research Supervisor of the scholar shall be the Convener of this Committee. This Committee shall have the following responsibilities:

- i. To review the research proposal and finalize the topic of research;
- ii. To guide the research scholar to develop the study design and methodology of research and identify the course(s) that he/she may have to do.
- iii. To periodically review and assist in the progress of the research work of the research scholar.

- iv. A research scholar shall appear before the Research Advisory Committee once in six months to make a presentation of the progress of his/her work for evaluation and further guidance. Every six months progress reports shall be submitted by the Research Advisory Committee to the Institution/College with a copy to the research scholar.
- v. In case the progress of the research scholar is unsatisfactory, the Research Advisory Committee shall record the reasons for the same and suggest corrective measures. If the research scholar fails to implement these corrective measures, the Research Advisory Committee may recommend with specific reasons for cancellation of the registration of the research scholar.

**** As per CUTN Ordinance.***

L. RAC shall consist of following members:

- i. Research Supervisor: Convener
- ii. One member to be nominated by Head/TIC (Out of the panel of three names to be proposed by the Convener)
- iii. One member to be nominated by Dean of Concerned School/Dean Research (Out of the panel of three names to be proposed by the Convener)

**** As per CUTN Ordinance.***

M. Medium and Mode of Instruction

The medium of instruction shall be English. Both Full Time & Part Time Scholars will have offline/ online class for the course work completion.

N. Research Thrust areas

- ❖ Sports Training
- ❖ Exercise Physiology
- ❖ Sports Psychology
- ❖ Sports Bio-mechanics
- ❖ Sports Data Analytics
- ❖ Test, Measurement and Evaluation in Physical Education.
- ❖ Yoga

O. Course Outline

A total of 16 credits must be obtained to complete the Ph.D. coursework. The course work has two parts; with two mandatory core papers in Part I, Research Methodology and Statistics in Physical Education and Research Ethics and Publication common for all PhD scholars as per CUTN ordinance. In Part II, each candidate has to opt two specialization out of the 7 papers mentioned in the course work.

*Candidates who have completed M.Phil Degree programme are exempted from one paper from Part-I, i.e., Research Methodology & Statistics in Physical Education.

SCHEME FOR Ph.D. PROGRAMME

The course details are as follows;

S.No.	Course Code	Title of the course	L	T	P	Credits
Part-I (Mandatory)						
1	PES3012	Research Methodology	4	0	0	4
2	RPE	Research and Publication Ethics	2			2
Part-II (Any Two Courses)						
3	PES3013	Sports Training	4	0	0	4
4	PES3014	Exercise Physiology	4	0	0	4
5	PES3015	Exercise Psychology	4	0	0	4
6	PES3016	Sports Biomechanics	4	0	0	4
7	PES3017	Sports Data Analytics	4	0	0	4
8	PES3018	Test, Measurement & Evaluation in Physical Education	4	0	0	4
9	PES3019	Yoga	4	0	0	4
Total Four courses (Part I &Part II)						14

Assessment

Internal and course end assessments are part of the continual and comprehensive assessment. The Central University of Tamil Nadu uses an absolute grading system. The marks in this system are transformed to letter grades depending on pre-determined mark intervals. Infractions of marks must be rounded to the nearest integer. Students' performance in each course is expressed in terms of both marks and letter grades.

Evaluation Scheme

	CLO1	CLO2	CLO3	CLO4	CLO5	Total Marks
Internal Marks	8	8	8	8	8	40
External Marks	12	12	12	12	12	60
Total Marks	20	20	20	20	20	100

Mapping Course Learning Outcome with Internal Assessment (40 Marks)

	CLO1	CLO2	CLO3	CLO4	CLO5
Assignments	2	2	-	-	2
Seminar	-	-	2	2	-
Test	5	5	5	5	5
Attendance	1	1	1	1	1
Total Marks	8	8	8	8	8

Mapping Course Learning Outcome with External Assessment (60 Marks)

Category	CLO1	CLO2	CLO3	CLO4	CLO5
Part – A (Objective - 10 x 1 = 10marks)	2	2	2	2	2
Part – B (Short Answer -5 x 3 = 15marks)	3	3	3	3	3
Part – C (Essay-5 x 7 = 35 marks)	7	7	7	7	7
Total Marks	12	12	12	12	12

Grading System

S.No.	Range of Marks in %	Letter Grade	Grade Point	Description
1	90 to 100	O	10	Outstanding
2	80 to 89	A+	9	Excellent
3	70 to 79	A	8	Good
4	60 to 69	B+	7	Above Average
5	50 to 59	B	6	Average
6	Below 50	RA	0	Reappear
7		FA	0	Failure due to lack of attendance
8		AE	0	Absent in the End Semester Examination
9		AU	None	Audit Course

SYLLABUS FOR - Ph.D PROGRAMME

Part – I

Course Title : Research Methodology

Course Code : PES3012

L	T	P	Credits
4	0	0	4

Course Objectives :

- ❖ Acquires knowledge of different aspects of Physical Education research
- ❖ Understand the types and techniques used in Physical Education research
- ❖ Develop the skills of preparing the research proposal, Hypotheses and research report.
- ❖ Understand and learn the method of computing statistics and use of SPSS packages

Course Outcomes:

CO1: The scholar will be able to know the criteria, finding gap and hypothesis framing the field of physical education and sports research.

CO2: The scholar will be able to understand the different types of research designs and its uses in finding the solution to the problem.

CO3: The scholar will gain the knowledge of preparing research proposal and report

CO4: The scholar will be able to know the necessary statistical techniques uses in Physical education and Sports research.

CO5: The scholar will be able to know the uses of Statistical Packages and its application.

Units	Content	Hours
I	Introduction and Selection of Research Problem Objective of research, types of research, research approaches, significance of research, criteria of good research. Define the Research problem, selection of a research problem, criteria for selection of	18

	research problem. Hypothesis – meaning, importance, and types.	
II	Research Design and Sampling Methods: Important Concepts Relating to Research Design, types of research designs: Exploratory research studies, Research design in case of descriptive and diagnostic research studies & hypothesis-testing research studies. Experimental Design – Single Group Design, Reverse Group Design, Repeated Measure design, Static Group comparison Design, equated Group Design, Factorial Design. Steps in sampling design, criteria of selecting a sampling procedure, Types of Sampling; Probability Methods: Systematic Sampling, Cluster sampling, Stratified Sampling. Area Sampling – Multistage Sampling and Non-Probability Methods: Convenience Sample, Judgment Sampling, and Quota Sampling.	18
III	Research Proposal and Report Scope of research proposal and research report, Chapter of Thesis / Dissertation: Front Materials, Body of Thesis and Back materials. Method of Writing Research proposal, Thesis/Dissertation; Method of writing abstract and full paper for presenting in a conferences, Seminar and to publish journals, Mechanics of writing Research Report, Footnote and Bibliography writing, Reviews of Literature – Ethical Issues in Research – Areas of Scientific duplicity, Ethical Issues regarding copyright, Responsibility of Researcher, working Ethics in the faculty, Projecting human Participants.	18
IV	Tools and Techniques in Statistics: Measures of central tendency, Variability, Reliability – t-ratio for independent and repeated group – Level of confidence, Standard scales – Different types of line, bar and Pie-diagram. Frequency polygon, histogram and Ogive curve –partial and multiple correlation – Problem. Chi square – Biserial, Tetrachoric, Correlations and Rank order	18

	correlation.	
V	Uses of Statistical Packages and using process. One way analysis of variance – Independent and repeated groups – Problem solution – Two way analysis of variance – Independent and repeated group – Problem solution –mixed design – One factor independent and other factor repeated measure design – Problem solution – Analysis of covariance – one way – Two way – Concepts- Application of Computer in Physical Education research- Usage of SPSS packages in research.	18

Task and Assignments: Seminar/Presentation, lass tests, Assignments

References:

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Bhaumik, S.K (2007), ‘Methodological Issues in Field Surveys’ in K K Bagchi (ed.).

Bryman, Alan (2004), Social Research Methods, Oxford University Press, Oxford, 2nd edition.

David H. Clarke and H.Harriossn Clarke (1984). Research Process in Physical Education. Prentice Hall Inc. Englewood Cliffs Publisher, New Jersey.

Glicken, Morley D. (2002). Social Research: A Simple Guide. Boston, MA: Allyn and Bacon. 282 p.

Gray, David E. (2004). Doing Research in the Real World. London, UK: Sage Publications. 422p.

John W. Best (1981). Research in Education. Prentice Hall Inc. Englewood Cliffs Publisher, New Jersey, USA. Kemple, Mary. (2000). Review of the Good Research Guide for Small-Scale Social Research Projects, by Martyn Denscombe. Journal of Advanced Nursing

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Kou, Lokesh (1988), Methodology of Research, Vikas, New Delhi. 15. Miller, Delbert C., and Neil J. Salkind. (2002). Handbook of Research Design and Social Measurement. 6th ed. Thousand Oaks, CA: Sage Publications. XXII, 786p.

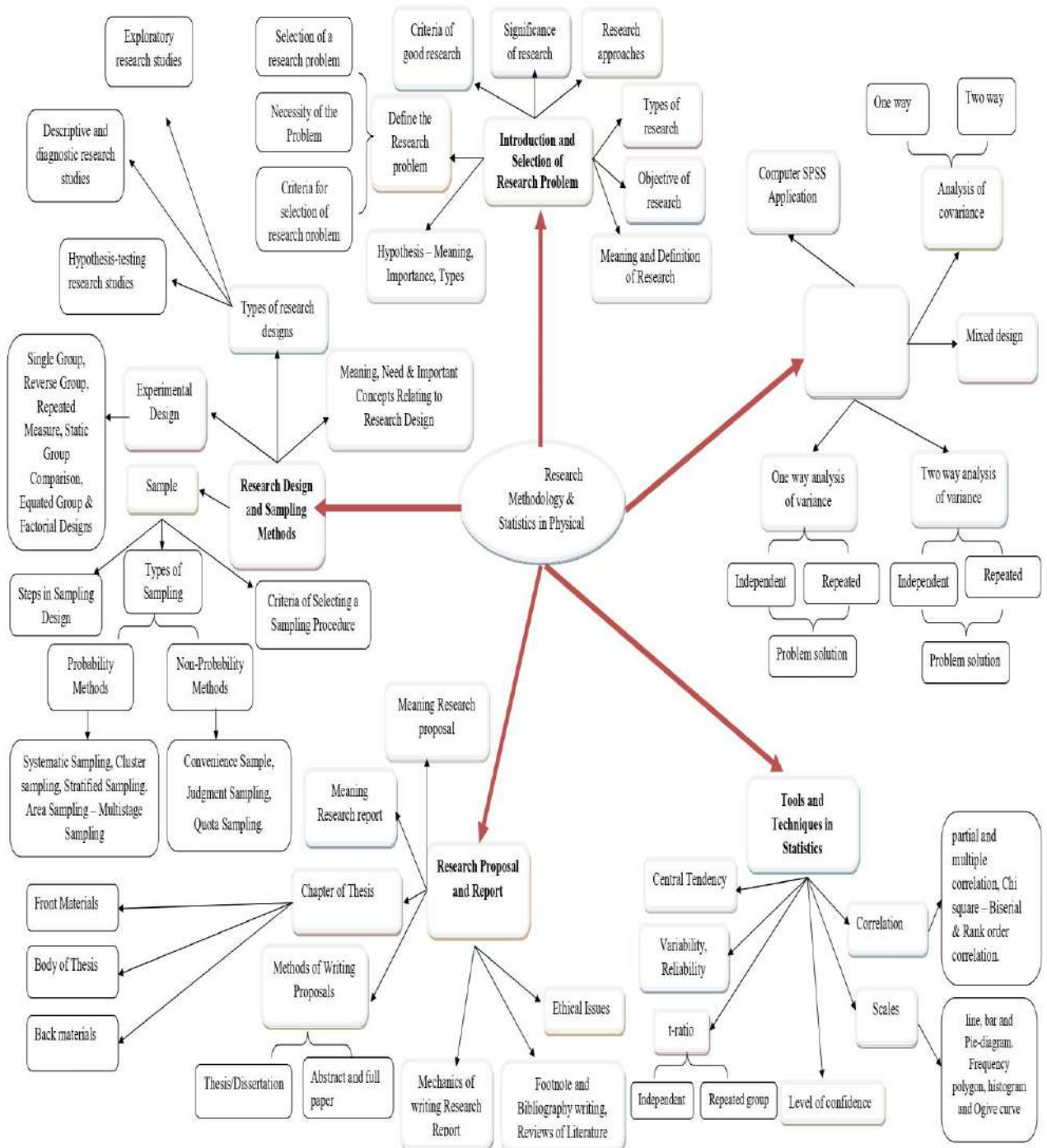
Mouly, A.J. (1963), The Science of Educational Research Euroasia, New Delhi

Mapping of Programme Outcomes with Course Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	3	2	3
CO2	3	2	3	2	2	2
CO3	3	2	3	3	3	2
CO4	2	2	2	2	2	2
CO5	2	2	3	3	2	2

Concept of Mapping: -

Research Methodology



Course Title : Research and Publication Ethics

Course Code : RPE

- **Research and Publication Ethics (RPE)**-Course for awareness about the publication ethics and publication misconducts.

Course Level:

- 2 Credit course (30 hrs.)

Eligibility:

- M.Phil., Ph.D. students and interested faculty members (It will be made available to post graduate students at later date)

Fees:

- As per University Rules

Faculty:

- Interdisciplinary Studies

Qualifications of faculty members of the course:

- Ph.D. in relevant subject areas having more than 10 years' of teaching experience

About the course

Course Code: CPE- RPE

Overview

- This course has total 6 units focusing on basics of philosophy of science and ethics, research integrity, publication ethics. Hands-on-sessions are designed to identify research misconduct and predatory publications. Indexing and citation databases, open access publications, research metrics (citations, h-index, Impact Factor, etc.) and plagiarism tools will be introduced in this course.

Pedagogy:

- Class room teaching, guest lectures, group discussions, and practical sessions.

Evaluation

- Continuous assessment will be done through tutorials, assignments, quizzes, and group discussions. Weightage will be given for active participation. Final written examination will be conducted at the end of the course.

Course structure

- The course comprises of six modules listed in table below. Each module has 4-5 units.

Theory		
RPE 01	Philosophy and Ethics	4
RPE 02	Scientific Conduct	4
RPE 03	Publication Ethics	7
Practice		
RPE 04	Open Access Publishing	4
RPE 05	Publication Misconduct	4
RPE 06	Databases and Research Metrics	7
	Total	30

Syllabus in detail

THEORY

- RPE 01: PHILOSOPHY AND ETHICS (3 hrs.)**

1. Introduction to philosophy: definition, nature and scope, concept, branches
2. Ethics: definition, moral philosophy, nature of moral judgements and reactions

- RPE 02: SCIENTIFIC CONDUCT (5hrs.)**

1. Ethics with respect to science and research
2. Intellectual honesty and research integrity
3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
4. Redundant publications: duplicate and overlapping publications, salami slicing
5. Selective reporting and misrepresentation of data

- RPE 03: PUBLICATION ETHICS (7 hrs.)**

1. Publication ethics: definition, introduction and importance
2. Best practices / standards setting initiatives and guidelines: COPE, WAME, etc.
3. Conflicts of interest
4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
5. Violation of publication ethics, authorship and contributorship
6. Identification of publication misconduct, complaints and appeals
7. Predatory publishers and journals

PRACTICE

- RPE 04: OPEN ACCESS PUBLISHING(4 hrs.)**

1. Open access publications and initiatives
2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving policies
3. Software tool to identify predatory publications developed by SPPU
4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc.

RPE 05: PUBLICATION MISCONDUCT (4hrs.)

A. Group Discussions (2 hrs.)

1. Subject specific ethical issues, FFP, authorship
2. Conflicts of interest
3. Complaints and appeals: examples and fraud from India and abroad

B. Software tools (2 hrs.)

Use of plagiarism software like Turnitin, Urkund and other open source software tools

RPE 06: DATABASES AND RESEARCH METRICS (7hrs.)

A. Databases (4 hrs.)

1. Indexing databases
2. Citation databases: Web of Science, Scopus, etc.

B. Research Metrics (3 hrs.)

1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
2. Metrics: h-index, g index, i10 index, altmetrics

References

- Bird, A. (2006). *Philosophy of Science*. Routledge.
- MacIntyre, Alasdair (1967) *A Short History of Ethics*. London.
- P. Chaddah, (2018) *Ethics in Competitive Research: Do not get scooped; do not get plagiarized*, ISBN:978-9387480865
- National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). *On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition*. National Academies Press.
- Resnik, D. B. (2011). What is ethics in research & why is it important. *National Institute of Environmental Health Sciences*, 1–10. Retrieved from <https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm>
- Beall, J. (2012). Predatory publishers are corrupting open access. *Nature*, 489(7415), 179–179. <https://doi.org/10.1038/489179a>
- Indian National Science Academy (INSA), *Ethics in Science Education, Research and Governance*(2019), ISBN:978-81-939482-1-7. http://www.insaindia.res.in/pdf/Ethics_Book.pdf

Mapping of Programme Outcomes with Course Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	3	3	2	3	2	3
CLO2	3	3	3	2	2	2
CLO3	2	2	3	3	3	3
CLO4	2	2	1	2	3	2
CLO5	2	2	3	3	2	2

Part – II

Course Title : Sports Training

Course Code : PES3013

L	T	P	Credits
4	0	0	4

Course Objective : To provide the essential knowledge of energy system and means and methods to develop the Bio-motor abilities.

Course Outcomes:

CO1: The scholars will be able to understand the importance of energy system and training the energy system.

CO2: The scholars will be equipped with the knowledge of load, adaptation and super compensation cycle.

CO3: The scholars will be able to draw out the types, means and methods to develop speed, strength and endurance.

CO4: The scholars will be able to draw out the types, means and methods to develop flexibility, agility and coordination.

CO5: The scholars will also be familiar with the planning and periodization of bio motor abilities.

Units	Content	Hours
I	Training the Energy system Energy, physiology of energy systems, Phosphagen (ATP-PC) System, Glycolytic System, Oxidative System, Overlap of the Energy Systems and Energy Delivery Systems (Ergogenesis in Percentages) for Sports.	12
II	Training load, Adaptation and Super compensation Training load, Volume, intensity, density, over training and overreaching, load progression, adaptation, specificity of Adaptation, Super compensation cycle, phases of super compensation monitoring, treating and preventing over training, recovery from exercise, recovery from training and	12

	competition, and, means of recovery.	
III	Training the Bio motor Abilities of speed, strength and endurance Speed: Speed training, factors affecting speed, methods to develop speed, Assessing speed. Endurance; Endurance training, designing an aerobic endurance training, methods to develop endurance, methods to develop high intensity aerobic exercise and assessment of endurance. Strength; Strength training, factors determining strength program design: need analysis, exercise selection, training, and frequency, exercise order, training load and repetitions, volume, and Rest periods.	12
IV	Training the Bio motor Abilities of flexibility, Agility, Balance and Co ordination Flexibility: Definition, Characteristics, types and importance of flexibility, factors affecting flexibility, principles of stretching, need and importance of dynamic stretching, special factors in flexibility, methods of flexibility development, and assessment of flexibility, Agility ; factors determining agility, assessment of agility, Balance: Guidelines for balance training and balance training programme, Coordination: definition, types of coordinative abilities, factors that make up coordination, importance and development of coordinative abilities.	12
V	Planning and Periodization of Bio motor abilities Planning; Types of training plans, Principles of planning, Workout planning, importance of planning, Periodization of biomotor abilities; Periodization, Periodization of speed, Periodization of strength, Periodization of Endurance and integrated periodization.	12
Task and Assignments: Seminar/Presentation, lass tests, Assignments		

References:

Wilmore, Jack H., David L. Costill, and W. Larry Kenney. Physiology of sport and exercise. Vol. 20. Champaign, IL: Human kinetics, 2004.

Kenney, W. Larry, Jack H. Wilmore, and David L. Costill. Physiology of sport and exercise. Human kinetics, 2021.

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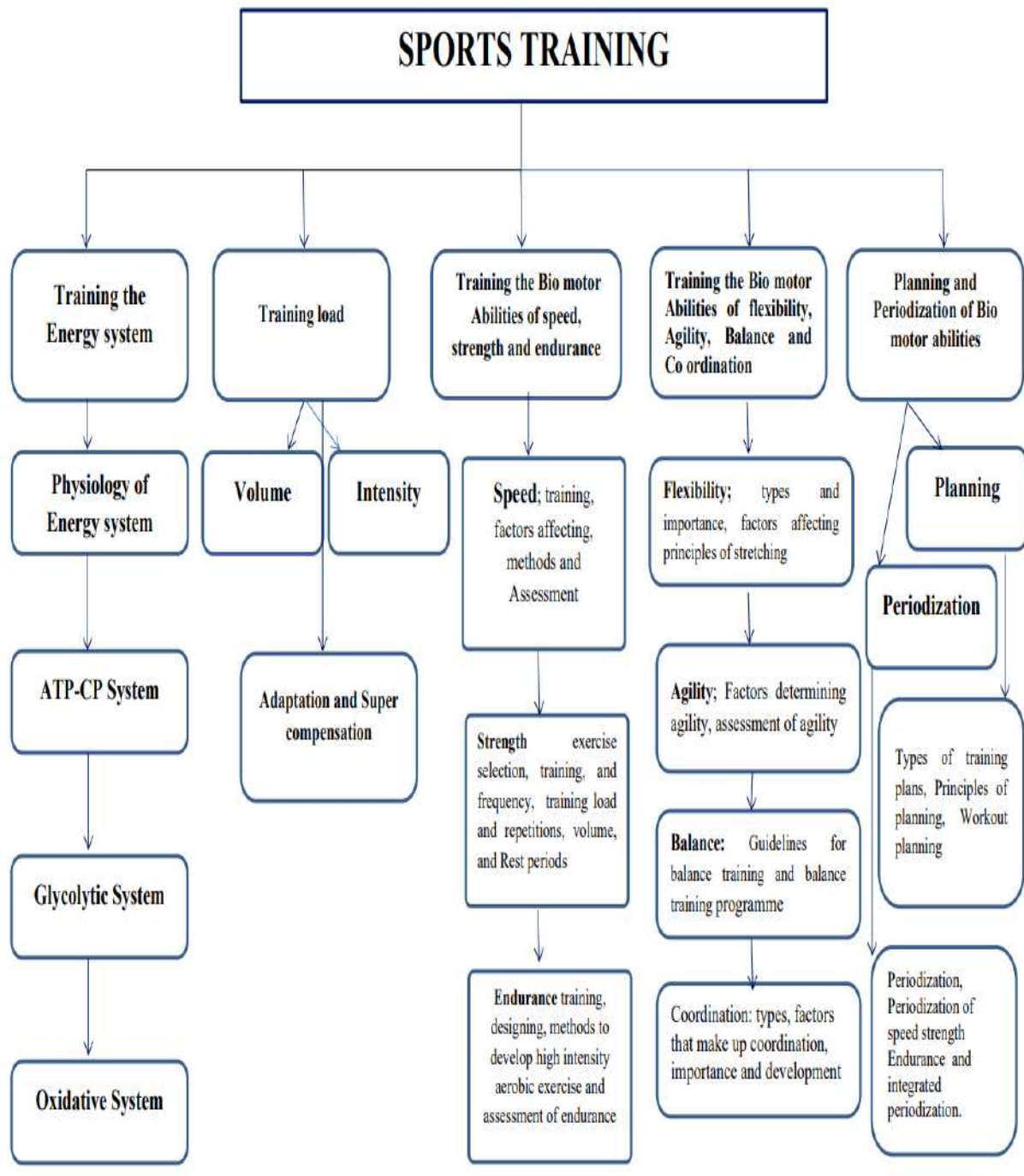
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Mapping of Programme Outcomes with Course Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	3	3	2	3	2	3
CLO2	3	2	3	2	2	2
CLO3	3	2	3	3	3	2
CLO4	2	2	1	2	2	2
CLO5	2	2	3	3	2	2

Concept of Mapping



Course Title : Exercise Physiology

L	T	P	Credits
4	0	0	4

Course Code : PES3014

Course Objective :

To have the depth knowledge of different energy systems, muscles and fiber types, and criterion for test and various test protocol to determine the energy system uses in various sports.

Course Outcomes:

CO1: To learn advances in exercise physiology and bio energetic

CO2: To Provide the necessary information on training principles

CO3: To Achieve the entire concept of energy and fitness training protocol

CO4: To create a platform to understand the development of muscular fitness

CO5: To Study the assessment energy fitness in a deeper context

Units	Content	Hours
I	Exercise Physiology and Bio Energetic Genesis of exercise physiology -Scope; Human energy transfer in rest and exercise; Concept of aerobic and anaerobic energy production; Energy expenditure in different activities; Physiological adaptations to exercise and training ;measurement of exercise and training related changes.	12
II	Sports Training and Principles Genesis of sports training - Scope of sports training; biological process in training; Individual response to training, Principles of training - Overload, Specificity, and Reversibility, Concept of Training load;	12

	Adaptation and Recovery, super compensation, training structure - volume, intensity, frequency; peaking, errors in training.	
III	Muscle and Physiological components Muscle structure and muscle ailments, Nervous and Motor units, Muscles and movement, Components of muscular fitness, Aerobic and anaerobic energy system, Anaerobic and aerobic power, lactate threshold, Energy demands, Energy training (Aerobic and anaerobic), effects of training on Blood volume, Cardiac output, and Pulmonary system.	12
IV	Physiology of Resistance training Resistance training term; Muscle balance, Repetitions maximum. Resistance training methods: Isometric (Static), Isotonic (Weight training) Isokinetic. Organization of strength training programme: Exercise selection, Exercise specificity, Exercise order, Frequency of resistance training, Developing power, power endurance, Power and power endurance training, Muscle balance, Speed and flexibility training.	12
V	Assessing and Developing Energy Fitness Assessing anaerobic power: Adenosine Triphosphate Phosphocreatine- Anaerobic glycolysis, Aerobic energy fitness: Aerobic capacity, Aerobic power, Lactate threshold measures, Performance threshold, Developing: Overload, Intensity, Speed and control of training, Heart rate to control training, Perceived Exertion training, Training zones: Easy training zone, No training zone, The performance zone-Maximal speed zone-Training intensities, Duration of energy training: The training pyramid (Aerobic training/Performance zone/anaerobic training/peaking , Energy fitness maintenance).	12

Task and Assignments: Seminar/Presentation, class tests, Assignments

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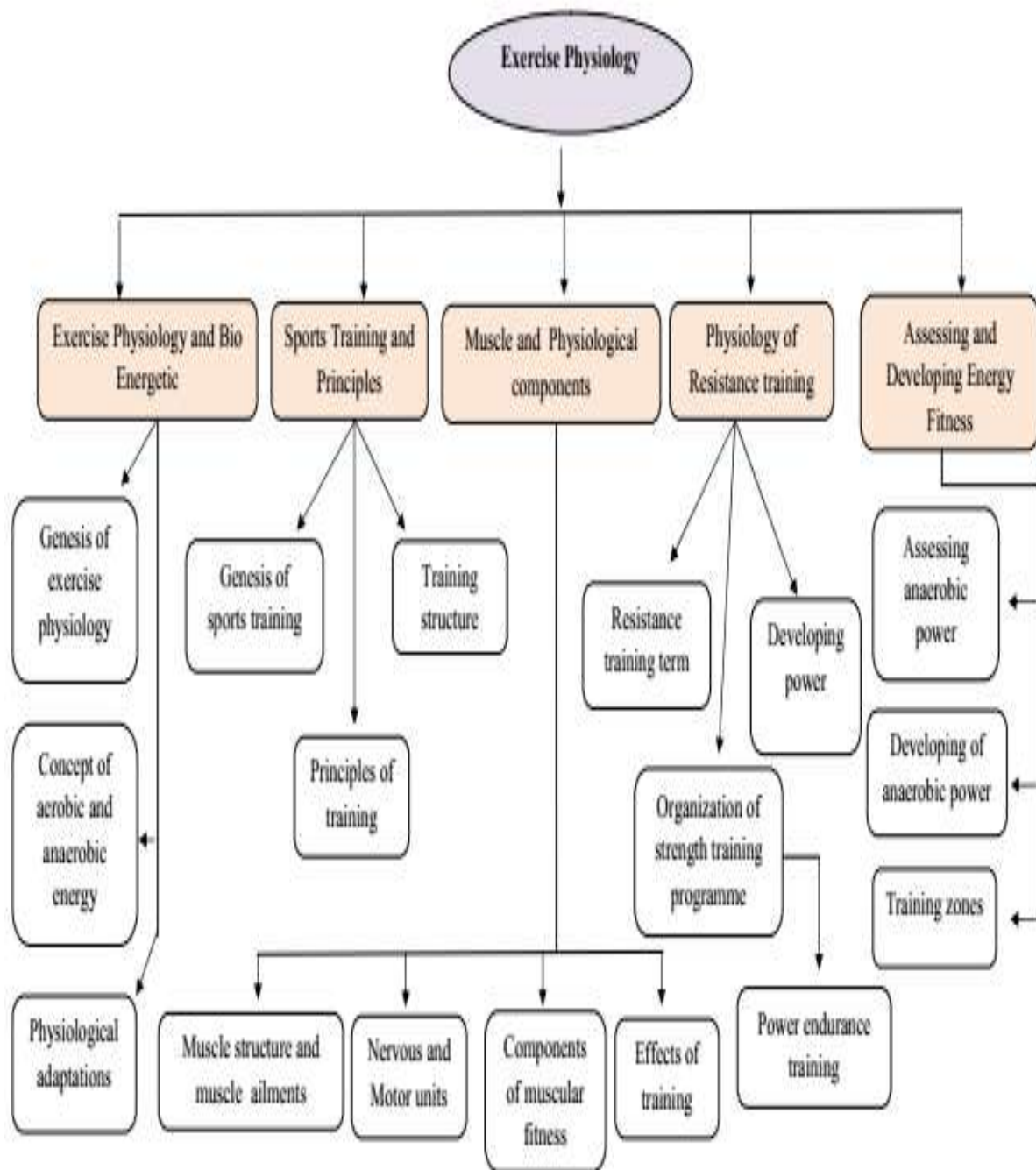
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Mapping of Programme Outcomes with Course Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	3	2	3
CO2	3	2	3	2	2	3
CO3	3	3	3	2	3	2
CO4	2	2	2	2	2	2
CO5	2	2	3	3	2	2

Concept of Mapping



Course Title : Exercise Psychology

Course Code : PES3015

L	T	P	Credits
4	0	0	4

Course Objectives :

To understand the advances in Sports psychology and it's application processes in the field of physical education to enhance various sports performance.

Course Outcomes:

CO1: Get acquainted Knowledge of Relationship of sport psychology in different sports

CO2: Understand theories of sports psychology and it's impact on athletes.

CO3: Know the uses of psychological questionnaire and scaling of an athlete.

CO4: To understand psychological training and it's implementation.

CO5: Acquire the process of psychological profiling, problems and it's coping techniques.

Units	Content	Hours
I	Sports Psychology and it's impact Scope of sport psychology in different sports, Relationship of sport psychology with other sport sciences. Personality traits of Sportsmen and Theories of Personality, Impact of Psychological Phenomena on sports performance.	12
II	Theories of Sports Psychology and it's impact Sports psychology Theories: behavioral, humanistic, psychodynamic, cognitive and biological. Learning & Learning Theories, Theory of anxiety, Blooms theory, Athletic motivation and theory of motivation, Effects of Spectators, society, family, etc. on sports performance.	12

III	Psychological Tests Questionnaire and Scaling Motivation: Athletic Motivation Scale, sports competition Anxiety scale, Aggression scale, self-esteem scale, Task and Ego orientation scale, Personality Test: 21 SPF, self-control scale, commitment scale, traits scale and, mental toughness scale.	12
IV	Psychological Skill Training PST and Sports Performance, Designing and Implementing PST Programme, Imagery, Types of Imagery, VMBR, PMR, Autogenic Training, Deep Breathing, Pep-talk, Guided Imagery, Cognitive Technique for Building Confidence, Concentration and Attention Control Training, Intervention strategies for activation techniques.	12
V	Psychological Profiling and data Analyzing Psychological Profiling of Sportsmen, Anxiety, Personality and Motivation. Psychological/Mental skill Training, Autogenic and VMBR Training, Improvement of Sports Performance and analyzing procedure.	12

Task and Assignments: Seminar/Presentation, lass tests, Assignments

References:

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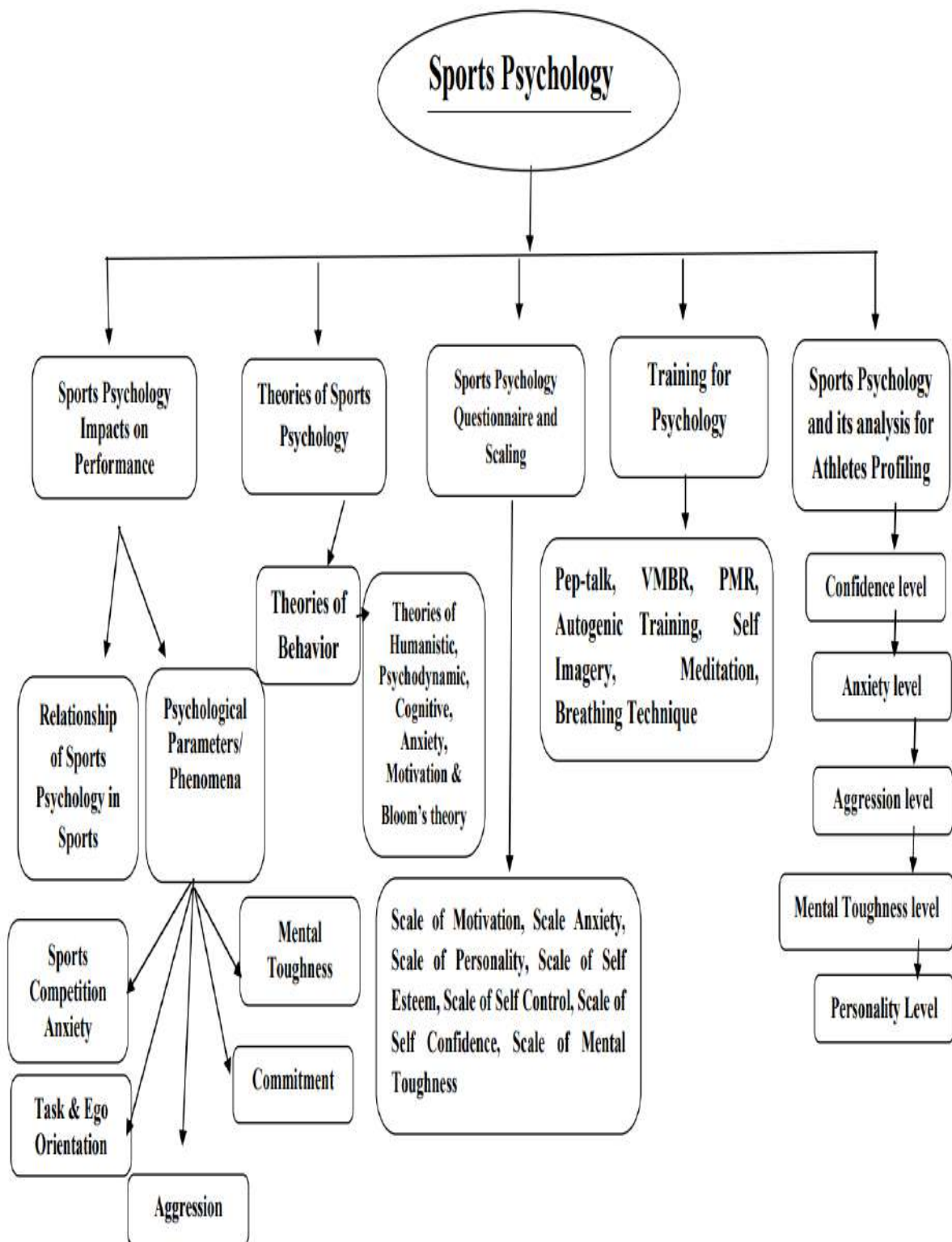
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Mapping of Programme Outcomes with Course Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	3	2	3
CO2	2	2	3	2	2	3
CO3	3	3	2	2	2	2
CO4	2	2	2	2	2	2
CO5	2	2	3	3	2	2

Concept of Mapping



Course Title : Sports Biomechanics

Course Code : PES3016

L	T	P	Credits
4	0	0	4

Course Objectives : To develop an in-depth understanding of the principles and concepts of sports biomechanics and to explore advanced theoretical and practical knowledge in the field of sports biomechanics.

Course Outcomes:

CO1: Develop a comprehensive understanding of muscle origin, insertion, and action at specific joints.

CO2: Apply principles and law of mechanics to sports-related scenarios.

CO3: Gain expertise in data collection methods and technologies used in sports biomechanics research.

CO4: To enhance proficiency in qualitative movement analysis to analyse sports techniques.

CO5: Analyze and interpret biomechanical data using appropriate analytical techniques.

Units	Content	Hours
I	Current Approaches & Muscle involved in various Joints Sports Biomechanics – Scope of Sports Biomechanics - Latest development of Sports Biomechanics – Movements at Specific Joints – Muscle origin, insertion & action - Shoulder and Shoulder Girdle - Elbow and Forearm – Wrist and Hand - Trunk and Spine - Hip - Knee - Ankle.	12
II	Laws and Principles Newton's Law of Motion - Moment of Inertia - Torque - Friction - Hooke's Law - Principle of Impulse and Momentum - Equilibrium - Projectile Motion - Conservation of Energy – Fluid Mechanics.	12

III	Gadgets, Software Packages and Sensors 2D analysis (Kinovea & Dart fish) – 3D analysis (MOKKA) - Timing devices - Radar guns - Laser Devices – IMU - Electro goniometry - Force platform - Force transducers - Pressure Sensors – Electromyography – Isokinetics – Artificial Intelligence.	12
IV	Qualitative Analysis Qualitative analysis - Observation and visual analysis - Skill decomposition and pattern recognition - Qualitative Analysis of Human Gait - Qualitative Analysis of Sports Techniques.	12
V	Quantitative Analysis Quantitative analysis - Biomechanics of Sports Techniques - Measurement issues - Laboratory data collection - Field data collection - Biomechanical Modelling and Simulation (Theory).	12

Task and Assignments: Seminar/Presentation, lass tests, Assignments

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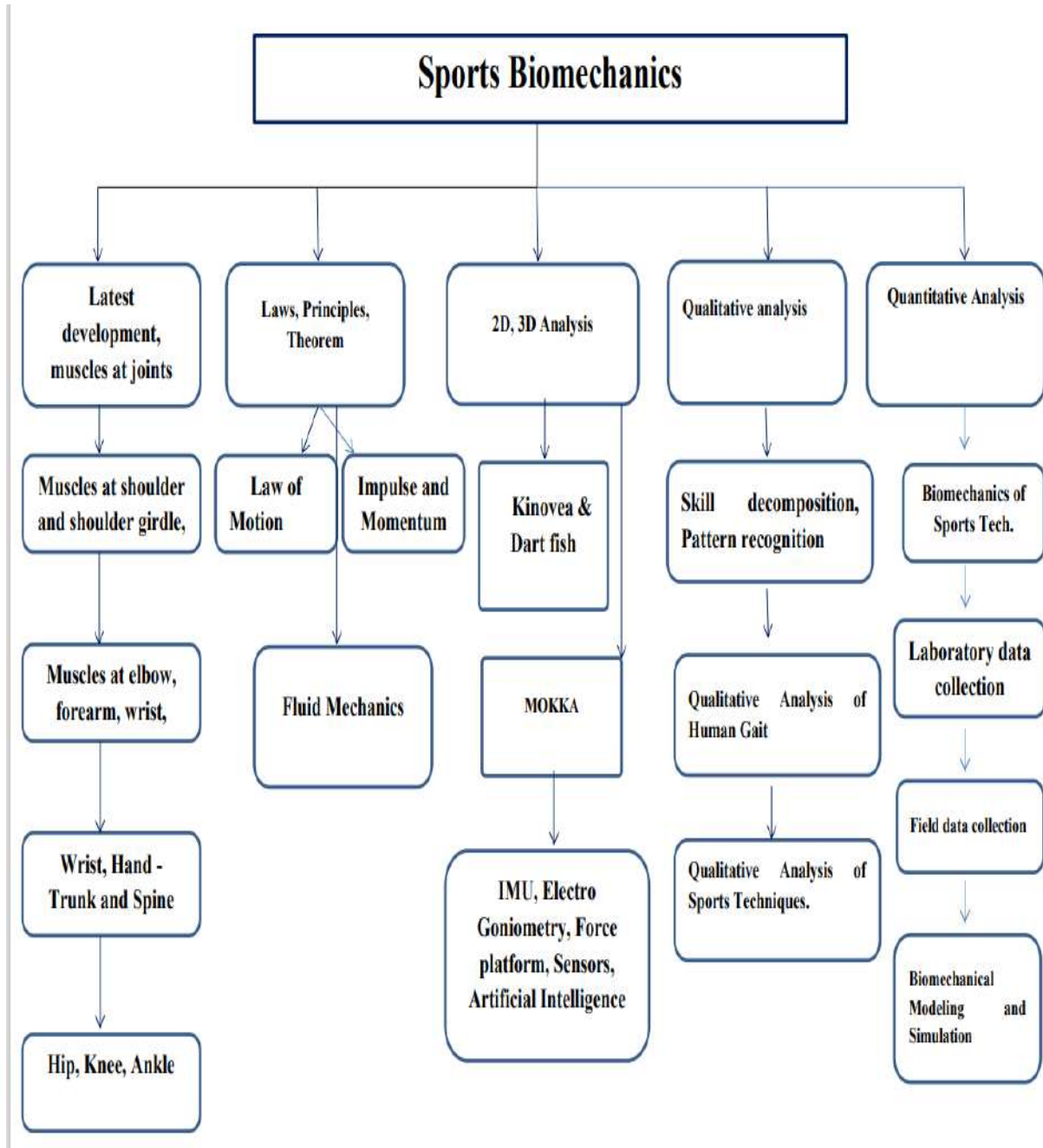
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Mapping of Programme Outcomes with Course Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	3	2	3
CO2	2	3	3	2	2	3
CO3	3	3	2	2	3	2
CO4	2	2	2	2	2	2
CO5	2	2	3	3	2	2

Concept of Mapping



Course Title : Sports Data Analytics

Course Code : PES3017

L	T	P	Credits
4	0	0	4

Course Objective :

To identify level of data sourcing and map sports performance, performance predication and optimization. To equip on use of machine learning and artificial intelligence in sports both for appraisal of performance and to understand fantasy sports.

Course Outcomes :

CO1: Scholars will display a deeper understanding on data analytics in sports and its importance.

CO2: They will be well versed in data analysis in par with the current trend.

CO3: They would be able to analytically examine the application of strategies through data driven approach.

CO4: Scholars will acquaint practice on utilizing the big data analysis tools to predict performance.

CO5: They would gain confidence on case analysis in sports through data analysis models.

Units	Content	Hours
I	Introduction to Data Analytics and Sports Data Analytics Concept of Data Analytics and Sports Data analytics, Scope of sports analytics; Importance of power, sports data analysis; recent trend in sports analytics, data analysis-A game changer, Careers in sports analytics.	12
II	Data Sources for Sports Performance Components of data in sports, Collecting data online, recording performance, play field data, personal data of athletes, Coaches, officials, organizers, sponsors and audience; Equipment level data- Personal equipment, Game related competition equipment, Training equipment and assessment equipment; Athlete level data including	12

	current performance analysis, error identification, Ranking, future performance prediction; Data sources on audience and predicting type, quality and quantity of Viewers.	
III	Sports Data Analytics and Application Historical analysis, status analysis, Predictive analysis, Player record analysis, Team analysis; Sports data analysis, Applying Statistical analysis to sports, On field and off field analytical application, predictive models on athlete, teams, winning probability; Enhancing performance of athletes through sport analytics, using rating models to simulate future performance; Emergence of Data driven decisions, sport analytics, Evaluation of athlete / player and team performance; Utilization of resources and data to ensure the performance during practice / training and during competition.	12
IV	Tools Used for Sports Data Analysis Recent technologies and applications used in field of sports to make spectators a lively view; Player evaluation and game strategies, Machine learning analytics in sports; software used in Data Analysis Model of Wearable Devices in Physical Education; Big data & Software tools used in sports analytics; Application for Fan management analysis, views analysis, visualization methods, visualization tools, interpretation of visualization; Big data mining to technical sports prediction, networking.	12
V	Case Study on Popular Models Understanding sports gambling and betting to prevent athlete exploitation; exhibit the cases and create an analysis on the respective specialization; Create a portfolio of a favorite player and forecasting performance; Tracking performance development of players; evaluation dashboards; player stat analysis to drive in game strategy; winning with analytical strategy.	12

Task and Assignments: Seminar/Presentation, class tests, Assignments

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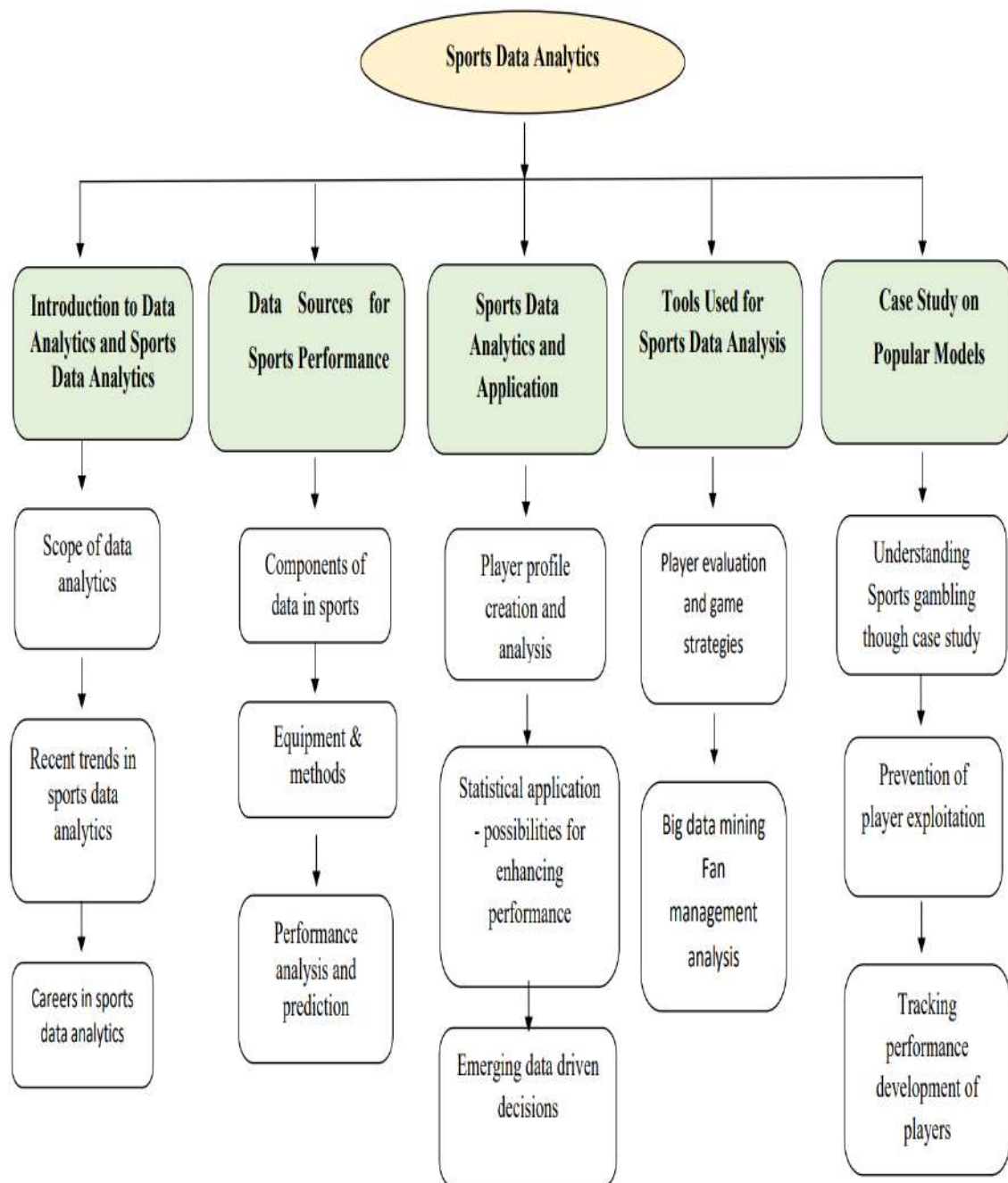
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Mapping of Programme Outcomes with Course Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	3	2	3
CO2	2	2	3	2	2	3
CO3	3	3	2	2	3	3
CO4	2	2	2	2	2	3
CO5	2	2	3	3	2	2

Concept of Mapping



Course Title : Test, Measurement and Evaluation in Physical Education

Course Code : PES3018

L	T	P	Credits
4	0	0	4

Course Objective : To acquire the knowledge and, importance of Test and Measurement and evaluation and it's application.

Course Outcomes:

CO1: To study the fundamentals of test, measurement and evaluation.

CO2: To develop the concepts of measurement and evaluation in physical education and sports.

CO3: To provide the knowledge about motor fitness, physical fitness and skill test.

CO4: To attain knowledge about anthropometric measurements, physiological and psychological parameters.

CO5: To gain the knowledge on various sport tests and it's assessment.

Units	Content	Hours
I	Test, Measurement and Evaluation in Physical Education and Sports Criteria of tests, scientific authenticity (reliability, objectivity, validity and availability of norms). Different types test in physical Education: Knowledge, Psychological, Fitness, Skill, Physiological, Special Population, Test batteries and Anthropometric test. Current Trend in Evaluation of Sports Performance.	12
II	Factors Affecting Measurement in Physical Education Different tools of Evaluation in physical Education, characteristics of test batteries, factors considering for selecting test and factors considering for administration of test.	12

III	Testing Validity and Reliability of Testing Tools Different methods for testing validity of tool, different methods for testing reliability of tool, norms- types, importance and construction and construction of motor test and questionnaire.	12
IV	Test Batteries for Bio-Motor and Bio-Chemical Bio-motor test batteries; Beep Test, VO2max from a One Mile Jog, Running-based Anaerobic Sprint Test (RAST), Balke Treadmill Test, Illinois Agility Run Test, Lateral Change of Direction Test, Margaria-Kalamen Power Test, Sprint Bound Index Test, Standing Stork Test. Bio-chemical test; blood and urine test(Glucose, Urea, Lactate, Lip-profile , Electrolyte), nutritional status test, Cyanmet haemoglobin method.	12
V	Test Batteries for Anthropometry and Physiology Anthropometric Measurements; measurement of various body segments and method of Measuring the Anthropometric Measurements. Method of Measuring Height, Method of measuring diameters / circumference, Method of Measuring Skin folds. Physiological Testing; blood pressure test, Respiratory function testing (Spirometry), Electrocardiogram test, Pulse rate test, muscle assessment test.	12

Task and Assignments: Seminar/Presentation, class tests, Assignments

References:

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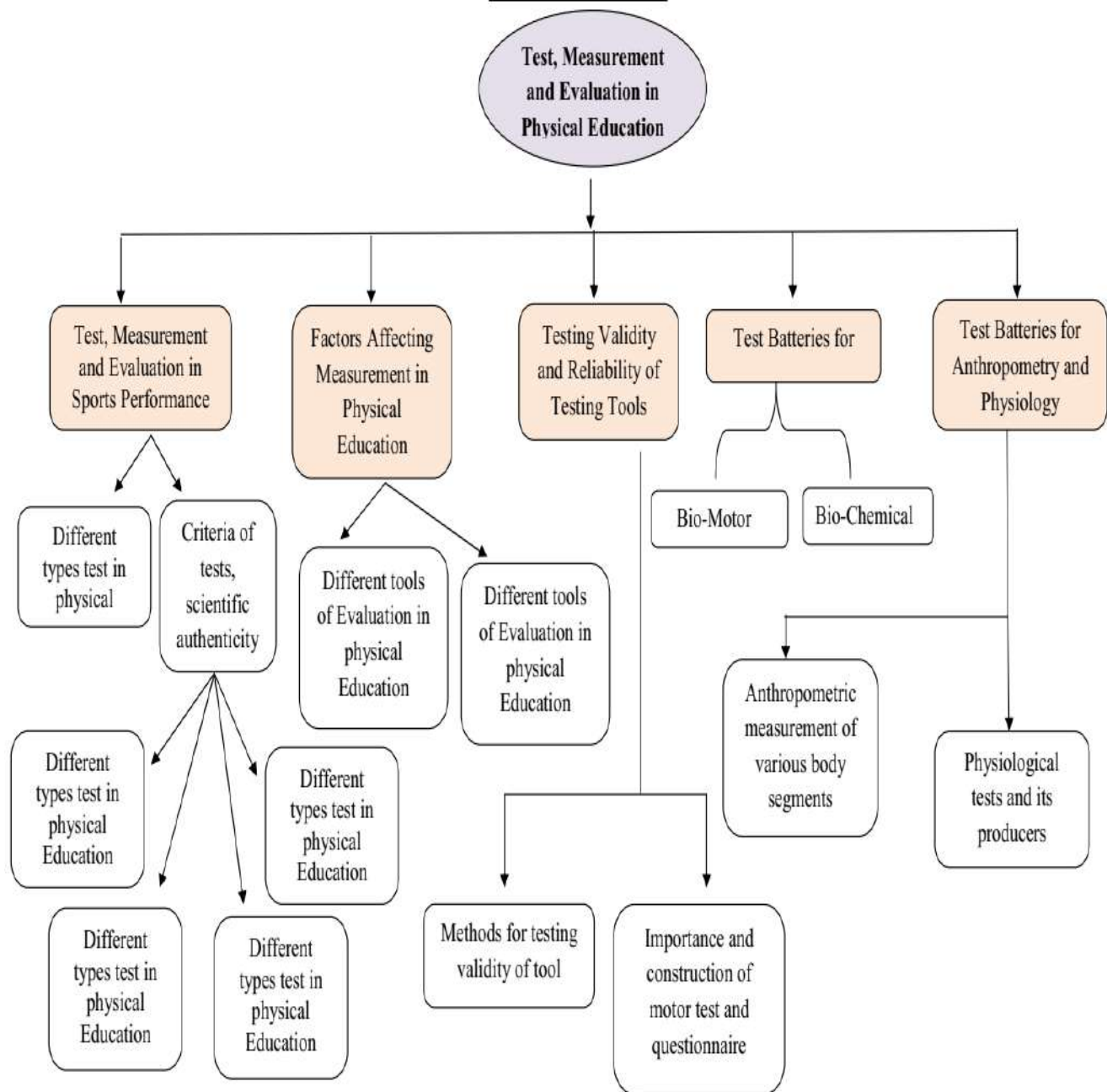
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Mapping of Programme Outcomes with Course Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	2	3	2	3
CO2	2	3	3	2	2	3
CO3	3	3	3	2	3	2
CO4	2	2	2	2	3	2
CO5	2	2	3	3	2	2

Concept of Mapping



Course Title : Yoga

L	T	P	Credits
4	0	0	4

Course Code : PES3019

Course Objective :

To enable deep learning on evolution of yoga, Indian philosophies, yoga traditions and advanced yogic practices of various schools of yoga. To teach the phonetics of the yogic text and facilitate recitation and to facilitate scholars to prepare training programs, prescriptions and diet charts for various target groups.

Course Outcomes:

CO1: Scholars will have a clear knowledge on the evolution of Yoga as a science.

CO2: They will be able to demonstrate yogic postures, pranayama, bandhas, mudras and meditation.

CO3: Scholars will be able to recite Yoga sutras, Bhagavad Gita and other yogic texts

CO4: They will be able to demonstrate advanced yogic practices as per the text and various schools.

CO5: They will be able to prescribe yogic protocols for research, therapeutic benefits and for ailments along with a yogic diet chart.

Units	Content	Hours
I	Origin and Evolution of Yoga Origin of Yoga, History and Development of Yoga, Etymology and Definitions as per yoga texts, Evolution of Yoga, International Yoga Day, Misconceptions and Current trends in yogic practices; Yoga in Jainism and Buddhism; Concept of Purushartha Chatushtaya, Epics and Smriti- yoga in Ramayana (Aranyakand), Mahabharata (Shantiparva) and Yajnavalkya Smriti; Indian Logic: Means of knowledge. Pramanas: Pratyaksha (Perception), Anumana (Inference), Upamana (Comparison), Shabda (Verbal testimony), Arthapatti (Implication) and	12

	Anupalabddhi (Non-apprehension). Structure and kinds of Anumana (inference), Vyapti (invariable relation), Hetvabhasas (fallacies of inference).	
II	Schools of Yoga and Guru-parampara Lineage Schools of Yoga Raja yoga, Jnana Yoga, Bakthi yoga, Hatha Yoga, yogic contribution of Maharshi Patanjali and Guru Gorakshanath Traditions; Yogic contribution of Thirumoolar through thirumandiram; Yogic Traditions of Swami Vivekananda, Shri Aurobindo; Maharshi Ramana and Maharshi Dayanand Saraswati; Sri Shyamacharan Lahidi ,Sri T. Krishnamacharya, Swami Shivanada Saraswati, Swami Rama of Himalayas, Maharshi 2 Mahesh Yogi, Pt. Sri Ram Sharma Acharya; Yoga in Narada Bhaktisutra and Yoga in the Literature of Saints- Kabirdas, Tulasidas and Surdas; Jnanayoga, Bhaktiyoga, Karmayoga, Rajayoga, Hathayoga and Mantra Yoga;	12
III	Principles of Yoga in Traditional Yoga Texts Vedas & Upanishads Shad- Darshanas, Samkhya, Yoga and Vedanta Darshana; Prasthanatrayee; Bhagavad Gita, Patanjali Yoga Sutra-samathi padha, sadhana padha, vibuthi padha and kaivalya pada; Texts - Hatha Yoga Pradipika, Gheranda Samhita, Yoga Vasishttha; Thirumoolar thirumandiram	12
IV	Advanced Yogic Practices Biomechanics of Yogic postures; Knowledge of centre of gravity(COG), Line of gravity (LOG), Base of Support (BOS) in Asanas, Shatkarmas, Sukshma Vyayama (Swami Dheerendra Brahmchari),, Sthula Vyayama, Suryanamaskar, Yogasanas, Pranayams, Breath awareness, Sectional breathing, Nadishuddhi, Suryabhedan, , Ujjai , Sitali, Sitkari, Bhastrika, Bhramari, Bahyavritti, Abhyantarvritti, Stambhavritti Pranayama; Bandhas and Mudras: Mula	12

	Bandha, Jalandhara Bandha, Uddiyana Bandha, Maha Bandha, Yoga Mudra, Maha Mudra, Shanmukhi Mudra, Tadagi Mudra, Vipareet Karni Mudra; Meditation.	
V	Therapeutic Advancements and it's Effects on Systems Effects of yoga on various systems; Vadha, pitha kapha body types; Yogic concept of diet; Integrated Approach of Yoga therapy for the following Common Ailments- Respiratory disorders, Cardiovascular disorders, Endocrinal and Metabolic Disorder, Obstetrics and Gynecological Disorders, Menstrual Disorders, Gastrointestinal Disorders, Muscular-Skeletal Disorders, Neurological Disorders, Psychiatric Disorders; Relaxation techniques; yoga training program, load dynamics; yogic prescription; yogic diet chart.	12

Task and Assignments: Seminar/Presentation, class tests, Assignments

References:

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Mapping of Programme Outcomes with Course Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	2	3	2	3
CO2	2	3	2	2	2	3
CO3	3	3	3	2	3	3
CO4	3	2	2	2	3	2
CO5	2	2	3	2	2	2

Concept of Mapping

