DELHI PHARMACEUTICAL SCIENCES & RESEARCH UNIVERSITY (DPSRU)

SYLLABUS

FOR SIX MONTHS

PRE-Ph.D. COURSE WORK

(Revised for 2022-23 Batch)

DELHI PHARMACEUTICAL SCIENCES & RESEARCH UNIVERSITY (DPSRU)

Mehrauli-Badarpur Road, Pushp Vihar, Sector-3, New Delhi - 110017

Delhi Pharmaceutical Sciences and Research University

Pre-Ph D Course Work – Pharmaceutical Sciences (2022-23)

S. No.	Course Code	Subject Nomenclature	Internal Assessment	Major Practical Exam	Major Exam Theory	Total	Credits
1	PPD-101	Research Methodology & Science of Scientific Writing	30	-	70	100	3
2	PPD 102	Biostatistics, Computer Applications & Communication skills	30	-	70	100	3
3	PPD 102 P	Computer applications Practical	30	70	--	100	3
4	PPD-103PH/ PPD-103SP	Advances in Pharmaceutical Sciences, IPR & Entrepreneurship / Exercise and Sports Physiology	30	-	70	100	3
5	PPD-104 PPD-105 PPD-106 PPD-107 PPD-108 PPD-109 PPD-110 PPD-111 PPD-112 PPD-113 PPD-114 PPD-115	**Current topics in Pharmaceutical Sciences** (Choose any **ONE** from the following)**:** Pharmaceutics Pharm. Chemistry Pharmacology Pharmacognosy Clinical Research Management Physiotherapy Public Health Sports Psychology Sports Nutrition Sports Biomechanics Sports Management	30 (Sessional)+ 20 (Seminar/ Internal assessment) = 50	_	50	100	3
					Total credits		15

- 1 credit = 15 hrs/semester
- A candidate shall be declared pass if he/she obtains 50 % aggregate marks individually in each subject (Internal plus main examination taken together) and in aggregate.

PPD-101: RESEARCH METHODOLOGY & SCIENCE OF SCIENTIFIC WRITING

MM: 100 3 hrs/week **Credit: 3**

i) There shall be one internal examination of 30 marks.

ii) The University examination shall be of three hours duration and 70 marks.

Learning Objectives:

- To provide research orientation among the scholars
- To acquaint them with fundamentals of research methods and ability to judge the reliability and validity of experiments
- To acquaint students with various sources of information for literature review and data collection
- To develop an understanding of the quality indicators and ethical dimensions while conducting research and publications

Learning Outcome:

1. Student are able to formulate research projects and execute them with proper design
2. Students can analyze/ present and interpret results with meaning conclusions
3. Students can produce quality publications with ethical standards

Syllabus

Elements of Research: Scientific Process- Meaning and Definition, a brief history of scientific process. Introduction of Research Methodology-Meaning of research, objectives of research, types of research, significance of research, problems encountered by researchers in India.

Literature survey & Bibliography: Importance of literature review, methods and sources of literature review, Concepts of bibliography and References, writing up the review, abstraction of a research paper, citation index and impact factor

Defining Research Problem- Definition, necessity and techniques of defining research problem, Objectives of research problem

Planning Methodology & Results Presentation: Research Design-Meaning, need and features of good research design, Types of Research Designs, Basic principles of Experimental Designs, development of a theoretical and conceptual framework, methods of results presentation, presentation & organization of data – Tabular / Graphical Form

Good Laboratory Practices: SOP in lab practice, Bio safety, disposal, ethical practices, standardization of techniques and instruments

Lab Safety Measures: Introduction to safety, Code of conduct - while entering in the lab, while working with the chemicals, while disposal of chemicals, Storage and disposal of chemical wastes - aqueous wastes, organic wastes and radioactive wastes, Human contribution to reduce hazardous wastes

Skills of Documentation Paper Writing and Report Generation: How of documentation, Techniques of documentation, Importance of documentation, Basic concepts of paper writing and report generation, significance of report writing, steps of report writing, Types of Research reports, Methods of presentation of report and Different parts of the research paper

Skills of writing Research grants: Funding agencies for Research proposals, research grant proposal writing, proposed budget and time line for the proposal

Ethics in Publication: Ethical issues in research, Plagiarism, scientific integrity, citation and acknowledgement

Ethics concerning studies on animals: Role of CPCSEA, Studies in human with ICMR and CDSCO guidelines

Suggested Reading:

1) Research Methodology, Methods & Techniques, C.R. Kothari, Viswa Prakashan, 2nd Edition, 2009. 6. Research Methods- A Process of Inquiry, Graziano, A.M., Raulin, M.L, Pearson Publications, 7th Edition, 2009.
2) How to Write a Thesis:, Murray, R. Tata McGraw Hill, 2nd Edition, 2010.
3) Writing For Academic Journals, Murray, R., McGraw Hill International, 2009.
4) Writing for Publication, Henson, K.T., Allyn &Bacon, 2005.
5) What is this thing called Science, Chalmers, A.F., Queensland University Press, 1999.
6) Methods &Techniques of Social Research, Bhandarkar & Wilkinson, Himalaya publications, 2009. 12. Doing your Research project, Bell J., Open University Press, Berkshire, 4th Edition, 2005.
7) Gummersson, E. Qualitative methods in Management Research, Sage publications
8) Verkevieser et al, Designing and conducting Health Systems Research Projects WHO and IDRC
9) Grundy F and Reinke W A, Health Practice Research and formalize Managerial Methods, Geneva, WHO

10) Blum, Deborah and Mary Knudson, eds. A field guide for science writers: the official guide of the National Association of Science Writers, New York: Oxford University Press, 1997.
11) Booth, Wayne, Gregory G Colomb, Joseph M. Williams. The craft of Research Chicago University of Chicago Press, 1995.
12) Fuscaldo, AA, Erlick, BI, Hindman, B. Laboratory Safety: Theory and Practice. New York: Academic Press, 1980.

PPD-102: BIOSTATISTICS, COMPUTER APPLICATIONS AND COMMUNICATION SKILLS

MM: 100 3 hrs/week **Credit: 3**

i) There shall be one internal examination of 30 marks.

ii) The University examination shall be of three hours duration and 70 marks.

Learning objectives

- To understand the methods of analysis of statistical data
- To understand computer-intensive methods for data analysis
- Development and comparison of statistical models

Learning outcome:

- The student able to perform exploratory data analysis using parametric and non-parametric hypothesis tests and interpreting their results
- Able to demonstrate conclusions from statistical test results
- Use the Internet as a tool for conducting and/or evaluating research studies;

Syllabus

A. **Biostatistics:** Introduction to Bio-statistics, Use of statistics in Pharmacy, translating research problem into hypothesis testing, Type I & Type II errors in statistics, checking errors in data and correcting them. Types of variables and types of data measurements scales, Data Collection methods, Sampling Designs, Descriptive Statistics - Measures of central tendency & measures of dispersion, Correlation Analysis, Regression Coefficient Analysis, Probability Theory - Binominal distribution, Poisson distribution, normal distribution, concept of testing of hypothesis **Tests of Significance**- Parametric tests-Z test, T test, ANOVA and Non Parametric tests- Chi- Square test, Wilcoxson Rank test, Kruskal Wallis test. Sample size calculation for different study designs, devising conclusion from data analysis, Factorial designs, Use of computers and data cleaning and management learning and vital statistics.

B. **Communication skills:** Meaning and importance of communication, Objectives of Communication. Need for Communication. Types of communication , Written & Verbal communication. language as a tool for communication. Developing effective

messages: Thinking about purpose, knowing the audience, structuring the message, selecting proper channel. Scope & significance. Forms of Technical Communication

C. Computer Applications in Pharmaceutical Sciences:

General elements and recent advances in Computers Gadgets and their applications

General aspects & some important software for Research in Pharmaceutical Sciences:

Software for Molecular modelling

Software for QbD

Software for Herbal drug research

Software for Image analysis

Software for genomics

Text & References:

1) An Introduction to Biostatistics: A manual for students in Health Sciences: P.S.S. Sundar Rao, J. Richard Prentice Hall, New Delhi, 1996.
2) Bio-Statistics: A foundation for Analysis in the Health Sciences: Daniel, W.W., John Wiley and Sons Pub., Canada, 1991.
3) Bio-Statistics: A Manual of statistical methods for use in the Health, Nutrition
4) Bio-Statistics perspective in Health care research and practice : Verma, B.L., Shukla, G.D., et. al., C.B.S. Publishers. New Delhi 1993.
5) Handbook of Statistics: Krishnaiah, P.K. Rao, C.R. (ed), Elsevier Science Pub. Netherlands, 1988
6) Davis, Martha. Scientific Papers and Presentations. San Diego: Academic Press, 1997.
7) Computer Technology for Health Professionals: A Guide to Effective Use and Best Practices by Elio Spinello. Cognella Academic Publishing.
8) Presentation skills - Michael Hallon- Indian Society for Institute education
9) Journals of high repute for software for research

PPD-102P: COMPUTER APPLICATIONS PRACTICALS

MM: 100 (Practical-50) 3 hrs/week **Credit: 3**

i) There shall be internal assessment by In-charge coordinator for 30 marks.

ii) The University examination for 70 marks will be conducted at the end of the semester

Learning objectives

Able to understand the use of application software packages in research

Learning outcome

Student able to demonstrate and use the software packages and advanced research tools in his/her are of research

Syllabus:

Use of computers in identification of research problem/ Literature search Use of application software packages- MS Office- Power Point, WORD, EXCEL and ACCESS, ANOVA, Regression analysis, etc., as tools for Data collection, Presentation and Analysis.

Uses of Computer packages in documentation : Applications of Microsoft excel for quantitative and statistical data analysis, Introduction to Internet database surfing

Advanced Research Tools– Exposure to SPSS, Design expert, Systat, SigmaPlot, WinNonlin, Kinetica and PK analyst software

Text & References:

1) Computer Technology for Health Professionals: A Guide to Effective Use and Best Practices by Elio Spinello. Cognella Academic Publishing.
2) Practical Computer Applications in the Medical Practice by David S. Gullion. Burgess Communications.
3) Introduction to Computers for Healthcare Professionals by Irene Joos, Irene Makar Joos, Marjorie J. Smith, Ramona Nelson. Jones & Bartlett Learning.
4) Biomedical Informatics: Computer Applications in Health Care and Biomedicine by Edward H. Shortliffe, James J. Cimino. Springer Science & Business Media.

PPD-103PH ADVANCES IN PHARMACEUTICAL SCIENCES, IPR & ENTREPRENEURSHIP

MM: 100 3 hrs/week **Credit: 3**

i) There shall be one internal examination of 30 marks.

ii) The University examination shall be of three hours duration and 70 marks.

Learning Objectives:

- To develop inquisiveness in students to know latent developments in pharmaceutical sciences
- To understand the process of patent search and filing of patents
- To understand the process of development of entrepreneurship

Learning outcome:

- Able to demonstrate process of patent filing and IPR protection
- Able to prepare project for start ups and become entrepreneur

Syllabus

A. Advances in Pharmaceutical Science:

Recent trends in Drug Discovery (Biomarker based Translational Research)

Recent trends in Pharmaceutical Analysis

Recent trends in Formulation Development (Smart & Targeted drug delivery)

B. **IPR & Patents**: Introduction to IP laws in India, Role of IP in Pharmaceutical industry growth, Procedure for patent application, Grant and opposition proceedings, Patent licensing, PCT – an introduction, PCT application & general rules, Filing procedures Patent search, Patent analysis & Patent drafting

C. Entrepreneurship: Concept need and process in entrepreneurship development. Role of enterprise in national and global economy. Types of enterprise – Merits and Demerits. Government policies and schemes for enterprise development. Institutional support in enterprise development and management. Preparing Project Proposal to Start on New Enterprise Project work – Feasibility report; Planning, resource mobilization and implementation.

D. Text & References

1) Journals of high repute and international books
2) P. Das & Gokul Das. Protection of industrial Property rights
3) Gavin Mcfarlane. Practical Introduction o copyright.

PPD-103SP EXERCISE AND SPORTS PHYSIOLOGY

MM: 100

3 hrs/week **Credit: 3**

i) There shall be one internal examination of 30 marks.

ii) The University examination shall be of three hours duration and 70 marks.

Learning Outcomes:

The scholar will able to:

1. Develop knowledge regarding how different systems of the body function.
2. Develop understanding about the effect of exercise on different systems and how recovery can be ensured.
3. Develop concept about effect of different environments on human physiology.
4. Develop understanding of physiological gender differences and special problems of female sports person.

UNIT – I

A. Introduction
   i. Definitions of Physiology, Exercise Physiology and Sport Physiology.
   ii. Importance of Exercise Physiology in physical education and sport.
   iii. Scope of Exercise physiology.

B. Muscle Structure and Function.
   i. Muscle – its types, characteristics and functions.
   ii. Microscopic structure of muscle fiber.
   iii. Sliding Filament Theory of Muscular Contraction.
   iv. Types of muscle fiber and sports performance.
   v. Effect of exercise on muscular system.

UNIT – II

A. Cardiorespiratory functions
   i. Physiology of circulation and respiration.
   ii. Effect of exercise of circulatory and respiratory systems.
   iii. Cardiorespiratory adaptation to long and short term physical activities.

B. Neuro-muscular Function.
   i. Neuromuscular function and transmission of nerve impulse.
   ii. Kinesthetic sense organs.
   iii. Neural control of motor skills.
   iv. Effect of exercise on nervous system.

UNIT – III

A. Environmental influence on human physiology under exercise.

i. Temperature.
ii. Altitude.
iii. Air Pollution.
iv. Spectators.

B. Biochemical aspects of exercise.
i. Forms of energy, structure and sources.
ii. Aerobic and anaerobic metabolism during rest and exercise.
iii. Direct and indirect methods of measuring energy cost.

UNIT – IV

A. Women and sport performance.
i. Trainability.
ii. Physiological gender differences.
iii. Special problems of women sportsperson.

B. Massage manipulations and their effect on different systems.

UNIT – V

A. Recovery Process.
i. Physiological effects of fatigue.
ii. Restoration of energy stores.
iii. Factors contributing to recovery.

B. Aging.
i. Physiological consequences of aging.
ii. Life style management.
iii. Healthful aging.

Current Topics in Pharmaceutical Sciences

The candidate admitted to pre-PhD course is required to compulsorily select only ONE subject of 100 marks, as detailed below:

PPD-104 ADVANCES IN PHARMACEUTICS

3 hrs/week **3 Credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Novel drug delivery systems: Gastroretentive, Ocular, Transdermal, Nasal, Nanoparticulate drug delivery, Peptide drug delivery, Self-emulsifying drug delivery systems

Intelligent drug delivery systems: Magnetically modulated, ultrasonically modulated, electrically regulated, photo-responsive, temperature sensitive, pH sensitive, inflammation responsive, glucose sensitive polymers, urea responsive delivery.

Overview of USFDA and Drug Development: Evolution of FDA, The Food and Drug Administration Amendments Act of 2007, organizational structure

Central Drug Standard Control Organisation (CDSCO): Functions and responsibilities. FDA, Application review by the FDA, Orange Book, Bioequivalence testing requirements, biowaivers, FDA Bioequivalence limits, Para certifications, FDA approval process.

Text & References:

Current journals of high repute and international books

PPD-105 ADVANCES IN PHARMACEUTICAL CHEMISTRY

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Identification and validation of novel target sites for various therapeutic areas

Asymmetric Synthesis

Combinatorial Chemistry

Peptide Synthesis

Eco-friendly Processes

Quantitative structure activity relationship (QSAR): Physicochemical parameters, Hansch analysis – Steps involved, Facts to be considered, Development of one-target and multi-target QSAR models, Free-Wilson analysis, Craig plot, Topliss scheme and CoMFA analysis

Molecular modelling: Generation of 3D coordinates, sketch approach, conversion of 2D structures in 3D form, force fields, geometry optimization, energy minimization procedures. Quantum mechanical methods, conformational analysis, Pharmacophore identification, molecular modeling in 3D QSAR-CoMFA and related approaches

Text & References:

Current journals of high repute and international books

PPD-106 ADVANCES IN PHARMACOLOGY

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Pharmacological Screening and Assays: **P**rinciples of screening and correlations between various animal models & clinical models

Drug discovery and Development: Pre-discovery, Drug Discovery, Early Safety Tests and preclinical Testing in the light of lnvestigational New Drug (IND) and New Drug Application (NDA), OECD guidelines for new drug approval

Recent developments in drug discovery and development process for new drugs including biopharmaceuticals and medical devices

Text & References:

Current journals of high repute and international books

PPD-107 ADVANCES IN PHARMACOGNOSY

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Emerging trends and challenges in development of formulations containing medicinal plants

Recent developments in biological and Pharmacological evaluation, isolation and characterization of active Phytoconstituents from medicinal plants

Drug discovery from non-herbal natural sources like Marine, Microbial, Mineral etc.

Recent Trends in Standardization of herbal drugs/formulations

Current Regulatory and WHO Guidelines for assessment of crude drugs from natural sources

Text & References:

Current journals of high repute and international books

PPD-108 ADVANCES IN CLINICAL RESEARCH

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Theory

1. Basic Principles of Clinical Research
2. Bioethics
3. Pharmacovigilance
4. Review of Literature

Practicals:

1. Designing of Clinical trial protocols
2. ADR Reporting
3. Consent form
4. Patient information sheet

Text & References:

Current journals of high repute and international books

PPD-109 Management

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

1. Organizational Management Skills
2. Virtual and open-source Management
3. Global and International Management
4. Business ecosystems –Networked Management
5. Sustainability management, corporate social responsibility

Text & References:

1) Sekaran, Uma: Organisational Behaviour-Text& Cases; Tata McGraw Hill(Indian Edition
2) Newstorm: Organisational Behaviour; Tata McGraw Hill(Indian Edition)
3) Philip Kotler and Kevin Lane Keller: Marketing Management, Prentice Hall of India, New Delhi
4) Walker, Boyd and Larreche : Marketing Strategy- Planning and Implementation, Tata MC Graw Hill, New Delhi.
5) Bovee and Thill: Business Communication Today, Tata McGraw Hill, New Delhi.
6) Ronald E. Dulek and John S. Fielder: Principles of Business Communication; Macmillan Publishing Company, London. Current journals of high repute and international books

PPD-110 ADVANCES IN PHYSIOTHERAPY

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Theory

1. **Research methodologies with special reference to physiotherapy:**

Epidemiology, Absolute rate of incidence, Relative rate of incidence, Prevalence, Inclusion criteria, Exclusion criteria, Study variables, Questionnaire, Self-report, Interview

2. Equipments used for evaluation in physiotherapy:

Spirometer, Dynamometer, Nerve conduction Velocity, Electromyography, Complete electrotherapy unit, Sensory evaluation kit, Audio-visual reaction time, Biofeedback, Bone densitometer, Podiascan, Jumping power board, Skinfold caliper, Sliding calliper

3. **Clinical assessment tools used for research in physiotherapy**

ADL & IADL, Functional outcome scales, Balance scales, Gait assessment scales, Disability scales, Cognitive assessment scales, Radiographic classification, Nutritional assessment scales, Spasticity assessment scales, Geriatric assessment tools, Disease specific assessment scales

Manual muscle testing, Aerobic and anaerobic capacity, Sports specific Skills test, Tests used for cardiopulmonary, musculoskeletal and neurological impairments.

Text & References:

Current journals of high repute and international books

Paper Code: PPD-111 Public Health

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Course Overview: The course will provide the requisite knowledge and understanding of health systems and policies, disease burden, health inequalities and global health scenario.It intends to teach population trends and patterns, population and health, enhance the technical skill and knowledge regarding use of demographic data for policy analysis, program strategies and priorities.

Course Content:

Module 1: Health System and Policies

- Health organization: National, State, District and Village level
- National health programmes, National health mission, National health policy
- National Health goals/ indicators/ Sustainable Developmental goals(SDG)
- Planning process: Five year plans
- National Health Committees and Reports
- Challenges of health care delivery system
- Ethics in Public health Profession

Module 2: Epidemiology

- Measurement of health and disease
  - ratios, proportion and rates
  - Incidence and prevalence
  - Sensitivity, specificity and predictive values
- Epidemiological approaches and types
- Cohort, cross sectional and case control studies
- Randomized controlled trial

Module 3: Population dynamics and control

- Demographic cycle, Population trends and demographic indicators,
- Factors affecting population
- Methods of family limiting and spacing
- Census, National Family Health Survey
- Information, education and communication

Module 4: Global Health and issues in disease prevention

- International Health
- Genetics and health
- Health agencies: NGO's, Roles and functions
- Disaster management

Text and References

- Park's Textbook of Preventive and Social Medicine. 2013.Park K
- Basics In Epidemiology & Biostatistics, KazmiWaqar H
- Epidemiology: Study Design and Data Analysis, Third Edition (Chapman & Hall/CRC Texts in Statistical Science) by Mark Woodward
- Control of Communicable Diseases Manual Paperback – 1 Oct 2014, by David L., M.D. Heymann
- National Health Programmes and Policies (2017-18)2017, by Soni S
- Disaster Management2016, by J.JEYADEVI and Dr. S. Arulsamy

PPD-112 SPORTS PSYCHOLOGY

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Learning Outcomes:

The scholar will able to:

1. Develop understanding of the subject as well as its importance in games and sports.
2. Develop clear concept about the psychological factors that affect performance in games and sports.
3. Develop knowledge regarding various principles of psychology and how they relate to games and sports.
4. Develop understanding regarding how psychological preparation of a sport person is to be done for participation in competition.

UNIT – I

A. Introduction

(i) Definition of psychology, exercise psychology and sport psychology.

(ii) Difference between exercise psychology and sport psychology.

(iii) Importance of sport psychology in the field of physical education and sport.

B. Motivation in sport.

(i) Definition and types.

(ii) Theories of motivation.

(iii) Dynamics of motivation in sport.

UNIT - II

Psychological factors affecting sports performance.

(i) Stress.

(ii) Anxiety.

(iii) Aggression.

(iv) Tension.

(v) Emotions.

(vi) Self-confidence.

(vii) Concentration.

(viii) Mental practice.

(ix) Goal setting.

UNIT - III

A. Personality.

(i) Definition of personality.

(ii) Types of personality.

(iii) Theories of personality.

(iv) Measurement of personality.

(v) Personality and sport performance.

B. Cognitive Process.

(i) Meaning of cognition.

(ii) Characteristics of cognitive process.

(iii) Memory and thinking.

(iv) Principles of motor skills learning.

UNIT – IV

A. Transfer of training

(i) Definition of transfer of training and its implications in sport.

(ii) Types of transfer of training.

(iii) Factors affecting transfer of training.

B. Attention in sports

(i) Definition and meaning of attention.

(ii) Role of attention in individual and team sports.

(iii) Strategies of improving attention.

UNIT –V

C. Psychology preparation for competition.

(i) Long and short-term psychological preparation.

(ii) Strategies of psychological preparation.

- Imagery.
- Self-talk.

(iii) Psychological skill training for activation and relaxation.

PPD-113 SPORTS NUTRITION

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Learning Outcomes:

The scholar will able to:

1. Develop clear understanding about different types of diseases, how they spread and how to prevent.
2. Develop understanding about causes of obesity and how to prevent it.
3. Develop concept about school health programme and responsibility of the school in maintaining health of the scholars.
4. Develop knowledge regarding importance of good nutrition and its role in improving sports performance.

UNIT – I

A. Introduction
   - (i) Definition of Health and Health Education.
   - (ii) Importance of Health Education.
   - (iii) Principles of Health Education.
   - (iv) Objectives of Health Education.

B. Diseases and their prevention
   - (i) Disease – Communicable and Non – Communicable.
   - (ii) Modes of spread of communication disease.
   - (iii) Causes of spread of Communicable and Non – communicable disease and their symptoms.
   - (iv) Prevention of diseases.

UNIT – II

A. Health – Related Physical Fitness.
   - (i) Definition of Health Related Physical Fitness.
   - (ii) Components of Health Related Physical Fitness.
   - (iii) Development of Health Related Physical Fitness.

B. Body – Composition.
   - (i) Definition of body composition.
   - (ii) Obesity related health problems.
   - (iii) How to tackle obesity.

UNIT – III

A. School Health Programme.
   - (i) Definition of School Health Programme.

(ii) Components of School Health Programme.

(iii) Responsibility of the school in maintaining health of scholars.

B. Personal Hygiene.

(i) Definition of Hygiene.

(ii) Hygiene of different systems of the body.

UNIT – IV

A. Community Health Programme and Concept.

(i) Definition of community health programme.

(ii) International and National Health Agencies.

(iii) Government and Private Health Agencies.

B. Pollution

(i) Air, Water and Sound pollution and Radiations.

(ii) Effect of pollution on health.

(iii) Preventive and Safety measures.

(iv) Effect of smoking, alcohol and drugs on health – prevention and rehabilitation.

UNIT – V

A. Nutrition

(i) Definition of Balanced Diet.

(ii) Factor affecting nutrition.

(iii) Components of nutrition and detailed concept of each nutrient.

(iv) Nutritional deficiencies.

B. Nutrition and Sports Performance.

PPD-114 SPORTS BIOMECHANICS

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Learning Outcomes:

The scholar will able to:

1. Develop clear concept of the subject and will develop the proficiency of analysing skills bio – mechanically.
2. Develop understanding regarding scalar and vector quantities relating to linear and angular motion.
3. Develop knowledge regarding how levels help in performing body movements and concept of balance.
4. Develop the skill of identifying center of gravity in the human body.

UNIT – I

A. Introduction.

(i) Definition of biomechanics and sports biomechanics.

(ii) Importance of sports biomechanics.

(iii) Scope of sports Biomechanics.

B.

(i) Concept of axes and planes.

(ii) Meaning of the terms – Movement analysis, Kinesiological analysis and Bio-mechanical analysis.

UNIT – II

(i) Motion – its laws and their application in sports

(ii) Levers – Types and identification of levers in the human body and their application in sport.

(iii) Projectile and its application in sports.

UNIT – III

A. Kinematic and Kinetic Factors.

(i) Linear Kinematic Factors.

(ii) Angular Kinematic Factors.

B.

(i) Linear Kinetic Factors.

(ii) Angular Kinetic Factors.

C. Concept of Scalar and Vector quantities.

D. Centripetal and Centrifugal forces and factors of force affecting sports performance, Force Systems.

UNIT – IV

A. Friction – types and its application in sports.

B. Spin – types and its application in sports.

C. Impact and Elasticity.

D. Equilibrium – types and factors affection degree of stability.

UNIT –V

A. Air and Water mechanics.

(i) Air resistance

(ii) Floatation.

(iii) Water resistance – and factors that cause loss of force in swimming.

B. Mechanical analysis of sports skills in games and sports.

(i) Track and Fields.

(ii) Soccer.

(iii) Basketball.

(iv) Volleyball.

(v) Tennis.

(vi) Swimming.

(vii) Cricket.

PPD-115 SPORTS MANAGEMENT

3 hrs/week **3 credits**

i) There shall be a seminar/internal assessment/review article publication of 50 marks

ii) The university examination will be of 2 hours duration and of 50 marks

Learning Outcomes:

The scholar will able to:

1. Develop clear understanding regarding planning, organising and administering a programme.
2. Develop knowledge regarding class managements and how to develop an effective lesson plan.
3. Develop concept of how to prepare tournaments fixtures and properly organize different types of sports programmes.
4. Develop understanding of different methods of teaching.

UNIT – I

(I) Meaning and concept of management.

(II) Importance of management.

(III) Principles of management.

(IV) Functions of management.

- Planning.
- Organizing.
- Administering
- Staffing.
- Directing
- Controlling.
- Evaluating.

UNIT – II

Financial Management.

(i) Need for financial management.

(ii) Principles of financial management.

(iii) Advantage of good budget.

(iv) Preparation of budget.

(v) Sources of budget.

(vi) Expenditure of funds.

(vii) Audit.

UNIT- III

A. Class management

(i) Importance and Principles of class management.

(ii) Steps in class management.

(iii) Ideal size of the class.

(iv) Safety measures and discipline

B. Audiovisual Aids.

(i) Principles governing the use teaching aids.

(ii) Uses of Audio – Visual Aids.

(iii) Audio – Visual Aids used in Physical Education.

C. Lesson Plans.

(i) Importance of Lesson Plan.

(ii) Types of Lesson Plan – General and Specific.

(iii) Parts of Lesson Plan.

D. Time Table.

(i) Importance of time table.

(ii) Principles of preparing time table.

UNIT – IV

Organization of Sport Competitions and Tournaments.

A. Types of tournaments.

(i) Knockout or Elimination.

(ii) League and Round Robin

(iii) Combination Tournament.

(iv) Challenge Tournaments.

B. Intramural and Extramural Programmes.

(i) Objectives of intramural and extramural.

(ii) Procedure of organizing intramural and extramural.

UNIT – V

A. Facility Management.

(i) Guidelines and principles of facility planning

(ii)Factors to be kept in mind while designing sports facility

(iii) Planning of indoor and outdoor facilities

B. Methods of Teaching.

(i) Explanation Method.

(ii) Demonstration Method.

(iii) Command Method.

(iv) Imitation Method.

(v) Set Drill Method.

(vi) Whole Method.

(vii) Part Method.

(viii) Whole – Part – Whole Method.

(ix) Project Method.