




தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்
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1.1. - CURRICULAR DESIGN AND DEVELOPMENT

1.1.1: Curricula developed and implemented have relevance to the local, regional, national and global developmental needs, which is reflected in the programme outcomes (Pos), and Course Outcomes (Cos) of the programmes offered by the University

DEVELOPMENTAL NEEDS	NO. OF COURSES
LOCAL	14
INTERNATIONAL	163
NATIONAL	103
TOTAL	280


Registrar
Tamilnadu Physical Education
and
Sports University
Chennai - 600 127.



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CRITERIA – 1 (1.1)

1.1 - Curricular Design and Development

LOCAL & REGIONAL

1. Fundamentals of fitness and exercise prescription
2. Dynamics of motor skill acquisition
3. Science of sports training and strength and conditioning
4. Biomechanics of track events
5. Biomechanics of field events
6. Biomechanics of sports and games – i
7. Biomechanics of sports and games – ii
8. Soil and ground improvement techniques
9. Tirumular'stirumandiram
10. Thirumular'stirumanthiram in yoga therapy
11. Coping with stress
12. Classroom psychology
13. Village placement programme
14. Thesis



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Global

1. Human anatomy and physiology – i
2. Human anatomy and physiology – i
3. Physics for biomechanics
4. Mathematics for biomechanics
5. Kinesiology
6. Basic biomechanics
7. Human gait, posture and corrective exercise
8. Physiology of exercise and ergogenic aids
9. Applied biomechanics
10. Research methodology and statistics in sports science
11. Sports performance analysis
12. Biomechanics of yoga
13. Bioenergetics and muscular physiology
14. Cardiovascular and respiratory physiology
15. Advanced human nutrition
16. Introduction to human nutrition
17. Clinical exercise testing procedures
18. Clinical exercise testing procedures
19. Kinanthropometry
20. Sports nutrition
21. Training and performance
22. Exercise for special population
23. Clinical dietetics
24. Effect of exercise on various systems
25. Strength training and conditioning
26. Nutritional ergogenic aids and exercise performance
27. Weight management



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28. Fitness and nutrition for geriatric
29. Elementary statistics in exercise physiology & nutrition
30. First aid and sports injury & physiotherapy
31. Sports biomechanics
32. Nutrition and immune function in athletes
33. Fitness and wellness computer application in exercise physiology and nutrition
34. Neuro physiology
35. Training and competition nutrition
36. Computer application in exercise physiology and nutrition
37. Environmental physiology
38. Research methodology in exercise physiology and nutrition
39. Exercise and diet prescription for special population
40. Endocrinology
41. Health, fitness and performance assessment
42. Muscle and exercise metabolism
43. Exercise bio-chemistry
44. Renal physiology
45. Supplements and ergogenic aids for performance enhancement
46. Nutritional planning for sports and exercise
47. Exercise assesment in special population
48. Exercise and sports for women
49. Exercise physiology
50. Sports nutrition
51. Anatomy and physiology
52. Historyand administration of sports/game(athletics/football/kabaddi/hockey/volleyball)
53. Science of sports training
54. Sports medicine and nutrition
55. Sports psychology and sociology of sport
56. Kinesiology and sports bio mechanics
57. Philosophy of sports coaching



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58. Principles of management
59. Business economics
60. Organisational behavior
61. Business mathematics and statistics
62. Operations research
63. Management information system
64. Production & operations management
65. Marketing management
66. Human resource management
67. Research methods in business
68. Total quality management
69. Sports organisation and administration
70. Fundamentals of sports management
71. Entrepreneurial development
72. Retail management
73. Sports marketing
74. Sports facility management
75. Principles of management
76. Organisational behavior
77. Managerial economics
78. Quantitative methods in business
79. Operations management
80. Marketing management
81. Human resource management
82. Operations research
83. Management information system
84. Total quality management
85. Strategic management
86. Research methods in business
87. Research methods in business
88. Sports management – principles and practices



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89. Sports marketing
90. Sports facility management
91. Sports psychology and sociology
92. Sports tourism
93. Advertising in sports
94. Sports media & event management
95. Aerodynamics in sports
96. Sports materials engineering and design
97. Sports biomechanics
98. Measurement and instrumentation in sports engineering
99. Sports engineering and technology
100. Robotics and artificial intelligence
101. Physiology of sports and exercise
102. Principles and design of sports turf
103. Race engine design for optimal
104. Sports equipment materials
105. Composite and nano materials in sports applications
106. Software in sports
107. Sports psychology: issues and applications
108. Applied biomaterials in sports technology
109. Commercialisation of sports
110. Sports economics
111. Motor sports applications
112. Sports equipment materials
113. Applications of statistics in sports
114. Sports material engineering
115. Race car vehicle dynamics
116. Foundations of yoga classical yoga practices with props (practical)
117. Classical yoga practices
118. Yoga for health



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119. Yogic diet and nutrition
120. Communication skill - i
121. Research process in yoga and statistics
122. Methodology of teaching yoga
123. Basic yoga texts
124. Computer application in yoga
125. Yoga for health and wellness
126. Yoga therapy - i
127. Statistics in yoga
128. Personality development
129. Stress management
130. Classical yoga practices with props (practical)
131. Environmental studies
132. Yoga therapy and psychology
133. Physical examination methods of yoga therapy
134. Methodology in yoga therapy
135. Psychological testing in yoga
136. Yogic practice and modification - ii
137. Pathology ailments and yoga therapy
138. Yogic practices and modifications - iii
139. Research process in yoga
140. Yoga practices and modifications – iv
141. Health and yoga therapy
142. Wellness and yoga therapy
143. Nutrition and yoga therapy
144. Advanced general physiology
145. Introduction to sports sociology
146. Research methodology
147. Psychological aspects of sports performance
148. Social and behavioral statistics
149. Fundamentals of counseling skills



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150. Life span development
151. Sociological theories
152. Counseling and behavioral modification in sports
153. Scientific dimensions of sports psychology
154. Intervention strategies and sports behavior
155. Principles of sports psychology
156. Biological basis of behaviour
157. Psychology of athletic injury & rehabilitation
158. Psychological preparation and mental skills training
159. Sports for the challenged
160. Athletic psychopathology
161. Psychopathology – i
162. Psychopathology ii
163. Advanced social psychology

National

1. Test, measurement and evaluation
2. Physiology of exercise and ergogenic aids
3. Environmental studies
4. Communication skill
5. Basic anatomy & physiology – i
6. Fundamentals in food science
7. Health education
8. Human anatomy and physiology –
9. Floor and step aerobics
10. Occupational and functional assessment
11. Stability and core training
12. Environmental studies (foundation course)
13. Exercise science and functional assessment
14. Floor and step aerobics
15. Stability and core training



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16. Training and performance
17. Life skills management
18. Bioenergetics and muscular physiology
19. Cardiovascular and respiratory physiology
20. Advanced human nutrition
21. Neuro physiology
22. Training and competition nutrition
23. Statistics in exercise physiology and nutrition
24. Computer application in exercise physiology and nutrition
25. Environmental physiology
26. Research methodology in exercise physiology and nutrition
27. Exercise and diet prescription for special population
28. Endocrinology
29. Health, fitness and performance assessment
30. Muscle and exercise metabolism
31. Exercise bio-chemistry
32. Renal physiology
33. Supplements and ergogenic aids for performance enhancement
34. Nutritional planning for sports and exercise
35. Exercise assessment in special population
36. Exercise and sports for women
37. Exercise physiology
38. Sports nutrition
39. Exercise science and functional assessment
40. Stability and core training
41. Training and performance
42. Life skills management
43. Financial and management accounting
44. Business environment
45. Legal aspects in business
46. Financial management
47. Business laws



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48. Management accounting
49. Financial management
50. Research methodology and ipr
51. Surveying and construction materials
52. Basic relevant of yogic science - i
53. Methods of naturopathy
54. Classical yogic practices and applied physiology practicum-i
55. Professional preparation for competitive exams
56. Patanjali yoga sutras
57. Traditional indian systems of medicine and therapies
58. Classical yoga practices – iii
59. Clinical applications in traditional systems of medicines and therapies
60. Hatha yoga text - ii
61. Applied yoga
62. Area of dissertation
63. Computer programming
64. Fundamentals of yoga therapy
65. Functional anatomy and physiology
66. Basic principles of yoga therapy
67. Yogic practices and modifications – 1
68. Applied physiology practicals
69. Computer applications
70. Text in yoga therapy
71. Traditional indian systems of medicine and therapies
72. Clinical application in traditional indian systems of medicine and therapies
73. Yoga therapy in yoga sutras
74. Clinical application of yoga therapy
75. Applied yoga
76. Methods of teaching yoga therapy
77. Lesson plan in yoga therapy
78. Methods of naturopathy
79. Stress management
80. Traditional indian systems of medicine and therapies
81. Statistics in yoga therapy
82. Yogic practices
83. testing and assessment
84. Applied yoga Psychological
85. Methods and measurement in psychology
86. Sociology of health
87. Environmental sociology
88. Motor learning and psychology of coaching
89. Team cohesion and group dynamics
90. Social problems and issues
91. Positive psychology
92. Psychometrics



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93. Sports in indian society
94. Emotional intelligence
95. Managerial psychology
96. Social problems and issues
97. Medical sociology
98. Indian social system and sports
99. Gender & society
100. Health psychology
101. Psychology of interpersonal relationship
102. Organizational behavior
103. Ttraining & development



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LOCAL & REGIONAL

Supportive Document

FUNDAMENTALS OF FITNESS AND EXERCISE PRESCRIPTION

COURSE CODE UBK23CT104

FUNDAMENTALS OF FITNESS AND EXERCISE PRESCRIPTION

Learning Objectives

1. To understand the importance of physical activity and health
2. To acquire skills to assess the cardiorespiratory fitness, muscle strength, body composition and flexibility components.
3. To design the exercise program for normal and special population

Unit – I

Physical activity and health – Health Benefits of physical activity - Domains of Physical Activity. Physical Activity Recommendations - Prevalence of Physical Activity - Benefits of Physical Activity and Chronic Disease. Benefits of Physical Activity and Chronic Disease - The Health Consequences of Physical Inactivity and Sedentary Behavior - Physical Inactivity- Sedentary Behavior - Preparticipation Screening, Fitness Assessment, and Interpretation - Preparticipation Health Screening - Risk Stratification for Those in Cardiac Rehabilitation and/or Medical Fitness Facilities.

Unit -II

Cardiorespiratory Fitness Assessment-Measuring Cardiorespiratory Fitness and the Maximal Oxygen Uptake-Contraindications to Exercise Testing - Maximal versus Submaximal Exercise Testing - Guidelines for Exercise Testing - Cardiorespiratory Test Sequence and Measurements - Procedures and Protocols for Maximal, Submaximal, and Field Exercise Tests - Field Tests for Cardiorespiratory Fitness Tests - Criterion-Referenced Standards versus Normative Data.

Unit – III

Muscle Strength Assessment - Dynamic Strength (Isotonic) - Muscular Endurance Strength - Isometric (Static) Strength-Handgrip Strength - Rate of Force Development - Isokinetic Strength Assessment - Functional Strength Assessments - Functional Movement Screen - Strength Evaluation. **Body Composition Assessment** - Rationale for Body Composition Assessment - Body Composition Models - Methodologies in Body Composition Assessment - Body Composition Assessment in Children and Adolescents - Body Fat Prediction Equation Selection - Interpretation of Body Fat Percentage Estimates.



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Unit-IV

Flexibility and Functional Movement Assessments - Functional Movement Assessments - General Principles of Exercise Prescription - Exercise Prescription for All - Current FITT- Recommendations from the American College of Sports Medicine - Aerobic Frequency - Aerobic Intensity- Aerobic Time (Duration) - Aerobic Type (Mode) - Aerobic Volume - Aerobic Progression - Resistance Components - Flexibility Components - Neuromotor Components - Setting Up a Program - **Special Considerations across the Lifespan: Pregnancy, Children - and Youth, and Older Adults – Pregnancy** - Preparticipation Health Screening, Medical History, and Physical Examination Exercise Testing Considerations Exercise Prescription and Progression Considerations - **Children and Youth** - Exercise Testing Considerations - Exercise Prescription and Progression Considerations Special Considerations and Physical Activity Recommendations for - Children and Youth - **Older Adults** - Exercise Prescription and Progression Considerations - Special Considerations for Exercise and Older Adults

Unit-V

Exercise Testing and Prescription for Special Populations - Testing and Prescription for Special Populations Special Considerations for Cardiovascular Disease: Chronic Stable - Angina and Coronary Artery Bypass Graft Surgery - Graded Exercise Testing Considerations: Pretransplant - Graded Exercise Testing Considerations: Posttransplant - Special Considerations for Type 1 and Type 2 Diabetes Mellitus - Special Considerations for Metabolic Syndrome, Hypertension, and Dyslipidemia - Special Considerations for Chronic Obstructive Pulmonary Disease - Special Considerations for Asthma and Interstitial Lung Disease - Special Considerations for Weight Management - Special Considerations for Chronic Pain - Special Considerations for Cancer - Special Considerations for Bone Health and Osteoporosis - Special Considerations for Psychological Health - Special Considerations for Physical and Intellectual Disabilities.

Reference Books:

1. **ACSM's Health/Fitness Facility Standards and Guidelines**, New York: Human, Kinetics, 1992.
2. **ACSM's Health-related Physical Fitness Assessment manual**, Lippincott, 2008.



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DYNAMICS OF MOTOR SKILL ACQUISITIONS

COURSE CODE - USSR2302001

DYNAMICS OF MOTOR SKILL ACQUISITIONS

Learning objectives:

1. To equip the students to understand the basic of skills acquisitions of sports performance.
2. To make them understand the basic of skills and selected sports movement pattern
3. To enable them to understand the link between motor skills, ability, learning and performance
4. To familiarize the students with various theories improving and affecting the sports skills performance

Unit I

Characteristics of a skilful performance - learned - Efficient - Goal directed - Technical model - Fluent -Aesthetically pleasing- Motor and perceptual skills- Classification of skills - Gross and fine- Open and closed - Discrete, serial and continuous- External and internally paced - Simple or complex - High and low organization- Definition and characteristics of abilities - characteristics: innate, underlying and enduring traits - gross motor and psychomotor abilities.

Unit II

Motor skill development - motor skills- fundamental motor skills- sports specific skills-Theories related to the learning of motor skills - Description of the stimulus-response (S/R) bond and application of related theories - Associationist theories: operant conditioning – shaping behaviour, the use of reinforcement, link to trial and error, linking of the S/R bond - Cognitive theory: work of the Gestaltists – wholeness and insight learning - Observational learning: the work of Bandura – the four elements (attention, retention, motor reproduction, motivation).

Unit III

Reinforcement : Definition and examples of positive reinforcement, negative reinforcement and punishment, as methods of strengthening or weakening the S/R bond - Ways of strengthening the S/R bond through repetition, satisfaction/annoyance, and through physical and mental



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preparedness- Theories related to motor and executive programmes - Definition as a generalised series of movements: creation of programmes in the long term memory; awareness of the major programmes/sub-routines of a range of motor skills - Open loop control: retrieval of programmes by making one decision, used in quick movements where there is no time for feedback, with examples - Closed loop control: detection and correction of movements during the performance through the use of feedback, with examples - Schema theory: a way of modifying the motor programme by the use of schema or rules of information- Schmidt's sources of information as recall and recognition schema -Four rules of schema (knowledge of initial conditions, knowledge of response specifications, sensory consequences, movement outcomes) - Examples of the application of the schema theory in teaching and coaching.

Unit IV

Theory of information processing in the performance of motor skills

Basic models of information processing: display, sensory information, sense organs, perception, decision making, effector mechanism response and feedback- Memory: basic model of the memory process: selective attention, short term sensory store, short term memory, long term memory - Reaction time : definitions of reaction time, movement time and response time - importance of a short reaction time -factors affecting reaction time, including psychological refractory period, in a range of sporting activities - Feedback - importance and functions of feedback - types of feedback to include: intrinsic and extrinsic, terminal and concurrent, positive and negative, knowledge of performance, knowledge of results- use of practical examples to show how feedback can be used effectively to improve performance.

Unit V

Phases of learning movement skills - Cognitive, associative, autonomous phases of learning - characteristics of each phase and their practical implications- Transfer of learning - definition of transfer of learning – types – Positive transfer – Negative transfer – Proactive and retroactive – Bilateral transfer- Motivation - definition of motivation - extrinsic and intrinsic motivation - -effect of extrinsic rewards on intrinsic motivation- Theories related to arousal levels - drive theory -inverted U theory - drive reduction theory



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SCIENCE OF SPORTS TRAINING AND STRENGTH AND CONDITIONG

SCIENCE OF SPORTS TRAINING AND STRENGTH AND CONDITIONING

Learning objectives:

1. To understand the principles of sports training
2. To deign the training to improve fitness components
3. To design the periodization of sports training

Unit-I

Introduction of Sports Training: meaning and definition of Sports Training and Coaching. Aim and objectives of Sports Training. Concept and importance of Warm-up and Cooling-down.

Concept of Physical Fitness: Health Related Fitness and Performance Related Fitness (HRF & PRF). Different components of physical fitness and their importance towards specific games and sports.

Unit-II

Methods of Training: - Continuous Method, Interval Method, Repetition Method, Fartlek Training, Circuit Training, Plyometric Training, Weight Training and others. **Training Load:** Classification and components of Training Load. Concept of Intensity, Density, Duration and Frequency of Exercise. Principle of Intensity and Volume of Stimulus. Relationship between Load and Adaptation. Overload; - Concept, Cause, Judgment and Remedies. **Flexibility and Mobility Training:** Importance of flexibility and mobility in strength training Static vs. dynamic stretching techniques - Strategies for improving joint mobility and muscle flexibility.

Unit-III

Resistance Training Techniques: Techniques for different types of resistance: free weights, machines, bodyweight - Proper form and safety considerations in strength exercises - Variations and modifications for different fitness levels - **Program Design for Strength and Hypertrophy** - Different goals: strength, hypertrophy, power, endurance - Repetition ranges, sets, rest intervals, and load selection - Designing effective workout routines. **Conditioning and Metabolic Training:** Cardiovascular conditioning methods: steady-state, interval, HIIT - Designing metabolic conditioning workouts - Integrating conditioning with strength training Biomechanics of Strength Training. Biomechanical principles relevant to strength exercises - Levers, force production, and mechanical advantages - Analysis of compound and isolation exercises.



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Unit-IV

Method of Development of different Fitness Components: Endurance, Speed, Strength, Flexibility, Agility and Coordinative ability. Program Design for Strength and Hypertrophy - Different goals: strength, hypertrophy, power, endurance Repetition ranges, sets, rest intervals, and load selection - Designing effective workout routines - **Plyometric and Power Training** - Plyometric exercises and their benefits - Power development through Olympic lifts and explosive movements - Considerations for integrating plyometrics and power training - **Olympic Weightlifting Techniques** - Techniques and progressions for Olympic lifts (clean and jerk, snatch) - Teaching proper form and execution - Safety considerations and injury prevention

Unit-V

Training Programme and Planning: - Meaning and Types of Periodization. Aim and Concept of Periodization; - Preparatory Phase, Competitional Phase and Transitional Phase. Training Cycle; - Micro, Meso and Macro. Concept and Application of Technique, Tactic and Strategy. **Injury Prevention and Rehabilitation:** Identifying common strength training injuries - Prehabilitation strategies to reduce injury risk - Integrating rehabilitation exercises into training programs - **Special Populations and Considerations** - Strength training for youth, seniors, pregnant individuals, and athletes - Considerations for training clients with specific medical conditions - Tailoring programs for different fitness levels and goals.

Reference Books:

1. **ACSM's Health/Fitness Facility Standards and Guidelines**, New York: Human, Kinetics, 1992.
2. **ACSM's Health related Physical Fitness Assessment manual**, Lippin Cott, 2008.
3. Michael Boyle. **Functional Training for Sports**. Human Kinetics, 2004.
4. Clake, H. Harrison. **Application of Measurement to Health and Physical Education**, New Jersey: Prentice Hall Inc. 1976.



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BIOMECHANICS OF TRACK EVENTS

BIOMECHANICS OF TRACK EVENTS

Learning objectives:

1. To equip the students to learn fundamental skills and techniques of track events.
2. To familiarize with mechanical principles involved in skills and technique track events.
3. To understand and conduct the qualitative and quantitative analysis in track events.
4. To acquire the skills of reviewing the current research studies.

Unit-I

100m Sprint: History, legends, world record, skills, technique, application of biomechanical principles, analysis of related research reviews, and analysis of current world and Olympic record holder's performance. Types of Crouch Start – Bunch start-Medium start-Elongated start - Running – Stride length - Take-off distance - Flight distance - Landing Distance - Stride Frequency - Action of leg - Supporting phase-Driving phase - Recovery phase - Action of arms -Action of trunk - Finish - Types of Finish - Start - Running – Finish- Spikes – Types of spikes - Starting block.

Unit-II

200m Sprint and 400m Sprint: History, legends, world record, skills, technique, application of biomechanical principles, analysis of related research reviews, and analysis of current world and Olympic record holder's performance. Technique- key performance indicators

Unit III

Hurdles (100m, 110m hurdles): History, legends, world record, technique, application of biomechanical principles, analysis of related research reviews, and analysis of current world and Olympic record holder's performance. Hurdles – High Hurdles-Approach-take-off-Flight-Landing- Running between hurdles – Key performance indicators



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Unit -IV

TNPESU

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B.Sc Sports Biomechanics and Kinesiology 2023-2024

400 m hurdles: History, legends, world record, technique, application of biomechanical principles, analysis of related research reviews, and analysis of current world and Olympic record holder's performance. Hurdles – High Hurdles-Approach-take-off-Flight-Landing-Running between hurdles - Key performance indicators

Unit-V

Middle and Long Distance and Relays (800m, 1500m, 5000m, 10000m , and 4x100m and 4x400m): History, legends, world record, technique, application of biomechanical principles, analysis of related research reviews, and analysis of current world and Olympic record holder's performance - Key performance indicators

Reference:

1. **The Sports Book** (3rd Edition). D.K publishers.
2. Will Freeman. **Track & Field Coaching Essentials**. Human Kinetics. 2014.
3. Joseph. L. Rogers. **USA Track & Field Coaching manual**. Human Kinetics.2000.
4. Ed House Wright. **Winning track & field for girls**. Mountain Lion. 2010.
5. Tom Ecker. **Basic Track & Field Biomechanics (4th edition)**. 2015
6. **The Olympic and World Records book**, Imagine Publishing, 2016.
7. James G. Hay, **Biomechanics of Sports Technique**, Prentice-Hall, 1993.



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BIOMECHANICS OF FIELD EVENTS

UBK23CT504 BIOMECHANICS OF FIELD EVENTS

Learning objectives:

1. To equip the students to learn fundamental skills and techniques of track and field events.
2. To familiarize with mechanical principles involved in skills and technique track and field events.
3. To understand and conduct the qualitative and quantitative analysis in track and field events.
4. To acquire the skills of reviewing the current research studies.

Unit-I

Throws (Shot-put, hammer, discus and javelin)

History, legends, world record, technique, application of biomechanical principles, analysis of related research reviews, and analysis of current world and Olympic record holder's performance. **Shot-put** - Shot-put - O'Brien style-Initial Stance - Glide-Delivery-Reverse - Rotation style- distance prior to release-Physique-Position-Distance after release-Height of release-Speed of release-Forces exerted -Angle of release -Air resistance - Advantages and Disadvantages of O'Brien and Rotation techniques.

Unit-II

Hammer - Hammer Throw – Preliminary swing-The first turn-The second turn-The third turn-The delivery - Air resistance Speed of release-Angle of release-Height of release.

Discus - Discus Throw – Initial stance –Preliminary swings -Transition-Turn-Delivery-reverse-Aerodynamic factors.

Unit-III

Javelin-Javelin Throw - Types of Grips –Carry- Run – Transition, Throw, and Recovery-Speed, Angle, Height of release-Aerodynamic factors influencing flight- Advantages and Disadvantages of different Grips- Aerodynamic Javelin.



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Unit-IV

Jumps (Long jump, Triple jump)

History, legends, world record, technique, application of biomechanical principles, analysis of related research reviews, and analysis of current world and Olympic record holder's performance. **Long Jump**-Hang style - Hitch Kick style - Approach run – Take-off -Flight in the Air - Landing – Take-off distance-Flight distance - Speed, angle, height of take off-air resistance-Advantages and Disadvantages of different styles. **Triple Jump** - Hop - Step and Jump- Approach Run – Take-off - Flight in the Air – Landing.

Unit-V

Throws (High jump and Pole vault)

High jump- straddle- Fosbury flop- run up- take off- bar clearance- landing- height of take off- physique – body composition at take off- flight height- vertical velocity at takeoff- clearance height- body position at peak- **pole vault**- carry- take off- clearance- landing- take off- swing height- clearance height- kinetic energy at take off- strain energy at take off- work done during ascent- mechanical energy losses - kinetic energy- usage and advantage of fiberglass- analysis of recent world pole vaulters.

Reference:

1. **The Sports Book** (3rd Edition). D.K publishers.
2. Will Freeman. **Track & Field Coaching Essentials**. Human Kinetics. 2014.
3. Joseph. L. Rogers. **USA Track & Field Coaching manual**. Human Kinetics.2000.
4. Ed House Wright. **Winning track & field for girls**. Mountain Lion. 2010.
5. Tom Ecker. **Basic Track & Field Biomechanics (4th edition)**. 2015
6. **The Olympic and World Records book**, Imagine Publishing, 2016.
7. James G. Hay, **Biomechanics of Sports Technique**, Prentice-Hall, 1993.



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MECHANICAL ANALYSIS OF SPORTS AND GAMES

MSBCT 302 - MECHANICAL ANALYSIS OF SPORTS AND GAMES – PART I

Learning objectives:

1. To provide the acquaintance about the history of games, legends, skills and technique.
2. To recognize the mechanical principles involved in various skills of a game.
3. To acquire the skills with conducting research and evaluate the data on particular skill and technique in the relevant game.
4. To enable the students to learn to prepare standard biomechanical analysis report.

Unit-I

Basketball and Handball

History of the game, legends, skills and technique, application of biomechanical principles, analysis of related research reviews - **Basketball**- Qualitative and Quantitative analysis- Dribbling, types of passes - Chest pass - Overhead pass - Bounce pass - Baseball pass, Types of shooting-Set shot-Jump Shot-Layup shot. **Handball** - Dribbling-Passing-types of passing- Overhead pass- Types of shot –Jump shot - Playing surfaces-Types

Unit-II

Volleyball and Kabaddi

History of the game, legends, skills and technique, application of biomechanical principles, analysis of related research reviews- **Volleyball**- Qualitative and Quantitative analysis- Serve, Types, Forearm pass Setting, Attack, Block, Floor defense - **Kabaddi**- offensive and defensive skills- match analysis.

Unit-III

Tennis and Table tennis



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History of the game, legends, skills and technique, application of biomechanical principles, analysis of related research reviews - **Tennis**- Qualitative and Quantitative analysis-Service, types of service- Rally – fore hand rally-Back hand rally-offensive and defensive techniques – Tennis Rackets –Types- Playing surfaces- **Table tennis**- Qualitative and Quantitative analysis-Grip, Stance, Footwork, Forehand drive, Backhand drive, Backhand push, Forehand push, Serve, Return of serve, Basic strokes-Drive, Push, Block, Smash; Advance stroke – Loop, Chop, Flip and Lob

Unit-IV

Badminton and Squash

History of the game, legends, skills and technique, application of biomechanical principles, analysis of related research reviews – **Badminton** - Qualitative and Quantitative analysis - grip, foot work, service and types; short, flick, high , drive - clears, drop shot, smash, drive, net play - **Squash**- Qualitative and Quantitative analysis, Racket Grip, Squash Swing (Forehand swing and back hand swing)

Unit-V

Swimming

History, legends, skills and technique, application of biomechanical principles, analysis of related research reviews-Swimming - Qualitative and Quantitative analysis – Free style, Front crawl, Butterfly, Breast stroke, and Back crawl.

Reference:

1. Hay, J. (1993). **The Biomechanics of Sports Techniques**, Benjamin Cummings.
2. Barth/Dietz. **Learning swimming**, Meyer & Meyer, 2002.



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BIOMECHANICS OF SPORTS AND GAMES - II

COURSE CODE: UBK23CT602

BIOMECHANICS OF SPORTS AND GAMES - II

Learning Objectives:

1. To enable the students to learn the basic skills and techniques of sports and games.
2. To learn and apply the mechanical principle on the technique of sports skill.
3. To understand the technique of qualitative and quantitative analysis.
4. To equip the students to carryout 3D analysis on sports skills and generate a valid report.

Unit-I

Hockey and football

History of the game, legends, skills and technique, application of biomechanical principles, analysis of related research reviews - **Hockey**- Qualitative and Quantitative analysis – Dribbling- Pushing –Scooping-slap shot-Drag push and Drag flick- Hockey Sticks- Types of sticks- Playing surfaces - **Football**- Qualitative and Quantitative analysis - Kicking – instep kick-inside of the foot kick- passing-inside of the foot pass- Receiving -Throw in- Dribbling – Heading-Volley.

Unit-II

Cricket

History of the game, legends, skills and technique, application of biomechanical principles, analysis of related research reviews - Cricket- Qualitative and Quantitative analysis - batting: forward defense, backward defense, drives, cut, pull, and sweep - Bowling: Pace bowling, types and technique; medium pace, Spin bowling: types, leg spin, off spin and



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their improvisation – Fielding: catching, ground fielding, close and deep fielding- Wicket keeping.

Unit-III

Boxing and fencing

History, legends, skills and technique, application of biomechanical principles, analysis of related research reviews - **Boxing**-Qualitative and Quantitative analysis- Foot work- a) Stand-up base b) Cross footwork c) Circling; Punches - a) Jab b) Cross c) Hook d) Uppercut; Blocks, parries and evasive techniques - a) Catch b) Side parry c) High front cover d) Low front cover e) Hook / side cover f) Shoulder roll g) Slip h) Duck i) Bob and weave - **Fencing**- Qualitative and Quantitative analysis- Lunge (attacking) - flunge (saber fencing) - Passatta sotto (movement with a twist) - Parry (defensive move) - Counter attack (attack) - Riposte (counter attack) - Remise (series of attack) - Beat (attack) – Feint.

Unit-IV

Gymnastics

History, legends, skills and technique, application of biomechanical principles, analysis of related research reviews - **Men** - Qualitative and Quantitative analysis -Floor exercise, parallel bar, horizontal bar, vaulting table. pommel horse and Roman rings – **Women** - Qualitative and Quantitative analysis -Uneven bars, Floor exercise, Balance beam and Vaulting table

Unit-V

Golf and cycling

History, legends, skills and technique, application of biomechanical principles, analysis of related research reviews - **Golf** - Qualitative and Quantitative analysis - carry-speed of release-Direction of Release-Height of release-Air resistance- The run-Putting-Techniques-Grip-Stance-The swing-back swing-Down swing-Impact-Follow through -



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SOIL AND GROUND IMPROVEMENT TECHNIQUES

PST18DE019

UNIT 1 SOIL PROPERTIES 9

Soil formation – Geotechnical engineering – Soil formation – Soil profile. Soil Composition –Water content determination – Determination of specific gravity of solids. Index properties of soil – Shape and size of particle –Shrinkage ratio - Volumetric shrinkage – Atterberg indices – Classification of soil.

UNIT II – PROBLEMATIC SOIL AND IMPROVEMENT TECHNIQUES 9

Role of ground improvement in foundation engineering – methods of ground improvement – Geotechnical problems in alluvial, lateritic and black cotton soils – Selection of suitable ground improvement techniques based on soil conditions.

UNIT III – DEWATERING 9

Dewatering Techniques - Well points – Vacuum and electroosmotic methods – Seepage analysis for two – dimensional flow for fully and partially penetrated slots in homogeneous deposits (Simple cases only).

UNIT IV – INSITU TREATMENT OF COHESIONLESS AND COHESIVE SOILS 9

In-situ densification of cohesion-less soils and consolidation of cohesive soils: Dynamic compaction Vibroflotation, Sand compaction piles and deep compaction. Consolidation: Preloading with sand drains, and fabric drains, Stone columns and Lime piles-installation techniques only – relative merits of above methods and their limitations - stabilization of expansive soils.

UNIT V – GROUT TECHNIQUES 9

Types of grouts – Grouting equipments and machinery – injection methods – Grout monitoring – stabilization with cement, lime and chemicals.

TEXT BOOKS:

1. Purushothama Raj, P.Ground Improvement Techniques, Laxmi Publications (P) Ltd. New Delhi, 1999.
2. Koerner, R.M. Construction and Geotechnical Methods in Foundation Engineering, McGraw Hill, 1994.
3. Moseley, M.P., Ground Improvement Blockie Academic and Professional, Chapman and Hall, Glasgow, 1998.
4. Jones J.E.P. Earth Reinforcement and Soil Structure, Butterworths, London, 1985



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TIRUMOLAR'S TIRUMANTIRAM

UNIT I:

Highlights and concepts of Yoga Therapy in Tirumantiram, History of Tirumular – Basics of Thirumantiram –learning and non-learning

UNIT II:

Second Tantra: Creation of Microcosm – KargapaKriyai

UNIT III:

Third Tantra: Ashtanga Yogam – The Eight great Siddhis – Way to Kayasiddhi – Kala Chakra – Breathe rhythm – Kechari Yoga – Pariyanga Yoga – Life Span

UNIT IV:

Tantra Seven: The Six adharas – Mudra Variations – Controlling Senses

UNIT V:

Yogic views on other tantras – Analytical views of Thirumular on Yoga Therapy Symptoms of death, longevity

References Books:

1. Nagarajan and Mahalingam (1991) Thirumantiram Madras: Sri Ramakrishna Math
2. Annamalai (2002) Tirumantiram, Chennai: Indian Cultural Research Institute
3. Manikavasagan (2008) TirumularTirumandiram, Uma Publications



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TIRUMULAR'S TIRUMANTIRAM IN YOGA THERAPY

Unit I:

Highlights and concepts of Yoga Therapy in Tirumantiram

History of Tirumular - Basics of Thirumantiram -learning and non-learning

Unit II:

Second Tantra: Creation of Microcosm - KargapaKriyai

Unit III:

Third Tantra: Ashtanga Yogam - The Eight great Siddhis - Way to Kayasiddhi - Kala Chakra -

Breathe rhythm - Kechari Yoga - Pariyanga Yoga - Life Span

Unit IV:

Tantra Seven: The Six adharas - Mudra Variations - Controlling Senses

Unit V:

Yogic views on other tantras - Analytical views of Thirumular on Yoga Therapy Symptoms of death, longevity

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2. Annamalai (2002) Tirumantiram, Chennai: Indian Cultural Research Institute
3. Manikavasagan (2008) TirumularTirumandiram, Uma Publications



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COPING WITH STRESS

PPS18CT407: COPING WITH STRESS

UNIT 1: Learning about sources of stress and its symptoms: Nature of stress- various sources of stress environmental, social, physiological and psychological; Symptoms of stress - emotional response, physiological & behavioural response.

UNIT 2: Coping --- (a) Concept of coping: Definition and Classification. (b) Measurement of coping behaviour.

UNIT 3: Life Style and Related aspects---- (a) Stress and Personality. (b) Life Style and Health : Cardiovascular disease, Atheroceterosis, cancer. (c) Stress and substance abuse: alcohol and other drugs

UNIT 4: Developing a sense of Humour – Learning to laugh – Using humour at work – Reducing conflicts with humour

UNIT 5: Learning to manage stress effectively: Methods - yoga, meditation, Vipassana, relaxation techniques, clarifying problem, alternate actions, support (Problem focused) emotion focused constructive approach

Readings: Weiten, W. & Lloyd, M.A (2007). Psychology applied to Modern life. Thomson Detmar Learning .

Suggested Readings:

Barrett.J.E. (1979) ---Stress and Mental Disorder, American Psychopathological Association Series,New York : Rayan Press, Section A-6.

Braumsteim, J.J. and Toister, R.P (1981)----- Medical Applications of Behaviour Science chicago:Year Books Medical publishers Inc. Section A. I:

Dohrenwend B.S. and Dohrenwend, B.P. (1974) --- Stress life events : their nature and effect, Newyork, Johan willy and sons.

Goldberger, L. and Breznitz,S. (1982) ---- Handbook of stress : theoretical and clinical as pact

Harzars, R.S. and Talkman, S. (1984) ---- Stress, Appraisal and coping, Newyork: Springer.

Selye. H.(1980) -----Selyes guide to stress research vol. I, Newyork : Van Nostrand Reinhold. ADACP -



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CLASSROOM PSYCHOLOGY

PPY18DSE03 CLASSROOM PSYCHOLOGY

Unit 1: Introduction : Class room behaviour in school setting - Social interaction between teacher and child - Influence of peer group - conformity and non-conformity in schools - nature of communication - interaction analysis in communication - social learning and role models - friendship patterns in the classroom and sociometry scale.

Unit 2: Class control and management : Class control and management - defining problem behaviour - behaviour modification techniques in classroom - merits and drawbacks of behaviour modification techniques - group behaviour problems - School refusal problems - Use of punishment and reinforcement for class room management

Unit 3: Educational guidance and counseling : Educational guidance and counselling - counselling in school - The problem of confidentiality -The importance of sympathy - The Counselling process - Categorizing the child's problem - The role of the counsellor - Problems faced by the counsellor.

Unit 4: Vocational Guidance : Vocational Guidance - developmental Stages in Career Choice – Steps in career decision making – Career counselling - The role of Counsellor in Vocational guidance - sex education for moral development and appropriate social behaviour -role of teacher as an applied psychologist

Unit 5: Skill development : Skill development - study skills development - Oral presentation skills - Written communication skills - Assertiveness skill development - Goal setting skills - Positive thinking skills - Techniques of creative thinking.

REFERENCES:

Think like a Winner by Walter Doyle Staples. UBPSD, New Delhi 1996.

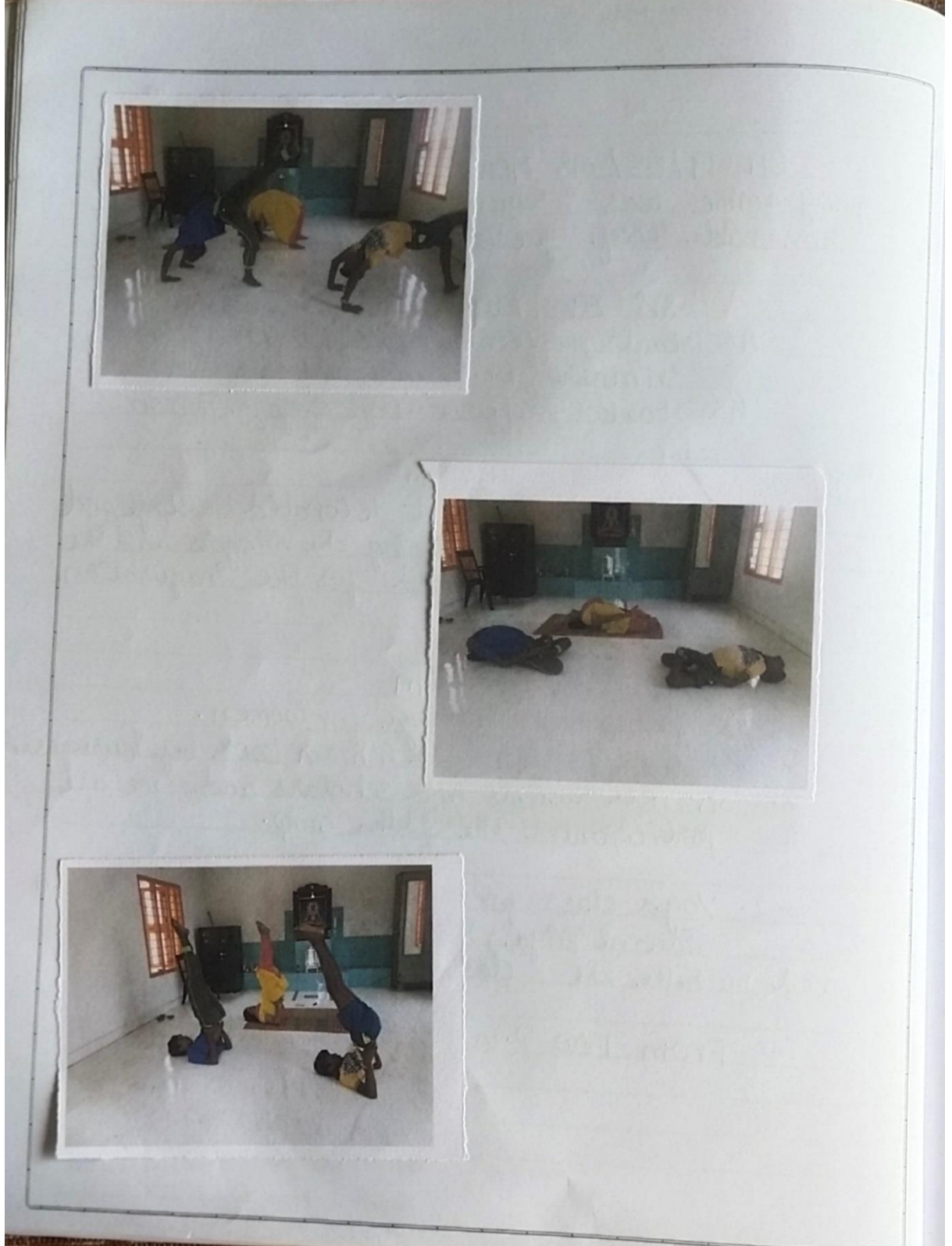
Psychology for Teachers by David Fontana, 3rd Ed. Palgrave: UK 1995

Modern Applied Psychology by Arnold P. Goldstein and Leonard Krasner.Pergamon Press, Inc. New York



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Village placement report(yoga department)





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Date _____

Expt. No. _____ Page No. 11

From 2.00 P.m to 4.00 P.m

After lunched - Mr. murugesan sir. He took
Varma therapy for all people.

From 4.00 P.m to 5.00 P.m (yoga for kids)
Sathyaki, Kamachi and me give the
Student, for competitionl programm perpus and me
us also take the yoga class for general
practice children.

Teacher's Signature : _____

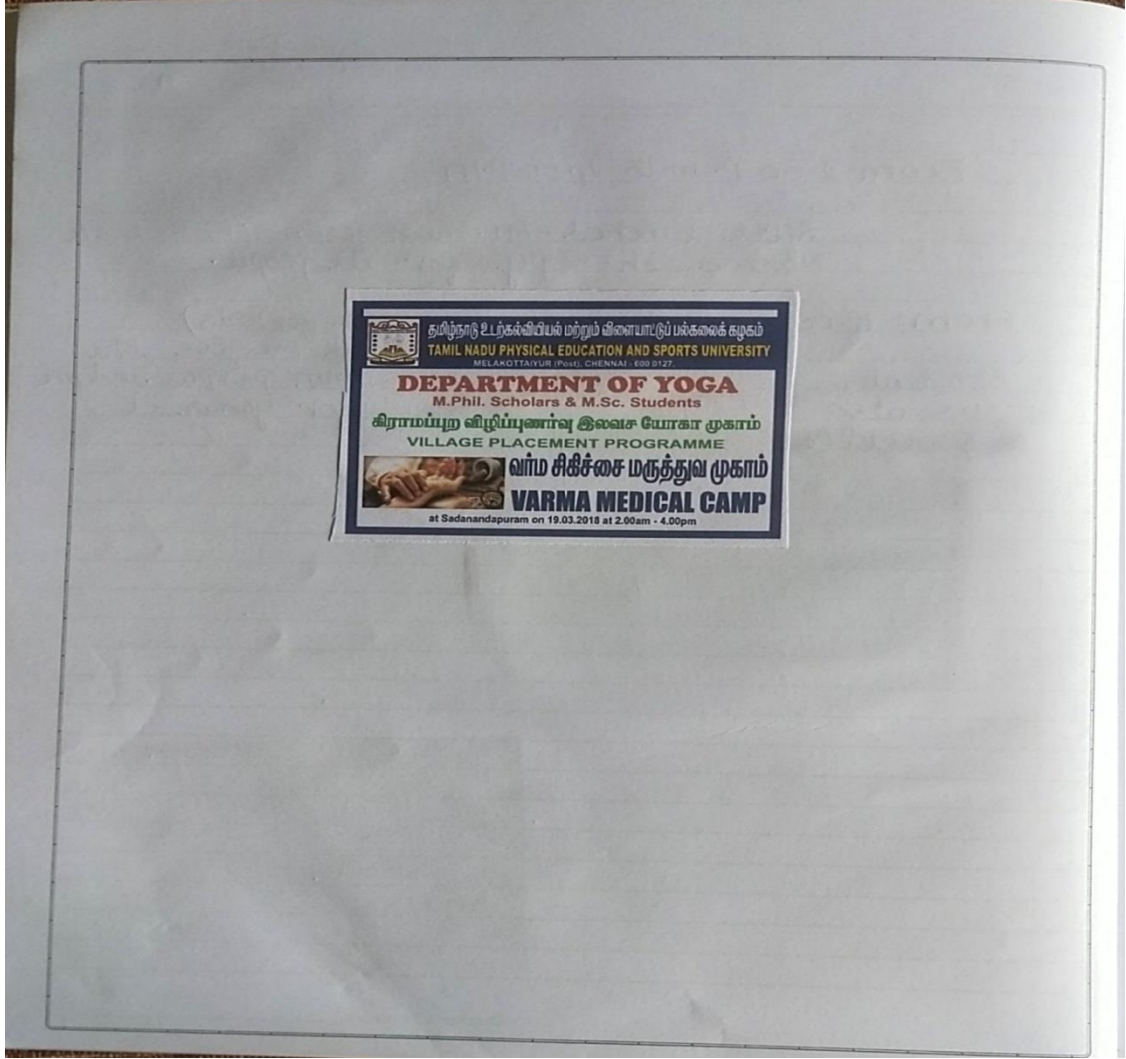


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Date _____

Expt. No. _____ Page No. 12

DAY - II

20 March, Tuesday

2018

Teacher's Signature : _____



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TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY
MELAKOTTAYUR (Post), CHENNAI - 600 017

DEPARTMENT OF YOGA
M.Phil. Scholars & M.Sc. Students

கிராமப்புற விழிப்புணர்வு இலவச யோகா முகாம்
VILLAGE PLACEMENT PROGRAMME

இயற்கை சிகிச்சை மருத்துவ முகாம்
NATUROPATHY MEDICAL CAMP
at Sadanandapuram mutt on 20.03.2018 at 02.00pm - 4.00pm

தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்
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DEPARTMENT OF YOGA
M.Phil. Scholars & M.Sc. Students

கிராமப்புற விழிப்புணர்வு இலவச யோகா முகாம்
VILLAGE PLACEMENT PROGRAMME

இயற்கை உணவு தயாரித்தல் முகாம்
NATUROPATHY FOOD CAMP
at Sadanandapuram mutt on 21.03.2018 at 2.00am - 4.00pm

தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்
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DEPARTMENT OF YOGA
M.Phil. Scholars & M.Sc. Students

கிராமப்புற விழிப்புணர்வு இலவச யோகா முகாம்
VILLAGE PLACEMENT PROGRAMME

அக்துவிஷர் & அக்து பஞ்சர் மருத்துவ முகாம்
ACUPRESSURE & ACUPUNCTURE CAMP
at Sadanandapuram mutt on 21.03.2018 at 11.00am - 1.00pm



தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்

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Date

Expt. No.

Page No. ...14.....

DAY - III

21 March, wednesday

2018

Teacher's Signature : _____



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Page No. 15

The third day programme was started at 9.00 a.m

9.00 A.m to 10.00 A.m (Yoga for Adults)
Babesh, Jayanti and me took the yoga class for the adults.

10.00 A.m to 11.00 A.m (Yoga for women)
Nalini, Anuradha, Vanlal Sangular and Babesh me also took class for the women.

11.00 A.m to 1.00 P.m (Acupuncture & Acupressure camp)

which is took by Sabena for the village people. That was very helpful and useful for the people.

1.00 P.m to 2.00 P.m (Lunch break)

2.00 P.m to 4 P.m (Naturopathy for preparation)

Naturopathy food, preparation camp was going on. We divided and each group took care work and helped for the Naturopathy camp.

Many home matters joined the session and prepared a lot of recipes. The participants themselves started chopping vegetables, Fruits grinding mixing and distribution.

Teacher's Signature : _____



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All these attracted the participants and created a good enthusiasm among them.

4.00 P.m to 5.00 P.m (yoga for kids)
Every day Sakya, Kamachi and me they took class for advance asana and cultural programme and one also took class for kids.

Teacher's Signature : _____



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TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY
MELAKOTTAYUR (POH), CHENNAI - 600 017.

DEPARTMENT OF YOGA
M.Phil. Scholars & M.Sc. Students

கிராமப்புற விழிப்புணர்வு இலவச யோகா முகாம்
VILLAGE PLACEMENT PROGRAMME

யோகாதரவி மருத்துவ முகாம்
YOGA THERAPY CAMP
at Sadanandapuram mutt on 22.03.2018 at 11.00am - 1.00pm



தமிழ்நாடு உடற்கல்வியியல் மற்றும் விளையாட்டுப் பல்கலைக்கழகம்

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DAY - IV

22 March , Thursday

2018

Teacher's Signature : _____



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Date

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Page No. 18

The Fourth days programme was started
at 9.00 A.M

9.00 A.M to 10.00 A.M (yoga for adults)
Initially Janani Priya, Indulekha, Meehalshi,
they took class for adults and all well, as
women.

Babeesh and me also took class for adults.

10.00 A.M to 11.00 A.M (yoga for women)
Indulekha, Nalini, Dipki there took class
for women. When they were taking class at that
time they was fully concentrated.

11.00 a.m to 1.00 P.m (yoga therapy)
After yoga for women class the next session
started yoga therapy.

The session for the yoga therapy of
∴ That was also yoga therapy class
for the village people. They asked many questions
about deskrip perpus and they answered
their adults.

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Date _____

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1.00 p.m to 2.00 p.m (Lunch break)

2.00 p.m to 4.00 p.m (Competition for children)

Rumli, Ramatchi, Satyaki Chakraborty they took class for last day's cultural yoga competition purpos. Minimum more than 13 students was involved that yoga competition class.

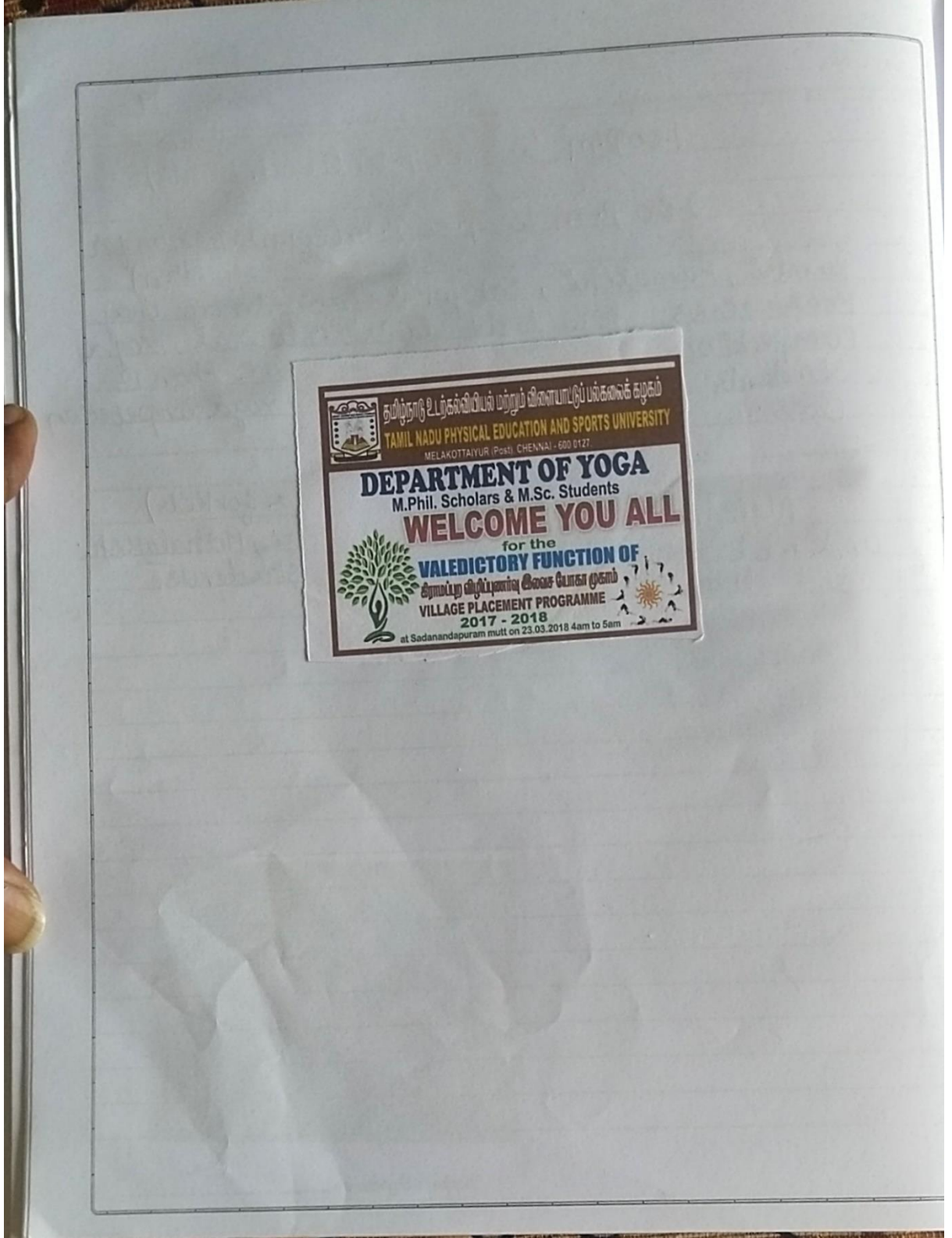
4.00 to 5.00 p.m (yoga for kids)

Nalini, Janani Priya, Kayatri, Mahalakshi and me took class for general students and also aged persons.

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VALEDICTION

. DAY - V

23 March, Friday
2018

Teacher's Signature : _____

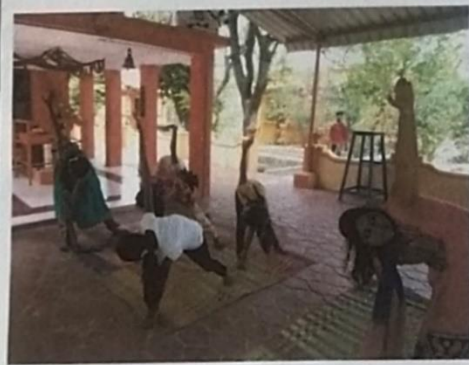


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Date

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The last day's programme was started
at 9.00 a.m

9.00 a.m to 10.00 a.m (yoga for adults)
Janani Priya, Indulekha, Jayanthi, Aishwarya
They took class for adults students and as
well as aged people and me also
took class for adults students.

10.00 a.m to 11.00 a.m (yoga for women)
Janani Priya, Nalini, Dipki, Indulekha They
took class for women people.

11.00 a.m to 1.00 p.m (rehearsal)
Rumki, Satyaki, Kamachi and me They took
class for stage programme perpus like advance
asanas pyramid, level veriyas types of model
they thought to them.

1.00 p.m to 2.00 p.m
(Lunch break)

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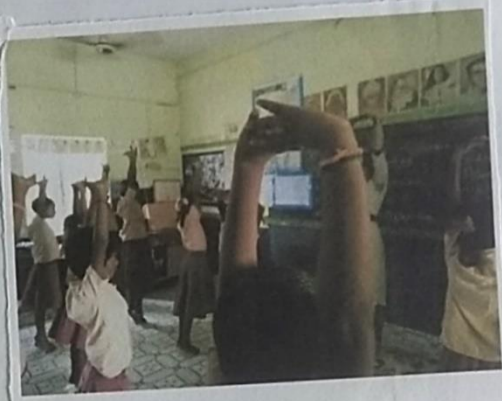


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2.00 P.m to 4.00 P.m (Preparation for function)

Preparations and arrangements were made so early on the valedictory programme in an organised manner.

4.00 P.m to 5.00 P.m (Valedictory function)

Valedictory function are started, many guest are came with our H.O.D and Murgesan Sir and Math's Mokka.

After the speech section, yoga dance group done a super yoga programme and yoga dance.

At last H.O.D Logout closing ceremony after that the guests are gave gifts to the students and prize distribution by M.Phil scholars and M.Sc students after that closed the camp.

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Conclusions:-

The village participation programme in the Sandhanada Puram village was held from 19-03-18 to 23-03-2018 by the M.Phil and 1st M.Sc and year students of TAMIL NADU PHYSICAL EDUCATION AND SPORTS UNIVERSITY - Chennai :- 600127. We have fought the free yoga camp of awareness perps.

The programme was very useful to the sandhananda village people and created a awareness of mental and physical sociological harmony of health.

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PPS18CT404- THESIS

Students are required to submit a thesis at the end of the year. The thesis shall embody the record of original investigation under the guidance of a supervisor.



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GLOBAL

Supportive Documents

ANATOMY AND PHYSIOLOGY

COURSE CODE - UBK23CT 103
ANATOMY AND PHYSIOLOGY

Learning Objectives

1. To impart knowledge on structure and functions of different organs
2. Learn the integrated functioning of cells, tissues, organs and systems
3. To introduce the interrelationship between nutritional science and physiological functions

UNIT-I Cell Biology: Introduction to human anatomy, Anatomical terms, language of anatomy, levels of organization, various organ systems. Cell: Definition, structure and function. Cell division: Mitosis and Meiosis. Tissues: Definition, classification and function- Epithelial tissue, Connective tissue, Muscle tissue and Nervous tissue-Body Membranes.

UNIT-II- Blood: Definition and Functions- Composition of blood – Types and Functions of blood cell –Red Blood Cells (RBC) -Hemoglobin, White Blood Cells (WBC)- Types of White Blood Cells – platelets and Plasma. Blood Grouping and Typing. Blood Clotting - Definition and Mechanism.

UNIT-III –Bones: Histology and Physiology of Bones -A brief introduction to bones, joints, ligaments and muscles of the body-Structure and Functions of Skeletal System. Anatomical terms of bones - axial skeleton, appendicular skeleton. Bones of the upper limb, Bones of the lower limb, the vertebral column, the sternum, ribs and the skull. Types of Bones- Sex Differences in the Skeleton.

UNIT-IV Cardiovascular System: Position, Structure and Function of the heart. – Types of Blood Vessels: Arteries, Capillaries and Veins. Cardiac Cycle and Heart Sounds. Blood Flow - Arterial Pulse and Blood pressure – Definition, Procedure to measure and its values. Types of circulation: Systemic, Pulmonary, Coronary and Portal circulation. Lymphatic system- structure and function.

UNIT-V Respiratory system: Structure and Functions of Upper and Lower Respiratory System. Mechanism of breath inspiration and Expiration. Mechanism and Control of respiration., Gaseous exchange in lungs and tissues, Transport of oxygen and carbon dioxide.



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HUMAN ANATOMY AND PHYSIOLOGY - II

HUMAN ANATOMY AND PHYSIOLOGY – II

Learning Objectives:

1. By learning the subject, the students will be aware of the various anatomical structures present in Human body.
2. The students after learning will gain knowledge about the normal functioning of various organs in Human body.
3. Only after knowing about normal functioning of the human body the students will the students will know about effect of exercise on various system.

UNIT-I- Digestive system - Mouth and its parts. Teeth - Classification, types and function. Salivary Glands – Position, types and function. Gastro Intestinal Tract - Esophagus, Stomach, Small intestine, Large intestine and Anus - Structure and function. Pancreas structure and Digestive function. Liver - structure and function. Secretion of Enzymes for Digestion in Gastro Intestinal Tract.

UNIT-II- Endocrine systems- Definition and classification. Anterior Pituitary hormones and their functions - Posterior Pituitary hormones and their actions - Thyroid hormones, Biosynthesis and functions - Parathyroid hormones, functions, Adrenal cortex hormones and their functions. Adrenal medullary hormones and their actions, Pancreas, Thymus Gland, Ovary and Testis.

UNIT-III- Nervous System- Definition and Classification. Neuron –Definition and types. Central Nervous Systems - Structure and Function of Cerebrum, Cerebellum, Pons, Hypothalamus, Medulla Oblongata and Spinal Cord. Peripheral Nervous Systems-Sensory and Motor nerves and impulses. Autonomic Nervous Systems- Sympathetic and Parasympathetic nervous systems. Cranial Nerves-Types and functions. Reflex action-Definition, Explanation and example.

UNIT-IV- Male and Female Reproductive Organs- Structure and Function of External genitalia, Ovary, Uterus and Fallopian tubes. Ovum – Definition and Structure. Male Reproductive Organs- Structure and Function of External genitalia, Epididymis, Vasdeferans, Prostate gland and Testis.



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PHYSICAL FOR BIOMECHANICS

COURSE CODE

UBK23CT204 PHYSICS FOR BIOMECHANICS

Learning Objectives

1. To learn about fundamentals of physics and SI Units
2. To learn the laws of motion and projectiles
3. To learn about optics and acoustics
4. To learn about fluid dynamics and electricity and semi-conductors

Unit – I

Units and Measurement: Branches in Physics - Role of Physics in Sports and Biological System - SI Base Quantities and Units - Fundamental and Derived Quantities and their Units - Measurement of different quantities - Accuracy and Precision - **Error Analysis - Significant and round off – Dimensional Analysis - Application of Unit and Measurements in sports.**

Unit -II

Laws of Physics and Motion: Rest and Motion - Displacement and Distance - Velocity and Acceleration - Momentum – Force and Reaction - Moment, Torque and Couple - Free Fall and Vertical upward motion – Projectile Motion (Horizontal Projectile and Angular Projectile) - Circular Motion - Inertia and mass - Angular velocity and Acceleration - Kinematic of circular motion - Application of Laws of Motion and application of projectile motion in ball sports. Work, power and energy.

Unit III

Optics and Acoustic: Law of Reflection - Types of the lens - Laws of Refraction - Types of Mirror - Prism - Snell's Law- Refractive Index - Human Eye - Working Principle of Optic Fibre - Hygen's Principle - Coherent and Incoherent - Nature of Sound - Difference between Sound and Light - Types of Wave - Echo - Noise cancellation Technique - Human Ear - Resonance - Application of optics in binocular, Range finder in golf and archery sight - Application of acoustic in Sport indoor stadium or hall.



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Unit IV

Applied Fluid Dynamics and Solid Mechanic: Fluid Dynamics Terminology - Types of Fluids - Viscosity effect based on Temperature - U-Tube manometer - Pascal Law - Bernoulli's principle - Drag and Lift - Types of Material - Stress and Strain - Hooks Law - Types of Stress and Strain - Factor of Safety - Types of Modulus. Role of Fluid Dynamics in water sports - Role of Aerodynamics in Cycling - Role of Solid Mechanics in Sports Helmet and Pole Vault.

Unit V

Electricity and Semiconductors - Basic Electricity Terminology - Circuit - Series and Parallel Connection - Power - Heating effect - of Current- Energy Consumption - AC and DC Current - Types of Battery - Semiconductor - Energy Level - P and N Type - Doping - Types of diodes - Application of Semiconductor.

Reference

1. John D. Cutnell and Kenneth W. Johnson, Introduction to Physics, Wiley, 10th Edition.
2. H C Sharma, Concept Physics: Part I, 2016 Edition.
3. H C Sharma, Concept Physics: Part II, 2016 Edition



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MATHEMATICS FOR BIOMECHANICS

COURSE CODE - UBK23CE 201 MATHEMATICS FOR BIOMECHANICS

Learning Objectives:

1. To learn and understand about Matrix and basic algebra
2. To understand sets and function and trigonometry
3. To Learn about integral calculus
4. To learn about complex numbers

Unit I

Matrix and Determinants: Definition - Order or size of a matrix - Types of a matrix, Row matrix, Column matrix, Square matrix, Diagonal matrix, Triangular matrix, Scalar matrix, Identity (or) unit matrix, Zero matrix (or) Null matrix, Equality of matrix, Transpose of matrix - Scalar multiplication - System of linear equation (Gaussian elimination) - Determinants. **Basic Algebra:** Real number system - Absolute value - Linear inequalities - Quadratic functions - Polynomial functions - Rational functions - Exponents and radicals - Logarithm.

Unit II

Sets and Function: Definition - Types of the set (finite set, infinite set, empty set, singleton set, equal set, equivalent set, power set, universal set, subset) - properties of a set - set operation (union of set, intersection of set, complement of set, Cartesian product of set, difference of set) - Constants and Variable Functions- Relation - Graphing functions using transformations. **Trigonometry:** Introduction of trigonometry - Understanding trigonometry, Trigonometry ratio - Graph of Trigonometric function - Trigonometric identities - Radian measure - Solution of triangle - Properties of triangle - Application to triangle - Inverse trigonometric functions - Principal Value of Inverse Trigonometric Functions - Properties of Inverse Trigonometric Functions - Measuring Heights, depth and Distance - Application of trigonometry in Sports.

Unit III

Two-Dimensional Analytical Geometry, Sequences and Series: Introduction - Locus of Point - Straight lines - Angle between two straight lines - Pairs of straight lines - Finite sequences and series - Infinite sequences and series. **Vector Algebra:** Definition - Scalar, Vector, Magnitude of a



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Negative vector) - Addition of vector, Parallelogram law of addition of vector, Position vector, Properties of multiplication of vector by a scalar. **Differential Calculus:** Limits - Continuity - The concept of derivative - Differentiability and Continuity - Differentiation rules - Meaning of Derivatives - Mean Value Theorem - Series Expansions - Indeterminate Forms - Applications of First Derivative, Second Derivative and Optimization - Symmetry and Asymptotes - Sketching of Curves.

Unit IV

Partial and Ordinary Differential: Linear Approximation and Differentials - Functions of Several Variables - Limit and Continuity of Functions of Two Variables - Partial Derivatives - Approximation - Differential Equation, Order, and Degree - Classification of Differential Equations - Formation of Differential Equations - Solution of Ordinary Differential Equations - Solution of First Order and First-Degree Differential Equation - First Order Linear Differential Equations - Applications of First Order Ordinary Differential Equations.

Unit V - **Integral Calculus and Application**

Newton-Leibnitz Integral - Basic Rules of Integration - Integrals of the form $f(ax + b)$ - Properties of Integrals - Methods of Integration - Fundamental Theorems of Integral Calculus and their Applications - Bernoulli's Formula - Improper Integrals - Reduction Formulae - Gamma Integral - Evaluation of Bounded Plane Area by Integration - Volume of a Solid obtained by Revolving Area about an Axis. **Complex Number:** Complex Numbers - Basic Algebraic Properties of Complex Numbers - Conjugate of a Complex Number - Modulus of a Complex Number - Geometry and Locus of Complex Numbers - Polar and Euler form of a Complex Number - de Moivre's Theorem and its Applications



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KINESIOLOGY

KINESIOLOGY

Learning Objectives:

1. To make students understand the in foundations of kinesiology.
2. To make them aware about the fundamental movement of human body.
3. To make them learn the role and functions of muscles.
4. To enable them to learn the exercise program to strengthen and stretch the muscles.
5. To make them to acquire a strong foundation in kinesiology.

Unit-I

Kinesiology, meaning, history, scope and importance- muscle fiber architecture- uni-joint, two joint and multi joint muscles factors affecting muscular force generation; force velocity relationship, length tension relationship, electromechanical delay - functional role of skeletal muscles- planes and axis – fundamental movements of joints – role of muscles.

Unit-II

structure of shoulder joint and shoulder girdle - origin, insertion and action of shoulder joint muscles and shoulder girdle muscles- - common injuries of the shoulder- Exercise program to stretch and strengthen the shoulder joint muscles. Structure of elbow joint- and wrist joint - Origin, insertion and action of elbow joint and wrist joint muscles- common injuries of elbow and wrist- Observation, palpation, and manual muscle testing - Range of motion assessment and joint mobility. Exercise program to stretch and strengthen the elbow joint and wrist joint muscles.

Unit-III

Structure of pelvic girdle and hip joint - Origin, insertion and action of pelvic girdle and hip joint muscles- common injuries of hip joint - Observation, palpation, and manual muscle testing - Range of motion assessment and joint mobility. Exercise program to stretch and strengthen the pelvic girdle and hip joint muscles.



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Unit-IV

Structure of knee joint and ankle joint - Origin, insertion and action of knee and ankle joint muscles- common injuries of knee and ankle - Observation, palpation, and manual muscle testing - Range of motion assessment and joint mobility. Exercise program to stretch and strengthen the knee and ankle joint muscles joint muscles

Unit-V

Structure of spinal column - Origin, insertion and action of spinal column muscles- Common injuries of spinal column-Exercise program to stretch and strengthen the spinal column muscles joint muscles. Observation, palpation, and manual muscle testing - Range of motion assessment and joint mobility. Kinesiological analysis of fundamental movements.



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BASIC BIOMECHANICS

COURSE CODE – UBKCT304 BASIC BIOMECHANICS

Learning objectives:

1. To enable the students to learn the basic concept of biomechanics.
2. To make the students to understand kinematic and kinetic concept of human movement.
3. To equip the students to learn the principle of aerodynamic and hydrodynamics.
4. To enable the students to acquire the skills of qualitative and quantitative of human movement.

Unit-I

Biomechanics – Sports Biomechanics- branches of biomechanics; statics, dynamics, kinematics, kinetics-Definition - Meaning - Scope - Need and importance of Biomechanics - Historical development of Sports Biomechanics - Scholarly societies-International Journal of sports Biomechanics-International society of Biomechanics-American society of biomechanics-Canadian society of biomechanics-European society of biomechanics-AAPHERD-ACSM-Journals in Biomechanics.

Unit-II

Kinematic concepts for analyzing human movement - Kinematics; linear and angular kinematics- distance, displacement, speed, velocity and acceleration-forms of motion, linear motion, angular motion and general motion- tools for measuring kinematic quantities- common units of kinematic quantities. Kinetic concepts for analyzing human movement- Inertia, mass, force, net force, centre of gravity, weight, pressure, volume, density, specific weight, torque, impulse- common units of kinetic quantities- mechanical loads on the human body; compression, tension and shear force- mechanical stress' torsion, bending and combined loads- scalar, vector, composition and resolution, graphic solutions of vector problems- trigonometric solutions of vector problems- tools for measuring kinetic quantities



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Linear kinematics of human movement - Linear kinematics- kinematics of projectile motion; horizontal and vertical components, influence of gravity, influence of air resistance- factors affecting projectile trajectory; projection angle, projection speed, relative height of release, optimum projection conditions, analysing projectile motion, equations of constant acceleration. Angular kinematics of human movement - Angular kinematics- measuring angles-relative and absolute angle-tools for measuring body angles- instant centre of rotation- angular kinematic relationship-; angular distance and displacement, angular speed and velocity, angular acceleration- relationship between linear and angular motion; linear and angular displacement, linear and angular velocity, linear and angular acceleration

Unit-IV

Linear kinetics of human movement - Newton laws; Law of inertia, law of acceleration and law of acceleration- law of gravitation- mechanical behaviour of bodies in contact; friction, static friction, kinetic friction, coefficient of friction- momentum – impulse- impact- coefficient of restitution- work, power and energy relationship- conservation of mechanical energy- principle of work and energy. Equilibrium and human movement - Torque, moment arm, couple, resultant joint torque, levers; types of levers, anatomical and mechanical levers- equations of static equilibrium- equations of dynamic equilibrium, centre of gravity and location of centre of gravity, location of human body centre of gravity; reaction board, segmental method- stability and balance. Angular kinetics of human movement - Resistance to angular acceleration; moment of inertia, determining moment of inertia, human body moment of inertia- angular momentum; conservation of angular momentum, transfer of angular momentum, change in angular momentum, angular analogues of Newton laws of motion- centripetal force and centrifugal force

Unit-V

Human movement in a fluid medium- The nature of fluids; fluid, relative motion, relative velocity, laminar and turbulent flow, fluid properties- buoyancy; characteristics of buoyant force, Archimedes's principle, centre of volume, floatation- drag, coefficient of drag, skin friction, surface drag, viscous drag, form drag, profile drag, pressure drag, wave drag- lift force, coefficient of lift,



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HUMAN GAIT, POSTURE AND CORRECTIVE EXERCISE

COURSE CODE – UBK23CT403

HUMAN GAIT, POSTURE AND CORRECTIVE EXERCISE

Learning objectives:

1. Know the basic parameters of human gait
2. Characterize normal human gait
3. Know the methods of gait analysis and assessment
4. Sketch the normal ranges of motion of the various joints during a gait cycle.
5. Describe various types of pathological gait.
6. Identify causes and compensation mechanisms for pathological gait.
7. Describe measurements used in analysis of human movement.
8. Understanding human posture, deformities and corrective exercise .

Unit-I

Fundamentals of gait - Meaning of gait, gait cycle divisions, Rancho Los Amigos gait terminology. **Gait parameters** - Temporal variables - stance time, single limb and double support time, swing time, stride and step time, cadence, speed. Spatial variables- stride length, step length and width, degree of toe out. Joint motion – Sagittal, frontal and Transverse plane joint angles. **Functional sub divisions of gait cycle** - Passenger unit, locomotor unit. Locomotor functions – Propulsion, stance stability, shock absorption, energy conservation.

Unit-II

Normal gait – Ankle foot complex – motion, muscle control and functional interpretation. Knee - motion, muscle control and functional interpretation. Hip - motion, muscle control and functional interpretation. Head, trunk, and pelvis - motion, muscle control and functional interpretation. Arm - motion, muscle control and functional interpretation. Total limb function- initial contact, loading response, mid stance, terminal stance, pre-swing, initial swing, mid swing, terminal swing.



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Unit-III

Pathological gait - Pathological mechanisms – deformity, muscle weakness, sensory loss, pain, spasticity. Abnormal gait - Structural impairment - leg length discrepancy, increased Q-angle, increased tibial torsion, increased pronation and supination of the foot. Functional impairment - Parkinson's gait, calcaneal gait, gluteus medius gait, gluteus maximus gait, antalgic gait, arthrogenic gait, ataxic gait, hemiplegic gait, scissors gait, foot drop gait, stiff knee gait, psoatic limp gait. Walking aids, types, prescription and indication.

Unit – IV

Kinematic methods of gait analysis - Observational gait analysis - Motion analysis – Qualitative analysis – Quantitative analysis – 2-Dimensional analysis, 3-Dimensional analysis - Motion marker systems- sagittal, coronal and transverse plane landmarks. Electro goniometers, Accelerometers. **Kinetic methods of gait analysis** – Electromyography – Ground reaction force and vector analysis – Instrumented walkways – Energy expenditure – normal walking speed, fast walking speed, and running.

Unit- V

Human Posture and corrective Exercise: Postural Assessment Techniques - Overview of postural assessment methods - Observation, plumb lines, and grids in assessing alignment - Use of technology for objective posture analysis- Normal and Abnormal Postural Patterns - **Examination of ideal and neutral posture** - Identification of common postural deviations - Relationship between postural deviations and biomechanical factors - **Muscular Imbalances and Posture** - Understanding the role of muscles in maintaining posture - Imbalances between agonist and antagonist muscles - Muscle length-tension relationships and their effect on posture - **Corrective Exercise Techniques** - Strengthening weak muscles and inhibiting overactive muscles - Mobility and flexibility exercises for improving posture - Integrating stabilization exercises into a program.



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PHYSIOLOGY OF EXERCISE AND ERGOGENIC AIDS

COURSE CODE: UBK23CT404

PHYSIOLOGY OF EXERCISE AND ERGOGENIC AIDS

Learning objectives:

1. To understand basic sports physiology and the physiological factors affecting health, fitness and performance.
2. To familiarize with knowledge of health and skill related components of physical fitness.
3. To explore how the body adapts sports & exercise activities.
4. To identify exercise needs of a person/team and design appropriate exercise interventions.

Unit I

Exercise physiology- definition, need and importance. Energy, work and power - Forms of energy- chemical, kinetic and potential- **ATP** - role, breakdown, re-synthesis of ATP- The principle of coupled reactions; exothermic and endothermic reactions- **ATP resynthesis**: three energy systems – ATP/PC (alactic) – The lactic acid system – The aerobic system - Detail required to include the type of reaction (aerobic or anaerobic), the chemical or food fuel used, the specific site of the reaction, the controlling enzyme, energy yield, specific stages within a system, and the by-products produced

Unit II

Energy continuum

The type of exercise (duration and intensity) – the onset of blood lactate accumulation/OBLA) -The effect of the level of fitness, availability of oxygen and food fuels, and enzyme control on the energy system used - **The recovery process**: returning the body to its pre-exercise state - The oxygen debt / excess post exercise oxygen consumption (EPOC) - The alactacid and lactacid debt components, including the processes that occur and the duration of each component -Replenishment of myoglobin stores and fuel stores, and the removal of carbon dioxide - implications of recovery process to be considered when planning training sessions, for example training intensities, work/relief ratios.



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Unit III

Principles of training: Specificity, progression, overloads (FIT), reversibility, moderation, and variance - The physiological implications of a warm up and cool down (for example, reduce the delayed onset of muscular soreness – DOMS) - periodization of training to include the macro, meso and micro cycle- Awareness of the implications of the principles when applied to the candidate's own training.

Unit IV

Components of fitness

Aerobic capacity - Definition – factors affecting- training, age and sex - Methods of evaluating aerobic capacity (for example, multi-stage fitness test, PWC170 test) - Assessment of the candidate's own VO₂ max., matching their result against the aerobic demand of their chosen activity -Types of training- continuous running, repetition running, fartlek and interval training - - Energy system and food/chemical fuels used during aerobic work - Physiological adaptations after aerobic training- **Strength** - Definition- types of strength – Strength endurance – maximum strength – Explosive/elastic strength – Static and dynamic strength -Factors affecting strength-, -Types of training used to develop strength -The repetition, sets and resistance guidelines used to improve each type of strength - Use of multi-gym, weights, plyometrics and circuit/interval training (work intensity, work duration, relief interval, number of work/relief intervals)- Energy system and food/chemical fuels - physiological adaptations after training, including neural and physiological changes to skeletal muscle- physiological adaptation to flexibility , Body composition, Balance, coordination, Reaction time and speed training.

Unit V

Ergogenic aids - An awareness of current methods of performance enhancement - The effects of each aid - Which athletes would benefit from each aid - Nutritional aids: – Carbohydrate loading – Pre/post competition meals – Food/fluid intake during exercise: Use of creatine supplements -Blood doping and recombinant erythropoietin (Rh EPO) - Effects of caffeine -Effects of alcohol - Anabolic steroids (e.g., Nandrolone)- Human



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APPLIED BIOMECHANICS

APPLIED BIOMECHANICS

Learning Objectives:

1. To familiarize the students with basic electronic devices.
2. To introduce the students the basic properties of high-speed cameras and calibrations.
3. To enhance their ability to assess and analyse human locomotion.
4. To provide students with a strong mechanical foundation to acquire the professional competence, knowledge and skills.
5. To study electromyography and force platform used for kinetic quantity measurement
6. To provide knowledge about advanced equipment and their significant practical applications in biomechanics.

Unit-I

Spots and exercise biomechanist- role and functions- research, scientific support services, education, consultancy- Analysis services; qualitative analysis, quantitative analysis- Procedures; ethics, pre analysis preparation, detailed reporting. **Sensors and**

Transducers:

Principles of sensors and transducers in biomechanics - Types of sensors: force, pressure, strain, acceleration, etc. - Calibration, accuracy, and reliability of sensors.

Unit-II

Motion Capture and Analysis: Overview of motion capture technologies - 2D and 3D mocap - Camera-based systems, marker placement, and data collection - Processing and interpretation of motion capture data- Marker less camera and procedures - Data Processing and Analysis. **Data acquisition systems and software tools** - Filtering, smoothing, and processing biomechanical data – IMU sensors and its uses in sports



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Unit-III

Force and pressure measurement - Force platform- piezoelectric and strain gauge technology - calibration- 2D and 3D force plates. Force Measurement and Analysis.

Techniques for measuring ground reaction forces: Instrumented treadmills, force plates, and load cells - Center of pressure analysis and force-time curves. **Pressure**

Measurement and Gait Analysis - Applications of pressure sensors in biomechanics. Plantar pressure measurement, foot pressure distribution analysis - Role of pressure measurement in gait analysis.

Unit-IV

Surface electromyography- equipment considerations- data collection procedures; electrode configuration, location and orientation, skin preparation, cross talk- sampling- processing, analyzing and presenting EMG- reporting an EMG study. **Isokinetic dynamometry-**Applications of isokinetic dynamometry- mechanical basis of isokinetic dynamometry measurements- isokinetic equipment considerations- isokinetic experimental and data collection procedures- processing, analyzing and presenting isokinetic data- reporting an isokinetic study. Eye tracker and its uses in sports

Unit-V

Instrumentation for Sports Performance Analysis: Technologies for analyzing sports-specific movements - Use of wearable sensors, accelerometers, and GPS devices - Real-time feedback and performance enhancement. **Emerging Technologies in Biomechanical Instrumentation** - Overview of current trends and innovations - Wearable sensors, virtual reality, artificial intelligence - Implications for future biomechanical research and applications. **Prosthetics, Orthotics, and Assistive Devices:** Biomechanics in designing and fitting prosthetics and orthotics - Improving mobility and function through assistive devices - Case studies of innovative biomechanical solutions. **Biomechanics of Footwear:** Impact of footwear on gait, running, and jumping mechanics - Components of sports footwear: outsole, midsole, upper - Designing and selecting footwear for different sports disciplines



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RESEARCH METHODS AND STATISTICAL PROCESS IN SPORTS SCIENCES

COURSE CODE -UBK23CT502

RESEARCH METHODS AND STATISTICAL PROCESS IN SPORTS SCIENCES

Learning objectives:

1. To equip students with a basic concept of research.
2. To enable the students to learn the sampling techniques.
3. To enable students to choose the most appropriate research method / design to address a particular research question.
4. To equip the students to prepare a research proposal for grants.
5. To enable the students to prepare a research thesis/report/article for a journal.
6. To enable the students to learn the basic concepts of statistics.
7. To acquire the skills of parametric and non-parametric statistical methods and apply the appropriate technique for a research data analysis.

UNIT-I

Fundamentals of Research- Meaning and Definition of Research, Scope of Research in sports sciences, Qualities and Characteristics of Scientific Research - Criteria for locating and selecting a research problem - Delimitations and Limitations of a problem- Hypothesis and its formulation - Sampling- Sampling and Population, Sampling Techniques - Characteristics of a good sample - Sampling errors- Types of Research based on purpose – Basic research, Applied research, Action research – Types of research based on methods – Descriptive research, Experimental research.

UNIT-II

Variables - Independent, Dependent, Extraneous and Intervening, Experimental, Control variables. Research design – Types of Research design – Single group design, Repeated measures design, Static group comparison, Random groups design, Post-test only random group design, Related groups design, Rotation group design, Quasi experimental design and Factorial design - Methods of Data Gathering and Sampling – Survey, Questionnaire, Interview, Case study, Observation, Opinionnaire.



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Chapterization of Thesis / Dissertation - Front Materials, Body of thesis, Back materials, Method of Writing research proposal, Thesis / Dissertation - Method of writing abstract, full paper for presenting in a conference, publishing in journals, Mechanics of writing Research Report, APA referencing style, Plagiarism.

UNIT- IV

Introduction to statistics types, classification and basic concepts of statistics – Levels of measurement - Measures of central tendency – Mean Median and Mode – Measures of variability - Range, Mean deviation Quartile Deviation and standard deviation. Introduction to Normal distribution – Normal curve – Characteristics of Normal Curve – Properties of Normal curve - Testing of Hypothesis: Hypothesis – Type I & II error- Parametric and Non parametric statistics.

UNIT- V

Test of significance of a single Mean – Difference between two means for small and large sample tests – paired t – test for difference of mean. One way and two way analysis of variance – Post hoc tests - Scheffe's, Newman, Duncan, Tukey – Analysis of covariance. Pearson product moment correlation – Rank order correlation – Bi-serial Correlation-bhi coefficient - Detrahoric correlation- Partial and Multiple correlation – Chi square – contingency coefficient - SPSS Package – Introduction and application – creating, saving and opening a data file – Data entry and analysis of descriptive statistics, dependent and independent t-test, one way and two way ANOVA, ANCOVA, Repeated Measure and correlation – Naming the variables – editing the output file.

Reference:

1. Clarke, David H. Clarke, Harrison H. **Research Process in Physical Education**, New Jersey: Prentice Hall Inc. 1984.



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SPORTS PERFORMANCE ANALYSIS

SPORTS PERFORMANCE ANALYSIS

Learning Objectives:

1. To make the students to learn the fundamental and advance strategies of performance analysis.
2. To enable the students to acquire the video capturing technique.
3. To make the students to learn and acquire the skills of using sports performance analysis software.
4. To enable the students to acquire the skills of sports performance analysis.
5. To enable the students to diagnose the strength and weakness of a player / team.
6. To create a platform for the students to choose sports perform analysis as a career.

Unit-I

Sports Performance analysis – meaning, need and importance of sports performance analysis, careers opportunities in sports performance analysis – purpose of sports performance analysis – match analysis, work rate analysis. Sports performance analysis methods and procedures

Unit-II

Notational Analysis - Sport-specific notational systems; computerised notational analysis; notation in individual sports; notation in team sports; augmented feedback through video-based technologies; modelling of competitive sport; analysis of structures of sports informing performance indicators; flowcharts and presentation models of sports performance; reliability and validity of notational data; data processing; probability analysis; literature searching; critical evaluation of literature.

Unit-III



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Analysis of Sports Technique - Observation of movement; systematic models of qualitative technique analysis; deterministic models of technique analysis; principles of movement (position, orientation, velocity, acceleration, force production); quantitative analysis of performance; accepted 2D filming protocols; comparison to model proformas; assessment of reliability; justification of methods.

Unit-IV

Athlete monitoring and analysis - Time-motion analysis in sport; analysis of athlete tracking systems; GPS and accelerometer analysis of training and competition; monitoring and analysis of sport-specific physical and psychological variables; physiological monitoring; external sources of data relating to sports performance; wind gauge, photo finish, hawk eye technology, goal line technology, hot spot, reliability of data and sources.

Unit-V

Softwares in sports performance analysis – Dartfish, Sports code, Quintic, Kinovea, and Longomatch. Technical requirements, installation procedure, tools, features and report generation.

Reference:

1. Hughes M. and Franks, I. **Essentials of performance analysis in sport.** Routledge. 2015..
2. McGarry, T., O'Donoghue, P. and Sampio J. **Handbook of sports performance analysis.** Routledge. 2013.
3. Peter & Lucy. **Data analysis in sports.** Routledge. 2015.



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BIOMECHANICS OF YOGA

COURSE CODE: UBK23CT602

BIOMECHANICS OF YOGA

Learning Objectives

1. Helping learners to realize biomechanics importance to yoga practice;
2. To learn general biomechanics concepts and principles that influence human movement;
3. Illustrate the use of these general biomechanical concepts in the professional skill for the diagnosis of the movement during yoga practices.

Unit I

Introduction to Kinesiology and the principles of Biomechanics in Yoga

Meaning and Definition of Kinesiology ; Basic Biomechanical terms – velocity; acceleration; angular velocity; angular acceleration; Mass; Pressure; Gravity; Friction; work; Power; Energy; Torque; Bio mechanics: Description of movement of the human body; Kinematics, Kinetics; Kinetics – the forces producing motion e.g. muscles, gravity; Kinematics – the description of motion e.g. type, location, direction, planes of movement; Type of displacement (movement); Location in space; Direction of movement; Magnitude of movement; Rate of movement; Importance of Kinesiology and Biomechanics for Yoga

Unit II

Fundamental Concept

Fundamental concepts of following terms – Axes and Planes, Centre of Gravity, Equilibrium, Line of Gravity; Fundamental movements at various joints; Fundamental concepts of the following terms – Angle of Pull, All or None Law, Reciprocal Innervations and inhibition; Stretch and postural reflex during the practice of Yoga postures; Force – Meaning, definition, types and its application to various Yoga postures; Lever – Meaning, definition, types and its application to human body; Newton's Laws of Motion – Meaning, definition and its application to Yoga activities.

Unit III

Biomechanics of Hip and spine

Biomechanics of Hip Structure & function of the bones & non contractile element of the Hip, mechanics & patho-mechanics of muscle activity at the hip & analysis of the forces on the



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analysis of the forces on the cervical spine during activity, structure & function of the bones & joints of the thoracic spine, mechanics of the thoracic musculature, analysis of the forces on the thoracic spine during Yoga Postures & structure & function of the bones & joints of the lumbar spine. c. Mechanics of the lumbar musculature, analysis of the forces on the lumbar spine during Yoga postures, structure & function of the bones & joints of the pelvis, mechanics of the muscle activity in the pelvis & analysis of the forces on the pelvis during activity.

Unit -IV

Biomechanics of Shoulder, elbow and wrist

Biomechanics of Shoulder: Structure & function of the bones & joints of the Shoulder complex, mechanics & patho-mechanics of the muscle activity in the Shoulder complex & analysis of the forces on the Shoulder complex during Yoga postures;

Unit-V

Biomechanics of Elbow: Structure & function of the bones & no contractile element of the elbow, mechanics of muscle activity at the elbow & analysis of the forces on the elbow during Yoga postures; Biomechanics of Wrist & Hand Structure & function of the bones & joints of the wrist & hand, mechanics of the muscle activity in the wrist & hand, analysis of the forces on the wrist during activity, mechanics of the Special connective tissue in the hand

REFERENCE BOOKS

1. Hay, J.G. and Reid, J.G.: Anatomy, mechanics and human motion. Englewood Cliffs, N.J.: prentice Hall Inc. 1988.
2. Knudson, D.: Fundamentals of biomechanics. New York, NY: Springer, 2007
3. McGinnis, P.: Biomechanics of sport and exercise. Champaign, IL: Human



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BIOENERGETICS AND MUSCULAR PHYSIOLOGY

PEN18CT101

Unit I

Muscular System: Types of Muscles - Structure and biochemical properties of skeletal Muscle - Functions, Muscle fibers types – Fast twitch Muscles fibers and slow twitch Muscles fibers, Mechanism of Muscle Contraction: Sliding Filament Mechanism of Muscle Contraction-Types of Muscular contraction.

Unit II

Define Metabolism and Energy: Energy for Muscle Contraction - ATP-PCr system – Glycolytic system – Oxidative system – Fatigue types, Causes and recovery – Cori cycle - Oxygen debt.

Unit III

Neuroendocrine control of Energy metabolism: Glucose Homeostasis, Feed Forward control of Glycemia during exercise, Facilitated glucose transport, insulin and hepatic fat metabolism, insulin response to exercise, Glucagon- Insulin antagonist. Autonomic Nervous system and Catecholamine: Effect of exercise, intensity and training on Catecholamine responses. Growth hormone and exercise, Anti- Diuretic Hormone (ADH) and exercise.

Unit IV

Metabolic response to exercise: Lactate metabolism during exercise and recovery, Metabolic fate of Lactic acid after exercise- lactate as a carbon reservoir during recovery, Exercise related disturbances to mitochondrial function – Temperature, fatty acids and Ions, calcium ion, sympathetic stimulation. Lactic acid turns over during exercise: production, removal and clearance.

Unit V

Training adaptation: Aerobic and anaerobic trainings and their effects on muscles - Muscle Hypertrophy and Muscle Atrophy-Hyperplasia of Muscle Fibers - Muscle soreness - Muscle atrophy and detraining -Rigor Mortis.

TEXT BOOKS:

1. William D.Mcardle, Frank I.Katch, Victor L.Katch, (2005), “Essentials of exercise physiology”, Lippincott Williams and wilkins.



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2. Victor L.Katch, Frank.I. Katch, William D.Mcardle, (2003), "Exercise physiology", Williams and wilkins.
3. Lorry G.Shaver(1981)"Essentials Of Exercise Physiology" Delhi: Surjeeth Publications.

REFERENCE BOOKS

1. William E.Garrett J.R., Donald T.Kirendall, (2000), "Exercise and sports science", Lippincott Williams and wilkins.
2. McArdle William D. (1998) "Essentials of Exercise Physiology" Malveern, Pennsylvania: Lea and Febiger.
3. Berger Richard A. (2003) "Applied Exercise Physiology" United States of America, Lea and Febiger, Philadeiphia.
4. Guyton,Arthur C.(2003) "Text Book of Medical Physiology",(7th edition),Philadelphia: Saunders Company.

PEN18CT102

CARDIOVASCULAR AND RESPIRATORY PHYSIOLOGY

UNII - I

Components of Fitness – Cardiorespiratory endurance – muscular strength – Flexibility – Body Composition. Basic Cardiac Anatomy – structure and functions of Heart – coronary arteries- valves of the heart – cardiac physiology concepts – conducting system of the heart – cardiac cycle – during rest and exercise - redistribution of blood – heart rate variability – importance of sleeping heart rate.

UNII - II

Electrocardiogram – Cardio dynamics – cardiac output – blood pressure –Factors affecting stroke volume – factors affecting cardiac output – measuring blood pressure – blood pressure and venous return. cardiac adaptations in response to aerobic training.

UNII - III

Cardiac electro physiology and mechanics – membrane and cellular structure and function – action potential – cardiac tissue and bioelectricity – cardiac mechanics.



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UNII - IV

Functional anatomy of the Bronchopulmonary system – Anatomy of the respiratory system – Internal and external respiration – respiration – mechanism of inspiration and expiration - alveolar ventilation – Dead space – diffusion and transport of gasses – lung volumes and capacities– O₂ – Haemoglobin – Dissociation curve in different circumstances.

UNII - V

Lung function test – cardiorespiratory endurance test – laboratory tests– direct Method Assessment O₂ and CO₂ through gas analyser by using standard protocol and indirect Method - Harvard step test – field test- 12 minutes run and walk test – Queens college Step test and Beep test - effect of exercise on respiratory system.

TEXT BOOKS:

1. Irwin S. Techlin JS. Cardipulmonary physical therapy: a guide to practice. St. Louis, Mo, Mosby Co., 2004.2.
2. William D. McArdle, Frank I. Katch, Victor L. Katch, (2005), "Essentials of exercise physiology", Lippincott Williams and Wilkins.

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1. McArdle, William D, Frank I. Katch, Victor L. Katch, (2005) "Essentials of Exercise Physiology", Philadelphia: Lea and Febiger.
2. Larry G. Shaver (1981) "Essentials of Exercise Physiology" Delhi; Surjeeth Publication.
3. Amrit Kumar R. Moses, Introduction to Exercise Physiology, (1995), pumpugarpathipagam, Madras.



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ADVANCED HUMAN NUTRITION

PEN18CT103

UNIT - I

Structural features of Carbohydrates –Classification of carbohydrates: Simple Carbohydrates: Monosaccharide – Disaccharides – Complex Carbohydrates: Oligosaccharides – Polysaccharides – Digestion: Digestion of Polysaccharides - Digestion of Disaccharides – Absorption of Glucose and Galactose- Absorption of Fructose - Monosaccharide Transport and cellular Uptake- Glucose Transporter-Maintenance of Blood Glucose level – Glycemic response to carbohydrates: Glycemic Index - Glycemic Load.

UNIT - II

Proteins – Functional Categories: Catalysts- Messengers-structural elements- Immunoprotectors –Transporters - Buffers - Fluid balance - Other role-Protein Digestion and Absorption - Amino acids: Essential amino acids and Non-essential amino acids - Kinds of Proteins: Complete Proteins and Incomplete Proteins – Functions of Proteins in the body - Nitrogen Balance.

UNIT - III

Lipids - Kinds of Lipids: Simple Lipids: Fatty acids-Saturated fatty acids- Unsaturated fatty acids and Trans Fatty Acid - Essential Fatty acids: Linoleic acid (an omega-6 fatty acid) and linoleic acid (an omega-3 fatty acid) and Non-essential Fatty acids (omega-9 fatty acid) – Triglyceride – Sterols - Compound Lipids: Phospholipids – Glycolipids-Lipoproteins Derived Lipids: Cholesterol- Functions of Cholesterol - Total Cholesterol - High density lipoproteins - Low Density Lipoproteins-Lipids Digestion and Absorption.

UNIT - IV

Vitamins - Classification of vitamins: Fat soluble vitamins - A (Carotenoids), D, E and vitamins K - Water soluble vitamins: Vitamin C (Ascorbic Acid) and B complex group: Thiamine (Vitamins B₁)-Riboflavin (Vitamins B₂) - Niacin (Vitamins B₃)- Pantothenic Acid - Biotin - Folate -Vitamins B₁₂(Cobalamin) - Vitamins B₆ - Absorption, Transport and storage- Functions and mechanisms of action – Interaction with other Nutrients - Dietary sources - Recommended Dietary allowances (RDA)-Deficiency.



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UNIT - V

Minerals: Classification of Minerals: Macro minerals and Micro minerals: Calcium – Phosphorus – Magnesium- Sodium- Potassium- Chloride- Iron- Zinc- Copper- Selenium Iodine-Manganese - Absorption, Transport and storage- Functions and mechanisms of action – Interaction with other Nutrients - Dietary sources - Recommended Dietary allowances (RDA)- Deficiency.

TEXT BOOKS:

1. Sareen S. Gropper and Jack L. Smith (2009), Advanced Nutrition and Human Metabolism, Wadsworth, Cengage Learning, USA.
2. Heather Hedrick Fink, Lisa A. Burgoon, Alan E. Mikesky, (2006), "Practical Application In Sports Nutrition", Jones and Bartlett.

REFERENCE BOOKS

1. McArdle William D. et.al., (2005) "Exercise Physiology, Nutrition and Human Performance", Philadelphia: Lea and Febiger.
- McArdle, William D., Katch, Frank I and Katch, Victor L (2005) "Exercise Physiology", Philadelphia, Lea and Febiger.



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INTRODUCTION TO HUMAN NUTRITION

UEN18CT202

UNIT I – CARBOHYDRATE -AN IDEAL SOURCE OF ENERGY

Definition of carbohydrate- classification: Simple Carbohydrate – Monosaccharide (glucose, Fructose, Galactose) – Disaccharides (Maltose, Lactose, Sucrose) – Complex Carbohydrate: Oligosaccharides- Polysaccharides (Starch, Glycogen, Cellulose) - Recommended Dietary intake – Food sources - Functions of carbohydrates in the body- Dietary fibre – Definition, soluble and insoluble fibres, sources of fibre, Physiological effects of dietary fibre – prebiotic – probiotic - Role of fibre in human nutrition, sources and requirements.

UNIT II - FAT (LIPIDS)

Definition Lipids-Fat Structure and Function- Types of Fat: Simple Lipid- Compound Lipid and Derived Lipids- Classifications of fatty acids:Saturated fatty acids– Omega 3, 6, 9 - Unsaturated fatty acids and Trans-Fatty Acid - storage of fat in the body – Dietary sources - Dietary Requirements.

UNIT III – PROTEIN-THE BASIS OF BODY STRUCTURES:

Definition Protein- Protein Structure and Functions – Amino acids: Essential and non-essential Amino acids – Kinds of Protein: complete protein and Incomplete Protein – Recommended protein intake - Protein Sources.

UNIT IV –VITAMINS ORGANIC MICRONUTRIENTS:

Vitamins: Fat soluble Vitamins – Vitamin A, D, E and K: Functions, requirements, sources and effects of deficiency - Water Soluble Vitamins: – Thiamine, riboflavin, niacin, ascorbic acid, folic acid, vitamin B6 and vitamin B12: Functions, requirements, sources and effects of deficiency.

UNIT V- MINERALS- INORGANIC MICRONUTRIENTS:

Minerals: Types of Minerals: Macro Minerals- Calcium and Phosphorous: Functions, requirements, sources and effects of deficiency-Micro minerals- Iron, Iodine, Copper, Fluorine and Zinc: Functions, sources, requirements and effects of deficiency. Sodium and Potassium: Functions, sources, requirements and effects of imbalances.

TEXT BOOK

1. Janice Thompson, Melinda Manore, (2005),” Nutrition: An applied approach”, Pearson.



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2. Robert E. C. Wildman, Barry S. Miller, (2004), "Sports and Fitness Nutrition", Thompson.
3. Heather Hedrick fink, Lisa A. Burgoon, Alan E. Mikesy, (2006), Practical Application in sports Nutrition", Jones and Barlett.

REFERENCE BOOKS:

1. McArdle William D. et.al., (2005) "Exercise Physiology, Nutrition and Human performance", Philadelphia, Lea and Febiger.
2. McArdle, William D., Katch, Frank I and Katch, Victor L (2005) "Exercise Physiology", Philadelphia, Lea and Febiger.
3. Srilakshmi B (2015), 'Nutrition Science' Fourth Edition, New Age International Publishers, New Delhi.



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CLINICAL EXERCISE TESTING PROCEDURES

UEN18CT203

UNIT I

Assessment of cardio respiratory variables – YMCA cycle ergometer- treadmill stress monitor - VO₂ max test - PO₂ -PCO₂- lactate threshold- measuring methods of TMR and RMR

UNIT II

Biochemical testing procedure - liver profile test - lipid profile test- measuring pulse rate - blood pressure – testing procedure - sodium - potassium- magnesium - protein- iron and anemia testing procedure

UNIT III

Doping and its types - testing procedure - stimulants - anabolic steroids - hormones and other related substances - estrogen- progesterone- testosterone

UNIT IV

Lung function test - oxygen dissociation curve - assessment of resting lung function - during exercise - assessment of neural transmission - heart rate monitor - Hydration measurement.

UNIT V

Assessment of nutritional status - 3 day food record - 7 day food record - 24 hours recall- food frequency - diet history - role of nutrition software to assess capacity of athlete.

TEXT BOOK

1. Ferrer M, Alonso A, Morera J, et al. Chronic obstructive pulmonary diseases stage and health related quality of life. The quality of life of chronic obstructive pulmonary disease study group. *Ann Intern Med* 1997; 127: 1072–1079.
2. Jones PW. Health status measurement in chronic obstructive pulmonary disease. *Thorax* 2001; 56: 880–887.

REFERENCE BOOKS

1. ATS statement: guidelines for the six-minute walk test. *Am J RespirCrit Care Med* 2002; 166: 111– 117.
2. Kessler R, Faller M, Fourgaut G, Menecier B, Weitzenblum E. Predictive factors of hospitalization for acute exacerbation in a series of 64 patients with chronic obstructive pulmonary disease. *Am J RespirCrit Care Med* 1999; 159: 158–164.



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TEXT BOOK

3. Ferrer M, Alonso A, Morera J, et al. Chronic obstructive pulmonary diseases stage and health related quality of life. The quality of life of chronic obstructive pulmonary disease study group. *Ann Intern Med* 1997; 127: 1072–1079.
4. Jones PW. Health status measurement in chronic obstructive pulmonary disease. *Thorax* 2001; 56: 880–887.



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REFERENCE BOOKS

3. ATS statement: guidelines for the six-minute walk test. *Am J RespirCrit Care Med* 2002; 166: 111– 117.
4. Kessler R, Faller M, Fourgaut G, Menecier B, Weitzenblum E. Predictive factors of hospitalization for acute exacerbation in a series of 64 patients with chronic obstructive pulmonary disease. *Am J RespirCrit Care Med* 1999; 159: 158–164.



KINANTHROPOMETRY

UEN18CT301

UNIT I:

Meaning and Definition of Anthropometry- Kinanthropometry- History and development of Anthropometry and Kinanthropometry -Anthropometrical assessment Identify and mark all anatomical sites for measurement Landmarks - Vertex: Acromiale – Subscapulare – Radiale- Mid-acromiale –radiale –Stylian –Mesosternale –Iliocristale – Iliospinale- Supraspinale –Trochanterion- Mid thigh- Tibialelaterale–Tibialemediale- Sphyrion- Mid-calf

UNIT II:

Meaning and Definition of Somatotype- History and development of Body Types- the Heath-Carter Somatotype Method: Endomorphy –Mesomorphy- Ectomorphy - Classification of Somatotype.

UNIT III:

Meaning and Definition of Body composition- The composition of The Human Body: atomic level- molecular level : Assessment of body composition – Matiegka method (MAT) to estimate body composition - Assessment of Fat mass- Assessment of Fat free mass- Assessment of Lean body mass- Assessment of Body mass (Weight) - Assessment of Stature (Height) – Ideal Body Weight-Fat-Free Mass Index (FFMI) and Fat Mass Index (FMI) - Assessment of Waist-to-hip ratio - cellular level-Tissues, Organs and systems level- whole body level.

UNIT IV:

Body composition Chemical Model-Assessment of Underwater weighing - Assessment of Dual-energy X-ray absorptiometry (DEXA) -Assessment of Bioelectrical Impedance Analysis- Assessment of Near infrared reactance (NIR) - Assessment of Skinfold measurements: Cheek-Chin-chest-Axilla-Triceps-Biceps-Subscapular-Iliac crest – Supraspinale-Abdominal-Front Thigh-Medial calf.

UNIT V:

Segment lengths and Girths: Lengths- Arm length-Forearm length-Hand length-Tibial length – Iliospinale-base height-Trochanterion-base height-Thigh length-Tibialelaterale - base



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height- Girths: Arm girth relaxed- Arm girth flexed and tensed- Forearm girth- Wrist girth- Chest girth- Waist girth- Gluteal girth- Thigh girth- Calf girth- Ankle girth.

TEXT BOOK

1. Eston R., Reilly T. (2009), Kinanthropometry and exercise physiology laboratory manual, Vol.1 3ed., Routledge.
2. Frank Spencer, (1997), History of Physical Anthropology, An Encyclopedia Volume 1 Garland Publishing, Inc, New York & London.

REFERENCE BOOKS:

1. Mike Marfell-Jones, Kinanthropometric Assessments, Private Bag 11022, Palmerston North, New Zealand.
2. Victor L. Katch, William D. McArdle, Frank I. Katch, (2011), Essentials of exercise physiology, Lippincott Williams & Wilkins, a Wolters Kluwer business, Philadelphia.
3. Scott J. Power and Edward Howley, (2009), Exercise Physiology Theory and Application to Fitness and Performance, McGraw-Hill Higher Education, Boston Burr Ridge, IL Dubuque, IA New York.



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SPORTS NUTRITION

UEN18CT302

UNIT I

Science of sports nutrition: Definition of sports nutrition- Need and Importance of sports nutrition- Balanced Diet-Planning Balanced Diets-Recommended Dietary Allowances (RDAs) - Dietary Reference Intakes (DRIs) – Estimated Average Requirement (EAR), Adequate Intake (AI)-Dietary Guidelines- Reference Man and Reference women- Dietary Guidelines -Food guide pyramid-MyPlate- Food Labels.

UNIT II

Energy Yielding Nutrition: Carbohydrates utilized during exercise-Carbohydrates consumed before exercise-Carbohydrates consumed during exercise-Carbohydrates consumed after exercise- Fats consumed before exercise-Fats consumed during exercise-Fats consumed after exercise-Protein consumed before exercise-Protein consumed during exercise-Protein consumed after exercise- Carbohydrates loading.

UNIT III

Energy Metabolism: Definition of Energy Metabolism -Energy – Anabolic process and Catabolic process- Basal Metabolic Rate (BMR) -Resting Metabolic Rate (RMR)-Factors affecting Basal Metabolic Rate (BMR) -Energy Cost of Physical Activities-Thermic Effect of Food- Estimation of Total Energy Needs-Calculating Total Energy Requirements- Energy balance- Human body's source of chemical energy: ATP-CP System- Lactic Acid system- Aerobic system.

UNIT IV

Energy Needs for Athletes: Energy needs different for team sport athletes- Daily energy needs calculation for team sport athletes-Carbohydrate needs for team sport athletes- Protein needs for team sport athletes- Fat needs for team sport athletes-Vitamin and Mineral needs for team sport athletes-Fluid recommendations for team sport athletes-Foods recommended for athletes while traveling.

UNIT V

Choosing A Performance Diet Weight Management- Regulation of body weight and composition: Genetic Influences-Hormonal Influences-Positive energy balance-Negative energy balance-Weight loss methods for athletes-Athletes Gain Weight Healthfully-



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Vegetarian Diets-Vegetarian Diets and Health-Vegetarian Diets and Athletic Performance-
Other Special Eating Plans: Paleo Diet-Raw Food Diet-Detox Diet-Other Diets – LCHF (Low
Carbohydrate and High Fat diet).

TEXT BOOK

1. Natalie DigateMuth,(2015), Sports Nutrition for Health Professionals, F. A. Davis Company, 1915 Arch Street, Philadelphia,USA.
2. Heather Hedrick fink, Lisa A. Burgoon, Alan E. Mikesy, (2006), Practical Application in sports Nutrition”, Jones and Barlett.
3. Robert E.C.Wildman, Barry S. Miller, (2004), “Sports and Fitness Nutrition”, Thomson.
4. Deakin , Burke(2006), 3rd, Clinical Sports Nutrition, McGraw- Hill Austria.
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1. Bean, Anitha (2006), 5thed, Sports Nutrition.
2. Bourns, Fred (ed), Essentials of Sports Nutrition, 2nd Ed (2002), John and Wiley.
3. Benardot, Don (2000), Advanced Sports Nutrition, Human Kinetics.
4. Burke, Louise (2007), Practical Sports Nutrition, Human Kinetics.
5. Gleeson, Jeukendrup (2004), Sports Nutrition: an introduction to energy production and performance, Human Kinetics.



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TRAINING AND PERFORMANCE

UEN18CT303

UNIT - I

Definition of training, performance, aerobic training, aerobic system, volume, Intensity.
Training principles – over load, specificity, reversibility – influence of Gender, Initial fitness level and Genetics – components of work session – Training to improve aerobic power - Interval training – long slow distance – High Intensity Continuous exercise - Training intensity and improvement in VO2 max.

UNIT - II

Definition of Anaerobic training and anaerobic system. Training for improved anaerobic power and capacity - ATP – Pc System – Glycolytic System – muscle adaptation – adaptation in a Lactic Threshold.

UNIT - III

Definition of strength, muscular fitness, resistance training – classification of strength training – Isometric – Isotonic – Isokinetic – factors involved in muscular adaptation – principles of resistance training- physiological effects of strength training – neural and muscular adaptation to resistance training.

UNIT - IV

Definition of Overtraining – Symptoms of overtraining – effect of overtraining – overtraining syndrome – predicting the overtraining syndrome – treating the overtraining syndrome – tapering for peak performance.

UNIT - V

Definition of Retraining, muscular strength, power, muscular endurance, speed, agility, flexibility and cardio respiratory endurance – effect of retraining on muscular strength, muscular endurance, speed, agility, flexibility and cardio respiratory endurance.

TEXT BOOK

- 1.Scott K. Powers Edward T. Howley (2004) “Exercise Physiology- Theory and application to fitness and performance”, Brown and Benchmark.
2. Diek, Frank W. (1978) “Sports training principles “, London: Lepus books.



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REFERENCE BOOKS:

1. E.L.Fox(1979) "Sports Physiology halt: CBS College publishing.
2. Nieman, David C" "The Exercise Health Connection" champaign L: Human kinetics.
3. Jack. H Wilmore and David L. Costill (2004) "Physiology of Sports and Exercise", Human kinetics.



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EXERCISE FOR SPECIAL POPULATION

UEN18CT401

UNIT – I

Children and adolescences – Body composition – Understanding the Basic Training Principles - FITT Guidelines: Frequency-Intensity-Time- Type Aerobic training- Maximum Heart Rate Method- Benefits of Aerobic Fitness - Strength Training-Estimating 1RM- Benefits of Resistance Training - Definitions of Flexibility-Types of Stretching- Benefits of Flexibility – Exercise guidelines.

UNIT-II

Meaning and Definition of Exercise and ageing- Theories of ageing: Biological Theories- Psychological Theories-Sociological theories- Impact of Ageing on Major Physiological Systems and Performance: Cardiovascular and respiratory systems-Musculoskeletal System- Nervous System-Endocrine system -Exercise guidelines for older people.

UNIT-III

Meaning and Definition of Arthritis- Types of Arthritis: osteoarthritis and rheumatoid arthritis- Epidemiology-Pathophysiology-Exercise for Osteoarthritis and Rheumatoid Arthritis: Aerobic Activity-Flexibility Exercise-Proprioceptive exercise-Strength training for osteoarthritis and rheumatoid arthritis.

UNIT – IV

Meaning and Definition of Osteoporosis and Osteopenia- Risk factors for osteoporosis and osteopenia-Assessment of osteoporosis-Physical Activity and Bone Health: Exercise guidelines -Jumping-Walking-Resistance training- Asthma-Diagnosis and Causes- Prevention of Asthma- Exercise-Induced Asthma.

UNIT – V

Relative Energy Diet (RED-S) - Physiology of the Exercising Female: Definition of menstrual cycles-Regulation of Menstrual Cycle – Menstrual disorders for female athletes. The menopause-Cause for Menopause-Physical activity guidelines for the postmenopausal female- Pregnancy-Changes in Physiological Systems-Physical activity guidelines for the pregnant female-Special Considerations.



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TEXT BOOK

1. John P. Buckley, (2008), Exercise Physiology in Special Populations, Advances in Sport and Exercise Science, Churchill Livingstone/Elsevier.
2. Sembulingam. K and PremaSembulingam, (2012), Essentials of Medical Physiology, Jaypee Brothers Medical Publishers (P) Ltd, Ansari Road, Daryaganj, New Delhi.

REFERENCE BOOKS:

1. Longenbaker, Susannah Nelson, (2017), Mader's Understanding, Human Anatomy & Physiology, McGraw-Hill Education, 2 Penn Plaza, New York.
2. Scott J. Power and Edward Howley, (2009), Exercise Physiology Theory and Application to Fitness and Performance, McGraw-Hill Higher Education, Boston Burr Ridge, IL Dubuque, IA New York.



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CLINICAL DIETETICS

UEN18CT303

UNIT - I

Definition of Dietetics, clinical dietetics - Food borne infections – definition- causes – symptoms – characteristics – control measures – types of diets for food borne infections – functions of the Liver - causes of liver damage – Alcoholic liver disease –NAFLD (Non-Alcoholic Fatty Liver Disease) diets for liver disease

UNIT - II

Functions of the Kidney – causes of acute renal failure – dietary intervention for chronic renal failure – Hemodialysis – Continuous Ambulatory Peritoneal dialysis (CAPD)- protein restricted diet.

UNIT - III

Definition of Obesity, Hypertension, Hypercholesterolemia– risk factors for obesity - Insulin Resistance (IR) – PCOD: Hypertension, Hypercholesterolemia – BMI – Measurement of Body fat Percent – Guideline for weight gain – Definition of diabetes – Types - symptoms – dietary guidelines – types of fat – Hyperlipidemia – dietary allowance

UNIT - IV

Definition, causes, symptoms and treatment of Anorexia Nervosa - Dumping Syndrome – Early Dumping – Dietary advice – Late dumping – dietary advice – irritable bowel syndrome – FODMAPs Diet - Symptoms – Dietary treatment – Diarrhea - meaning – definition – symptoms – food to avoid – Mal Absorption Syndrome – causes and symptoms – Coeliac Disease – foods allowed - Cancer – causes – symptoms – Dietary intervention.

UNIT - V

Assessment of Nutritional Status for patient admitted in Hospital – Aim of Nutritional Assessment – Methods of Assessment of Nutritional Status – weight – dietary history – anthropometric measures – Dynamometry (grip strength)- Biochemical measures – special feeding method – Enteral feeding – Home enteral feeding - Parenteral nutrition – method – administration of parenteral solution.



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TEXT BOOK

1. Janice Thompson, Melinda Manore, (2005), "Nutrition: an applied approach", pearson.
2. Heather Hedrick fink, lisa A. Mikesky, (2006), practical application in sports nutrition.

REFERENCE BOOKS:

1. Robert E.C.Wildman , Barry S. Miller, (2004), "Sports and Fitness Nutrition", Thompson.
2. McArdle William D. et.al., (2005), "Exercise Physiology, Nutrition and Human Performance, Philadelphia lea and febiger.



EFFECT OF EXERCISE ON VARIOUS SYSTEMS

UEN18CT403

UNIT -I

Cardiovascular System – Structure and functions of heart- Definitions of Cardiovascular parameters - stroke volume – cardiac output- blood pressure – coronary circulation - cardiac muscle – Arterial - Venous Oxygen Difference (a-v O₂ diff) –Heart rate - blood flow—Availability of nutrients –acute and chronic effect of training on cardiovascular system.

UNIT -II

Respiratory system – structure and functions of lungs – Definition of respiration, inspiration, expiration, diffusion – Ventilation-Perfusion Ratio - factors for exchange of gases –Tidal volume - Vital capacity - Respiratory muscles – homeostasis – PH – oxygen Debt – Oxygen Deficit - acute and chronic effect of training on Respiratory system.

UNIT -III

Muscular system – types of muscle – types of muscle fibre – Definition of – Hyperplasia -Hypertrophy - muscle tone - MET – Posture – Body coordination –muscle spindle – Golgi tendon - acute and chronic effect of training on Muscular system.

UNIT -IV

Nervous System – Structure and functions of Neuron – sympathetic and parasympathetic nervous system – motor unit – screening and facilitation process – Decision making process – pain tolerance - acute and chronic effect of training on Nervous System.

UNIT -V

Structure, function and definition of Pituitary, thyroid, parathyroid, adrenal, pancreas and gonadal hormones –Exercise and hormones.

TEXT BOOK

1. William D. McArdle, Frank I. Katch, Victor L. Katch, (2005), “Essentials of exercise physiology “, Lippincott Williams and Wilkins.
2. Victor L. Katch, Frank. I. K atch, William D. McArdle, (2003), “Essentials of exercise physiology “, Williams and Wilkins.



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3. Lorry G. Shaver (1981) "Essentials of exercise physiology" Delhi: SurjeethPuplications.
4. William E.Garrett J.R., Donald T. Kirendall, (2000), "Exercise and sports science", Lippincott Williams and Wilkins.

REFERENCE BOOKS:

5. McArdle William D. (1998) "Essentials of exercise physiology" Malveern, Pennsylvania: Lea and Febiger.
6. Roger M. Enoka, (2002), "Neuromechanics of human movement", Human Kinetics.
7. Fox, Edward L. and Mathews Donald K. (1981), "The Physiological basis for Exercise and Sports", Kerper Boulevard, Dubuue: Wm. C. Brown Communications, Inc.
8. Amrit Kumar R. Moses (1995), "Introduction to Exercise Physiology", poompugarpathipagam.



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STRENGTH TRAINING AND CONDITIONING

UEN18DE502

UNIT - I

Meaning and Definition of Strength training and conditioning-Benefits of resistance training- Principles of Resistance Training: Progressive overload- Specificity- Variation- Individualization and Detraining-Resistance Training Program Design: Exercise Selection- Exercise order and Workout Structure-Intensity-Training Volume-Rest Intervals-Repetition Velocity-Frequency.

UNIT - II

Competitive forms of Resistance Training- Resistance Training Modalities: Body Weight- Manual or Partner Resistance-Free Weights: Advantages-Disadvantages -Machines: Advantages-Disadvantages -Free Weights versus Machines-Medicine Balls, Stability Balls, Bosu Balls, and Other Balance Devices-Elastic Bands, Tubing, Chains, and springs.

UNIT - III

The SAID Principle: Mechanical Specificity-Neuromuscular Specificity-Metabolic Specificity-Progressive Adaptations from Resistance Training: Stabilization-Muscular Endurance-Muscular hypertrophy-Strength-Power-Resistance Training Systems: The Single-Set System-The Multiple-Set System-The Pyramid System-The Superset System-Drop-Sets-The Circuit-Training System-The Peripheral Heart Action System-The Split-Routine System- Vertical Loading and Horizontal Loading

UNIT - IV

Stages of training -Stage I- Stage II- Stage III-Circuit Training- Continuous Training-Fartlek Training-Interval training.

UNIT - V

Cardiorespiratory Fitness: Benefits of Cardiorespiratory Fitness-Cardiorespiratory Fitness Training: Warm-Up Phase-Conditioning Phase-Cool-down phase-General Guidelines for Cardiorespiratory Training: Frequency-Intensity-Time-Type-Methods for Prescribing Exercise Intensity.



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1. Micheal A. Clark, Scott C. Lucett, and Brian G. Sutton, (2012), NASM Essentials of Personal Fitness Training, Fourth Edition, Lippincott Williams & Wilkins, a Wolters Kluwer business, Two Commerce Square, 2001Market Street, Philadelphia, PA 19103 USA.
2. Nicholas Ratamess, (2012), ACSM's Foundations of Strength Training and Conditioning, Lippincott Williams & Wilkins.

REFERENCE BOOK

1. Thomas R. Baechle, and Roger W. Earl, (2008), Essentials of Strength Training and Conditioning, Human Kinetics, P.O. Box 5076, Champaign, USA.



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NUTRITIONAL ERGOGENIC AIDS AND EXERCISE PERFORMANCE

UEN18DE503

UNIT - I

Definition of ergogenic aids – Definition of dietary supplements – BMI – Antioxidants – self management education – Phytochemical rich foods – Anthocyanidins – ascorbic acid – Beta carotene – ellagic acid – Flavonols – Flavanones – Flavones – Isoflavons – Lutein – Lycopene – Organosulfur compounds.

UNIT - II

WADA-IOC- Doping agency – Doping in sports – Blood Doping in sports – Effects of Blood Doping – Erythropoietin – Effect of Exogenous administration of erythropoietin – Banned supplements in sports and Androstenedione – Dehydroepiandrosterone (DHEEA) – 19 – nonandrostenedione and 19 norandrostenediol – Ephedrine.

UNIT -III

Dietary Supplements that may perform as claimed – Beta- hydroxymethylbutyrate – Ribose – Carnitine – Chromium picolinate.

UNIT - IV

Pharmacological acids – Amphetamines – Anabolic steroids – Beta- hydroxymethylbutyrate – creatine – caffeine – carnitine – chromium picolinate – Dehydroepiandrosterone (DHEA) – Human growth hormone (HGH).

UNIT- V

Harmful and Illegal Pharmacological Ergogenic aids – Anabolic and other steroids – Ephedrine – Blood Doping –Definition of Nutritional aids – caffeine – creatine – sodium bicarbonate.



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TEXT BOOK

1. Bell., D., Jacobs, I., and Zameenik J. (1998), effects of caffeine, ephedrine and their combination on time to exhaustion during high intensity exercise. European Journal of Applied Physiology, 427-433.
2. Website [http / www. Webmd.com/ fitness-exercise/human-growth-hormone](http://www.Webmd.com/fitness-exercise/human-growth-hormone) hgh.
3. Jerry E. Graham and Lawrence L. Sprite (1996), Caffeine and Exercise performance. Gastorade Sports science Institute,9(i) Retrieved from [http./www.gssiweb.org/Articles /Sse-60-caffeine](http://www.gssiweb.org/Articles/Sse-60-caffeine) and exercise performance.

REFERENCE BOOK

4. Pharmacological ergogenic aids(n.d.) Retrieved Nov.30,2015 from [http://www.getfit.net/body/ physiology/ ergogenic/ pharmacological.htm](http://www.getfit.net/body/physiology/ergogenic/pharmacological.htm).
5. Whitney.E. and Rolfes, S. 2013. Supplements as Ergogenic aids, understanding nutrition (14thed), Belmont, CA; Thomson/ Wadsworth.



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WEIGHT MANAGEMENT

UEN18DE504

Unit - I

Metabolism and Weight loss: Factors that Influence Metabolism - Basal Metabolic Rate and Methods for Measuring BMR - How Metabolism Affects Weight - How to Increase the Metabolism - Relationship between Metabolism and Caloric Intake

UNIT - II

Nutrients: Ingestion to Energy Metabolism: Carbohydrates, Protein, Fat – Meaning, Classification and its Functions. Role of Carbohydrates, Fat and Protein during Exercise. Vitamins, Minerals, Water: Meaning, Classification and its Function. Role of Hydration during Exercise, Water Balance.

UNIT - III

Weight Management: Meaning, Concept of Weight Management in the Modern Era – Factors affecting Weight Management and Values of Weight Management - Maintaining a Healthy Life Style - Barriers to Lifestyle Changes - Body Mass Index (BMI)

UNIT - IV

Planning of Weight Management: Determination of Desirable Body Weight – Daily Caloric Intake and Expenditure – Balanced Diet for Indian School Children – Weight Management Programme for Sporty Children – Role of Diet and Exercise in Weight Management – Diet Plan and Exercise Schedule for Weight Gain and Loss.

UNIT - V

Obesity: Meaning – Definition – Types – Causes and Solution for overcoming Obesity. Myths of Spot Reduction and Weight Loss – Dieting and Exercise for Weight Control - Weight Management for Special Populations - Pregnant and Postpartum Women - Weight Management for Seniors - Weight Management for Persons with Disabilities

TEXT BOOK

1. Wadden TA, Stunkard AJ (Eds.). Handbook of obesity treatment. New York: The Guilford Press, 2004.
2. Fairburn CG, Brownell KD (Eds.). Eating disorders and obesity: A comprehensive handbook (2nd ed.). New York: The Guilford Press, 2002.



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REFERENCE BOOK

1. Hill JO. Understanding and addressing the epidemic of obesity: An energy balance perspective. *Endocrine Reviews* 2006;27(7):750-761.
2. Wardlaw, Smith. *Contemporary Nutrition: A Functional Approach*. 2nd ed: 2012. McGraw Hill. 7. Williams, Melvin. *Nutrition for health, fitness and sports*. 2004. McGraw Hill
3. Joshi, A.S. *Nutrition and Dietetics*. 2010. Tata McGraw Hill.



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FITNESS AND NUTRITION FOR GERIATRIC

UEN18DE505

UNIT - I

Definition of Geriatric –physical changes with aging – physical health – How to make aging well a reality – general characteristics of aging process – theories of aging – how aging affects fitness.

UNIT - II

Physiological changes in aging – muscle tissue – muscle strength – power – balance – cardiorespiratory fitness – aging and cardiorespiratory system.

UNIT - III

Aging and Nervous system – Aging and respiratory system – aging and gastrointestinal system – aging and urinary system – aging and endocrine system.

UNIT - IV

Different exercise – strength training – endurance exercise – stretching/ flexibility exercise to develop physical fitness and for sports.

UNIT - V

Nutritional risk for older adults – Screening for nutritional status – geriatric nutritional requirements – calorie need – nutrient needs – nutritional need for older athletes – Macro and micronutrients.

TEXT BOOK

1. Kathleen.c. Niedert, Nutrition care of the older adult, A handbook for nutrition throughout the continuum of care; third edition.

REFERENCE BOOK

1. RonniChernoff, Geriatric Nutrition: The health professionals hand book; 4th edition.



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ELEMENTARY STATISTICS IN EXERCISE PHYSIOLOGY & NUTRITION

UEN18SE501

Unit 1 – Introduction

Meaning and definition of Statistics, Raw Score, Attribute, Variable – Type of Variable, Data – Type of Data, Population, sample, Parameter, Statistic, Frequency distribution, Construction of frequency distribution.

Unit 2 – Measures of Central tendency

Meaning, Types of Central tendency – Mean, Median, Mode – Calculation, Merits and Demerits of Central tendency.

Unit 3 – Measures of Variability

Meaning, Types of Variability – Range, Mean deviation, Quartile deviation and Standard deviation – Calculation. Merits and demerits of Variability.

Unit 4 – Graphs

Graphical representation in Statistics Line diagram, Bar diagram, Histogram, Frequency curve, Frequency Polygon, Ogive curve, Pie diagram. Advantages of graphs.

Unit 5 – Applications of Statistics

Meaning of Correlation, Pearson product moment correlation, Rank order correlation , Chi – square test , Independent of attribute , Equal Occurrence test , Additive Properties Test of significance – Hypothesis , Types of Error , Acceptance region , Rejection region , Level of Significance , ‘t’ test – Independent and Dependent ‘t’ test.

TEXT BOOK

1. Blum, J.R., and Fattu, N.A. 1954. Nonparametric methods. Rev. Educ. Res., 24, 467-487.
2. Conover, W.J. Practical Nonparametric statistics, 2nd edition. New York; John Wiley & sons, 1980.
3. Gibbons, J.D., and Chakraborti. S., Nonparametric Statistical Inference, 3d ed., New York, Marcel Dekker. 1992.
4. Kraft, Charles H. and Van Eeden. Constance A Nonparametric Introduction to Statistics. New York: Macmillan, 1968.



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REFERENCE BOOK

1. Owen, D.B. Handbook of Statistical Tables. Reading, Mass; Addison- Wesley, 1962.
2. Siegel, Sidney. Nonparametric statistics for the behavioral Sciences. New York : McGraw-Hill, 1956.
3. VarmaJ.Prakash ; Sports Statistics Copyright 2000 by Venus Publication.



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FIRST AID AND SPORTS INJURY & PHYSIOTHERAPY

UEN18DE601

UNIT - I

Meaning, definition and importance of Sports Medicine. Definition and Principles of therapeutic exercises. Coordination exercise, Balance training exercise, Strengthening exercise, Mobilization exercise, Gait training, Gym ball exercise. Injuries: acute, sub-acute, and chronic. Advantages and Disadvantages of PRICER therapy, Aquatic therapy.

UNIT - II

Principles of injury prevention – warm – up & cool down – stretching – static, dynamic, ballistic, PNF stretching – protective equipments & shoes. Principles of rehabilitation – muscle conditioning – flexibility – proprioceptive sports skills – cardiovascular fitness – progression & stages of rehabilitation – return to sports.

Unit - III

First Aid: Definition – Principles – First aid Kit. First Aid for Bleeding, Epilepsy, Shock, Drowning, Heart attack, Heat stroke, Snake bite. Types of Dressing and bandages- Cardio Pulmonary Resuscitation.

UNIT - IV

Sports Injury: Meaning and Definition – Prevention of sports injuries – classification of injuries. Open injuries: Abrasion, Laceration, Incision, Puncture, Avulsion. Closed injuries: Sprain, strain, subluxation, dislocation, fracture, contusion, Muscle cramp; its first aid and treatments.

UNIT - V

Physiotherapy: Definition and Guiding principles. Hydrotherapy: Cryotherapy, Ice pack, Ice wrap, Ice massage, Ice towel. Thermo therapy: - Hot bag, Contrast bath, Whirlpool bath. Electro therapy: Short wave diathermy, Infrared therapy, Ultrasound therapy. Wax therapy, Traction Unit. Massage: Definition, Physiological effects – Classification of massage -Swedish system.



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TEXT BOOK

1. Christopher M. (1993). Norris Sports Injuries Diagnosis and Management for Physiotherapists, East Kilbride: Thomson Litho Ltd.
2. CleareMaxwell., & Hudson. (1998). The Complete Book of Massage. London: Dorling Kindersley Ltd.
3. James, A. Gould., & George J. Davies. (1985). Physical Therapy. Toronto: C.V. Mosby Company.

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1. Morris, B. Mellin (1989). Sports Injuries and Athletic Problems. New Delhi: Surjeet Publication.
2. Steven Roy., & Richard Irvin. (1983). Sports Medicine. New Jersey: Prentice - Hall Inc.
3. The Encyclopedia of Sports Medicine. (1998). The Olympic Book of Sports Medicine. Australia: Tittel Blackwell scientific publications.



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SPORTS BIOMECHANICS

UEN18DE603

UNIT-I

Definition and meaning of Biomechanics –Sports Biomechanics- Scope –Need and importance of biomechanics- historical development of sports biomechanics- Role of biomechanics in sports

UNIT-II

Definition of Forces- Classifying Forces:Internal Forces-External Forces-Friction- Equilibrium – Types of Equilibrium – linear kinematics – acceleration and projectile motion.

UNIT-III

Newton's Laws of Motion – First of Law of Inertia, Second Law of Acceleration and Third Law of Action Reaction – Linear Motion – Angular Motion – General Motion – angular linear velocity – angular acceleration – anatomical system for describing limb movements.

UNIT-IV

Meaning of stress and strain – stress and strain of the body – types of stress and strain – types of strain – mechanical properties of stress and strain relationship.

UNIT-V

Bio-mechanical analysis – mechanical properties of stress and injury – tissue responses to injury – mechanism of over injury – individual differences tissue threshold – intrinsic and extrinsic factors affecting injury.

TEXT BOOK

1. Peter. M. Mcgimis, (2005), Biomechanics of sports and exercise”, Human Kinetics.
2. Susan J. Hall, Mc Grow Hill, (2003), Basic Biomechanics”.

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Dr.A.K.Uppal, V. Lawrence Gray Kumar, Mamatamanjari panda, “Bio mechanics in physical education and exercise science”, Friends publications.



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NUTRITION AND IMMUNE FUNCTION IN ATHLETES

UEN18DE604

UNIT – I

Immune system – Functions of the immune system- Components – Leukocytes – Types of Neutrophils – Eosinophils – Basophils – Monocytes - Lymphocytes - function and characteristic

UNIT – II

Immune response – mechanism of general response – Clonal selection and immunological memory – cellular immune response –Humoral fluid response – Antigen – Antibody reactions – Complement – Disorders of the immune mechanism

UNIT – III

Effect of exercise on the immune system – Acute effect of exercise on immune function – Chronic effect of exercise on immune function – Guidelines for the athlete to reduce the risk of infection – nutritional counter and measures.

UNIT – IV

Nutritional Manipulation - immune depression in athletes –nutritional influence on immune function in athletes –Role of carbohydrate, protein and fat in immune function – pre and post exercise

UNIT – V

Immune function and nutrition of elite athletes -Nutritional influence – role of vitamins and minerals in immune function – Effect of Dietary deficiency and excess - Dietary Sources – RDA – Fluid Concentration

TEXT BOOK

1. Asker Jeukendrup and Michael Gleeson (2004) “Sports nutrition” Human Kinetics, inc
2. Nieman, D.C., and B.K. Pederson (2000) “Nutrition and Exercise Immunology”. CRC press: Boca Raton, FL.

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FITNESS AND WELLNESS

UEN18DE605

UNIT – I

Definition and Meaning of Physical Fitness- Strategies for increasing Physical Fitness in India - Values of Physical Fitness - Components of Health-Related Physical Fitness and performance related Physical Fitness - Definition and components of wellness - Relationship between fitness, health and Wellness.

UNIT – II

Factors influencing Fitness Age – Sex-Climate-Diet-Exercise and Training - Types of Exercises used in Fitness (Aerobic, Anaerobic, Isometric, Stretching, Agility and Balancing). Health benefits of Physical Activity - Assessment of Cardio-respiratory Fitness, Musculoskeletal Fitness, Flexibility and Body Composition.

UNIT – III

Prescription for aerobic exercise - Modes of aerobic exercise - Implementing an aerobic fitness programme - Principles of cardiovascular exercise prescription - Aerobic exercise programmes (walk-jog-run) aerobic dancing, rope jumping, treadmill running, jogging in place, stair climbing, stationary bicycling.

UNIT – IV

Prescription for Flexibility - Principles of flexibility Exercise - Types of Flexibility and methods of training - Flexibility exercise for the low back, round shoulders, joggers, runners and various muscles or upper and lower extremities.

UNIT – V

Resistance Training Meaning - Benefits of resistance training - Terminology used in resistance training - sets, resistance (Load), repetitions maximum - Principles of exercise prescription the threshold - over load, specificity, reversibility, and Progression - warm-up - cool-down.

TEXT BOOK

1. Franks Don B. et.al (1999), "The Health Fitness Handbook", Human Kinetics.
2. Lindsey Ruth, Corbin B.Charles (2007), "Fitness for Life", Human Kinetics.
3. Pollock,Michael.et.al(1998), "Health and Fitness Through Physical Activity", New York: McGrew Hill Book Company.



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1. Williams H. Melvin (1995), "Life time Fitness and Wellness", Brown Publications, Dubugue.
2. Siedentop Daryl, 1994 "Introduction to Physical Education Fitness and Sport", Mayfield Publishing Company, Mountain view, California.
3. Batman P. and Van Capelle M. (1995) "The Exercise Guide to Resistance Training", FITAU Publications, Australia.



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COMPUTER APPLICATION IN EXERCISE PHYSIOLOGY AND NUTRITION

UEN18SE601

Unit-I:

Definition of Computers – Types of Computers – Microcomputer – Mini Computers, Mainframe Computers and Super Computers – Binary number system – Bits and Bytes – Hardware Input – Output – The arithmetic / Logic Unit – Control Unit. Computer Memory – Auxiliary Storage. The Punched Card – Magnetic & Tape – Disk oriented data entry system; Out-put devices

Unit-II:

MS-Word – Creating documents – Formatting, Editing, Deleting, Background and copying, Spelling check and Thesaurus – Ms-Excel-Opening – Saving – Editing File – Basic Mathematical Problems – Addition, Subtraction, Multiplication, Division – Ms Power Point – Opening – Creating Saving – Deleting Slides / Templates – Slide Show – Important Feature of Power point Presentation.

Unit-III:

Background online designing - Scanning – Animation - slide sounds, Impact and non-impact printers-mobile devices to assess physiological parameters, Internet explorer – Different types of connections – Modem types - Network types, types of internet communications - e.mail - Text chatting - video chatting and calling.

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Benefits and uses of biochips, heart rate monitor for team sports and individual events - Monitoring of 24h ECG - Caloric expenditure- workload- blood pressure – Circadian rhythms – methods of record sleeping stages- physiological monitoring devices.

Unit-V:

Role of computer in Exercise Physiology and Research- Assessment of Physiological parameters – Latest computer technology – Software involving interpreting variables in exercise physiology – Role of Nutrition software to boost the human longevity.



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TEXT BOOK

1. Abraham Silberchatz, Henry F. Korth and S.Sundarshan, (2002), "Data Z Base System concepts", 4th Edition, McGraw Hill.
2. Michael Halvorson, Michael.J Young. Microsoft Office XP Inside Out (paper back), Microsoft press.

REFERENCE BOOK

ITL Education Solutions Limited, (2005), "Introduction to Information Technology", Pearson Education (India).



NEURO PHYSIOLOGY

PEN18CT201

UNIT - I

Definition of Neurophysiology – structure and functions of neuron – degeneration and regeneration – receptors – reflex – Action potential – Depolarization – Repolarization – Synapse- Synaptic transmission – Neurotransmitters.

UNIT - II

Cutaneous and deep visceral sensation – Ascending and Descending tracts of spinal cord- Motor unit – organization of motor and sensory functions of CNS and Spinal cord – functions of Brain stem – cerebellum – Basal Ganglia - Hypothalamus – Thalamus- cerebral cortex.

UNIT - III

Higher function of Brain – Arousal – sleep, learning memory, speech – EEG – conditioned reflex – neural basis for instinctual and Behavior emotion – control of posture – equilibrium – muscle tone.

UNIT - IV

Diencephalon function – Hypothalamus and body's Homeostasis- the control of body temperature – appetite – defecation – micturition - heart rate-Sleeping- arterial Blood Pressure – Anterolateral system conducting afferent pain and temperature interacts with the thalamus.

UNIT - V

Brain imaging techniques – CT (Computerised Tomography) – MRI (Magnetic Resonance Image) - Use of CT and MRI for identifying deep brain structure, acute pain, hemorrhage, tumors, and edema. Effect of Exercise on Nervous System.

TEXT BOOKS:

1. Johnson and WU. Foundations of Cellular Neurophysiology.
2. Hille, Ionic Channels of Excitable Membranes, 3rd edition, Sinauer Associates, Inc.

REFERENCE BOOKS

1. Levitan and Kaczmarek, The neuron, Oxford University press.
2. William D.Mcardle, Frank I. Katch, Victor L. Katch, (2005), "Essentials of exercise physiology", Lippincott Williams and Wilkins.



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TRAINING AND COMPETITION NUTRITION

PEN18CT202

Unit I:

Sport Nutrition -Assessment of nutritional status: Three Day Food Record – Seven Day Food Record – 24 Hours Recall – Food Frequency - Diet History - Carbohydrate Diets for training – Muscle Glycogen - Liver Glycogen - Regulation of Glucose Concentration – Hypoglycemia - Carbohydrates Ingestion before Exercise - Carbohydrates Maintenance During exercise- Carbohydrates Replenishment Alter Exercise - Glycemic load – Carbohydrates loading.

Unit II:

Biology of protein and amino acid requirements: Body protein mass-Protein synthesis, degradation, and turnover- Protein Utilization in Athletic Performance- Protein requirements for Endurance Athletes - Protein requirements for Strength Athletes – Protein essential for before exercise, during exercise and in recovery from exercise - Benefits and Risks of a High-Protein Diet-Nitrogen Balance.

Unit III:

Weight management – Methods used to determine weight status: Body mass index – Waist-to-hip ratio - Body Composition and Performance - Changes in Body Composition - Methods for measuring body composition: Hydrostatic weighing - Bioelectric Impedance Analysis - Dual Energy X-ray Absorptiometry (DEXA) - Skin fold Thickness -Principles of healthy weight reduction - Making weight for weight category sports - Principles of healthy weight gain.

Unit IV:

Composition of Body Fluids: Intracellular Fluid - Extracellular Fluid - Fluid guidelines - Fluid need before exercise - Fluid need during exercise - Fluid need after exercise, Dehydration - Effects of dehydration and overhydration - Heat cramps, Sports drinks - Types of sports drinks - Energy drinks, Fluid and Electrolyte Management- Strategies to delay fatigue- Effects of hyperthermia and dehydration on performance.

Unit V:

Planning Diets: Principles of Planning Diets - Steps involved in Planning a Diets - Dietary guidelines for Eating Right - Food Guide Pyramid - Healthy Eating Pyramid -



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Planning Diets for aerobic and anaerobic sports - Planning Diets for Intermittent sports -
Planning Diets for the traveling athlete - Planning diets for a vegetarian athlete.

TEXT BOOKS:

1. Heather Hedrick fink, Lisa A.Burgoon, Alan E.Mikesky, (2006), "Practical Application in Sports Nutrition", Jones and Bartlett.
2. Janice Thompson, Melinda Manore, (2005), "Nutrition: An Applied Approach", Pearson.
3. Robert E.C.Wildman, Barry S. Miller, (2004), "Sports and Fitness Nutrition", Thomson.

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1. William D.McArdle, Frank I.Katch, Victor L.Katch, (2000), "Essentials Of Exercise Physiology", Lippincott Williams and wilkins.
2. Steven B.Heym'sfield, Timothy G.Lohman, Zimianwang, Scott B.Going, (2005), "Human body composition", Human kinetics.
3. Kevin Nortor and Tim olds (2006), "A Textbook of Body Measurements for Sports and Health Education- Anthropometric", CBS.
4. McArdle William D. et.al.,(2005) "Exercise Physiology, Nutrition and Human Performance", Philadelphia :lea and Febiger.



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COMPUTER APPLICATION IN EXERCISE PHYSIOLOGY AND NUTRITION

PEN18SE201

Unit-I:

Definition of Computers – Types of Computers – Microcomputer – Mini Computers, Mainframe Computers and Super Computers – Binary number system – Bits and Bytes – Hardware Input – Output – The arithmetic / Logic Unit – Control Unit. Computer Memory – Auxiliary Storage. The Punched Card – Magnetic & Tape – Disk oriented data entry system; Out-put devices

Unit-II:

MS-Word – Creating documents – Formatting, Editing, Deleting, Background and copying, Spelling checks and Thesaurus – Ms-Excel-Opening – Saving – Editing File – Basic Mathematical Problems – Addition, Subtraction, Multiplication, Division – Ms Power Point – Opening – Creating Saving – Deleting Slides / Templates – Slide Show – Important Feature of Power point Presentation.

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Role of computer in Exercise Physiology and Research- Assessment of Physiological parameters – Latest computer technology – Software involving interpreting variables in exercise physiology – Role of Nutrition software to boost the human longevity.



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ENVIRONMENTAL PHYSIOLOGY

PEN18CT301

UNIT - I

Definition of Homeostasis, thermoregulation, metabolism – heat stress – Fundamental principles involved in thermoregulation – Conduction – Convection - - Radiation – Evaporation – Hypothalamus and heat losing mechanism- role of endocrine glands in regulating body temperature – temperature regulation during exercise.

UNIT - II

Temperature regulation in hot environment – Acclimatization to heat – sweating –increased plasma volume – increased stroke volume – improved cutaneous blood flow – heat exhaustion – heat cramps – heat stroke -precaution to be taken in hot environment-- precaution to be taken to avoid heat illness- Temperature regulation in cold environment – acclimatization to cold – fine motor activity – facilitation of metabolic heat production - precaution to be taken in cold environment.

UNIT - III

The environmental differences between High altitude and sea level – immediate physiological changes at high altitude - Acclimatization - in respiratory system – in cardiovascular system – long term adaptation - time of acclimatization – the importance of training at altitude- aerobic process – anaerobic process – performance at Altitude – Hypoxic training methods for improving endurance exercise performance.

UNIT – IV General characteristics of underwater environment – SCUBA diving –

physiology of underwater diving – physiological response to water immersion –exposure – breath hold limitations – Ambient pressure changes – breathing under pressure – physiology of decompression.

UNIT - V

Factors affecting physiological performance – skeletal system – muscular system – cardiovascular system – respiratory system –Bio-energetic system – lactate tolerance – maximum aerobic capacity – hormonal difference.



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1. William D. Mcardle, Frank I. Katch, Victor L. Katch, (2005), "Essentials of exercise physiology ", Lippincott Williams and Wilkins.
2. Victor L. Katch, Frank. I. K atch, William D. Mcardle, (2003), "Essentials of exercise physiology ", Williams and Wilkins.
3. Lorry G. Shaver (1981) "Essentials of exercise physiology" Delhi: SurjeethPuplications.

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1. William E.Garrett J.R., Donald T. Kirendall, (2000), "Exercise and sports science", Lippincott Williams and Wilkins.
2. McArdle William D. (1998) "Essentials of exercise physiology" Malveern, Pennsylvania: Lea and Febiger.
3. Roger M. Enoka, (2002), "Neuromechanics of human movement", Human Kinetics.



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RESEARCH METHODOLOGY IN EXERCISE PHYSIOLOGY AND NUTRITION

PEN18CT302

UNIT – I

Definition of research – Meaning, Need, Important of research in Exercise Physiology and Nutrition, Qualities of good research, classification of research – Basic Research, Action Research, Applied Research, Philosophical Research, and Historical Research.

UNIT –II

Experimental Research – Comparative and Analytical Research – Descriptive Research Methods – Need, Importance and Tools of Survey, Case Study, Interview Technique.

UNIT – III

Experimental Design – Single Group Design – Reverse Group Design, Repeated Measures Design – Static Group Design, Equated Group Design, Random Group Design, Rotated Group Design, Static Group - Comparison Design, Repeated-Measures Design.

UNIT – IV

Sampling - Need for Sampling; Advantages – Disadvantages; Determining the Sample Size; Types of Sampling - Probability Sampling Method, Non- Probability Sampling Method, Random Sampling Design - Simple Random Sampling; Complex Random Sampling Design - Stratified Sampling-Proportionate Sampling-Cluster Sampling-Multistage Sampling, Systematic Sampling, Sequential Sampling

UNIT – V

Research format, Research proposal, Style of writing research, Objectives of the Study, The significance of the problem, Hypothesis, Delimitations, Limitations Review of Related Literature, Methodology, Results and Discussions, Method of writing Abstract



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TEXT BOOKS:

1. Taylor "Research Methodology guide for Research Management" Phi Publisher.
2. Berg, "Essential of Research Methods in health Physical education", Lippincott William and Wilkins Publisher.
3. Rothstein, Anne L. (2006), "Research Design and Statistics for Physical Education, Englewood Cliffs, and New Jersey: prentice Hall Inc.
4. Clarke, David H. Clarke, Harrison H. Research Process in Physical education, New Jersey: Prentice Hall Inc.1984.
5. Jerry R. Thomas, Jack K. Nelson and Stephen J. Silverman., Research methods in Physical Activity (5th Ed), New York: Human Kinetics, 2005.



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EXERCISE AND DIET PRESCRIPTION FOR SPECIAL POPULATION

PEN18CT401

UNIT - I

Definition of obesity - Prevalence of obesity - Factors that contribute to obesity-
Assessment: Body mass index-Waist to Hip ratio (WHR) - Broka's Index-Types of obesity -
Dietary Modification of obesity - Behavior Modification-III Effects of Obesity-Exercise
Testing - Exercise prescription for obesity -Special Considerations-Recommended Weight
Loss Programs.

UNIT - II

Definition of Diabetes Mellitus – Prevalence of Diabetes Mellitus – Etiology of
Diabetes Mellitus – Types of Diabetes Mellitus – Signs and Symptoms - Diagnostic Tests-
complications of Diabetes Mellitus – Healthy Approaches to Managing Diabetes: Focusing
on Nutrition-Dietary Macronutrients -Fiber Intake-Carbohydrate Intake–Exercise Testing-
Exercise and Diabetic Diet prescription for Diabetes Mellitus-Special Considerations.

UNIT - III

Definition of Hypertension - Prevalence of Hypertension - Etiology of Hypertension -
Regulation of blood pressure-Causes of Hypertension-Classification of hypertension -
complications of Hypertension - Prevention of Hypertension: Dietary Management -Sodium
Restricted Diets-Exercise Testing-Exercise prescription for Hypertension -Special
Considerations.

UNIT - IV

Definition of Coronary Heart Disease (CHD) - Prevalence and Risk factors of
coronary heart disease - Sign and symptoms of coronary heart disease - Role of Fat in the
Development of Atherosclerosis-Prevention of Coronary Heart Disease: Dietary Management
- Heart-Healthy Diet Plans-Heart-Healthy Dietary Recommendations- Inpatient
Rehabilitation Programs - Outpatient Exercise Programs -Exercise Prescription without a
Preliminary Exercise Test -Exercise prescription for coronary heart disease



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UNIT - V

Chronic Pulmonary Diseases - Chronic obstructive pulmonary disease –Types of Obstructive Pulmonary Disorders - Impairments and Impact on Function-Management Guidelines-Restrictive pulmonary disorders-Acute and Chronic Causes of Restrictive Pulmonary Disorders-Management Guidelines -Pulmonary function tests-Nutritional impact-Nutritional screening and nutritional assessment-Nutritional requirements-Breathing Exercises and Ventilatory Training-Guidelines for Teaching Breathing Exercises.

TEXT BOOKS:

1. Joan Gandy, (2014), Manual of Dietetic Practice Fifth Edition, The British Dietetic Association, John Wiley & Sons, Ltd, UK.
2. Carolyn Kisner and Lynn Allen Colby, (2007), Therapeutic Exercise Foundations and Techniques Fifth Edition, F. A. Davis Company 1915 Arch Street, Philadelphia.
3. Greg Mclatchie, Mark Harries, Clyde Williams, John king, (2003), "ABC of Sports Medicines", BMJ Books.

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1. Barbara Herlihy, Nancy K. Maebius, Caithin Duckwall, (2003), "The human body in health and illness", Saunders.
2. Kate Woolf- May, Steve Bird, Polly Davey, Jane Fallows, (2006), "Exercise prescription physiological foundations", Churchill living stone.
3. Gordon Edlin, Eric Golanty (2004), "Health and wellness", Jones and Bartlett Publishers.



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ENDOCRINOLOGY

PEN18CT402

UNIT I:

Principles of Endocrinology. – Neuroendocrine interactions. – Endocrine glands and endocrine tissues. - Processes hormones regulate. – Definition of hormones. – Chemical classification of hormones and their synthesis. – Mechanism of hormone secretion. - Regulation of hormone secretion. Negative feedback loop. Positive feedback loop. Cyclic variations of hormones secretion.

UNIT II:

Hypothalamus and Anterior Pituitary. - Anterior pituitary hormones. Tropic hormones, hormones with direct effects on non-endocrine target tissues. - Releasing and inhibitory hormones of the hypothalamus. Hypothalamus and Posterior Pituitary. - Hormones of the posterior pituitary. Secretion and function of antidiuretic hormone (ADH) and oxytocin. - Signals generating stimuli for ADH (AVP) secretion. - The major actions of ADH. Target cells, intracellular mechanism.

UNIT III:

Thyroid Gland - Functional anatomy of the thyroid gland. - thyroid hormones (TH). Role of thyroglobulin. - Transport of TH by the blood. – Peripheral metabolism of TH. – TH receptors and action of TH on target cells. – Role of TH in normal body growth and development of CNS. - Effect on basal metabolic rate. - Cardiovascular system. - Respiration - GIT. – nervous system. - Other endocrine glands. - Carbohydrate, lipid and protein metabolism. - Regulation of TH secretion and synthesis.



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UNIT IV:

Adrenal gland -Adrenal Cortex – Glucocorticoids. - Transport of glucocorticoids in blood. – Metabolic actions of cortisol, principal target tissues. Mineral corticoids. – Adrenal steroids with mineral corticoid activity. - Transport of aldosterone in the blood. - Target cells and cellular mechanism of aldosterone action. - Effect of aldosterone in tubular epithelium of the kidney, on extracellular fluid volume, and blood pressure. - Regulation of aldosterone secretion. Renin-angiotensin system, plasma potassium and sodium levels, ACTH. Adrenal Medulla. - Catecholamines, functions of Catecholamines and storage. Mechanism of the secretion and degradation of catecholamines.

UNIT V:

Pancreas. – Islets of Langerhans, beta, alpha, delta, and PP cells. Secretion of pancreatic hormones. Neural and hormonal control of insulin secretion. - Insulin receptor and mechanism of cellular action. – Effect of insulin on carbohydrate, lipid, and protein metabolism in the liver, muscle, and adipose tissue- glucagon. Secretion and action of glucagon, effect of glucagon, role on metabolic process.

TEXT BOOKS:

1. Degroot LJ, Jameson JL (eds): Endocrinology, 5th ed. Philadelphia, Elsevier, 2006
2. Gereben B et al: Cellular and molecular basis of deiodinase-regulated thyroid hormone signaling. Endocr Rev 29:898, 2008

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1. Golden SH et al: Clinical review: Prevalence and incidence of endocrine and metabolic disorders in the United States: A comprehensive review. J Clin Endocrinol Metab 94:1853, 2009
2. Hammes A et al: Role of endocytosis in cellular uptake of sex steroids. Cell 122:751, 2005



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HEALTH, FITNESS AND PERFORMANCE ASSESSMENT

PEN18DE001

UNIT – I

Preliminary Health Evaluation: Physical Activity Readiness Questionnaire (PAR-Q)- Medical History Questionnaire-Signs and Symptoms of Disease and Medical Clearance- Coronary Risk Factor Analysis-Disease Risk Classification-Lifestyle Evaluation-Informed Consent-Clinical Tests: Physical Examination-Blood Chemistry Profile-Resting Blood Pressure-Graded Exercise Test.

UNIT – II

Meaning and Definition of Blood Pressure, Heart Rate, and Electrocardiogram: Testing Procedures for Resting Blood Pressure Measurement - Auscultation-Palpation-Heart Rate Determination by Palpation –Electrocardiogram Recordings- Twelve-Lead Electrocardiogram- Electrocardiogram Basics- Resting 12-Lead Electrocardiogram Procedures.

UNIT – III

Meaning and Definition of Physical Fitness-Types of Physical Fitness: Health-related fitness and Skill-related fitness- Health-related fitness components: Cardiovascular Endurance-Muscular strength and Endurance–Flexibility-Body composition-Pretest Instructions-Tests Administration and Interpretation-Skill-related fitness: Power-Speed-Agility-Balance and Coordination-Reaction time- Pretest Instructions- Tests Administration and interpretation.

UNIT – IV

Basic Training Principles for Exercise Program Design: Principle of Specificity- Principle of Overload-Principle of progression- Principle of initial values -Principle of individual variability-Principle of diminishing returns-Principle of reversibility- Basic Elements of the Exercise Prescription: Mode-Intensity-Duration-Progression of Exercise.

UNIT – V

Definition of Terms cardiorespiratory fitness or Maximum oxygen uptake (VO_2max): General Guidelines for Exercise Testing-General Procedures for Cardiorespiratory Fitness Testing- Maximal Exercise Test Protocols-Treadmill Maximal Exercise Tests-Graded Exercise protocol -Balke Treadmill Protocol-Bruce Treadmill Protocol.



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1. ACSM (2014) ACSM's Resource Manual for exercise testing and prescription – Lippincott Williams and Wilkins
2. Kwok JM Miller TD, Hodge DO, Gibbons RJ. Prognastic value of the duke treadmill score in the lderly J Am CollCardiol 2002:39(9); 1475- 81

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1. Guidelines 2000 for cardiopulmonary resuscitation and emergency cardiovascular care, part 6: advanced cardiovascular life support: section7 algorithn approach to ACLS EMERGENCIES. The American Heart Association in coloborATION WITH THE International Liaison committee on resuscitation. Circulation2000:102 (8suppl); 1136-65.



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MUSCLE AND EXERCISE METABOLISM

PEN18DE002

UNIT - I

Define metabolism – Energy for muscular contraction – Aerobic metabolism – Anaerobic metabolism – Fat oxidation –

UNIT - II

Fuel stores in skeletal muscle – Regulator of energy metabolism – Intracellular factors – Hormones – Insulin – Glucagon – Catecholamines – Growth hormones and cortisol

UNIT - III

Metabolic response to exercise – Properties of muscle fibre types – Sarcoplasmic Reticulum and calcium release – Fuel utilization during exercise – Oxygen deficit – Oxygen Debt – Oxygen deficit and debt during light - Moderate and heavy exercise – Factors Contributing to excess post – Exercise oxygen consumption – Metabolic Response to exercise short term Intense exercise – Prolonged Exercise – Incremental exercise – Lactate threshold – Estimation of fuel Utilization during exercise – Exercise Intensity and Fuel selection – Source of Fuel during exercise - Cause of fatigue in High – Intensity exercise – prolonged exercise – Metabolic adaptation to training

UNIT - IV

Metabolic calculation – Importance of metabolic Calculation – Meta Calculation General principles - Expressions of energy expenditure – Relative oxygen consumption – Metabolic equivalents (METs) – Fat stores – Net versus gross Vo_2

UNIT - V

Metabolic formulae - Walking and running formulae – Leg and arm ergometry formulae.

TEXT BOOKS:

1. Astrand, P.O., K.Rodahl, H.Dahl, and S.Stromme. 2003 Textbook of Work Physiology. Physiological Basis of Exercise. Human Kinetics:Champaign, IL

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1. Asker Jeukendrup and Michael Gleeson (2004) Sports nutrition. Introduction to energy production and performance Human Kinetics, inc
2. Heather Hedrick Fink (2018) Practical Application to Sports Nutrition, Jones and Bartlett Publishers, Sudbury, Massachusetts, 31 - 61



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EXERCISE BIO-CHEMISTRY

PEN18DE003

UNIT – I

Biochemistry – Definition and Importance. Composition of plasma. Energy and Calorie (Kilocalorie) - Definition. Free Energy- Definition and its units. Mitochondria- Structure and function of. ATP, ADP, AMP and Creatine Phosphate-Definition and its formation and breakdown. Role of Oxygen in Energy metabolism. Catabolism and Anabolism–Definition and its Process.

UNIT – II

Central Role of Glucose in Carbohydrate Metabolism. Transport of Glucose Through the Cell Membrane. Glycogenesis—The Process of Glycogen Formation. Glycogenolysis- Removal of Stored Glycogen. Role of Insulin, Epinephrine and Glucagon in glucose transport and metabolism. Glycolysis and the Formation of Pyruvic Acid. Citric Acid Cycle (Krebs cycle). Formation of ATP by Oxidation of Hydrogen (Oxidative Phosphorylation). Anaerobic Glycolysis (CORI Cycle). Pentose Phosphate Pathway (Phosphogluconate Pathway). Gluconeogenesis. Role of Carbohydrate (Breakdown of Glucose) In Energy Metabolism.

UNIT – III

Lipid - Basic Chemical Structure of Triglycerides. Lipoproteins-Classification, Importance, Functions and normal values. Absorption and Transport of Lipids. Fat Deposit in adipocytes. Triglycerides for Energy. Hydrolysis of Triglycerides. Degradation of Fatty Acids to Acetyl Co A by Beta-Oxidation and Oxidation of Acetyl-Co A. ATP Formation by Oxidation of Fatty Acids. Formation of Acetoacetic Acid in the Liver and Its Transport in the Blood. Synthesis of Triglycerides from Carbohydrates. Conversion of Acetyl-CoA into Fatty Acids. Combination of Fatty Acids with α -Glycerophosphate to Form Triglycerides. Importance of Fat Synthesis and Storage. Hormonal Regulation of Fat Utilization. Formation and Uses of Phospholipids. Formation and Uses of Cholesterol. Factors That Affect Plasma Cholesterol Concentration—Feedback Control of Body Cholesterol.



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UNIT – IV

Basic Chemical Structure of Amino Acids. Transport and Storage of Amino Acids. Functional Roles of the Plasma Proteins. Essential and Nonessential Amino Acids. Use of Proteins for Energy- Deamination, Urea Formation by the Liver and Oxidation of Deaminated Amino Acids Ketogenesis-Definition. Hormonal Regulation of Protein Metabolism. Effect of Starvation on Protein Degradation.

UNIT – V

Acid-base balance Hydrogen Ion and PH. Causes of Alteration in Acid-Base Balance- Volatile acids and Non-volatile acids. Regulation of Acid-Base Balance by Acid-Base Buffer System- Mechanism and Importance of Bicarbonate buffer system, Phosphate buffer system and Protein buffer system Regulation of Acid-Base Balance by Respiratory Mechanism. Regulation of Acid-Base Balance by Renal Mechanism. Acidosis and Alkalosis-Definition, Types (Respiratory and Metabolic) and its causes.

TEXT BOOKS:

1. Lorry G.Shaver(1981) "Essentials Of Exercise Physiology" SurjeethPublications, Delhi
2. Mcardle (2000) "Essentials of Exercise Physiology" 3rd edition, lippincottwillams and wilkins publisher.
3. Sharon,(2003) "Exercise Physiology for Health Fitness and Performance" LippincottWillams and Wilkins Publisher.

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1. Clerk, D.H (1975.)"Exercise Physiology" Prentice – Hall,Inc.,Englewood Cliffs ,New Jersey.
2. Michael j.Gibney ,Ian A. Macdonald and Helen M.Roche (2007), *Nutrition and Metabolism*. Publisher. Blackwell Science, Oxford. Pg 126-127,135, 137,277.



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RENAL PHYSIOLOGY

PEN18DE004

UNIT I:

Physiological Anatomy of the Kidney-Structure of the kidney.Cortex. Medulla. – Nephron-functional unit of the kidney. Cortical and juxtamedullary nephrons. – Anatomy of the nephron. Glomerulus. Tubule. – Bowman's capsule. Proximal tubule.Loop of Henle.Distaltubule.Collecting duct. – Kidney blood vessels. Afferent and efferent arterioles. Peritubular capillary network.Vasarecta.Juxtaglomerular apparatus. - Principles of urine formation.

UNITE II:

Glomerular Filtration. Glomerular filtration membrane. - Net filtration pressure. – Glomerular filtrate. Composition. Glomerular filtration rate. – Clearance. Definition. Calculation. Inulin clearance. Creatinine clearance. PAH clearance. – Renal plasma flow. Filtration fraction. – Physiological control of glomerular filtration and renal blood flow. Nervous regulation. Humoral regulation. Autoregulation. Tubuloglomerular feedback. Myogenic autoregulation.

UNIT III:

Excretion of Water. Reabsorption of water in tubular segments. – Excreting excess water by forming a dilute urine. – Conserving water by excreting a concentrated urine. Obligatory urine volume. Osmotic stratification of renal medulla. Countercurrent multiplier system (loop of Henle).Role of distal tubule and collecting duct. Contribution of urea. Recirculation of urea. Countercurrent exchange system (vasa recta). - Mechanism of water reabsorption. Role of antidiuretic hormone (ADH). Diabetes insipidus. – Water diuresis. Osmotic diuresis.

UNIT IV:

Excretion of Sodium, Chloride, Potassium and Other Ions. Reabsorption of sodium in tubular segments. Mechanisms of sodium reabsorption. Reabsorption of sodium in late distal tubule and in collecting duct.Role of aldosterone. – Excretion of potassium. Reabsorption of potassium.Secretion of potassium.Principalcells.Intercalated cells. Regulation of potassium secretion.– Excretion of chloride. – Excretion of calcium. Regulation of calcium reabsorption. – Excretion of phosphate. - Excretion of magnesium.



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UNIT V:

Acid-Base Balance and Kidney. Plasmatic pH. Acidosis, alkalosis. Sources of hydrogen ions. - Acid-base buffer systems. Bicarbonate buffer system. – The role of kidney in the acid-base regulation. Secretion of hydrogen ions. Filtration and reabsorption of bicarbonate ions. Generation of new bicarbonate ions. – Renal response to acidosis. Tubular buffers. The role of ammonium ion and ammonia. Renal response to alkalosis. – Respiratory acidosis and alkalosis. Metabolic acidosis and alkalosis. Micturition. Ureter Ureterorenal reflex. – Bladder. Detrusor muscle. Innervation of the bladder. Internal sphincter. External sphincter.

TEXT BOOKS:

1. Seldin, Donald W., and Giebisch, Gerhard. 1989. The Regulation of Acid-Base Balance. Raven Press.
2. Valtin, Heinz. 1983. Renal Function: Mechanisms Preserving Fluid and Solute Balance in Health.

REFERENCE BOOKS

1. Little, Brown. Vander, Arthur J., Sherman, James H., and Luciano, Dorothy S. 1985. Human Physiology: The Mechanisms of Body Function, 4th ed. McGraw-Hill.
2. Vander, Arthur J., Sherman, James H., and Luciano, Dorothy S. 1990. Human Physiology: The Mechanisms of Body Function, 5th ed. McGraw-Hill.



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SUPPLEMENTS AND ERGOGENIC AIDS FOR PERFORMANCE ENHANCEMENT

PEN18DE005

Unit: 1 Introduction to Ergogenic aids - History and development of Ergogenic aids - types of Ergogenic aids - Anabolic Steroids - Amphetamines -**Beta-2-Agonists**– health risk of steroid abuse - Effects of Anabolic Steroids abuse.

Unit: II WADA - IOC - Doping agency - Doping in sports - Blood Doping in sport – effects of blood doping - Erythropoietin – effects of exogenous administration of erythropoietin- Banned supplements in sports: Androstenedione - Dehydroepiandrosterone (DHEA) - 19-norandrostenedione and 19- norandrostenediol - Ephedrine.

Unit: III Diuretics - Target organ for Diuretic Action - Narcotic Analgesics & Athletic performance - mechanism of Action - Non-steroidal Anti - inflammatory Drugs & Corticosteroids, Narcoleptics: Beta – Adrenergic Antagonists.

Unit: IV Research and scientific evidence approved supplements: Supplements - Liquid meal supplements - Sports gels - Sports bars - Creatine - Creatine as Supplement - Mechanisms of Creatine action - Creatine and safety - Glycerol - Iron Supplement- BCAA Supplement.

Unit: V Supplements under consideration: Glutamine - Ribose - Colostrum - Beta-HydroxyBetaMethylbutyrate (HMB) - Carnitine - Carnitine in the body - Coenzyme Q10 - Ginseng – Pyruvate - Vitamin Supplement.

TEXT BOOKS:

1. Michael S. Beatrice, Charles E. Yesalis, (2002), “Performance Enhancing Substances in Sport and Exercise”, Human kinetics.
2. Melinda Manore, Janice Thompson, (2000), “Sport Nutrition for Health and Performance”, Human kinetics.

REFERENCE BOOKS

1. Asker Jeukendrup Michael Gleeson, (2004), “Sport Nutrition”, an introduction to energy production and performance.
2. Louise Burke, (2007), “Practical Sport Nutrition”.



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NUTRITIONAL PLANNING FOR SPORTS AND EXERCISE

PEN18DE006

Unit I-

Meal Planning and Preparation: Principles of meal planning-Planning and preparation of nutritionally adequate diets for adult man - Adult woman- Adolescent - School going child - Preschooler- Nutrition for Active Pregnant woman and Lactating woman- Special Nutritional Concerns: Vegetarian diets-The types of vegetarians: Flexitarian-Lacto-Ovo-Vegetarian-Lacto-Vegetarian-Ovo-Vegetarian-Vegan-Other Styles (Fruitarians)-Nutrition Challenges for Vegetarians.

Unit II-

Water Balance and imbalance: Euhydration, Hypohydration, and Hyperhydration- Thermoregulation-Hyponatremia-Dehydration-Rehydration- Fluid balance in sports and exercise, importance, symptoms and prevention of dehydration-Age-Related Fluid Needs - Sports Drink – Hypotonic, Isotonic and Hypertonic drink for hydration/ energy and recovery drink-Other Types of Drinks:Energy Drinks-Oral Rehydration Solutions (ORS)-Sports Waters-Vitamin Waters-Coconut Water-Alcohol-Tea, Coffee and Cola.

Unit III

Energy and Sports Performance: Dietary Carbohydrate and Sports Performance- Dietary Fat and Sports Performance-Dietary Protein and Sports Performance-Vitamins and Sports Performance-Minerals and Sports Performance-The Pre-competition Meal-Liquid Meals-Planning and preparation of Energy dense recipes- High fibre recipes- Low fat recipes- Low sodium recipes- Antioxidants, Exercise and freeradicals, Role of antioxidants in preventing damage and recovery time.

Unit IV

Meal planning for regular training- Balanced diet of different calorific value for specific sport and exercising person-Diet before competition-during Competition-after Competition (Basketball and Netball,Cricket,Cycling,Football,Hockey, Rugby,Swimming, Marathonand Endurance Running, Sprints and Power Sports)



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Unit V

Paralympic sports -Classification of disabilities-Physiology and metabolism-
Physiological responses to exercise-Energy expenditure-Thermoregulation-Body
composition-Bone density-Dietary issues for athletes with disabilities: Current dietary
intakes-Fiber, timing of food intake and bowel control-Fluid intake-Body composition
management-Nutritional supplements-Eating difficulties and behaviors observed in some
athletes with disabilities

TEXT BOOKS:

1. Louise Burke and Vicki Deakin, (2010), Clinical Sports Nutrition, The McGraw-Hill Companies, Sydney New York.
2. Glenn Cardwell,(2012), Gold Medal Nutrition, Fifth Edition, Human Kinetics, 57A Price Avenue, Lower Mitcham, Australia.
3. Natalie DigateMuth,(2015), Sports Nutrition for Health Professionals, F. A. Davis Company, 1915 Arch Street, Philadelphia, USA.

REFERENCE BOOKS

1. Corinne H. Robinson, Emma S. Weigley Donna H. Mueller, Basic Nutrition and Diet Therapy 7 ed, Macmillon Publishing Company
2. L. Anderson Dibble P. R. Turkki H. S. Michael H. J. Ryribergen J. B, Nutrition in Health and Disease 17th ed , Lippincott Company, Philadelphia
3. Sumati R. Mudambi and M. V. Rajagopal , Fundamentals of Food & Nutrition, New Age International (P) Ltd. Bombay



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EXERCISE ASSESSEMENT IN SPECIAL POPULATION

PEN18DE007

UNIT - I

Health screening – importance of pre- exercise evaluation – Medical history, personal history, family history, physical examination, past medical history – for children and elderly

UNIT - II

Exercise assessment in Children's – exercise testing considerations – Hemo dynamic and pulmonary characteristic of children response to exercise –equipment used in testing - exercise equipment -Cycle ergometer – treadmill – ECG recording equipment Comparison of treadmill versus cycle ergometer for pediatric exercise testing– exercise protocol- Indications and Contra indication for stress testing – relative risks for Stress testing – Lower risk and Higher risk.

UNIT - III

Exercise assessment in Elderly - clinical evaluation - practical considerations of Routine exercise testing- Exercise testing Consideration - prognostic assessment with exercise testing – exercise protocol – Special consideration for older than 75 years.

UNIT - IV

Definition of Preeclampsia – Post partum –Exercise and pregnancy - Exercise testing – Exercise assessment in pregnancy – Pre testing screening - PAR Med-X for Pregnancy- physical activity readiness examination – Patient information – Pre exercise testing checklist – general health status – Status of current pregnancy – activity habits during pregnancy period – Contra indication to exercise to be recommended by the healthcare provider Medical and safety Concerns for mother and foetus Maximal exercise testing – fetal response to maximal exercise – submaximal exercise - Aerobic capacity testing, strength testing.

UNIT - V

Emergencies – information pertinent to the information report – emergency equipment and supplies for a health/ fitness facility.Sudden cardiac arrest – Automated External Defibrillators – Implantable Cardio inverter Defibrillators and Sudden cardiac Arrest. Other medical concerns – First aid kits – Blood borne pathogens – first aid kit for a fitness facility.



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TEXT BOOKS:

1. ACSM (2014) ACSM's Resource Manual for exercise testing and prescription – Lippincott Williams and Wilkins
2. Artal R, OToolwe M. Guidelines of the American college of obstetricians and gynaecologist for exercise during pregnancy and post-partum period – BrJSportsmed: 37 (i:6-12)
3. HebestreitH.Exerise testing in children – what works and what does not and where to go? Paediatr-Respir – Rev 2004:suppl A S 11 – 4

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1. Kwok JM Miller TD, Hodge DO, Gibbons RJ. Prognastic value of the duke treadmill score in the lderly J Am CollCardiol 2002:39(9); 1475- 81
2. Guidelines 2000 for cardiopulmonary resuscitation and emergency cardiovascular care, part 6: advanced cardiovascular life support: section7 algorithym approach to ACLS EMERGENCIES. The American Heart Association in coloborATION WITH THE International Liaison committee on resuscitation. Circulation2000:102 (8suppl); 1136-65.



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EXERCISE AND SPORTS FOR WOMEN

PEN18DE008

Unit I :

Structural and Physiological differences between male and female – Body size & Composition, strength, metabolic function, Bone mass – Muscle mass – Fat mass- Heart – Blood Volume – RBC and respiratory difference –Gonadal hormones and Sports performance.

Unit II:

Menstrual cycle – Physiology of menstrual cycle – Exercise during menstrual cycles – Female athletic triad: Disorder of Eating- Amenorrhea – osteoporosis, menstrual cycle and Physical performance.

Unit III:

Pregnancy – Physiological changes during pregnancy – Lactation – Indications and Contraindications to exercise during Pregnancy - Guidelines for exercise during and after pregnancy.

Unit IV:

Hormonal Disorders - Physiological changes – Pre menopause, Menopause and Post menopause - Osteoporosis and its pathophysiology due to lack of exercise – Effect of exercise to prevent Osteoporosis – Anemia – Iron supplements.

Unit V:

Mechanism of hormone action – Gonadal Hormones - Women and weight training – hormonal responses to exercise - Masculinization due to exercise, Hormonal effects on fluid and electrolyte balance during exercise – aldosterone – renin- ADH - Doping and performance – women participation in contact and non-contact sports.

TEXT BOOKS:

1. Mary Lloyd Ireland, Aurelia Nattiv, (2002), “The Female Athlete”, Saunders
2. Kate Woolf- May, Steve Bird, Polly Davey, Jane Fallows, (2006), “Exercise Prescription Physiological Foundations”, Churchill living stone.
3. William D.Mcardle, Frank I.Katch, Victor L.Katch, (2000), “Essentials Of Exercise Physiology”, Lippincott Williams and Wilkins



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4. Victor L.Katch, Frank.I. Katch, William D.McArdle, (1996), "Exercise physiology",
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REFERENCE BOOKS

1. William E.Garrett J.R., Donald T.Kirendall, (2000), "Exercise and sports science",
Lippincott Williams and Wilkins.
2. Greg McLatchie, Mark harries, Clyde Williams, John king, (2003), "ABC of sports
medicines", BMJ Books
3. Barbara Bushman, J.C.Young (2005), Action Plan for Menopause, Human Kinetics.
4. Peter J.Maud and Carl Foster (1995), Physiological Assessment of Human
Fitness,Champaing, IL:Human Kinetics.



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EXERCISE PHYSIOLOGY

PEN18GE001

Unit- I

Structure and functions of heart- cardiac cycle- Blood pressure- cardiac output- Heart Rate- Stroke volume- Structure and Functions of respiratory system-Lung volumes and capacities- BMR- Regulation of body temperature- Physiological responses to Heat and Cold- Effect of exercise on cardiac respiration system.

Unit- II

Types of Muscles- Muscles fiber types- Mechanism of Muscles contraction- Sliding filament theory- structure of Neuron- central neurons- brain and spinal cord-peripheral neurons- Automatic Ns- Motor unit- Action potential- depolarisation- Reflex are- proprioceptors- Effect of Exercise on Muscular and Neuron System.

Unit- III

Energy Metabolism - ATP- PC System - Glycolytic and Oxidative system- Oxygen debt and deficit- Aerobic and anaerobic training and their effects on Aerobic and Anaerobic System.

Unit- IV

Structure and Secretion of Pituitary gland- Thyroid Gland- Liver- Adrenal Gland and pancreas- Structural and Physiological differences between Male and Female- Menstrual Cycle- Physiological changes during pregnancy- Guidelines for Exercise during and after pregnancy effect of exercise on Endocrine System.

Unit- V

Immunity- definition and classification- physiology of sleep- Cardiac rhythm- obesity- Exercise perception for obesity- Diabetes mellitus- Exercise Perception- Hyper tension- Exercise Perception- coronary heart disease- Exercise Prescription- pulmonary disease- Exercise Prescription.

TEXT BOOKS:



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1. William E.Garrett J.R., Donald T.Kirendall, (2000), "Exercise and sports science", Lippincott Williams and wilkins.
2. McArdle William D. (1998) "Essentials of Exercise Physiology" Malveern, Pennsylvania: Lea and Febiger.
3. Berger Richard A. (2003) "Applied Exercise Physiology" United States of America, Lea and Febiger, Philadeiphia.



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SPORTS NUTRITION

PEN18GE002

Unit- I

Basic Nutrition- classification of carbohydrates- Proteins- Essential and Nonessential – Lipids- classification- Vitamins- classification- Minerals- classifications.

Unit- II

Sports Nutrition- Assessment of Nutritional status- carbohydrate diets for training- Muscles and Liver Glycogen- carbohydrate loading- Carbohydrate intake before, during and after exercise.

Unit- III

Protein requirement for training for Endurance, Strength- Protein essential for before, during after Exercise- Dehydration- strategies to delay fatigue.

Unit- IV

Nutritional need for Special population- Nutrition need for young and Ageing athletics- Athletics with diabetes- Glucose monitoring during exercise- Preventing and managing Hypoglycemia- Physical activity for people type with II diabetes.

Unit- V

Dietary guideline for eating right- Food Plate - Functional food pyramid- Planning Diets for aerobic and anaerobic sports- Planning for vegetarian athlete and vegan athlete, overweight and obesity, Hyper tension, Coronary Heart Disease and Lung disease.

TEXT BOOKS:

1. Sareen S. Gropper and Jack L. Smith (2009), Advanced Nutrition and Human Metabolism, Wadsworth, Cengage Learning, USA.
2. Heather Hedrick fink, Lisa A. Burgoon, Alan E. Mikesky, (2006), "Practical Application In Sports Nutrition", Jones and Bartlett.

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3. McArdle William D. et.al., (2005) "Exercise Physiology, Nutrition and Human Performance", Philadelphia: lea and Febiger.
4. Mcardle, William D., Katch, Frank I and Katch, Victor L (2005) "Exercise Physiology", Philadelphia, lea and Febiger.



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ANATOMY AND PHYSIOLOGY

UNIT – I

Anatomy: meaning – definition- need - importance. Physiology: meaning - importance - Cell – structure – function - types - Tissue - structure - Skin – Structure – function

UNIT – II

Muscular system: meaning - structure: skeletal, cardiac, smooth. – hypertrophy. Functions - contraction: isotonic - isometric - concentric – eccentric- cycle. Muscular fiber: type I- type II A – type II B. Effect of exercise

UNIT – III

Cardio vascular system - meaning. Organs - Heart - Structure - functions Cardiac cycle – Cardiac output - stroke volume. Pulmonary circulation - systemic circulation. Lungs: structure and functions - Spinal cord. Effect of exercise

UNIT – IV

Respiratory system: meaning - structure - mechanism of breathing – Gas exchange. Effect of exercise. Endocrine - kidney - structure functions

UNIT - V

Nerves system: meaning – types - central nervous system - brain and spinal cord - peripheral nervous system - cranial, spinal, peripheral nerves Function: sensory, integration, and motor.

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1. Surrender H Singh, Krishna Garg, (2008), : Anatomy and Physiology for Nurses & Allied Health Sciences” CBS
2. Clerk.D.H.(1995) : Exercise Physiology Prentice-Hall,Inc., Englewood Clif, New jersey
3. Frank W Dick, Sports training principles, London, Lepus Book Co., 1980
4. Kara Rogers(2011), “The Respiratory System” Britanniacal educational publishers
5. S.B. Bhise and Yadan (2009) “Human anatomy and Physiology” Chelsea house publisher.



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HISTORY AND ADMINISTRATION OF SPORTS/GAME

(ATHLETICS/FOOTBALL/KABADDI/HOCKEY/VOLLEYBALL)

UNIT – I

History of Volleyball/Football/Kabaddi/hockey/Athletics - Origin - Development - International federation - National federation – organization Structure - functions and role - Recent Trends

UNIT – II

Competitions: School levels - Bharathiar day – Republic day – National level: SGFI – University level - State associations – District associations- Mini – Sub junior - Junior inter district – national championship - International competitions – method of organization – Drawing of fixtures – Knockout seeding - league

UNIT - III

Developmental schemes: Sports Authority of India - Aim- motto- vision- organizational set up. Schemes: academics - Kholo India – STC – SAG – NSTC – SPDA- NCOE- regional centers - Sports promotion - infrastructure facilities – selection of teams.

UNIT - IV

Developmental schemes: Sports Development Authority of Tamil Nadu - aim- motto- vision- schemes: Sports Hostel- Hostel of excellence –academies – World beaters - infrastructure facilities- organizational set up – recent trends -

UNIT - V

Sports awards: SDAT - Chief Minister's award – Coach – Physical education teacher – players' incentives – High cash incentives – pension - Sports scholarship – medal winners – Awards: Arjuna award – Dhronachariya award – Rajive Khel rathina award- Dhayan chand life time achievement award - eminent sports personalities in sports

REFERENCES :

1. FIVB coaches manual. FIFA manual , AAA Coaches book
2. www.sdat.tn.gov.in
3. www.sportsauthorityofindia.nic.in



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SCIENCE OF SPORTS TRAINING:

UNIT - I

Sports training: meaning - definition - aim - objective - characteristic - General principles – Progression of load – Individualizing - over load - specificity- reversibility. Warming up: types – general – special - importance and benefits. Cool down : importance and benefits.

UNIT - II

Physical fitness components: meaning definition- importance. Speed – strength- endurance – coordinative abilities – flexibility. Training load: over load – symptoms – causes – recovery. Forms of speed – reaction speed – Speed in movement- locomotors speed- sprinting speed – speed endurance. Factors affecting speed.

UNIT - III

Strength: Meaning – definition- types – maximum strength- explosive strength- strength endurance- factors affecting strength. Flexibility: meaning – definition – importance – factors affecting flexibility - types

UNIT – IV

Coordinative abilities: meaning – definition – types - Differential ability - Orientation ability - Coupling ability- Reaction ability -Balance ability-Rhythm ability- adaptation ability. Endurance: meaning – definition- types – Nature of activity – duration of activity – long term – middle term- short term- importance.

UNIT - V

Periodization : meaning – definition- types – single – double- multiple- Periods: preparatory – competitive – transition . Plan: annual plan - Micro – meso- macro – session plan

REFERENCE

1. Frank W. Dick, Sports training principles, London, Lepus Book Co., 1980
2. Hardyal Singh Science of Sports training, DVS publication, New Delhi, 1995



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SPORTS MEDICINE AND NUTRITION

UNIT – I

Sports medicine: meaning - aim - objective - need - importance - preventive - measures
- First Aid - Safety - hygiene

UNIT - II

Injuries: Meaning - types – sprain- strain – contusions - tear - sports specific injuries -
fracture - types - laceration - abrasion - dislocation - CPR

UNIT - III

Women in sports : anatomical - biological - physiological - psychological - factors
affecting sports performance

UNIT - IV

Massage - types - importance - need - principles - doping – classifications.
Rehabilitation – treatments.

UNIT - V

Nutrition - classification - sources - balance diet - Carbohydrate - fat - protein -
vitamins - supplements - pre game meal - post game meal

REFERENCE

1. Lars Peterson and Per Restorn (2001) Sport Injuries – Their Prevention and treatment, United States, Human Kinetics
2. Richard B.Birrer (2004), Sports Medicine for the Primary care physician, Florida, United States, Human Kinetics
3. Bruckner and Karim Khan (2006) Clinical Sports medicine, Australia Megraw Hill
4. Sports medicine by Richer H. strauss



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SPORTS PSYCHOLOGY AND SOCIOLOGY OF SPORT -

UNIT - I

Psychology - Definition – importance – branches - sports psychology - Definition – importance – role - development

UNIT - II

Personality – definition – theories - traits– neuroticism – extraversion – introvert- openness – agreeableness – conscientiousness - inter personal relation – temperament – sanguine – choleric – melancholic - phlegmatic.

UNIT – III

Motivation - definition – types – intrinsic – extrinsic – social influence – peer group - anxiety – cognition - stress - aggression – arousal – emotions

UNIT - - IV

Learning - Theories of learning - classical conditioning – gestalt learning theory – law and effect – operant conditioning - transfer of learning – self confidence – development - Psychological skill training – imagery – goal setting

UNIT – V

Sports sociology: meaning – definition - need - importance - scope - sociogram - audience effect

REFERENCES :

1. John.D,Lauther, (2001) Psychology of coaching, New jersy; Enginewood Cliffs, Prenticce Hall Inc.
2. Thelma Horn (2002) Advances in Sports Psychology, Human Kinetics.
3. Jay Coakley(2001), Sports in society – issues and conterouersies in International education, Mc-Craw Seventh.Ed.
4. Yobu A Sports sociology, Jehova Nissin Publication 2003
5. David Tod, “Sports Psychology” Macmillan international 2010
6. Ramalingam “Education Psychology” Mc Graw Hill Publication 2013



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KINESIOLOGY AND SPORTS BIO MECHANICS

UNIT – I

Kinesiology - meaning – definition – need – importance – role - Planes – Axis

Myology -structure - Muscles – origin – insertion – Osteology –structure - bones - joints – fundamental movements.

UNIT – II

Bio mechanics – definition - meaning - need - importance – kinematics – kinetics - speed - Velocity - Acceleration –displacement – equilibrium.

UNIT – III

Motion – meaning – definition – types – liner motion – curvilinear - Newton laws – first law – second law – third law - Lever – types – importance.

UNIT – IV

Force : concept – effects - types - factors determining - Projectile motion – importance – friction – advantage.

UNIT – V

Kinesiology and bio mechanical movements – walking – running – jumping – throwing

REFERENCES :

1. Bruce Aberethy, (2005). The Biophysical foundation of human movement. Human Kinetics
2. MC Clawaig, (2002). Biomechanics of human motion. Delhi : Sports publication
3. Rai Ramesh, (1998), Bio mechanics – Mechanical aspects of human motion, Delhi,
4. Peter Jain, (2006). Atlas of Human body. Delhi: Sports publication
5. Nancy Hamilton, (2002) Kinesiology. Scientific basis of human motion. Newyark: Mc Graw-Hall companies, Inc.
6. Paul Jackson Mansfield “ Essentials of Kinesiology” Elsevier 2014
7. NichdasStergiuous, (2004). Innovative Analysis of human movement. Human Kinetics



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57 PHILOSOPHY OF SPORTS COACHING

UNIT – I

Coaching philosophy: definition – meaning - objective - coaching - art – science - technique - skill - style- secret of successful coaching

UNIT - II

Effective practices - knowledge –what makes coach - functional activities of coach – fitness – rules – anatomy and physiology- sport psychology - bio mechanics – anthropometric – test and measurement

UNIT - III

Role and quality of coach- teacher – trainer - research - teacher - trainer - motivator - disciplinarian - scientist - social worker – student.

UNIT - IV

Coaching skill practice – coaching method – coaching path way - - Long Term Athlete Development (LTAD) - development model – other countries plan

UNIT - V

Performance management - coaching process – planning principles - Long term training conception - legal responsibilities - General Methodology psychological preparation Performance development

REFERENCES:

1. Coaching Manual I & II FIVB
2. Football Coaching -1, (1983), BLV Verlagsgesellschaft, Munich
3. Hockey coaches manual
4. Athletics – Coaches manual
5. Kabaddi - coach manual



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58 PRINCIPLES OF MANAGEMENT

Unit-I: Evolution of Management Thought

Definition; Nature; and Purpose of Management; Managerial Functions at Different Organizational Levels; Evolution of Management Thoughts –Traditional, Medieval and Modern Levels of Management; Fredrick Taylor and Scientific Management; The Emergence of the Human Relations School.

Unit-II: Planning and Organizing

Nature of Planning; Six Ps of Planning; Types of Plan; the Purpose of Planning for Sport Events, Federations and Marketing Firms. Objectives: Hierarchy of Objectives, The Process of Setting Objectives; The Nature and Purpose of Strategies and Policies; Steps in Planning. Formal and Informal Organizations in the Sports Industry; The Process of Organizing; Organizational Structure: Design,-Steps- Benefits and Determinants of Organizational Structure, Types of Organizational Structures, Delegation, centralization and Decentralization.

Unit-III: Directing and Motivating:

Direction - Nature and Purpose - Importance of Direction - Written vs. Oral Directives - Techniques of Direction; Recruitment - Sources of Recruitment - Selection - Steps in the Selection Process; Training - Methods of Training. Definition of Motivation–theories of motivation –Maslow, two factor theory, McClelland theory, theory X and theory Y, kinds of motivation.

Unit-IV: Leading for Sport

Defining Leadership; Ingredients of Leadership; The Trait Approach to Leadership; The Behavioral Approach to Leadership; Different Types of Leadership - Controlling; The Basis Control Process; Control techniques, Modern Control Techniques.

Unit-V: Management and Society in the Sports context

Management and Society; The Concept of Social Responsibility; Social Responsibility of Managers - Sports Academies & Facility management; Obligation of the State to the Community - Inculcating a Sporting Lifestyle - Community Development Vs Elite Athlete Development.

Reference

1. Principles and Practice of Management – Heinz Wehrich& Harold Koontz.
2. Principles of Management by Moshal
3. Principles of Management: Tripathi & Reddy
4. Management Principles and Practices: Chunawala and Shreenivasan
5. Principles & Practice of Management: M.D. Kakade.
6. Paradigm Shift in Sports Management in India: Shail Kapri
7. Various Case Studies.



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59 BUSINESS ECONOMICS

Unit-I: Introduction to Business Economics

Meaning, Nature, Functions and Scope of Business Economics; Factors Influencing Business Decisions; Macro Economic Concepts – Inflation and National Income.

Unit-II: Demand Analysis and Estimation

The Law of Demand: Price-Demand Relationship, The Demand Function, Elasticity of Demand in Sports Context, Importance of Elasticity, Measuring Demand elasticity, Demand Forecasting, The Law of Supply.

Unit-III: Cost Concepts

Cost- Definition, Types- Fixed, Variable, Total, Average, Marginal and other costs. Break Even Analysis – Short Run, Long Run Cost Functions, Cost – Output relationship; Pricing Methods.

Unit-IV: Market structure and objectives of business firms

Objectives of Business Firms, Profit Maximization; Price and output determination under perfect competition: The Market Structure; Features of Perfect Competition, Monopoly: Definition and Sources, Monopolistic Competition and Its Features, Oligopoly and Duopoly.

Unit-V: Production Functions and Profit Theories:

Production Function – Factor Productivity and Returns to Scale – Managerial Use of Production Function; Profit – Definition, Profit Theories.

References

1. Economics by Samuelson.
2. Business Economics by Adhikari.
3. Managerial Economics by P. Maheshwari.



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60 ORGANISATIONAL BEHAVIOR

UNIT I

Introduction To Organizational Behavior – Definition of OB – Various Disciplines contributing to OB – Harwthron Experiment - Foundation Of Individual Behavior – Need And importance Of Organizational Behavior – Nature And Scope – Framework of Organizational Behavior Models.

UNIT II

Personality – Types – Factors Affecting Personality – Perception – Importance – Factors influencing Perception – Interpersonal Perception. Learning - Types of Learning Styles – Learning Process – Learning Theories. Motivation – Theories – Importance – Types – Motivation at Work

UNIT III

Values and Attitudes – Characteristics – Components – Formation And Measurement – Group Dynamics – Group Behavior – Formation – Types Of Groups – Stages of Group Development – Conflict Management – Nature of Conflict – Types of Conflict.

UNIT IV

Leadership – Meaning – Importance. Behavioral and Contingency Theories – Leadership Styles – Leaders Vs Managers; Power and Politics – Sources of Power – Power Centers – Organization Politics - Transactional Analysis (T.A) and Work stress.

UNIT V

Organizational Structure and Design – Organization Climate – Factors Affecting Organization Climate – Importance; Job Satisfaction – Organization Development – Organization culture – Organization Change – Current Trend in OB

Reference Books:

1. *Stephen Robbins, Organisational Behavior, Prentice Hall of India*
2. *Udai Pareek, Understanding Organisational Behavior, Oxford University Press*
3. *L.M.Prasad, Organisational Behavior, Sultan Chand & Sons*
4. *Fred Luthans, Organisational Behavior, McGraw Hill Book Co.*



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61 BUSINESS MATHEMATICS AND STATISTICS

Unit-I: Probability

Introduction – Basic Concepts in Probability. Baye's Theorem; - Theory of Distributions – Binomial, Poisson and Normal. Decision Theory – Decisions under risk & uncertainty – Decision tree analysis.

Unit-I: Differentiation and Integration

Basic Concepts of differentiation and integration – Concepts of Marginal, average and total cost – Economic Order Quantity, Break Even Analysis.

Unit-I: Statistics: Nature and Scope

Statistics in Business and Management; Statistical terms and concepts – Data, Variable, Random Variable, Population, Sample, Random Sample; Descriptive Statistics; Inferential Statistics; Graphical Representation and Histogram, Classification of Data; Frequency Distribution; Mean, Median and Mode.

Unit-IV: Regression and Correlation Analysis

Correlation Analysis, Spearman's Rank Correlation; The Scatter Diagram; The Linear Regression Equation.

Unit-V: Time Series Analysis and Index numbers

Time Series Analysis; Trend Analysis; Index Numbers; Seasonal Variation; Measuring Irregular Variation; Seasonal Adjustments.

References

1. Business Statistics-by Hooda
2. Fundamental of Statistics-by S.C. Gupta
3. Statistical Methods - by Sancheti – Kapoor



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62 OPERATIONS RESEARCH

UNIT I

Introduction to Operations Research, basic definition, scope, objectives and limitations of Operations Research.

UNIT II

Linear Programming Problem, Formulation of LPP – Graphical Method – Simplex Method (simple problems only)

UNIT III

Transportation Model – Initial Basic Feasible Solution – NWCR method – Vogel's Approximation method – LCM - Optimum solution – MODI Method - Assignment problem

UNIT IV

Replacement Models, Single replacement and group replacement problems - Sequencing problem.

UNIT V

Network Analysis – Rules for constructing a network diagram –Merits and demerits of CPM & PERT.

Reference Book:

1. *N.D.Kapoor, Mercantile Law – Sultan & Sons*
2. *S.D. Sharma, Operations Research*
3. *Hamdy A. Taha, Operations Research – An Introduction*
4. *Gupta & Manmohan, Problems in Operations Research, Methods and Solutions.*
5. *Dharani Venkatakrishnan, Operations Research, Principles and Problems.*



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63 MANAGEMENT INFORMATION SYSTEM

UNIT I

Information system: Concepts of systems – Strategic uses of Information Technology. Business perspective on information systems – Dimensions of information systems - Contemporary Approaches to Information Systems.

UNIT II

Computer System Resources: Computer Hardware and Computer software – File and DBMS
– Distributed System – Internet and Office Communications.

UNIT III

Application of Information System to functional Business Areas: Operational Information System – Tactical and Strategic Information system. Major types – ESS – DSS – MIS – TPS
–
Systems from a functional perspective – Introduction to BPO & KPO

UNIT IV

Planning and development of Information system: Systems as planned organizational change
– Business process reengineering & process improvement – Overview of Systems Development –
System analysis – Systems design. Alternative application development approaches.

UNIT V

Enterprise Resource Planning – Introduction – Related Technologies – ERP Modules – Benefits of ERP and End user computing – Security and ethical issues of Information Systems.

Reference Books:

1. Kenneth C. Laudon & Jane P.Laudon – *Management Information Systems-Managing the Digital Form-Eighth Edition, Eastern Economy Edition*
2. Alexis Leon, *Enterprise Resource Planning – Tata McGraw Hill Publishing Co. Ltd., New Delhi – 2005*
3. Raymond Meleod, *JR Information Systems – Mac Millan Publishing Co. ltd – 4th Edition.*
4. Gerald V.Post David L. Anderson, *Management Information System-Solving Business Problems with Information Technology – Tata McGraw Hill Publishing Co. ltd, New Delhi*
5. Gordan B.Davis Margrette H.Olsan, *Management Information System, Conceptual Foundations, Structure & Development – Second Edition – Tata McGraw Hill Co. Ltd, New Delhi*



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64 PRODUCTION & OPERATIONS MANAGEMENT

Unit-I: Production and Operations Management

Production and Operations Management – Objectives, Scope and Functions of Production and Operations Management.

Unit – II: **Manufacturing systems** - Need for Process Design and Process Selection; Steps in Process Design and Process Selection; Differences between Continuous and Intermittent Production Systems; Product-Process Matrix.

Unit-III: Production Planning and Control of sports goods

Elements of Production Planning; Strategy of Production Planning; Production Control; Input / Output Control; Shop-Floor Control; Elements of Automation; Computer-Aided Design (CAD); Computer-Aided Manufacturing (CAM); Flexible Manufacturing System (FMS); Computer-Integrated, Manufacturing System (CIMS). Product Design and Forecasting Product Selection; Product Selection Process; Need for Product Design and Development.

Unit-IV: Project Analysis and Evaluation

Definitions of Project and Project Management; Characteristics of a Project; Life Cycle of a Project - Conception and Definition Phase, Planning and Organizing Phase, Implementation Phase and Project Close; Types of Projects; The Project Planning Process; Constructing Networks; PERT and CPM.

Unit-V: Event Staging

Nature of Events; Pre-production processes; Post-production processes; Understanding the Sport Event Consumer.

References

1. Production and Operations Management– K. Aahwathappa and K. Sridhara Bhat.
2. Manufacturing automation – Morris Cohen – Tata McGraw Hill.
3. Management and Technology Management – L.C. Jhamb.
4. Production and Operations Management – Dr, B.S. Gole.



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65 MARKETING MANAGEMENT

Unit-I: Fundamentals of Marketing

The Marketing Concept: Marketing Concept vs. Production Concept - Service Concept - Profile of Customer-centric Organizations; Understanding Consumer Behavior: The Buyer - The Buying Process - Customer Relationship Management - Relationship Marketing - Overview of Sport marketing.

Unit-II: Product Positioning

Positioning: Elements of Positioning; Marketing Environment: Economic, Technological, Socio-cultural, Demographic and Political-Legal Environment; Product Life Cycle: Managing Brands and Product Lines.

Unit-III: Branding, Pricing and Distribution

Marketing Mix: New Product Development and Product Strategies: Branding of Products - Promotion Mix Strategies - Pricing Mechanism - Methods – Objectives - Factors affecting Pricing Decisions - Distribution Strategy: Nature and Types of Distribution Channels – Retailing – Wholesaling - Logistics.

Unit - IV: Sales Management

Sales Management: Selection and Training of Salespersons: Selection of the Salesperson; Methods of Training; Objectives of Salespersons' Performance Evaluation; Marketing Research: Need, Importance and Scope of Marketing Research - Market Research Report: Report Writing and Presentation, Research Proposal.

Unit V: Sponsorship Marketing Strategies in sports

Significance of sponsorship in Sports – Sponsor - Categories of Sponsorship - Benefits to Sponsors - Presentation Making - Sports Sponsorship as a Marketing Tool - Different Strategies practiced. **Ethics in Sports:** Meaning of sports ethics; Significance of ethics in sports - Ethical analysis. Issues in Event Marketing

References

1. Marketing Management – Philip Kotler.
2. Fundamentals of marketing – Steenton.
3. Marketing Management- S. Ramaswamy & S. Nama Kumari.
4. Principle of Marketing, 9th ed. Philip Kotler & Gary Armstrong
5. Marketing Management – S.A. Sherlekar.
6. Ethics & Sports – M.J. McNamee & S.J. Parry



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66 HUMAN RESOURCE MANAGEMENT

Unit-I: Introduction to Human Resource Management

Definitions, Objectives, Scope and Importance of HRM; Problems of HRD and Challenges for the Future.

Unit-II: Human Resource Planning

Definition, Objectives and Importance of HR Planning; Guidelines for making Effective HR Planning - Job Analysis - Job Description - Job Specification - Job Evaluation: Definitions, Objectives, Principles, Advantages, Limitations and Methods of Job Evaluation; Recruitment - Sources of Recruitment.

Unit-III: Induction, Training, Development and Orientation

Induction - Steps in the Induction Program; Content and Types of Induction Program; Training and Development; Training versus Development; Significance of Training and Development as Investment; Training Needs and Objectives. Training Process; Steps in the Training Program; Selection of a Training Method; Training Techniques; Evaluation of Training Programs

Unit-IV: Performance Appraisal

Meaning and Scope of Performance Appraisal; Objectives ; Uses ; Purpose and Need of Performance Appraisal; Appraisal Process; Appraisal Systems; Essentials of a Good Appraisal System; Methods or Techniques of Performance Appraisal; Potential Appraisal; Career Development; Functions and Significance.

Unit-V: Labour Welfare Measures and Wage and Salary Administration

Statutory and Non Statutory Labour Welfare Measures - Indian Factories Act 1948, Sec 42-49. Wage and Salary Administration; Methods of Wage Payment; Incentive Wage Plans; Concept of Variable Compensation; Fringe Benefits.

References

1. Performance Management by M. Armstrong.
2. Performance Management by LOWE.
3. Performance Management by T.V. Rao.
4. Principles of personnel management by Edwin. B. Flippo



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67 RESEARCH METHODS IN BUSINESS

UNIT- I

Research: Meaning – Scope and Significance – Types of Research – Research Process -Problems in Research – Significance of Research in Social Sciences – Identification – Selection and formulation of problem – Review of Literature - Research Hypothesis – Meaning – Sources – Types – Formulation of Research Design – Features of Good Design – Factors affecting Research Design – Evaluation of Research Design.

UNIT- II

Formulation of Hypothesis-Types, Testing – Sampling Design: Censes Method and Sampling Method – Principles of Sampling – Methods of Sampling –Probability and Non-Probability Sampling Methods – Selection of a sample – Size – Criteria of Good Sample Design. Scaling Techniques: Meaning, Types of Scale - Scale Construction Techniques.

UNIT- III

Data Collection: Types of Data – Sources of Data – Primary Data and Secondary Data -Data Collection Methods – Observation – Survey – Questionnaire – Interview Schedule - Effective in Interview Techniques – Constructing Questionnaire – Format of Good Questionnaire – Differences between Schedule and Questionnaire – Pilot Study. Analysis and Processing of Data: Meaning – Editing – Coding and Tabulation – Diagrams.

UNIT- IV

Tests of Significance – Assumption about parametric and non-parametric tests – Parametric Tests –Chi Square, T-Test, F-Test and Z Test. Non-Parametric Tests U-Tests – Kruskal Wallis – Introduction to ANOVA – One Way –Two Way –Multivariate Analysis – Correlation and Regression.

UNIT- V

Report Writing –Layout of report – Mechanics of writing Research Report –Norms for using tables – Charts and Diagrams – Appendix – Index and Bibliography.

Reference Books:

1. William C E mory, *Business Research Methods*, Richard D Irwin, NJ
2. Donald R Cooper, *Business Research Methods 7th Ed*, McGraw Hill, 2001
3. Krishnaswami OR, *Methodology of Research for Social Science*, Himalaya, Mumbai, 2001
4. Anderson J. et.al, *Thesis and Assignment writing*, Wiley Eastern



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68 TOTAL QUALITY MANAGEMENT

UNIT I

Introduction to Total Quality Management – Leadership – Information and Analysis – Managing in 21st century- global environment- cultural and ethical environment.

UNIT II

Human Resource Development and Management – Management of process quality – Customer focus and satisfaction – Bench marking.

UNIT III

Organizing for Total Quality Management – Productivity and Quality – Strategic Quality Planning. Cost of Quality.

UNIT IV

Processes and Quality tools – The Concept of Quality process – Total Quality Management – Quality improvement tools – Understanding process variation, Managing for quality- Japanese Management.

UNIT V

ISO 9000 Overview- Important steps in ISO Registration- ISO in Indian Companies. Criteria for Quality programs, Universal Standards of Quality – Reengineering.

Reference Books:

1. *Vincent K. Omachonu & Joel E. Ross, Principles of Total Quality.*
2. *Ron Collard, Total Quality.*
3. *Townsend & Gebhardt, Commit to Quality.*
4. *John Bark, Essence of TQM.*
5. *Willborn & Cheng, Global Management of Quality Assurance Systems.*



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69 SPORTS ORGANISATION AND ADMINISTRATION

UNIT I

Social Context for Modern Sports: Need for New Structure in Sports Today.
International Sports Environment: IOC and International Federations – National Sports Environment: National Olympic Committees – National Federations – Governmental and Quasi – Governmental Organizations.

UNIT II

Origin and Operations of Sports Organizations – Defining the Legal Status – Social Profile of the Sports Organization – Choosing a type of Organization: Environmental Indicators – Power and Authority – Delegation of Responsibilities – Organizational Charts.

UNIT III

Sports Organizations and their Environment: The nature of the Organizational Environment – Research on Organizational Environments – Controlling Environmental Uncertainty: Other Perspectives on the Organizational Environment.

UNIT IV

Sports Organizations and Technology: Technology – Research on technology and Organizations – Critiques of the Technology Imperatives – Micro-Electronic Technologies – Relationship Between technology and Organizational Structure.

UNIT V

Cases of Strategic Approaches by some Olympic Sports Organizations: IOC- FIFA – ICC - WADA – IOA – BCCI - Measuring the Performance of Olympic Sports Organizations.

Reference Books:

1. *Ruben Acosta Hernandez, Managing Sports Organizations, Human Kinetics.*
2. *Trevor Slack, Milena M. Parent, Understanding Sports Organizations.*
3. *Jean – Loup Chappelet and Emmanuel Bayle, Strategic and Performance Management of Olympic Sports Organization.*



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70 FUNDAMENTALS OF SPORTS MANAGEMENT

UNIT I

Defining Sports and Sports Management – Nature and Scope of the Sports Industry – Unique Aspects of the Sports Management – Sports Management Competencies – Future Challenges and Opportunities for Sports Managers.

UNIT II

The Sports Manager: Basics of Sports Management – Managing in the Sports Environment – Managing People and Administrative Units – Management Functions in sports – Motivating Abilities: Fundamentals.

UNIT III

Planning in Sports Organizations: Planning Process – preparing the Organization for Planning– Long Term Planning – Creating a Medium Term National Plan.

UNIT IV

Controlling in Sports Organizations: Fundamentals of Budgeting – Preparing Budget – Allocating Resources- Control as Measurement and as Accountability – Financing and Budgeting Operations.

UNIT V

Management of National Level Leagues: Indian Premier League (IPL), Pro Kabaddi, Indian Super League (ISL), Hockey India League (HIL), etc – Challenges and Opportunities in India.

Reference Books:

1. Jane B.Parks, Jerome Quarterman and Lucie Thibault, *Contemporary Sports Management*.
2. Ruben Acosta Hernandez, *Managing Sports Organizations, Human Kinetics*.
3. Trevor Slack, Milena M Parent, *Understanding Sports Organizations*.



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71 ENTREPRENEURIAL DEVELOPMENT

UNIT-I

Introduction - Understanding the meaning of Entrepreneurship - Characteristics of an Entrepreneur - Classification of the Entrepreneurs - Entrepreneurial Scene in India - Factors influencing Entrepreneurship

UNIT-II

Entrepreneurial growth - Role played by government and Non-Government agencies - EDP's, TIIC, SIDBI, PIPDIC, IDBI, IFCI, ETC. Problems and prospects of Women entrepreneurs - Rural Entrepreneurs - Small scale entrepreneurs and Export Entrepreneurs

UNIT-III

How to enter into Market? - Business idea generation Techniques - Identification of Business Opportunities - Marketing Feasibility - Financial Feasibility - Technical - Legal - Managerial and Vocational Feasibility

UNIT-IV

Project Appraisal - Methods - Techniques - Preparation of Business Plan - Content of a Business Plan - Project Report.

UNIT-V

How to start an enterprise? - Franchising and Acquisition - Product Strategies - Pricing Strategies - Distribution Strategies - Promotional Strategies. How to be a successful Entrepreneur? - Learning to be Successful - Successful entrepreneurs.

Text and Reference Books

1. Jayshree Suresh - Entrepreneurial Development.
2. Khanka - Entrepreneurial Development.
3. Saini - Entrepreneurship : Theory & Practice.
4. Gupta CB - Entrepreneurial Development.
5. Vasant Desai - Dynamics of Entrepreneurial Development and Management.



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72 RETAIL MANAGEMENT

UNIT I

INTRODUCTION TO RETAILING: Functions of a Retailer, Characteristics of Retailing, Categorizing Retailers-Types of retailers-Multichannel Retailing ,The rise of Consumerism and the rise of retailer, Social and Economic Significance of retailing, The global Retail market: Issues and challenges - Supply chain Management and Logistics- Challenges to Retail development in India.

UNIT II

RETAILING STRATEGY: Retail Market Strategy, Target Market and Retail Format-Building Sustainable Competitive Advantage-Growth strategies - The strategic Retailing Planning Process-Retail locations.

UNIT III

MERCHANDISE MANAGEMENT: The Buying organization, Merchandise Category, Evaluating Merchandise Management Performance, Types of Merchandise Management Planning Processes, Forecasting Sales, Setting Inventory And Product Availability Levels-Merchandise Planning Systems -Methods of Merchandise procurement: Merchandise Sourcing.

UNIT IV

RETAIL PRICING: Concept and considerations in setting Retail prices, Pricing Strategies, Pricing Techniques, The Internet and Price Competition.

UNIT V

STORE MANAGEMENT: Recruiting, Orientation and Training ,Motivating, Evaluating, Compensating and Rewarding Store employees, Controlling Costs and Inventory Shrinkage-Store Layout, Design and Visual Merchandising - Customer Service: Setting Service Standards, Meeting and exceeding service standards, Service recovery.

TEXT AND REFERENCES BOOKS

1. Chetan Bajaj, Rajnishtuli, Nidi Varma Srivastava , “Retail Management”, Oxford University Press, Second Edition, 2010.
2. Swapna Pradhan, “Retailing Management Text and cases”, McGrawHill,3rd edition, 2009.
3. Barry Berman, Joel R.Evans, “Retail Management A Strategic Approach”, Pearson Education, Inc, Tenth edition, 2010.
4. Michael Levy, Barton A Weitz and Ajay Pandit , “Retail Management”, Tata McGraw Hill,Sixth Edition, 2008.



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73 SPORTS MARKETING

Unit-1:

Sports marketing: Definition – Marketing Myopia in Sport – Uniqueness of Sports Marketing – Model of the Sports Industry – Implementation of Sports Marketing Programme.

Unit-2:

Perspectives in Sports Consumer Behavior: Environmental Factors – Individual Factors – Decision Making for Sports Involvement.

Unit-3:

The Sports Product: Its Core and Extensions – Key Issues in Sports Product Strategy – Managing Sports Brands: Benefits and Development of Brand Equity. Sales Approaches Used in Sports – Selling Sports to the Community.

Unit-4:

Pricing Strategies: The Basics of Pricing – Core Issues – Special Pricing Factors – **Advertising Media** for Sports – **Promotional** Concepts, Practices and Components – **Sponsorship:** Definition – Growth of Sponsorship – Evaluating and Ensuring Sponsorship Effectiveness – Selling the Sponsorship.

Unit-5:

Place/Product Distribution: Placing Core Products and their Extensions – The Facility – Marketing Channels – Marketing of International Sports Events: Olympic, World Cup Football, World Cup Cricket, NBA Tournaments, European Cup football, Wimbledon Tennis, F1 Races, etc..

References:

1. *Bernard J Mullin, Stephen Hardy, William A Sutton, Sport Marketing, Human Kinetics.*



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74 SPORTS FACILITY MANAGEMENT

Unit-I:

Facility Management: Meaning – The Facility Manager – Constituents – Managerial Functions – Computer Aided Facility Management.

Unit-II:

Facility Planning: Fundamentals – Planning for Existing and Future Facilities – Facility Site and Design: Site Location – site Cost – Site Selection.

Unit - III

Facility Design and Construction – Construction Planning and Elements – Project cost – Completion and Analysis.

Unit-IV:

Facility Systems: Heating, Ventilation and Air-Conditioning – Energy Systems – Interior and Exterior Systems – Space Management – Facility Repair Management: Maintenance and Repair Program – Basic Maintenance.

Unit-V:

Facility Marketing - Sales – Financial Concepts – Revenue and Expenses – Budgeting – New Facility Financing – Selling of a Facility – Sports Facility Jobs – Employment Management – Training – Risk Management and Insurance.

Reference:

Gil Fried, Managing Sports Facilities, Human Kinetics



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75 Principles of Management

PSM18CT101-

UNIT I

Fundamentals of Management – Evolution of Management -Planning and Decision Making : Relationship with other managerial functions – Types of plans and their implementation – Management by objectives.

UNIT II

Organizing and Staffing: - Basic concepts of organizing and staffing. Departmentalization, delegation, decentralization – span of control – line and staff functions – reasons for and resolution of conflicts between line and staff functions.

UNIT III

Directing and Leading: Leadership- processes and approaches – Transactional and transformational leadership – Motivation – Important theories – Group Dynamics – Control and coordination: Basic concepts, elements, processes and techniques of control and co-ordination.

UNIT IV

Corporate social responsibility- ethics and values in business – social audit – Government regulation of business.

UNIT V

Communication – Characteristics of a good communication system- types of communication – barriers to communication – Recent trends in business and Management.

Reference Books:

1. William F Glueck and Lawrence R Jaach, *Business Policy and Strategic Management*, Mc Graw Hill, 1984.
2. Koontz and O' Donnel, *Management*, Mc Graw Hill, 1996.



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76 ORGANISATIONAL BEHAVIOR

PSM18CT102-

UNIT I

Introduction To Organizational Behavior – Definition of OB – Various Disciplines contributing to OB – Harwthorne Experiment - Foundation Of Individual Behavior – Need And importance Of Organizational Behavior – Nature And Scope – Framework of Organizational Behavior Models.

UNIT II

Personality – Types – Factors Affecting Personality – Perception – Importance – Factors influencing Perception – Interpersonal Perception. Learning - Types of Learning Styles – Learning Process – Learning Theories. Motivation – Theories – Importance – Types – Motivation at Work

UNIT III

Values and Attitudes – Characteristics – Components – Formation And Measurement – Group Dynamics – Group Behavior – Formation – Types Of Groups – Stages of Group Development – Conflict Management – Nature of Conflict – Types of Conflict.

UNIT IV

Leadership – Meaning – Importance. Behavioral and Contingency Theories – Leadership Styles – Leaders Vs Managers; Power and Politics – Sources of Power – Power Centers – Organization Politics - Transactional Analysis (T.A) and Work stress.

UNIT V

Organizational Structure and Design – Organization Climate – Factors Affecting Organization Climate – Importance; Job Satisfaction – Organization Development – Organization culture – Organization Change – Current Trend in OB



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Reference Books:

2. *Stephen Robbins, Organisational Behavior, Prentice Hall of India*
3. *Udai Pareek, Understanding Organisational Behavior, Oxford University Press*
4. *L.M.Prasad, Organisational Behavior, Sultan Chand & Sons*
5. *Fred Luthans, Organisational Behavior, McGraw Hill Book Co.*



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77 MANAGERIAL ECONOMICS

PSM18CT104-

UNIT I

Basic Concepts, Scope, Importance and Definitions Relevant to Managerial Economics- Factors Influencing Managerial Decision – Managerial Economics and other Disciplines.

UNIT II

Demand - Meaning - Types – Determinants – Demand Functions – Demand Elasticity and Demand Forecasting Methods.

UNIT III

Production Function – Factor productivity and Returns to Scale – Statistical Production Function – Managerial uses of Production Function – Costs Concepts - cost analysis, breakeven analysis, short run and a long run cost functions, Cost – Output Relationship.

UNIT IV

Price - Determinants of Price - Pricing under Different Market Structures- Price Discrimination- Pricing of Joint Products- Pricing Methods in Practice.

UNIT V

Money Supply & Demand for Money – Inflation – Business Cycle - Government Policy – Fiscal & Monetary Policy – Indian Government Policy, National Income & Current Issues.

Reference Books:

1. Dominick Salvatore, “Managerial Economics in a Global Economy” 4th Edition, Thomson South-Western
2. V.L.Mote et al, “Managerial Economics”, Tata McGraw-Hill Publishing Company Limited, India.
3. John Sloman, “Economics”, Pearson Education, India.
4. Joel Dean, “Managerial Economics”, Prentice – Hall of India.
5. Sumitra Pal, Managerial Economics, Cases & Concepts, Mac Millon India Ltd.,
6. G.S.Gupta, Macro Economics, Tata McGraw Hill Company Ltd., India



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78 QUANTITATIVE METHODS IN BUSINESS

PSM18CT106-

UNIT I

Probability – Introduction – Basic Concepts in Probability. Baye's Theorem; - Theory of Distributions – Binomial, Poisson and Normal. Decision Theory – Decisions under risk & uncertainty – Decision tree analysis.

UNIT II

Basic Concepts of differentiation and integration – Concepts of Marginal, average and total cost – Economic Order Quantity, Break Even Analysis. Presentation of Statistical Data – Tables and Graphs – Frequency Distribution and Histogram.

UNIT III

Basic Statistics – Introduction – Measure of Central Tendency & Dispersion – Mean, Median, Mode, Range and Weighted Average.

UNIT IV

Correlation and Regression- simple, partial and multiple correlation- simple, partial and multiple regressions- estimation using regression line.

UNIT V

Sampling Theory – Basic Concepts in sampling theory – T Test, Z Test – One way ANOVA, Two way ANOVA - χ^2 Test – Goodness of fit and Independent of Attributes.

Reference Books:

1. *Statistics for Management by Richard I. Levin David S Rubin*
2. *Business Statistics by S.P.Gupta*
3. *Quantitative Techniques for Management by P.R.Vittal*
4. *Business Statistics by V.K.Kapoor.*



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79 OPERATIONS MANAGEMENT

PSM18CT107-

UNIT I

Production & Operations Management – Meaning, Scope, Functions, Relationship between POM & other functional areas of Management. Classification of Production Systems – Intermittent, Job shop, Batch, Continuous, Flow and Mass Production Systems. Product Design – Reverse Engineering

UNIT II

Process Planning – Steps in Process Planning – Make or Buy Decision. Computer Integrated Manufacturing – Computer Aided Design - Computer Aided Manufacturing – Flexible Manufacturing Systems. Production Planning & Control – Preplanning – Forecasting – Scheduling - Dispatching – Routing – Expediting

UNIT III

Plant Location – Factors Influencing Plant Location, Importance of Environmental Health & Safety factors in deciding the location of plant - Cost Factor – Semi Quantitative Techniques, Plant Layout – Principles, Flow Patterns, Types of Plant Layout. Capacity Planning – Types of Capacity, Capacity Decision, Capacity Planning Strategies.

UNIT IV

Inventory – Definition, Classification of Inventories, Purchase Model, Manufacturing Model, Just in Time, Selective Inventory Control Techniques. Statistical Quality Control – Control Charts – Work Study – Method Study – Symbols, Charts, Diagrams. Time Study.

UNIT V

Maintenance Management – Types of Maintenance, Procedure for Maintenance. Fundamentals of Purchasing – Functions of Purchasing, Purchasing Procedure, Vendor Rating, Stores Management – Functions of Store Keeping, Store Records, Stock Verification.

Reference Books:

1. Senthil. M, *Production & Operations Management*, Pearson Education
2. Monks, Joseph G, *Operations Management*, McGraw Hill International
3. Adam Jr. Ebert, *Production & Operations Management*
4. Buffa E.S., *Modern Production & Operations Management*



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80 MARKETING MANAGEMENT

PSM18CT108-

Unit 1- Introduction to Marketing Management: Market and Marketing – the Exchange Process – Functions of Marketing – Importance of Marketing – The Marketing Process: Marketing Mix – The Traditional 4Ps – the Modern Components of the Mix – Developing an Effective Marketing Mix – Marketing Planning and Control.

Unit 2- Marketing Environment: Environmental Scanning – Techniques of Environment Scanning – Analysing the Micro and Macro – Difference between Micro and Macro Environment – Segmentation, Targeting and Positioning: Concept of Market Segmentation – Benefits of Market Segmentation – Requisites of Effective Market segmentation – The process of Market segmentation - Bases for Segmenting Consumer Markets.

Unit 3- Consumer Buying Behaviour: Types of Buying Decision Behaviour – Henry Assael Model – Consumer Buying Decision Process – Buyer Decision Process for New Products – Buying Motives – Buyer Behaviour Models – Understanding the Marketing Research: Marketing Research Process – Customer Relationship Management(CRM): process – Significances.

Unit 4- Product Management: Classification of Products – Product Line Strategies – Product Mix Strategies: New Product Development – Packaging and Labelling – Product Life Cycle(PLC) – Brand and Branding – Advantages and Disadvantages of Branding – Brand name Selection – Types of Brands – Brand Equity – Brand Positioning – Pricing: Pricing Objectives – Factors Affecting Price Decisions – Pricing Policies/Methods – Significance of pricing.

Unit 5- Promotion Management: Introduction to Advertising – Advertising Development – Budget Allocation – Media Selection – Fundamentals of Sales Promotion – Basics of Public Relations and Publicity – Personal Selling – Personal Selling Process – Sales Management Basics – HR Practices in Sales Management – Training and Compensation – Distribution Management: Need For Marketing Channels – Types of Channels – Decisions Involved in Setting up the Channel – Channel Management Strategies – Introduction to Logistics Management.

Reference Books:

1. *Philip Kotler, Kevin Lane, Abraham Koshy-Marketing Management – A South Asian Perspective-Pearson/Prentice Hall India Ltd*
2. *Rajan Saxena – Marketing Management-Tata McGraw Hill*
3. *Ramaswamy & Namakumary-Marketing Management-Global Perspective-Indian Context-Mac Millon India Ltd*



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81 HUMAN RESOURCE MANAGEMENT

PSM18CT110-

UNIT I

Meaning, Nature and Scope of HRM - Personnel Management Verses HRM- Importance of HRM-Functions of HRM-Classification of HRM Functions- Organization of HRM Department-Qualities and Qualifications of HRM Managers

UNIT II

Meaning and Objectives of HRP – Benefits of HRP, Objectives of Recruitment – Company strategies and recruitment strategies – Job Analysis – Purpose & Techniques – Job Description – Job Specification – Searching for prospective Employees/Sources of Recruitment – Traditional sources – Modern sources – Factors affecting Recruitment.

UNIT III

Selection - Meaning and definition – Essentials of Selection Procedure – Steps in Selection Procedure – Application form – Written examination – Preliminary Interview – Psychological Tests – Final Interview – Medical examination – Reference checks – Line Manager's Decision – Job Offer – Employment – Placement– Induction and Retention of Employees.

UNIT – IV

Training & Development – Purpose – Need – Importance – Techniques (on the job & off the job) – Evaluation – Benefits – Management Development Programme – Knowledge Management - Job Enlargement – Job Enrichment – Job Evaluation – Meaning – Purpose - Techniques. Quality of working life – Issues in Quality of Working life– Quality Circles – Management By Objectives.

UNIT V

Wage & Salary Administration: Compensation Plan – Individual – Group – Incentives – Bonus – Fringe Benefits. Performance Appraisal – Meaning - Need and Importance – Objectives – Methods and Modern Techniques of Performance Appraisal – Requisite of Good Appraisal Plan – Problems in Performance Appraisal – Corporate Social Responsibility.

Reference Books:

1. Venkatraman C.S & Srivastava G.K. *Personnel Management and Human Resources*, Tata MoGraw Hill, 1991
2. Arun Monappa, *Industrial Relations*, Tata MoGraw Hill, 1987
3. Dale Yoduer & Paul D Standohar *Personnel Management and Industrial Relations*, Sterling Publishers, 1990
4. C.B Matoria, “ *Personnel Management*” Himalaya Publishing House, 1995
5. P Subba Rao, “ *Essentials of Human Resource Management and Industrial Relation*” Himalaya Publishing House, 2004.



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82 OPERATIONS RESEARCH

PSM18CT111-

UNIT I

Introduction to Operations Research – Linear Programming Problem – Graphical solution – Simplex Method and Special cases in linear programming.

UNIT II

Transportation Model – Initial Basic Feasible Solution – NWCR method – Vogel's Approximation method – LCM - Optimum solution – MODI Method.

UNIT III

Assignment problem - Travelling Salesman Problem- Queuing theory - Elements of Queuing system – Characteristics of Queuing System – Single channel Single server system – Single channel multi server system – Application.

UNIT IV

Sequencing problem - Network Analysis – Rules for constructing a network diagram –Merits and demerits of CPM & PERT.

UNIT V

Game theory – Saddle point - Applications of Game theory -Simulation – Monte Carlo Simulation. Replacement problems.

Reference Book:

6. *N.D.Kapoor, Mercantile Law – Sultan & Sons*
7. *S.D. Sharma, Operations Research*
8. *Hamdy A. Taha, Operations Research – An Introduction*
9. *Gupta & Manmohan, Problems in Operations Research, Methods and Solutions.*
10. *Dharani Venkatakrishnan, Operations Research, Principles and Problems.*



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83 MANAGEMENT INFORMATION SYSTEM

PSM18CT112-

UNIT I

Information system: Managers' view – Concepts of systems – Strategic uses of Information Technology. Business perspective on information systems – Dimensions of information systems - Contemporary Approaches to Information Systems – Learning to Use Information Systems – New Opportunities with Technology.

UNIT II

Computer System Resources: Computer Hardware and Computer software – File and DBMS – Distributed System – Internet and Office Communications.

UNIT III

Application of Information System to functional Business Areas: Operational Information System – Tactical and Strategic Information system. Major types – ESS – DSS – MIS – TPS – Systems from a functional perspective – Introduction to BPO & KPO

UNIT IV

Planning and development of Information system: Systems as planned organizational change – Business process reengineering & process improvement – Overview of Systems Development – System analysis – Systems design. Alternative application development approaches.

UNIT V

Enterprise Resource Planning – Introduction – Related Technologies – ERP Modules – Benefits of ERP and End user computing – Security and ethical issues of Information Systems.

Reference Books:

1. *Kenneth C. Laudon & Jane P. Laudon – Management Information Systems-Managing the Digital Form-Eighth Edition, Eastern Economy Edition*
2. *Alexis Leon, Enterprise Resource Planning – Tata McGraw Hill Publishing Co. Ltd., New Delhi – 2005*
3. *Raymond Meleod, JR Information Systems – Mac Millan Publishing Co. Ltd – 4th Edition.*
4. *Gerald V. Post David L. Anderson, Management Information System-Solving Business Problems with Information Technology – Tata McGraw Hill Publishing Co. Ltd, New Delhi*
5. *Gordan B. Davis Margrette H. Olsan, Management Information System, Conceptual Foundations, Structure & Development – Second Edition – Tata McGraw Hill Co. Ltd, New Delhi*



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84 TOTAL QUALITY MANAGEMENT

PSM18CT113-

UNIT I

Introduction to Total Quality Management – Leadership – Information and Analysis – Managing in 21st century- global environment- cultural and ethical environment.

UNIT II

Human Resource Development and Management – Management of process quality – Customer focus and satisfaction – Bench marking.

UNIT III

Organizing for Total Quality Management – Productivity and Quality – Strategic Quality Planning. Cost of Quality.

UNIT IV

Processes and Quality tools – The Concept of Quality process – Total Quality Management – Quality improvement tools – Understanding process variation, Managing for quality- Japanese Management.

UNIT V

ISO 9000 Overview- Important steps in ISO Registration- ISO in Indian Companies. Criteria for Quality programs, Universal Standards of Quality – Reengineering.

Reference Books:

6. *Vincent K. Omachonu & Joel E. Ross, Principles of Total Quality.*
7. *Ron Collard, Total Quality.*
8. *Townsend & Gebhardt, Commit to Quality.*
9. *John Bark, Essence of TQM.*
10. *Willborn & Cheng, Global Management of Quality Assurance Systems.*



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85 STRATEGIC MANAGEMENT

PSM18CT114-

UNIT I

Overview of Strategic Management: Strategic Planning– Strategic Management process – Mission – Vision and Objectives. Changing Business Environment – Globalization – Technological Changes– Strategic responses of Organizations to Changing Environment.

UNIT II

Environment and Resources Analysis: Environment Analysis – Industry Analysis – Competitive Analysis – Internal Analysis – SWOT Analysis. Human Resource and Business Strategy – Changing work Roles – Portfolio – Process and Structure Related Strategic Responses and SHRM system.

UNIT III

Strategy Formulation and Choice: Corporate level strategy – Global Strategy – Business level strategy – Strategic Analysis and choice. Strategic HRM Practices and Facilitators.

UNIT IV

Strategy Implementation: Activating strategies – Structural Implementation – Behavioral Implementation – Functional and Operational Implementation. Management of Careers – National Cultures and International Management.

UNIT V

Strategy Evaluation and Control: Overview – Strategic control process – Operational control – Techniques – Future of Strategic Management. Economic Indicators of Human Resource Management.

Reference Books:

1. Arthur A Thompson and AJ Stickland III *Strategic Management*, New Delhi Tata McGraw Hill, 2002.
2. Gerry Johnson *Exploring Corporate Strategy* Prentice Hall 2002
3. Maisana Mazzucato *Strategy for Business*, New Delhi, Sage Publication 2002
4. Craig Fleisher et.al. *Strategic and Competitive Analysis* Prentice Hall 2002
5. Shaun Tyson. *Strategic Prospects for HRM*
6. Miller & Dass *Business Policy & Strategic Management*
7. V. Subba Rao *Business Policy & Strategic Management*
8. Bhaskar Rao *Ethical Choices in Business*



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86 RESEARCH METHODS IN BUSINESS

PSM18CT115-

UNIT- I

Research: Meaning – Scope and Significance – Types of Research – Research Process -Problems in Research – Significance of Research in Social Sciences – Identification – Selection and formulation of problem – Review of Literature – Formulation of Research Design – Features of Good Design – Factors affecting Research Design – Evaluation of Research Design.

UNIT- II

Formulation of Hypothesis-Types, Testing – Sampling Design: Censes Method and Sampling Method – Principles of Sampling – Methods of Sampling –Probability and Non-Probability Sampling Methods – Selection of a sample – Size – Criteria of Good Sample Design. Scaling Techniques: Meaning, Types of Scale - Scale Construction Techniques.

UNIT- III

Data Collection: Types of Data – Sources of Data – Primary Data and Secondary Data -Data Collection Methods – Observation – Survey – Questionnaire – Interview Schedule - Effective in Interview Techniques – Constructing Questionnaire – Format of Good Questionnaire – Differences between Schedule and Questionnaire – Pilot Study. Analysis and Processing of Data: Meaning – Editing – Coding and Tabulation – Diagrams.

UNIT- IV

Tests of Significance – Assumption about parametric and non-parametric tests – Parametric Tests –Chi Square, T-Test, F-Test and Z Test. Non-Parametric Tests U-Tests – Kruskal Wallis – Introduction to ANOVA – One Way –Two Way –Multivariate Analysis – Correlation and Regression.

UNIT- V

Report Writing –Layout of report – Mechanics of writing Research Report –Norms for using tables – Charts and Diagrams – Appendix – Index and Bibliography.

Reference Books:

1. William C E mory, *Business Research Methods*, Richard D Irwin, NJ
2. Donald R Cooper, *Business Research Methods 7th Ed*, McGraw Hill, 2001
3. Krishnaswami OR, *Methodology of Research for Social Science*, Himalaya, Mumbai, 2001
4. Anderson J. et.al, *Thesis and Assignment writing*, Wiley Eastern



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87 SPORTS ORGANIZATION AND ADMINISTRATION

PSMDE101-

UNIT I

Social Context for Modern Sports: Need for New Structure in Sports Today.
International Sports Environment: IOC and International Federations – National Sports Environment: National Olympic Committees – National Federations – Governmental and Quasi – Governmental Organizations – Sports Conflicts –Conflicts arising from Anti-Doping Tests.

UNIT II

Origin and Operations of Sports Organizations – Defining the Legal Status – Social Profile of the Sports Organization – Choosing a type of Organization: Environmental Indicators – Power and Authority – Delegation of Responsibilities – Organizational Charts – Sports Identity Vs Image – Establishing a Sports Identity.

UNIT III

Sports Organizations and their Environment: The nature of the Organizational Environment – Research on Organizational Environments – Controlling Environmental Uncertainty: Other Perspectives on the Organizational Environment. Relationship between Organizations's Environment and its Structure.

UNIT IV

Sports Organizations and Technology: Technology – Research on technology and Organizations – Critiques of the Technology Imperatives – Micro-Electronic Technologies – Relationship Between technology and Organizational Structure.

UNIT V

Cases of Strategic Approaches by some Olympic Sports Organizations: FIVB – FIH - IPC – WADA – ISC – ZOC – OCM – OS – Measuring the Performance of Olympic Sports Organizations.

Reference Books:

4. *Ruben Acosta Hernandez, Managing Sports Organizations, Human Kinetics.*
5. *Trevor Slack, Milena M. Parent, Understanding Sports Organizations.*
6. *Jean – Loup Chappelet and Emmanuel Bayle, Strategic and Performance Management of Olympic Sports Organization.*



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88 SPORTS MANAGEMENT – PRINCIPLES AND PRACTICES

PSMDE102-

UNIT I

Managing Sports in the 21st Century: Defining Sports and Sports Management – Nature and Scope of the Sports Industry – Unique Aspects of the Sports Management – Sports Management Competencies – Future Challenges and Opportunities for Sports Managers – Future of Sports Industry/Organizations.

UNIT II

The Sports Manager: Basics of Sports Management – Managing in the Sports Environment – Managing People and Administrative Units – Management Functions in sports – Motivating Abilities: Fundamentals.

UNIT III

Planning in Sports Organizations: Planning Process – preparing the Organization for Planning – Participatory Strategic Planning – Long Term Planning – Creating a Medium Term National Plan.

UNIT IV

Controlling in Sports Organizations: Fundamentals of Budgeting – Preparing Budget – Allocating Resources – Control as Measurement and as Accountability – Financing and Budgeting Operations – Result – Oriented Budgeting – Controlling Deviations – The Challenges in Sports Today – Rising to New Challenges – Serving the Sports Organization's Clients.

UNIT V

The Future of Sports Management: Why Sports Managers need to understand Research – Commercial and Academic Researchers in Sports Management – Sports Management Research: Key Concepts – Research Process – Current Challenges in Sports Management Research – The Future of Sports Management Research.

Reference Books:

4. *Jane B.Parks, Jerome Quarterman and Lucie Thibault, Contemporary Sports Management.*
5. *Ruben Acosta Hernandez, Managing Sports Organizations, Human Kinetics.*
6. *Trevor Slack, Milena M Parent, Understanding Sports Organizations.*



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89 SPORTS MARKETING

PSMDE103 –

Unit-1:

Sports marketing: Definition – Marketing Myopia in Sport – Uniqueness of Sports Marketing – Model of the Sports Industry – Implementation of Sports Marketing Programme.

Unit-2:

Perspectives in Sports Consumer Behavior: Environmental Factors – Individual Factors – Decision Making for Sports Involvement – Role of Research in Sports Marketing: Types of Primary Market Research – Common Problems in Sports Marketing Research.

Unit-3:

The Sports Product: Its Core and Extensions – Key Issues in Sports Product Strategy – Managing Sports Brands: Benefits and Development of Brand Equity – Sales: Definition – Typical Sales Approaches Used in Sports – Selling Sports to the Community.

Unit-4:

Pricing Strategies: The Basics of Pricing – Core Issues – Special Pricing Factors – Advertising Media for Sports – Promotional Concepts, Practices and Components – Sponsorship: Definition – Growth of Sponsorship – Evaluating and Ensuring Sponsorship Effectiveness – Selling the Sponsorship – Ethical Issues.

Unit-5:

Place/Product Distribution: Placing Core Products and their Extensions – The Facility – Marketing Channels – The Product-Place Matrix – Electronic Media Landscape – Media Impact on Sport Public Relations – Integrating Sales, Promotion, Sponsorship, Media and Community Relations – Cross Impacts among the Five P's – the Legal Aspects of Sports Marketing.

References:

Bernard J Mullin, Stephen Hardy, William A Sutton, Sport Marketing, Human Kinetics.



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90 SPORTS FACILITY MANAGEMENT

PSMDE104-

Unit-I:

Facility Management: Meaning – The Facility Manager – Constituents – Managerial Functions – Computer Aided Facility Management – Strategies – Leadership – Outsourcing.

Unit-II:

Facility Planning: Fundamentals – Planning for Existing and Future Facilities – Facility Site and Design: Site Location – site Cost – Site Selection – Facility Design and Construction – Construction Planning and Elements – Project cost – Completion and Analysis.

Unit-III:

Facility Systems: Heating, Ventilation and Air-Conditioning – Energy Systems – Interior and Exterior Systems – Space Management – Facility Repair Management: Maintenance and Repair Program – Basic Maintenance.

Unit-IV:

Facility Marketing - Sales – Financial Concepts – Revenue and Expenses – Budgeting – New Facility Financing – Selling of a Facility – Sports Facility Jobs – Employment Management – Training – Risk Management and Insurance.

Unit-V:

Facility Preparation: Attracting Events – Event Preparation Implementing a Security Plan: Crowd Management – Crisis Management – Event Management in the Facility: Marketing Efforts and Costs – Marketing for the Future.

Reference:

Gil Fried, Managing Sports Facilities, Human Kinetics



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91 SPORTS PSYCHOLOGY AND SOCIOLOGY

PSMDE105-

Unit-1:

Sports Psychology – Meaning and Definition of Sports Psychology – The Need and Importance of Sports Psychology in Physical Education and Sports – General Factors Affecting Sports Learning and Performance – Development of Sports Psychology – Motivation of Children and Youth in Sports – Perception – Reaction Time – Movement Time – Reflex Time – Response Time.

Unit-2:

Motor Learning – Tension – Frustration – Depression – Stress – Anxiety – Motivation – Factors influencing Motivation – Achievement Motivation – Ways and Means of Motivation – Personality – Meaning – Traits of Sportsmen – Effect of Sports Participation on Personality.

Unit-3:

Sports Sociology – Meaning and Definition of Sports Sociology – Sports and Socialization of the Individual – Culture – Definition and Culture – Functions of Culture and Sports.

Unit-4:

Social Institutions – Sports as a Social Institutions – Sports and its Relationship with Social Institutions – Growth of Commercial Sport – Sports and Politics – Sports and Religion – Sports and Social Stratification – Sports Participation and Career Success – Athletic Retirement and Social Mobility.

Unit-5:

Women in Sports – Sports Women in Our Society – Participation Pattern among Women – Gender Inequalities – Consequence of Sports Competition – Evaluation Processes.

Reference:

1. John D. Lauther, "Sports Psychology", Englewood, Prentice Hall Inc.
2. Robert N. Singer, "Motor Learning and Human Performance", New York: The Macmillan Co.
3. MicroslawVauks and Bryant Cratty, "Psychology and the Superior Athlete", London, The Macmillan Co.
4. Robert N. Singer, "The Psychology Domain Movement Behavior" Philadelphia – Lea and Febiger
5. John D Lauther, "Psychology of Coaching", Englewood Cliffs, New Jersey Prentice Hall Inc 1983.
6. H.I.A. Whiting K. Karman, L.B. Hendry and M.G. Jones, "Personality and Performance in Physical Education and Sports", Hendry Kimpton Publishers, London.
7. Cratty B.J., "Social Dimensions of Physical Activity", New Jersey: Prentice Hall Inc.



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92 SPORTS TOURISM

PSMDE106-

Unit 1- Sports and Tourism: The Nature of Sport, Tourism and Sports Tourism - Classification Scheme for Sports Tourism - The Infrastructure of Sports, Tourism and Sports Tourism - The Characteristics of Participants.

Unit 2- Sports in the Development of Tourism: The influence of increased Sports Participation and Sports Tourism - Active and Passive Sports in the Holiday - active and Passive Sports during Non-holiday time - **Tourism in the Development of Sports:** Sports development based on available Tourism Resources and as a result of visiting Tourist Resources - Major Events used to stimulate Sports Development

Unit 3-The Economic Impact of Sport Tourism: Sports and Tourism as Economic Activities - Sports Activity Holidays - Major Sports Facilities and Events as an attraction for visitors - **The Socio-cultural impact of Sport Tourism:** Conceptual Background to Socio-cultural Impacts - Positive Impacts and Negative Impacts - Violence in and Surrounding Sport and Tourism.

Unit 4- The Environmental Impact of Sport Tourism: Concern for the Natural Environment - Increasing Participation in Outdoor Sports - Damage to the Natural Environment caused by Tourism - Impact of Holiday Resorts and Sports Tourism Activities on the Natural Environment - Impact of Sports Tourism on Urban Environments - **The Health Impact of Sport Tourism:** Health Implications of Sports Tourism Activities - Sports Tourism for People with Disabilities.

Unit 5-Present Status and Future Prospects: Administrative and Policy Issues- Sports Tourism Administrative Infrastructures in various Countries and its Implications on Sports Tourism Policy - Sport Tourism in the Twenty-First Century - Future Trends.

Reference Books:

1. Joy Standeven and Paul de Knop, *Sport Tourism*, Human Kinetics
2. Mike Weed and Chris Bull, *Sports Tourism: Participants, Policy and Providers*, ELSEVIER
3. Mike Weed, *Sport and Tourism: A Reader*, Routledge



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93 ADVERTISING IN SPORTS

PSMDE107

UNIT 1. INTRODUCTION TO ADVERTISING – Concept and definition of advertisement – Social, Economic and Legal Implications of advertisements – Objectives of Advertising in Sports.

UNIT 2. IMC IN SPORTS – Concepts of Integrated Marketing Communication in Sports, Elements of Integrated Marketing Communication- Media plan – Type and choice criteria – Reach and frequency of advertisements – Cost of advertisements – Media strategy and scheduling.

UNIT 3. BUSINESS OF ADVERTISING – Advertiser- Advertising Agency and World of Media -Brand Manager- Duties and responsibilities of a Brand manager - Message development – Different types of advertisements – Layout – Design appeal – Copy structure – Advertisement production -Media Research – Testing validity and Reliability of ads – Measuring impact of advertisements

UNIT 4. SPORTS PERSONALITIES AS BRAND ENDORSER- Celebrities - Reputed sports persons - brandendorsed –Impact of Celebrities - Role of Public Relations in promoting sporting events.

UNIT 5. SPONSORSHIP IN SPORTS - Meaning and Objectives of Sponsorship, Advertising and Sponsorship, Developing Sponsorship proposal-Details of Sponsorship Agreement in National and International sports bodies.

TEXT BOOKS

1. Wells, Moriarty & Burnett, Advertising, Principles & Practice, Pearson Education 7 th Edition, 2007.
2. Kenneth Clow. Donald Baack, Integrated Advertisements, Promotion and Marketing communication, Prentice Hall of India, New Delhi, 2003.

REFERENCES

1. S. H. H. Kazmi and Satish K Batra, Advertising & Sales Promotion, Excel Books, New Delhi, 2001.
2. George E Belch and Michel A Belch, Advertising & Promotion, McGraw Hill, Singapore, 1998.
3. Julian Cummings, Sales Promotion, Kogan Page, London 1998.
4. E.Betch and Michael, Advertising and Promotion, McGraw Hill, 2003.
5. Jaishri Jefhwaney, Advertising Management, Oxford, 2008.



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94 SPORTS MEDIA & EVENT MANAGEMENT

PSMDE108-

UNIT 1. SPORTS MEDIA- Definition of Media - Introduction to different Sports Media – Impact of Sports Media – future of media.

UNIT 2. SPORTS CHANNELS- Introduction to Sport Communication - Careers in Sport Related Fields - Sport Publishing- Electronic-New Media.-Popular Sports Channels Operating in India.

UNIT 3. COMPREHENSIVE STUDY ON DIFFERENT SPORTS CHANNELS- Profile - Top Management- Functional Departments - Work Culture- Career Opportunities- Telecast rights for major Sporting Events- Program Mix- Advertising Opportunities.

UNIT 4. SPORTS JOURNALISM- Introduction- Scope- News - Value of Sports- Essential Qualification of Sports Writer -Presenter.

UNIT 5. EVENT MANAGEMENT- Meaning of Events, Event Management, Designing an Event- 5C's (Conceptualisation, Costing, Canvassing, Customisation, Carrying out). Key Elements of Events-Event Infrastructure- Organisers- Clients- Target Audience- Media-Venue - Role of Mass Media in Event Promotion.

References:

1. Hall, Nichols, Moynahan, and Taylor (2007). Media Relations in Sport – 2 nd Ed. Morgantown, WV: Fitness Information Technology.
2. Managing Sporting Events – Jerry Solomon (Human kinetics)
3. Sports Journalism – Philip Andrews (Sage Publication)



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95 AERODYNAMICS IN SPORTS

PST18CT101 –

UNIT I BASIC AERODYNAMICS 9

Aerodynamic terminologies, aerodynamic force and moment , drag and lift, one and two dimensional flow, momentum equation, energy equation, Navier –stock equation, angular velocity.

UNIT II POTENTIAL AND AXISYMMETRIC (INVISCID INCOMPRESSIBLE) FLOW 9

Laplace equation, Bernoulli's equation for rotational flow, Fundamentals of Inviscid incompressible flow, sources of flow, Non lifting and lifting of flow over a cylinder, Kutta-Joukowski theorem, vortex system and laws of vortex motion, incompressible flow, pitot tube equation, normal shock waves, Mach and shock waves in two dimensional flow.

UNIT III VISCOUS FLOW AND BOUNDARY LAYER 9

Development of boundary layer, boundary layer equation, laminar and turbulent flow, boundary layer separation, momentum integral equation, Reynolds number, Performance factors in bicycling- Human power, drag and rolling resistance.

UNIT IV AERODYNAMICS ON SPORTS EVENTS

Cycling aerodynamics, Factors influencing on running and running aerodynamics ,Skin suit aerodynamics, aerodynamics in cross country skiing and speed skiing. Performance factors in ski jumping, Ski jumping aerodynamics.

UNIT V SPORTS BALL AERODYNAMICS AND MEASUREMENT 9

Sports Ball Aerodynamics- aerodynamics on Base ball, Golf ball, tennis ball, cricket ball, volley ball , soccer ball , magnus effect, effect of velocity and spin, CFD simulations and wind tunnel test.

Total No.of periods : 45

Reference

1. Aerodynamics for Engineering students , E.L. Houghton, P.W.Carpenter, BH, 2003
2. Sports Aerodynamics, Noerstrud, Helge (Ed.), Springer, 2008
3. Projectile Dynamics in Sport: Principles and Applications, By Colin White, Routledge, 2010
6. Aerodynamic Measurements , G P Russo, Woodhead Publishing, 2011.



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96 SPORTS MATERIALS ENGINEERING AND DESIGN

PST18CT102 –

UNIT I SPORTS EQUIPMENT AND PHILOSOPHY OF DESIGN 9

Materials in sports- Factors determining sports performance, role of bioengineering in sports equipment, Advanced materials in the design of sports equipment, materials selection in design of pole vaulting, Bicycle construction , relationship between advanced materials technology in designing sports equipments and performance.

UNIT II FUNDAMENTALS OF ADVANCED MATERIALS 9

Composite materials , Nano and smart materials, Comparing and selecting materials , Basis of sports shoe design , Cycle mechanics from bamboo to fibre composites, Space frame Materials The wheels, Future trends

UNIT III MATERIALS FOR TENNIS SQUASH RACKETS 9

String types, function of string in a racquet, frame stiffness loss in a string, perception of string properties, Racket mechanics: the sweet spot, Influence of materials on racket technology, Specific designs and tests on racket, frame materials, Ball construction , tennis and squash ball ,

UNIT IV MATERIALS IN BOATS AND BOARDS AND MOUNTAINEERING 9

Materials for racing hulls, Canoes and Kayaks , Surfboards, Testing ski properties , Materials in boots and bindings , Ski-sticks, Advanced materials and design in skis, materials for ropes in mountaineering, harnesses and slings karabiners, belay, descending and ascending devices, rock protection, ice climbing equipment,

UNIT V MATERIALS FOR SPORTS BALLS AND HELMET 9

Materials for golf club and golf ball, cricket ball, baseball, soccer and volleyball, discus, javelin, archery, fencing and foam materials, material selection and design of helmets,

Total No.of periods : 45

Reference

1. Mike Jenkins, Aleksandar Subic, “Materials in sports equipment” published by Woodhead publishing.
 2. Easterling, E.A., Advanced Materials for Sports Equipment, Springer, 1993
 3. A. Subic, Materials in Sports Equipment , Volume 2 , Woodhead, 2007
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97 SPORTS BIOMECHANICS

PST18CT201 –

UNIT I BASIC TERMINOLOGY AND SKELETAL CONSIDERATIONS FOR MOVEMENT 9

Basic Terminologies- biomechanics versus kinesiology, anatomy versus functional anatomy, kinematics versus kinetics, statics versus dynamics, anatomical terms, movement description, Reference Systems, Measuring the Mechanical properties of Body tissues, Biomechanical Characteristics of Bone, Mechanical properties of bone, loads applied to bone, cartilage- articular cartilage, fibrocartilage, ligaments , bony articulations- the diarthrodial or synovial joint and other types of joints

UNIT II MUSCULAR AND NEUROLOGICAL CONSIDERATION FOR MOVEMENT 9

Muscle Tissue Properties-Irritability, Contractility, Extensibility, Elasticity, Functions of Muscle, Produce Movement, Maintain Postures and Positions, Stabilize Joints, Other Functions, Skeletal Muscle Structure-Physical Organization of Muscle, Force Generation in the Muscle-Motor Unit ,Muscle Contraction, Transmission of Muscle Force to Bone Mechanical Model of Muscle, The Musculotendinous ,Role of Muscle-Origin versus Insertion, Developing Torque, Muscle Role versus Angle of Attachment, Muscle Actions Creating, Opposing, and Stabilizing Movements, Net Muscle Actions, One- and Two-Joint Muscles, Force–Velocity Relationships in Skeletal Muscle-,Force–Velocity and Muscle Action or Load, Factors Influencing Force and Velocity Generated by Skeletal Muscle Strengthening Muscle-Principles of Resistance Training, Training Modalities, Injury to Skeletal Muscle-Cause and Site of Muscle Injury, Preventing Muscle Injury Inactivity, Injury, and Immobilization Effects on Muscle. General Organization of the Nervous System, Motoneurons, Sensory Receptors and Reflexes, Electromyography.

UNIT III FUNCTIONAL ANATOMY OF THE UPPER AND LOWER EXTREMITY9

Anatomical and Functional Characteristics of the Joints of the Shoulder,Combined Movement Characteristics , Muscular Actions, Injury Potential of the Shoulder, Elbow and Radioulnar Joints, Wrist and Fingers, Contribution of Upper Extremity Musculature to Sports Skills or Movements, External Forces and Moments Acting at Joints in the Upper Extremity, Pelvis and Hip Complex, Knee Joint, Ankle and Foot Movement Characteristics, muscle



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Actions, Contribution of Lower Extremity Musculature to Sports Skills or Movements, Forces Acting on Joints in the Lower Extremity, Vertebral Column, Muscular Actions, Contribution of the Trunk Musculature to Sports Skills or Movements.

UNIT IV LINEAR AND ANGULAR KINEMATICS 9

Collection of Kinematic Data, Position and Displacement, Velocity and Speed, Acceleration, Differentiation and Integration, Linear Kinematics of Walking and Running, Linear Kinematics of the Golf Swing, Linear Kinematics of Wheelchair Propulsion Projectile Motion, Equations of Constant Acceleration, Angular Motion, Measurement of Angles, Lower Extremity Joint Angles, Representation of Angular Motion Vectors, Angular Motion Relationships, Relationship between Angular and Linear Motions, Angle–Angle Diagrams, M-Tech Syllabus Page 22 of 45 Department of Sports Technology

Angular Kinematics of Walking and Running, Lower Extremity Angles, Angular Kinematics of the Golf Swing, Angular Kinematics of Wheelchair Propulsion.

UNIT V LINEAR AND ANGULAR KINETICS 9

Force, types of forces, laws of motion, Representation of Forces Acting on a System, Special Force Applications, Linear Kinetics of Locomotion, Linear Kinetics of the Golf Swing , Linear Kinetics of Wheelchair Propulsion, torque, types of torque, Newton's Laws of Motion: Angular Analogs, centre of mass, Rotation and Leverage, Representation of Torques Acting on a System, Analysis Using Newton's Laws of Motion, Special Torque Applications, Cinematography and video analysis



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Total No.of Periods : 45

References:

1. Hamill, J & Knutzen, K , Biomechanical Basis of Human Movement. Lippincott, Williams and Wilkens, 4th Ed., (2015)
2. Roger Bartlett, Introduction to Sports Biomechanics, Taylor & Francis, 2002
3. Hay, J. (1978). *The biomechanics of sport techniques. (2nd. ed.). Englewood Cliffs: Prentice-Hall.*
4. Hay, J. & Reid, J. (1982). *The Anatomical and Mechanical Bases of Human Motion. Englewood Cliffs: Prentice-Hall.*
5. Nordin, M. & Frankel, V. (1990). *Basic Biomechanics of the Musculoskeletal System, Philadelphia: Lea &Febiger.*
6. Northrip, J., Logan, G. & McKinney, W. (1983). *Analysis of Sport Motion. (3rd. ed). Dubuque: William C. Brown.*

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98 MEASUREMENT AND INSTRUMENTATION IN SPORTS ENGINEERING

PST18CT202

UNIT I INTRODUCTION 5

Sports engineering definition, purpose, advantages and applications; General principles and purpose of instrumentation in sports, Workflow of instrumentation and business aspects; Technological and social impacts on sports.

UNIT II SENSORS AND TRANSDUCERS 10

Sensors, data transfer and signal processing, Systematic of sensors and transducers Mechanics and design of sensor, Wireless technology, A/D boards and software systems Signal processing, fractal geometry, Design and problems of measurement chains.

UNIT III INSTRUMENTATION OF EQUIPMENT 10

Instrumentation of Equipment -Workflow of instrumentation, constraints, and sporting rules , Product overview, Definition and identification of performance parameters, Optimisation of training and biofeedback, Calculation and graphical representation of vector diagrams and instantaneous centres of pressure using software , Design of instrumented equipment, sensor locations and balancing, Application of instrumented equipment and case reports, Instrumentation for testing of equipment

UNIT IV INSTRUMENTATION OF THE ATHLETE 10

Overview of instrumentation systems, Worn instrumentation and constraints, Kinematic systems with skin markers (EGM, video, infrared, ultrasound, electromagnetic), Application of kinematic systems and case reports, Performance analysis, Golf swing analysers,

UNIT V INSTRUMENTATION OF THE ENVIRONMENT AND SPORTS

FACILITIES 10

Instrumentation of the environment and sports facilities, Video systems and software (Dartfish, SiliconCoach, Simi), Hawk Eye, Infrared contact measurement (Hotspot), Application of video systems and case reports , Performance analysis

Total No of periods: 45

References:

- 1.. Franz Konstantin Fuss, Aleksandar Subic, SadayukiUjihashi “*The Impact of Technology on Sport II*” Taylor and Francis 2007
 - 2. Craig J.J., " *Introduction to Robotics Mechanics and Control* ", Addison-Wesley, 1999.
 - Murty, D.v.s. *Transducers And Instrumentation Prentice Hall of India, 2008*
- M-Tech Syllabus Page 24 of 45 Department of Sports Technology



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100 SPORTS ENGINEERING AND TECHNOLOGY

PST18DE001

UNIT I SUSTAINABLE SPORTS ENGINEERING & INSTRUMENTATION TECHNOLOGY 9

Sustainable Design of sports products-Sustainable Manufacturing of sports products-Instrumentation Sports equipment-Smart devices and Technologies of sports equipment-Instrumentation of athletes-Technologies in Exertion games.

UNIT II MOBILITY SPORTS 9

Summer mobility sports-Design of Racing Bicycle-Mountain Bike technology-Rowing equipment technology-sports wheel chair technologies-Winter mobility sports-Cross country ski technology-Snow board technology-Ice hockey skate and design performance.

UNIT III APPAREL AND PROTECTION EQUIPMENT 9

Design and Mechanics of Running Shoes- Sports Apparel-Sports Helmets - Design and Mechanics of Mountaineering Equipment.

UNIT IV SPORTS BALLS 9

The Science and Engineering of Golf Balls-Solid Mechanics and Aerodynamics of Cricket Balls -Mechanical and Aerodynamic Behaviour of Baseballs and Softballs - Hockey balls - Oval Shaped Sports Balls: Aerodynamics, Friction and Bounce -Aerodynamics and Court Interaction of Tennis Balls-Aerodynamics and Construction of Modern Soccer Balls .

UNIT V SPORTS IMPLEMENTATION, SURFACES AND FACILITIES

9

Golf Club Construction, Design and Performance-Tennis Racquet Technology-Mechanical Behaviour of Baseball and Softball Bats- Ice Hockey Stick Mechanics and Designs - Artificial Turf- Natural Turf Sports Surfaces - Design of Sports Facilities.

Reference:

1. Routledge Handbook of Sports technology and Engineering edited by Franz Konstantin Fuss, Aleksandar Subic, Martin Strangwood, Radindra Mehta.
 2. Margaret Estivalet, Pierre Brisson,"The Engineering of Sport 7, Springer 2009
- M-Tech Syllabus Page 25 of 45 Department of Sports Technology



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101 ROBOTICS AND ARTIFICIAL INTELLIGENCE

PST18DE002 –

UNIT I INTRODUCTION TO ROBOTS 9

Fundamentals of Robots: Introduction, Fundamentals of robot technology, classification, programming and applications. Robot technology: Systems overview of a robot, basic components, control system and Components, Robot end effectors, sensors in robotics, Machine Vision. Interfacing and Microcontroller.

UNIT II MECHANISMS AND PROGRAMMING 9

Control of Actuators in robotic mechanisms. Control of a Robot joints, Stepper Motor, direct drive actuators, Hydraulic & Pneumatic systems. Computer considerations for Robotic systems. Architectural, Hardware, Real time consideration, Robot programming & languages. Use of AI in Robotics. Robot motion analysis and control.

UNIT III ROBOT APPLICATION AND IMPLEMENTATION 9

Robot application in Manufacturing: Material Transfer, Machine loading & unloading, Precutting operation, Assembly & Inspection. Implementation of Robots, testing, safety, training, maintenance & quality, future applications

UNIT IV ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM 9

Artificial intelligence: Concepts, components, heuristic problem solving approach, search method, crypt arithmetic, Predicate logic, I languages. Expert systems: Architecture of ES, component of ES, Expert system shells, Rule based ES, Forward & Backward chaining, Expert system for CAD & CAM.

UNIT V FUZZY LOGIC AND SEMANTIC NETS 9

Fuzzy logic: Fuzzy set theory & its application in AI. Semantic Nets: Neural network, Pattern Matching, Machine vision. Application of AI & ES in sports Engineering.

Reference:

1. *Robotic Engg. An integrated approach – Richard D. Klofter & Thomas A. Chmielewski, PHI,*
 2. *Fundamentals Of Robotics- Analysis & Control- Robert I. Schilling. PHI 1996*
 3. *Industrial Robotics - M.P. Groover, Mitchell Weiss, Roger N. Nagel & Nichola Godfrey. Mc-Graw Hill Book Company.*
 4. *Artificial Intelligence – Elein Rich & Knight*
 5. *Artificial Intelligence & Expert system – Dan W. Patterso*
 6. *Neural network and Fuzzy system By Kosko bart - Prentice Hall of India.*
 7. *Understanding neural network and Fuzzy logic By Kartalopo Ulos Stamations - PHI.*
- M-Tech Syllabus Page 26 of 45 Department of Sports Technology



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102 PHYSIOLOGY OF SPORTS AND EXERCISE

PST18DE003

UNIT I BASIC PHYSIOLOGY OF MOVEMENT 9

Introduction and Overview, Muscular Control of Movement, Neurological Control of Movement, Neuromuscular Adaptations to Resistance Training, Metabolism and Basic Energy Systems

UNIT II SYSTEMIC REGULATION OF EXERCISE 9

Hormonal Regulation of Exercise, Metabolic Adaptations to Training
Cardiovascular Control During Exercise, Respiratory Regulation During Exercise.

UNIT III ENVIRONMENT AND TRAINING 9

Cardiorespiratory Adaptations to Training, Thermal Regulation and Exercise,
Exercise in Hypobaric, Hyperbaric, and Microgravity Environments, Quantifying Sports Training.

UNIT IV NUTRITION AND ERGOGENIC AID 9

Ergogenic Aids and Performance, Nutrition and Nutritional Ergogenics, Optimal Body Weight for Performance, Growth, Development, and the Young Athlete.

UNIT V AGING AND EXERCISE PRESCRIPTION 9

Aging and the Older Athlete, Sex Differences and the Female Athlete,
Prescription of Exercise for Health and Fitness, Cardiovascular Disease and Physical Activity Obesity, Diabetes, and Physical Activity.

Total No.of Periods : 45

Reference:

1. Mooren, Volker, "Modular and Cellular Exercise Physiology". Human Kinetics.
 2. Katch, Katch, McArdle, "Exercise Physiology", Williams and Williams
 3. Dr.Sandhya Tiwari, "Exercise Physiology", Sports
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104 PRINCIPLES AND DESIGN OF SPORTS TURF

PST18DE004

UNIT I INTRODUCTION 9

Turf grasses Biology and identification- Turf grass selection, Planting times and rates, soil preparation, Planting techniques, establishment, overseeding warm season fields, Soils and soil science, soil as a medium for turfgrass, soil for hard surfaces, fertility and fertilizers, nutrient requirements, nutrient uptake, soil reaction, fertilizer analysis, fertilizer sources, application rates and frequencies, micro nutrients.

UNIT II AERATION, MOWING AND IRRIGATION 9

Aeration- Aeration for optimum Turf responses, aeration equipment, topdressing.

Thatchdefinition

of thatch, advantages and disadvantages of thatch in sports turf, how thatch develops, maintaining a managed thatch layer, reducing excessive thatch buildings, Mowing- types of mowers, Turf response, height and frequency, pattern, clipping removal, equipment and safety, chemical regulators. Irrigation – Irrigation and turf grass culture, general principles of turf grass irrigation, Portable irrigation systems, Installed irrigation systems.

UNIT III DRAINAGE

Drainage – Surface drainage, internal drainage, Installed drainage systems, Other drain system practices. Turf grass stresses and remedies, Mechanical stresses, environmental stresses, weeds, insects and disease, wise use of chemicals, the label is the law, Planning and performance applications, record keepings.

UNIT IV APPLICATION IN DIFFERENT FIELDS I 9

Base ball and softball fields, Rugby, Lacrosse and Field hockey fields, Lawn Bowling Greens and croquet courts - Design, construction and reconstruction, renovation, maintenance and management procedures, Rules and regulations.

UNIT V APPLICATION IN DIFFERENT FIELDS I 9

Tennis courts, Track and field facilities, sand volleyball courts, playgrounds, Bocce courts - Design, construction and reconstruction, renovation, maintenance and management procedures, Rules and regulations.

Total No.of Periods: 45

Reference

1 .Jim Puhalla, Jeff Krans, Mike Goatley, "Sports Fields – A manual for design, construction and maintenance." John Wiley and Sons

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104 RACE ENGINE DESIGN FOR OPTIMAL

PST18DE005

PERFORMANCE

UNIT I BASIC ENGINE THEORY 9

Relationships between torque, brake specific fuel consumption, engine design parameters, engine operating conditions, and four fundamental efficiencies (volumetric, combustion, indicated thermal, and mechanical) ,Effects of fuel/air equivalence ratio, Effects of load , Effects of engine speed , MBT and LBT,Goals for race engines ,Goals for production engines , Correction factors

UNIT II ENGINE SENSORS 9

Need for and use of sensors, Crank position sensor, Cam position sensor, Intake air temperature sensor, Manifold air pressure sensor, Mass air flow sensor (if used), Exhaust "oxygen" or lambda sensor, Throttle position sensor, Engine coolant temperature sensor , Knock sensor.

UNIT III AIR/FUEL RATIO CONTROL AND IGNITION TIMING CONTROL 9

Base pulse width look-up table for speed-density systems, Benefits of MAF systems, Multipliers, Base ignition timing look-up table, Adders

UNIT IV ENGINE CONTROL MODULE 9

ECM-engine control module, exhaust gas recirculation (EGR) functions in race engine and production engine. ECM to Formula SAE race engines, ECM for other types of race engines and production engines. Case studies

UNIT V COMPUTATIONAL FLUID DYNAMICS 9

CFD Classification, Initial and Boundary conditions, Initial and Boundary value problems. Finite difference method, Central, Forward, Backward difference, Uniform and non-uniform Grids, Numerical Errors, Grid Independence Test.

Total No.of Periods: 45

Reference

1. Jörge Segers "Analysis Techniques for Racecar Data Acquisition", SAE – Publications, 2007

2. www.sae.org

3. Muralidhar, K.,andSundararajan,T., "Computational Fluid Flow and Heat Transfer", NarosaPublishingHouse ,New Delhi1995.

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105 SPORTS EQUIPMENT MATERIALS

PST18DE006

UNIT I SPORTS MATERIALS 9

Adhesives- Nano glue, nano moulding technology, Nano turf, Foot wear production, Factors and application in sports, constraints. Foams- Polyurethane, Polystyrene, Styrofoam, closedcell

and open-cell foams, Neoprene, Foam Product Case Study. Engineering Polymers- Classification, application in sports, Smart Materials - Shape Memory Alloy (SMA), Thermo chromic film , d3o, Polymorph, Lenticular Sheet, High-density modelling foam, Motorcycle Gloves and d3o Case Study, applications

UNIT II THERMOPLASTICS-I 9

Polycarbonate (PC), Polyhydroxyalkanoates (PHAs), Polyketone (PK), Polyester Polyethylene (PE), Polyetheretherketone (PEEK), Polyetherimide (PEI), Polyethersulfone (PES), Polyethylenechlorinates (PEC), Polyimide (PI), Polylactic acid (PLA), Polymethylpentene (PMP), Polyphenylene oxide (PPO), Polyphenylene sulfide (PPS), Polyphthalamide (PPA), Polypropylene (PP), Polystyrene (PS), Polysulfone (PSU), Polyvinyl chloride (PVC), Polyvinylidene chloride (PVDC), Spectralon Acrylonitrile butadiene styrene (ABS). structures and applications in sports engineering.

UNIT III THERMOPLASTICS-II 9

Acrylic, Celluloid, Cellulose acetate, Ethylene-Vinyl Acetate (EVA), Ethylene vinyl alcohol (EVAL), Fluoroplastics (PTFEs, including FEP, PFA, CTFE, ECTFE, ETFE) Ionomers, Kydex, a trademarked acrylic/PVC alloy, Liquid Crystal Polymer (LCP) Polyacetal (POM or Acetal), Polyacrylates (Acrylic), Polyacrylonitrile (PAN or Acrylonitrile), Polyamide (PA or Nylon), Polyamide-imide (PAI), Polyaryletherketone (PAEK or Ketone), Polybutadiene (PBD), Polybutylene (PB), Polybutylene terephthalate (PBT), Polyethylene terephthalate (PET), Polycyclohexylenedimethylene terephthalate (PCT).

UNIT IV FIBRES, FERROUS METALS 9

High Tech Fibres- Carbon Fibre& Aramids, Uses and applications of Carbon Fibre in Sports, Formula One Car Monocoques Case Study. Resins- types , Composite resins and Thermoset resins, Most common and less common resins, Resin Reinforcement, case study, future uses. Ferrous Metals - Mild Steel, Cast Iron, Stainless Steel, application in sports. Alloys - Sheet form, Plate form and Extrusions, The Future For Metal Alloys

UNIT V APPLICATION OF NANO TECHNOLOGY 9

Applications in Medicine, Electronics, Space, Food, Fuel Cell, Solar Cells, Batteries, Fuels, Better Air Quality, Cleaner Water, Chemical Sensors, Sporting Goods with nano technology- Nanocomposite barrier film, Bicycle components strengthened with carbon nanotubes, Golf shafts with nanoparticles filling any voids in the shaft material, Golf balls using nanoenhanced

polymer, nstm Tennis racquet frames containing carbon nanotubes , nCodetm racquet frames containing silicon dioxide nanoparticles. Carrier areas and risks of nano technology.

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Total No.of periods : 45

Reference

1. John Mongillo, "Nano Technology 101 " Green wood publishing group.
2. Mike Jenkins, Aleksandar Subic, "Materials in sports equipment" published by Woodhead publishing.

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106 Composite and Nano Materials in Sports Applications

PST18DE007

Lecture: - 3 h/week

UNIT-I

INTRODUCTION: Definition – Classification and characteristics of Composite materials. Advantages and application of composites. Functional requirements of reinforcement and matrix.

Effect of reinforcement (size, shape, distribution, volume fraction) on overall composite performance.

UNIT – II

REINFORCEMENTS: Preparation-layup, curing, properties and applications of glass fibers, carbon fibers, Kevlar fibers and Boron fibers. Properties and applications of whiskers, particle

reinforcements. Mechanical Behavior of composites: Rule of mixtures, Inverse rule of mixtures.

Isostrain and Isostress conditions.

UNIT – III

Manufacturing of Metal Matrix Composites: Casting – Solid State diffusion technique, Cladding – Hot isostatic pressing. Properties and applications. Manufacturing of Ceramic Matrix

Composites: Liquid Metal Infiltration – Liquid phase sintering. Manufacturing of Carbon – Carbon

composites: Knitting, Braiding, Weaving. Properties and applications.

UNIT-IV

Manufacturing of Polymer Matrix Composites: Preparation of Moulding compounds and prepregs – hand layup method – Autoclave method – Filament winding method – Compression

moulding – Reaction injection moulding. Properties and applications.

UNIT – V

Strength: Laminar Failure Criteria-strength ratio, maximum stress criteria, maximum strain criteria, interacting failure criteria, hygrothermal failure. Laminate first ply failure-insight

strength; Laminate strength-ply discount truncated maximum strain criterion; strength design using

caplet plots; stress concentrations.

TEXT BOOKS:

1. Material Science and Technology – Vol 13 – Composites by R.W.Cahn – VCH, West Germany.

2. Materials Science and Engineering, An introduction. WD Callister, Jr., Adapted by R. Balasubramaniam, John Wiley & Sons, NY, Indian edition, 2007.

References:

1. Hand Book of Composite Materials-ed-Lubin.

2. Composite Materials – K.K.Chawla.

3. Composite Materials Science and Applications – Deborah D.L. Chung.

4. Composite Materials Design and Applications – Danial Gay, Suong V. Hoa, and Stephen W.Tasi.

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107 SOFTWARE IN SPORTS

PST18DE008 –

UNIT I STASTICAL PACKAGES

SPSS-Introduction-software in spss-versions-applications-ANNOVA-introduction-design of experiments-classes of models-characteristics-applications-REGRESSION-introductionmodels-

types of regression-applications-comparison of stastical packages-applications.

UNIT II GAIT ANALYSIS & CUTTING EDGE TECHNOLOGY

Gait analysis-introduction-process&equipment-techniques-factors¶meters-applications-

Cutting edge technology-introduction-how it used-innovations-applications

UNIT III HAWKEYE & GOAL LINE TECHNOLOGY

Hawkeye-introduction-methods of operation-implementation in sports-Goal line

technologyintroduction-

principles-mode of operation

UNIT IV TOOLS

Hot spots-introduction-operation principles-Wagon wheel-introduction-operationcomponents

used-Snickometer-introduction-principles-Accelerometer-introductionprinciples-

operation-umpire decision review system-procedures

UNIT V OTHER TOOLS & TECHNIQUES

Simulation-principles-implementation-procedures-various applications-factors-

CFDprinciples-

procedures-applications-performance analysis-procedures-video analysistechniques-

procedures-implementation in various sports-volleyball-baseball-tennis-athletesothers

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108 SPORTS PSYCHOLOGY: ISSUES AND APPLICATIONS

PST18DE009

UNIT I- PSYCHOLOGICAL MEASUREMENT OF INDIVIDUAL

DIFFERENCES: 9

The nature of individual differences; Characteristics and construction of standardized psychological tests; Types of psychological tests; Use, misuse and limitation of psychological tests; Ethical issues in the use of psychological tests.

PSYCHOLOGICAL WELL BEING AND MENTAL DISORDERS:

Concept of health-ill health; Positive health, well being; Causal factors in mental disorders (Anxiety disorders, mood disorders, schizophrenia and delusional disorders; personality disorders, substance abuse disorders); Factors influencing positive health, well being, life style and quality of life; Happiness disposition.

UNIT – II THERAPEUTIC APPROACHES: 9

Psychodynamic therapies; Behaviour therapies; Client centered therapy; Cognitive therapies; Indigenous therapies (Yoga, Meditation); Bio-feedback therapy; Prevention and rehabilitation of the mentally ill; Fostering mental health.

Work Psychology and Organisational Behaviour: Personnel selection and training; Use of psychological tests in the industry; Training and human resource development; Theories of work motivation – Herzberg, Maslow, Adam Equity theory, Porter and Lawler, Vroom; Leadership and participatory management; Advertising and marketing; Stress and its management; Ergonomics; consumer psychology; Managerial effectiveness; Transformational leadership ; Sensitivity training; Power and politics in organizations.

UNIT III APPLICATION OF PSYCHOLOGY IN INFORMATION TECHNOLOGY AND MASS MEDIA: 9

The present scenario of information technology and the mass media boom and the role of psychologists; Selection and training of psychology professionals to work in the field of IT and mass media; Distance learning through IT and mass media; Entrepreneurship through ecommerce;

Multilevel marketing; Impact of TV and fostering value through IT and mass media; Psychological consequences of recent developments in Information Technology.

UNIT IV PSYCHOLOGY AND ECONOMIC DEVELOPMENT 9

Achievement motivation and economic development; Characteristics of entrepreneurial behaviour; Motivating and training people for entrepreneurship and economic development; Consumer rights and consumer awareness, Government policies for promotion of entrepreneurship among youth including women entrepreneurs.

UNIT V APPLICATION OF PSYCHOLOGY TO ENVIRONMENT AND RELATED FIELDS 9

Environmental psychology-effects of noise, pollution and crowding; Population psychology: psychological consequences of population explosion and high population density; Motivating for small family norm; Impact of rapid scientific and technological growth on degradation of environment.

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Application of psychology in other fields: Sports Psychology -Psychological interventions in improving performance of athletes and sports. Persons participating in Individual and Team Games.



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Total No. of periods : 45

Reference

1. Graham Jones, J. Graham Jones, Lew Hardy, Daniel Gould, "Understanding Psychological Preparation for Sports" John Wiley & Sons Inc , 1994
2. *Stephen Mellalieu, Sheldon Hanton* Advances in Applied Sport Psychology, Routledge 2008.
3. *Arnold LeUnes*, Sport Psychology, Psychology Press (formerly published by Lawrence Erlbaum Associates) 4th Edition
4. Morgan & King, "Introduction to Psychology "McGraw-Hill Book Co., 1971
5. Coleman, James C , "Abnormal Psychology and Modern Life", Pearson Scott Foresman, 6th edition, 1980.
6. Milton L Blum, James C Naylor, "Industrial Psychology: Its Theoretical and Social Foundations (Hardcover)" Harper & Row (Dec 1968).
7. B. Kuppuswamy (1990) " Elements of. Social Psychology" , Konark Publishers Pvt Ltd, 7th Edition. 1990

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109 APPLIED BIOMATERIALS IN SPORTS TECHNOLOGY

PST18DE011 –

UNIT I INTRODUCTION 9

Definition of biomaterials, requirements of biomaterials, classification of biomaterials, Comparison of properties of some common biomaterials. Effects of physiological fluid on the properties of biomaterials. Biological responses (extra and intra-vascular system). Surface properties of materials, physical properties of materials, mechanical properties.

UNIT II METALLIC IMPLANT MATERIALS 9

Metallic implant materials - Stainless steel, Co-based alloys, Ti and Ti-based alloys. Importance of stress-corrosion cracking. Host tissue reaction with biometal, corrosion behavior and the importance of passive films for tissue adhesion. Hard tissue replacement implant: Orthopedic implants, Dental implants. Soft tissue replacement implants: Percutaneous and skin implants, Vascular implants, Heart valve implants-Tailor made composite in medium.

UNIT III POLYMERIC IMPLANT MATERIALS 9

Polymeric implant materials - Polyolefins, polyamides, acrylic polymers, fluorocarbon polymers, silicon rubbers, acetals. (Classification according to thermosets, thermoplastics and elastomers). Viscoelastic behavior: creep-recovery, stress-relaxation, strain rate sensitivity. Importance of molecular structure, hydrophilic and hydrophobic surface properties, migration of additives (processing aids), aging and environmental stress cracking. Physiochemical characteristics of biopolymers. Biodegradable polymers for medical purposes, Biopolymers in controlled release systems. Synthetic polymeric membranes and their biological applications.

UNIT IV CERAMIC IMPLANT MATERIALS 9

Ceramic implant materials- Definition of bioceramics. Common types of bioceramics: Aluminium oxides, Glass ceramics, Carbons. Bioresorbable and bioactive ceramics. Importance of wear resistance and low fracture toughness. Host tissue reactions: importance of interfacial tissue reaction (e.g. ceramic/bone tissue reaction). Composite implant materials - Mechanics of improvement of properties by incorporating different elements. Composite theory of fiber reinforcement (short and long fibers, fibers pull out). Polymers filled with osteogenic fillers (e.g. hydroxyapatite). Host tissue reactions.

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UNIT V BIOCOMPATIBILITY & TOXICOLOGICAL SCREENING 9 OF BIOMATERIALS

Biocompatibility & toxicological screening of biomaterials-definition of biocompatibility, blood compatibility and tissue compatibility. Toxicity tests: acute and chronic toxicity studies (in situ implantation, tissue culture, haemolysis, thrombogenic potential test, systemic toxicity, intracutaneous irritation test), sensitization, carcinogenicity, mutagenicity and special tests.

Sterilisation techniques - ETO, gamma radiation, autoclaving. Effects of sterilization on material properties. Testing of biomaterials/Implants - *In vitro* testing (Mechanical testing): tensile, compression, wears, fatigue, corrosion studies and fracture toughness. *In-vivo* testing (animals): biological performance of implants. *Ex-vivo* testing: *in vitro* testing simulating the *in vivo* conditions. Standards of implant materials.



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India's First State University in Physical Education and Sports

Total No.of Periods : 45

Reference

1. J B Park, *Biomaterials - Science and Engineering*, Plenum Press , 1984.
 2. Sujata V. Bhat, *Biomaterials*, Narosa Publishing House, 2002.
 3. Jonathan Black, *Biological Performance of materials*, Marcel Decker, 1981
 4. C.P.Sharma&M.Szycher, *Blood compatible materials and devices*, Technomic Publishing Co. Ltd., 1991.
 5. Piskin and A S Hoffmann, *Polymeric Biomaterials (Eds)*, Martinus Nijhoff Publishers. (Dordrecht. 1986)
 6. Eugene D. Goldbera , *Biomedical Ploymers*, Akio Nakajima.
 7. A . Rembaum& M. Shen, *Biomedical Polymers*, Mercer Dekkar Inc. 1971
 8. Lawrence Stark &GyanAgarwal , *Biomaterials*
 9. L. Hench & E. C. Ethridge, *Biomaterials - An Interfacial approach*.
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110 COMMERCIALISATION OF SPORTS

PST18DE012

UNIT I SPORTS INDUSTRY 9

Sports in the late capitalist movement- sporting goods industry- Struggling entrepreneurs – National Business- Transnational corporations- Sports globalization- State and problem of governance.

UNIT II PUBLIC SECTOR AND SPORTS 9

Government subsidization – private control of civic asset – partnership between local government and leisure departments and commercial sector changes – complexities and consequences.

UNIT III AMATEUR 9

Piercing the veil of amateurism commercialization – Corruption and US college sports. Strategic responses to institutional pressures for commercialization- A case study of an English Rugby Union Club. – Commercialisation of the modern Olympics.

UNIT IV TELEVISIONAL AND COMMERCIALISATION OF SPORTS 9

Media sport- globalization and the challenges to commercialisation- Sports advertising and cultural resistance in Aotearoa/New Zealand.- Televised sport in global consumer age- Media Ownership of teams- The latest stage in the commercialization of team sports.

UNIT V SPORTS SPONSORSHIP 9

Critical perspective on sport sponsoring- spectator sport's strange Bed fellows. – The commercial sponsorship of sporting events to promote Alcohol- Tobacco and Lotteries.- Let the market decide- Sport sponsorship and its implications for Moral Autonomy.

Total No of periods: 45

REFERENCE:

1. Trevor Slack, "The commercialization of sport", Routledge Publication, 2005
 2. Franz Konstantin Fuss, Aleksandar Subic, SadayukiUjihashi "The Impact of Technology on Sport II" Taylor and Francis 2007
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111 SPORTS ECONOMICS

PST18DE013 –

UNIT I. DEMAND SUPPLY, AND SPORTS MARKET OUTCOMES 9

Demand and Sports Revenue - The Market for Sports Broadcast Rights - Team Cost, Profit, and Winning - Leagues, Team Location, Expansion, and Negotiations - Leagues and Competitive Balance

UNIT II. THE MARKET FOR TALENT AND LABOR RELATIONS 9

The Value of Sports Talent - The History of Player Pay - Labor Relations in Pro Sports Government Subsidies and Economic Impact Analysis - The Stadium Mess - Taxes, Antitrust, and Competition Policy

UNIT III. SPORTS PSYCHOLOGY AND LEGAL ISSUES 9

Psychological interventions in improving performance of athletes and sports. Persons participating in Individual and Team Games. Media influences on pro and antisocial behaviour. National and International Law regarding sports.

UNIT IV SPSS SOFTWARE FOR SPORTS ENGINEERING 9

Online analytical processing- Descriptive statistics – Customer tables- Basic, general, multiple tables – Compared means, ANOVA- General linear model- Univariate, Multivariate.- Regression linear – Relabilityanaysis, Non parametric Tests- Chi Square- Independent Samples.

UNIT V SPSS APPLICATION FOR SPORTS ENGINEERING 9

Chart and Tables – Graphs, Bar, Line, Area, pie, Pareto Boxplots, Error bars, scatter histogram, chart options, services, format, edit, view, insert pivot. Miscellaneous Options – Utilities, variables, file info, define sets, use sets, Run, Window, Page break, insert old graph.

Total No.of Periods : 45

Reference:

1. Nikos Ntoumanis “SPSS for Sport and Exercise Studies - A Step-by-Step Guide for Students”.
 2. Peter Taylor, Chris Gratton “The Economics of Sport and Recreation- An Economic Analysis” Taylor and Francis
- M-Tech Syllabus Page 39 of 45 Department of Sports Technology



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112 MOTOR SPORTS APPLICATIONS

PST18DE014

Purpose

To impart knowledge about racing vehicle behavior and various technologies used in motorsports.

Instructional Objectives

At the end of the course, student will be able to

1. Understand the fundamentals of racing vehicle characteristics.
2. Understand aerodynamic requirements in racing vehicles.
3. Understand the concepts of chassis behavior of racing vehicles.
4. Gain knowledge about the concepts of suspension characteristics of racing vehicles.
5. Understand the problems faced in drives and braking systems in motorsports

UnitI: Race Car Design and Development

Problems Imposed By Racing, Racing Objective, “g-g” Diagram. Constraints And Specifications, Performance, Handling, Structure. Driver Accommodation And Safety, Tires.

Adjustable Features, Preliminary Design And Analysis. Driver-Vehicle

Relationship. Desirable Vehicle Characteristics, Fundamentals Of Testing. Track Test Program Planning And Test Methodology. General Notes On Development—Circular Skid Pad Testing.

UnitII: Race Car Aerodynamics

Aerodynamic characteristics, Aerodynamic Force And Moment, Race Car Drag Components, Drag Improvement And Estimation. aerodynamic Development of a Vehicle, Ground Effects

And Ground-Plane Simulation In Race Car Applications. Spoiler, Dams, Wings Effectiveness Of Wings In Steady State Cornering. High Lift Devices-Flaps And Slats. Flow

Control Devices-Dams, Fences, Vanes, Skirts, Spoilers. Vortex Creating Devices-Ledges,

Edges, Cusps, Lips. Pressure Change Creation Devices-Perforations, Vents, Bleeds, Scoops, Seals. Air-Foil Devices-Slats, Flaps, End Plates, Cuffs, Fillets, Trips. Active Flow Control

Devices-Internal Airflow.

UnitIII: Race Car Chassis

Conditions For Traversing A 90° Corner, Principle Chassis Tuning Items. Effects Of High Speed Braking, Cornering, Combined Braking Cornering. Steady State Cornering,

Acceleration Out Of A Corner, Straight Line Acceleration. Throttle Behaviour, Steering

Wheel Force And Kick Back. Moving CG Position, Roll Center Position Changing Anti-Pitch Geometry. Chassis Steering Axis Geometry, Changing Camber. Chassis Ride Roll

Characteristics, Chassis Track Width. Chassis Ride Spring Rate, Tires And Rims, Adjusting Roll Stiffness And Roll Stiffness Distribution

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UnitIV: Race Car Suspension System

Front Suspension-General Design Issues, Camber Effects. SLA Suspension, McPherson Struts. Independent Rear Suspension-Trailing Arm Types, Instant Axis Concept. SLA Rear

Suspension, Beam Axle Rear Suspensions. Torque Tube And Torque Arm Suspension,

Decoupled Rear Axle Suspension Suspension Springs-Torsion Springs, Coil Springs,

Progressive Rate Coil Springs. Leaf Springs, Types, Installation Consideration, Inter Leaf

Friction, Spring Fatigue. Damping In Racing-Ride/Handling Compromise, Steering Activity, And Transient Maneuvering, Bump Damping And Rebound Damping.

UnitV: Race Car Drives And Braking Systems

Merits Of Front, Rear And Four-Wheel Drive In Racing. Differentials Used In Racing-Open Differentials, Locked (Spool), Limited Slip Differentials. Traction Control And Other



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Electronic Improvements In Racing..Mechanical Components In Braking System.Limitations And Considerations Of Braking In Racing.Brake Boost, Effects Of “g” Force On Brake Fluids. Brake Hydraulics,Ventilation.Brake Distribution, ABS In Racing.arbon-Carbon discs.

Reference

1.William F.Milliken and Douglas L.Milliken, “Race car vehicle dynamics”, 11th edition, SAE, 1995.

2.Peter Wright, “Formula 1Technology”,2001.

3.Thomas D. Gillespie, “Fundamental of Vehicle Dynamics, Society of Automotive Engineers”, USA 1992.

4.Wolf-Heinrich Hucho, “Aerodynamics of road vehicles”, 4th edition, 2000

5Jörge Segers “Analysis Techniques for Race car Data Acquisition”, SAE – Publications, 2007

6. www.sae.org

7. www.annualreviews.org/aronline

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113 SPORTS EQUIPMENT MATERIALS

PST18DE015

UNIT I SPORTS MATERIALS 9

Adhesives- Nano glue, nano moulding technology, Nano turf, Foot wear production, Factors and application in sports, constraints. Foams- Polyurethane, Polystyrene, Styrofoam, closedcell

and open-cell foams, Neoprene, Foam Product Case Study. Engineering Polymers- Classification, application in sports, Smart Materials - Shape Memory Alloy (SMA), Thermo chromic film , d3o, Polymorph, Lenticular Sheet, High-density modelling foam, Motorcycle Gloves and d3o Case Study, applications

UNIT II THERMOPLASTICS-I 9

Polycarbonate (PC), Polyhydroxyalkanoates (PHAs), Polyketone (PK), Polyester Polyethylene (PE), Polyetheretherketone (PEEK), Polyetherimide (PEI), Polyethersulfone (PES), Polyethylenechlorinates (PEC), Polyimide (PI), Polylactic acid (PLA), Polymethylpentene (PMP), Polyphenylene oxide (PPO), Polyphenylene sulfide (PPS), Polyphthalamide (PPA), Polypropylene (PP), Polystyrene (PS), Polysulfone (PSU), Polyvinyl chloride (PVC), Polyvinylidene chloride (PVDC), Spectralon Acrylonitrile butadiene styrene (ABS). structures and applications in sports engineering.

UNIT III THERMOPLASTICS-II 9

Acrylic, Celluloid, Cellulose acetate, Ethylene-Vinyl Acetate (EVA), Ethylene vinyl alcohol (EVAL), Fluoroplastics (PTFEs, including FEP, PFA, CTFE, ECTFE, ETFE) Ionomers, Kydex, a trademarked acrylic/PVC alloy, Liquid Crystal Polymer (LCP) Polyacetal (POM or Acetal), Polyacrylates (Acrylic), Polyacrylonitrile (PAN or Acrylonitrile), Polyamide (PA or Nylon), Polyamide-imide (PAI), Polyaryletherketone (PAEK or Ketone), Polybutadiene (PBD), Polybutylene (PB), Polybutylene terephthalate (PBT), Polyethylene terephthalate (PET), Polycyclohexylenedimethylene terephthalate (PCT).

UNIT IV FIBRES, FERROUS METALS 9

High Tech Fibres- Carbon Fibre& Aramids, Uses and applications of Carbon Fibre in Sports, Formula One Car Monocoques Case Study. Resins- types , Composite resins and Thermoset resins, Most common and less common resins, Resin Reinforcement, case study, future uses. Ferrous Metals - Mild Steel, Cast Iron, Stainless Steel, application in sports. Alloys - Sheet form, Plate form and Extrusions, The Future For Metal Alloys

UNIT V APPLICATION OF NANO TECHNOLOGY 9

Applications in Medicine, Electronics, Space, Food, Fuel Cell, Solar Cells, Batteries, Fuels, Better Air Quality, Cleaner Water, Chemical Sensors, Sporting Goods with nano technology- Nanocomposite barrier film, Bicycle components strengthened with carbon nanotubes, Golf shafts with nanoparticles filling any voids in the shaft material, Golf balls using nanoenhanced

polymer, nstm Tennis racquet frames containing carbon nanotubes , nCodetm racquet frames containing silicon dioxide nanoparticles. Carrier areas and risks of nano technology.

Total No.of periods : 45

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Reference

3. John Mongillo, "Nano Technology 101 " Green wood publishing group.
 4. Mike Jenkins, Aleksandar Subic, "Materials in sports equipment" published by Woodhead publishing.
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114 APPLICATIONS OF STATISTICS IN SPORTS

PST18DE016 –

UNIT I STATISTICS IN FOOTBALL 9

Introduction use of sports in teaching statistics . Football articles, Geometry model for NFL fixed goal kickers .predictions for NFL games via linear – model methodology , probability of winning a football game

UNIT II STATISTICS IN BASEBALL 9

Introduction to baseball articles – exploring baseball hitting data – player game percentage, estimation with selected binomial information – progress of the score during a baseball game

UNIT III - STATISTICS IN BASKETBALL 9

Introduction to basketball articles – Improved NCAA basketball Tournament modeling via point spread and team strength information, probability models for basketball tournaments

UNIT IV – STATISTICS IN ICE HOCKEY & MISCELLANEOUS SPORTS 9

Introduction to ice hockey articles – statistical methods for rating college hockey teams ,deciding ties in hockey rating skating, estimating the effect of a red card in soccer, heavy defeats in tennis – psychological momentum or random effect.

UNIT V – STATISTICAL METHODOLOGIES AND MULTIPLE SPORTS 9

Introduction to the methodologies and multiple sports articles, bridging different Eras in sports, Data analysis using stein's estimator and its generalizations, assigning probabilities to outcomes of multi – entry competitions, basketball, baseball and the null hypothesis lessons from sports statistics, TQM in athletic performance, Brownian motion model for the progress of sports scores.

Total No. of Periods: 45

Reference :

1. Jim Albert, Jay Bennett, James J.cochran, “Anthology of statistics in sports” – Cambridge university press – 2005
2. Jim Albert, “Teaching statistics using baseball”, mathematical association of America
3. Jim Albert, Jay Bennett, “Curve Ball Baseball statistics and the role of chance in the game” Springer - 2005

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115 SPORTS MATERIAL ENGINEERING

PST18DE017

UNIT I MATERIAL IN CRICKET 9

Introduction –cricket balls-cricket bat-protective equipment in cricket-future trendsconclusions

UNIT II MATERIAL IN PARALYMPIC SPORTS 9

Introduction-physical disabilities-devices and materials used in paralympic sportsconsiderations

and limitations in design and materials based on paralympic sport regulation

UNIT III MATERIAL IN GOLF 9

Introduction-role of the face-oversized golf drivers-head design criteria-construction effectsfrequency

spectrum testing-test variables-CoR –frequency relationship-variability within a single club type-design trends-further work-conclusions.

UNIT IV MATERIALS IN SKIING & BALLISTICS 9

Introduction-the impact of technology-contribution of materials & manufacturing – development of competitive & recreational skiing-future trends.Ballistics –introduction-basic aerodynamic principles of cricket-tennis-baseball-discus-javelin-golf-soccer-volleyballboomerang-furture trends.

UNIT V FOAM PROTECTION & PERFORMANCE OF SPORTS SURFACES 9

Introduction-static foam protection products-rigid foam foam protection for sports wear-cycle helmets-soccer shin and ankle protectors.Introduction of surface performance-measurement of surface

performance-diversity of sports surface-sports specific surfaces.future developments.

Total no.of.periods:45

Reference

1. Mike Jenkins, Aleksandar Subic, “Materials in sports equipment” published by Woodhead publishing.
 2. John Mongillo, “Nano Technology 101 ” Green wood publishing group.
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116 RACE CAR VEHICLE DYNAMICS

PST18DE018

UNIT I TIRE BEHAVIOUR, AERO FUNDAMENTALS, AXIS SYSTEM 9

Tire behaviour-lateral, longitudinal, tire force-chamber effects, other effects, combined operation-aligning torque, pneumatic trail, torque wheel spin axis-aerodynamics fundamentals properties

of air, bernoulli, equation, pressure difference & its coefficient, aerodynamics

force & its testing-vehicle axis system-vehicle motions, two types of axis system. Tire data treatment-pure slip & combined slip characteristics

UNIT II SIMPLIFIED STEADY STATE AND TRANSIENT STABILITY 9

Steady state-low speed geometry, under, neutral, over steer car, responses & its data, non-linear analysis, path curvature stiffness, neutral steer, over steer & under steer responses, physical significance. Transient stability-response data, spring-mass-damper system, single & two degree of freedom automobile, early approach, advanced models

UNIT III STEADY STATE ANALYSIS & FORCE MOMENT ANALYSIS 9

Steady state pair analysis-procedure, MRA computer programme, lateral load transfer-Force moment analysis-computer programme, limit behaviour, constrained testing, moment methods, CN-AY, N-AY sports car chasis, lap time analysis.

UNIT IV RACE CAR DESIGN, TESTING AND DEVELOPMENT & CHASIS SET UP 9

Race car design-design process, constraints specification-g-g diagram-conceptual development, vehicle capability, race car applications, general uses. Driver-vehicle relationship, fundamentals of testing, desirable vehicle characteristics, track test programme circular skid pad testing, test methodology-chasis set up-primary & secondary set up.

UNIT V TOOLS OF RACE CAR 9

Ride roll rates-definitions, installation ratios, 1st & 2nd examples-Dampers-technical approach fundamentals,

application-Driving braking-brake systems, merits of front, rear, 4 wheel drive-

Wheel loads-chassis stiffness, effects of banking, asymmetrical & terrain effects-Steering system-steering geometry, gears, Ackermann geometry, alignment-Suspension geometry & springs-degrees of freedom, beam-independent-front suspensions-twist rear, beam rear, independent rear suspensions.

Reference

Race Car Vehicle Dynamics. William F. Milliken and Douglas L. Milliken.



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117 FOUNDATIONS OF YOGA

UNIT - I:

History, Evolution of Yoga and Schools of Yoga: Origin of Yoga, History and Development of

Yoga; Etymology and Definitions, Misconceptions, Aim and Objectives of Yoga, True Nature and

Principles of Yoga, Introduction to Vedas, Upanishads, Prasthanatrayee and Purushartha Chatushtaya, General introduction to Shad-darshanas with special emphasis on Samkhya and Yoga

Darshana, Yoga in Vedanta.

UNIT - II:

Modern Developments Introduction to Epics - (Ramayana, Mahabharata), Yoga in Ramayana, Yoga

in Mahabharata, Introduction to Smritis and Yoga in Smritis; General introduction to Agamas and

Tantra, Yoga in Tantra; Concepts of Nadi and Prana in Tantra, Kundalini, Effects of Kundalini

Shakti and Shat chakra Sadhana, Yoga in Medieval Literature, Bhakti Yoga of Medieval Saints,

Yoga in Narada Bhakti Sutras.

UNIT - III:

Yoga in Modern Times: Yogic Traditions of Ramakrishna and Swami Vivekananda, Shri Aurobindo; Maharshi Ramana and Swami Dayanand Saraswati, Yoga in Contemporary Times:

Brief Introduction to important Yoga Paramparas (lineages), Sri T. Krishnamacharya, Yoga Parampara of Swami Shivananda Saraswati, Swami Rama of Himalayas, Maharshi Mahesh Yogi

and their contributions for the development and promotion of Yoga.

UNIT - IV:

Introduction to Schools (Streams) of Yoga: Yoga Schools with Vedanta Tradition (Jnana, Bhakti,

Karma, and Dhyana), Yoga Schools with Samkhya-Yoga Tradition (Yoga of Patanjali) and Yoga

Schools with Tantric Tradition (Hatha Yoga, Swara Yoga and Mantra Yoga).

UNIT - V:

Astanga Yoga – Yama – Niyama- Asana- Pranayama- Prathyahara – Dharana – Dhyana – Samadhi.

Elements of Yoga and Yogic practices on Hinduism, Jainism, Buddhism, Christianity, Islam, Sufism- Spirituality - Role of yoga & Religions on Spirituality- Methods to promote Spirituality.

Reference Books:

1. Brahma Kumaries Jagdish Chander Mount Abu: PBK Ishwarlya Vishwa vidyalaya.
2. HaustulDesikachar (2016) The Hota yoga pradipika,'Chennai: Madia Garuda.
3. Meena Ramanathan (2006) Granda samihitaLonavla:Kaivalyadama S.M.Y.M. Samiti



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118 CLASSICAL YOGA PRACTICES

UNIT – I

Shatkarmas Dhauti (Kunjla), Vastradhauti, Danda dhauti, Laghoo and Poorna sankhaprakshalana, Neti (Sutra and Jala), Kapalbhathi, Agnisara, Nauli – Surya namaskar- Surya namaskar must be practiced traditionally and the variation in Surya namaskar may be taken into consideration based on the convenience of patients for therapy.

UNIT - II

Asnas (yogic postures) Standing Postures Ardhakatichakrasana, Hastapadasana, Ardihakrasana, Trikonasana, Parivrittatrikonasana, Parsvakanasana, Veersana, Sitting postures Paschimottanasana, Suptavajrasana, Ardhamatsyendrasana, Vakrasana, Marichasana, Malasana, Badhakanasana, Merudandasana, Akarnadhanurasana, Gumukhasana, Prone postures Bhujangasana, Salabhasana, Dhanurasana, Urdhvamukhosvanasana, Makarasana, Supine postures Halasana, Chakrasana, Sarvangasana, Matsyasana, Shavasana, Setubandhasana, Balancing postures Vrikshasana, Garudasana, Namaskarasana, Tittibhasana, Natrajasana.

UNIT – III

Pranayama Breath awareness, Sectional breathing, Nadishuddhi, Bhastrika, Ujjai, Cooling pranayama (Sitali, Sitkari and Sadanta), Bhramari, Pranayama (with Antar & Bahya Kumbhaka)

UNIT - IV

Bandhas and Mudras: Jivha Bandha, Jalandhara Bandha, Uddiyana Bandha, Mula Bandha, Maha Bandha, Yoga Mudra, Maha Mudra, Shanmukhi Mudra, Tadagi Mudra, Vipareet Karni Mudra.

UNIT – V

Practices leading to Meditation: Pranav and Soham Japa, Yoga Nidra (1,2,3), Antarmauna, Ajapa Dharana (Stage 1,2,3), Practices leading to Breath Meditation, Practices leading to Om Meditation, Practices leading to Vipassana Meditation, Practices leading to Preksha Meditation. porary Yogic Practices - Yogic Sukshma Vyayama, Cyclic Meditation (SVYASA); Mindfulness based Stress Reduction Technique (Kabatzin); Mind Sound Resonance Technique (S-VYASA); Raja Yoga Meditation (Brahmakumaris); Transcendental Meditation (Mahesh Yogi); ZEN Buddhist Meditation; Yoga Nidra (BSY); Savita Ki Dhyana Dharana (DSVV).

Reference Books:

1. Iyengar B.K.S (1976) Light on =Yoga, London, Unwin paper packs.
2. Sivananda Sarawathi Swamy (1934) Yoga Asanas Madras: My magazine of India.
3. Iyengar B.K.S (2008) Light on pranayama, New Delhi: Haper Collins publishers India
4. Chandrasekaran K (1999) Sound Health Through Yoga, Sedapatti: Prem kaliaan publication



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119YOGA FOR HEALTH

UNIT - I

Yoga – Meaning and Relevance. Tradition and origin of yoga. The body, mind and role interlink

with yoga. Concepts of yoga. Types of yoga – Hatha Yoga, Bhakti Yoga, Raja yoga, Karma yoga,

Jnana yoga, Kundalini yoga, Mantra Yoga, Tantra Yoga and integral Yoga (Sri Aurobindo).

UNIT - III

Components of fitness – Flexibility, Strength, speed, ability, co-ordinative abilities and Endurance.

Fitness development – cycling, Aerobic activities, Jogging, calisthenics, Rhythmic exercise, and circuit Training. Components of wellness - Factors (Psychological, Physiological and Anatomical),

Progression, warming up and limbering down, Special Physical Fitness Exercise and Principles of Physical fitness development.

UNIT - III

Bandhas: Jalandhar bandha, Uddiyana Bandha, Moola bandha and Mahabandha. Yogi purification: BamanaDhouti, BarisaraDhouti, sahajAgnisaraDhouti, Noli, Neti kriya, Nasa-polar shahaj Bastrikria, Water bath, Tub-bath, Hip-bath, sun bath, spinal bath, Air bath, Hot foot bath, The sitz bath, Tratak and message.

UNIT - IV

Food and meditation Food types: Sattvic (Cheese, Butter, curd, Ghee, sweet fruits, Honey, apples, bananas, Grapes, Papaya, Pomegranates, Mangoes, pears, Pineapple, Guavas, Figs etc. Rajasic (Eggs, Meat, Salt, Chillies, Chutney, Asafoetida, Pickles, Tea, Coffee etc.) and Tamasic (Beaf, Pork, wine, onion, Garlic, Rotten, state things). Balanced diet, carbohydrate, proteins, Fats, and vitamins (Fat and water soluble).

UNIT - V

Curative power for life - threatening diseases and disorders (Arthritis, Arteriosclerosis, Chronic fatigue, diabetes, Asthma, and obesity). Yoga control the respiratory problem, high blood pressure, Body pain and weight reduction. Yogic practices reduce anxiety, create self-awareness, and provide personal social values.

Reference Books:

1. George Feuerstein: The Yoga Tradition (Its history, literature, Philosophy, and practice).
2. Swamy Satyananda Saraswathi: Asana, Pranayama, Mudra, Bandha (India: Yoga Publications Trust, Munger, Bihar).
3. Swami Sivandana Practice of Yoga (The Divine Life Society, Shivananda Nagar P.O. U.P. Himalayas, India).



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120 YOGIC DIET AND NUTRITION

UNIT - I

Basic concepts and components of food and nutrition Understanding Nutrition, Basic Terminology in Relation to Nutrition Requirement, Human Nutritional Requirements; Concept of food, Acceptance of Food, Functions of Food; Components of Food & their Classification; Macro Nutrients –Sources, Functions and Effects on the Body; Micro Nutrients - Sources, Functions and Effects on the Body; Fat Soluble Nutrients - Sources, Functions and Effects on the Body; Water soluble Nutrients - Sources, Functions and Effects on the Body; Significance of Carbohydrate, Proteins, Lipids, Vitamins, Minerals and water in the body; Antioxidants and their Role.

UNIT - III

Yogic concept of diet and its relevance in the management of lifestyle.

UNIT - III

Nutrients, proximate principles of diet, balanced diet concept; Carbohydrates, proteins, fats – sources, nutritive values, importance; Minerals-calcium, iron, phosphorus etc. Vitamins – sources, roles, requirements

UNIT - IV

Food groups. Cereals & Millets –Selection, Preparation and Nutritive Value; Pulses, Nuts and Oil Seeds- Selection, Preparation and Nutritive Value; Milk and Milk Products- Selection, Preparation and Nutritive Value; Vegetables and Fruits- Selection, Preparation and Nutritive Value, Fats, Oils and Sugar, Jaggery- Selection, Preparation and Nutritive Value.

UNIT - V

Food and metabolism. Energy- Basic Concepts, Definition and Components of Energy Requirement, Energy Imbalance Concept of Metabolism, Anabolism, Catabolism, Calorie Requirement-BMR, SDA, Physical Activity; Metabolism of Carbohydrates, Lipids and Protein;

Factors Affecting Energy; Requirement and Expenditure, Factors affecting BMR.

Reference Books:

1. Hoger (1990) Fitness and wellness, Colorado: Morton Publishing Company.
2. GirijaShyamsundar (2007) Nutrition perspectives Chennai: University of Madras.
3. Swami Sivananda (2007) Health and Hygiene Sivanandanagar: The Divine Life society.



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121COMMUNICATION SKILL - I

UNIT – I

Communication Skills: Role of communication in Present Days- Importance of

Communication -

Communication Barriers - Types of Communications: Verbal communication: Oral -Story telling-

Crucial conversation – Face to Face Communication- Telephone communication, Aral- Listening

and Hearing, Non - Verbal Communication: Facial Expressions- Body Language-Posture- Eye

Contact, Written Communication: Journals - E-Mails - Blogs - Text Messages, Visual Communications: Signs - Symbols - Pictures.

UNIT – II

Components of Communication – Context - Encoder- Encoding - Message - Medium - Receiver –

Feedback- Level of Communication – Intrapersonal – Intrapersonal- Group and Public communication, Characteristics of Communication, Memorandum: Purpose- Format- Business

Memo and Agenda, Basic Skills for Communications- Listening – Speaking- Reading and Writing.

UNIT – III

Interview Skills: Preparing for Interview - Personal interview - Technical interview - Group Discussion- Body language- Pronunciation- Speaking - Presentation skills: Preparation – The Subject – The Audience – The place- The time - Length of Talk and Structure of Presentation.

UNIT – IV

Phonetics: Elements of English Language - Phonology- Morphology-Lexis- Syntax- Grammar, The

Different Speech Organs, and Their Role- The Individual Sounds- Vowel- Pure Vowel - Semi Vowel - Diphthongs - Classification of Diphthongs -Monotones - Consonants - Manner of Articulation - Place of Articulation.

UNIT – V

Strong and weak Forms of Words- Stress- Word Stress- Primary Stress- Secondary Stress- Sentence

Stress, Rhyme and Rhythm – Rhythm – Intonation- Raise - Fall - Raise Fall intonation.

Reference Books:

1. Second Edition of “Communication Skills” Published by Carrier Skill Library.
2. Effective Communication Skills – A Book of MTD Training.
3. The Language Sound of Language by Michael Dobrovolsky and Francis katamba.
4. ‘Soft Skills’, University of Madras, Chennai
5. ‘Communication Skills,’ University of Madras, Chennai



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122 RESEARCH PROCESS IN YOGA AND STATISTICS

UNIT-I:

Research –Meaning, Definitions, Need, Nature and scope of research in yoga, Types of research-

Basic-Applied-Action – Qualities of a researcher-Criteria in locating and selecting a research problem- preparation of research proposal Mechanism of research proposal- formulation of hypothesis-variables and its types.

UNIT-II:

Types of research design –Describe research –survey method, case study, method, Experimental

Method- Categories: Longitudinal design, Quasi Experimental design, cross sectional design, Double blind placebo design, Experimental Design Types: Single group Design Reverse group

design, repeated measure design static group comparison design, Rotated group design, Random

group design, Equated group design, Factorial design.

UNIT-III:

Data- Population- Sample-Subject- Sampling: Characteristics, Principles, steps, Determining the

sample size, criteria in selection, Types of sampling probability sampling methods- Random and

complex, Non –Probability Sampling methods- Writing Synopsis and Research report-Front Materials, Main Chapters and Back materials- Recent trends in yoga research, yoga research centers

and their works in India.

UNIT-IV:

Statistics-Meaning- Need and importance in research – non-parametric statistics- Treatment of Ftest,

‘t’ test one way- two way – testing- chi square-statistical packages- SPSS-SAS- data process, data analysis-Graphical Representation, Data interpretation.

UNIT-V:

Types of Statistics- Parametric and non-parametric-Normality of data-Normal Curve – Data Analysis- ‘t’ Test, F-test Type I Type II error-ANOVA-ANCOVA (one way & two way)- Post hoc

test- Pearson product moment correlation-Partial and Multiple Correlation- Regression simple linear

and multiple linear-Post hoc tests.

References:

1. Best john W and Kalm James, V (1980) research Education, New Delhi, Prentice Hall India.
2. Thomas AL (1986) The Art of Using computers, boyd& fresher Boston publishing Co.
3. Paul R kinear and colin D Gray (2006) SPSS 14 Made simple, New York: psychology press.
4. Kothari CR (1985) Research Methodology, New Delhi: Wiley Eastern Limited.



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123 METHODOLOGY OF TEACHING YOGA

UNIT- I:

Education: Yoga Education, Goal, Scope and importance, Principles of Teaching Yoga- Yogicpsychological, Physiological, Pedagogical, sociological, meaning of methodology of teaching

- factors influencing Methodology, Presentation technique, Role of language, Voice, fluency, clarity

and body language in Teaching, Factors of Yoga Education: Teacher, Student and Teaching-Guru-

Shishya Parampara, Types of students and teachers – promotion of leadership qualities, Yogic levels

of learning, Vidyarthi, Shishya, mumukshu, Yoga Guru.

UNIT- II:

Methods of Yoga Teaching, Lecture method, Response to instruction method (method), Individualized Instructional Method, Group discussion Method, Directed Practice Method, Project

method, Demonstration Method, Lecture cum Demonstration Method, Imitation Method, Dramatization Method, Sources of teaching methods

UNIT- III:

Teaching aids: Audiovisual aids, Visual aids, Audio aids, Models, Props, Wooden brick and foot rest

belt, ropes, slanting plank, chair, stool, bench, box, the heart rate, ladder stool and drum, bolster and

pillow, bandage, weight, the horse, big and small.

UNIT- IV:

Preparing lesson plan- Essentials of a good lesson plan, Advantages of preparing a lesson plan,

Contents of a lesson plan, Class management- formation of the class, conducting yoga practical

lessons: Precautions and contra-indications of practices, Lesson plan: Assembly and roll call, Relaxation & prayer

Loosening the joints, Introduction of the practice, Demonstration, Individual practice, Group practice, Yoga game (if time permits), Question and answer session, Relaxation, End prayer.

UNIT- V:

Organizing yoga class, Yoga camp, workshop in yoga, Yoga tours, Yoga games and competitions,

classification of age groups for competitions, Evaluation, Advantages, Devices of evaluation.

Reference Books:

1. Sivananda, Yoga teachers training Manual. val morin: Sivananda Ashram Yoga camp
2. Anandamitra (1991) Teachers' Manual Calcutta: Ananda Marga Pracaraka Samgha
3. Thirunarayanan and Hariharan (1975) Methods in Physical Education. Karaikudi



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124 BASIC YOGA TEXTS

UNIT- I:

Introduction to Vedas and Upavedas, Upanishads, Principles Upanishad & Yoga Upanishads. Introduction to Prasthanatrayee, Purushartha Chatushtaya and goal of human life. NaradaBhaktisutra, Thirumular' s Thirumanthiram, Shankiya, Yajnavalkya Smriti

UNIT - II

Ishavasyopanishad: Concept of Karmanishta; Concept of Vidya and Avidya; Knowledge of Brahman; Atma Bhava.

Kena Upanishad: Self and the Mind; Intuitive realization of the truth; Moral of YakshaUpakhyana.

Katha Upanishad: Definition of Yoga; Nature of Soul; Importance of Self Realization.

Prashna Upanishad: Concept of Prana and rayi (creation); Panchapranas; The six main questions;

Mundaka Upanishad: Two approaches to Brahma- Vidya- Para and Aparā; The greatness of Brahmavidya; Worthlessness of Selfish-karma; Tapas and Gurubhakti; The origin of creation, the aim of Meditation-Brahmanubhuti.

UNIT - III

Mandukya Upanishad: Four States of Consciousness and their relation to syllables in Omkara.

Aitareya Upanishad: Concept of Atma, Universe and Brahman.

Taittiriya Upanishad: Concept of Pancha Kosha; Summary of Shiksha Valli, AnandaValli, Bhriguvalli.

Chhandogya Upanishad: Om (udgitha) Meditation; Shandilyavidya.

Brihadaranyaka Upanishad: Concept of Atman and Jnana Yoga; Union of Atman and Paramatman

UNIT - IV

Bagavad Gita: General Introduction to Bhagavad Gita, Definitions of Yoga, their relevance & Scope; Essentials of Bhagavad Gita - meanings of the terms Atmaswarupa, Stithaprajna, Sankhya

Yoga (Chpt.II), Karma Yoga (Chpt.III), Samnyasa Yoga and Karma Swarupa (Sakama and Nishkama) Samnyasa, Dhyana Yogas (Chpt. VI); Types of Bhakta (Chpt. VII) Nature of Bhakti

(Chpt.XII), Means and End of Bhakti-Yoga; The Trigunas and nature of Prakriti; Three Kinds of

Faith. Food for Yoga-Sadhaka, Classification of food (Chpt.XIV& XVII) Daivasura-Sampad-Vibhaga Yoga (Chpt.XVI);Moksa-SamnyasaYoga (Chpt. XVIII)

UNIT – V

Yoga Vasishtha: Salient features of Yoga Vashitha, Concept of Adhis and Vyadhis; Psychosomatic

Ailments; The four Dwarpaals to Freedom; How Sukha is attained in the Highest State of Bliss;

Practices to overcome the Impediments of Yoga; Development of Satvaguna; Eightlimbs of Meditation; JnanaSaptabhumika.

Reference Books:

1. Iyenger B.K.S (1976) Light on yoga, London, Unwin paperbacks
2. Sivananda Sarawathi swami (1934) Yoga Asanas Madras My magazine of India.



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3. Satyanadasarawan swami (2008) Asana, Pranayama. Mudra, Bandha, mungar: Yoga publications trust
4. Iyenger B.K.S (2008) Light on pranayama. New Delhi: HaperCollinspublishers India.
5. Chandrasekaran k (1999) Sound Health Through Yoga, Sedapatti: Prem kalyan Publications
6. Vishnu Devananda Swami (1972) The complete Illustrated book of yoga, New York: Pocket Books.
7. Yogeshwaranandseraswathi swami (1975) First steps to higher yoga, Gangothari: Yoga nikanetan trust.
8. Coulter, David (2001) Anatomy and Hatha yoga, USA Body, and Breath Inc
9. Kirk Martin (2006) Hatha Yoha Illustrated Campaign. Humenkinetics
10. Gharote (2004) Applied yoga, Lonvla. Kaivalyadhama



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125 COMPUTER APPLICATION IN YOGA

UNIT- I

Introduction to computer- definition- History of Computers - Generations of computer

(Computer

Languages)- Hardware and Software: types of software - Computer Memory - Comparison of Human being and Computer.

UNIT - II

Basic components of computers: Input and Output devices - Central Processing Unit: Arithmetic &

Logic Unit & Control unit -Uses of computers in different environments: corporates, educational

institutes, business.

UNIT - III

Desktop Window: Parts and the versions of software - Microsoft Office application window: Title

bar, Menu bar, Standard toolbar bar - Formatting toolbar bar- Scroll bar – Ruler bar - Status bar –

Workspace.

UNIT - IV

Microsoft Word: Creating a document – Formatting: Change of Font style, color, Background –

Editing: Cut & Paste, Copy & Paste, deleting - Insert: Picture, Objects, Table, Header & Footer –

Creating a Mail Merge - Saving a document - Uses of MS-Word in Yoga.

UNIT - V

Microsoft Excel: Creating a Spreadsheet–Cell: Rows and Columns - Formula Bar: using a formula,

Mathematical operations - Insert Chart: Types of Charts - Fill Series: Numbers, Dates, Days/Months

–Sorting – Filters – Worksheets - Uses of MS-Excel in Yoga

Reference Books:

1. Venugopal fundamentals of computers practice all India
2. Sudarshan C John Manoj Kumar computer fundamentals RBF Publication
3. Dromwey how to solve it by computer tata Mcggraw, Gill
4. Computer for beginners Vikas publishing house New Delhi



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126 YOGA FOR HEALTH AND WELLNESS

UNIT - I

Health: Goals of life – Adhi and Vyadhi, Kleshas, Doshas, Factors affecting Health – Panchamabhudas (Five Elements), Rules for Good Health, Dimension of Health, and Pillars of

Health – Disease: Stages of Development of Disease - Mental and Emotional ill-health, Causes of ill-health, Mode of Transmission.

UNIT - II

Yoga for Communicable Diseases: Malaria, Typhoid, Cholera, Whooping cough, Tuberculosis,

Measles, Venereal diseases. Yoga for Life Style Diseases: High Blood Pressure, Diabetes Mellitus,

Obesity, Cancer, Stoke.

UNIT - III

Role of yogic positive attitudes (Maître, Karuna, Mudita and Upeksha) for Healthy Living, concept

of Bhavas and Bhavanas with its relevance in Health and well – being. Health and Environment –

Mental Health – Concepts of Health: Air, Water, Food, Clothing, Exercise- Rules of Health – Sanitary Laws- Personal Hygiene of Human Systems- Population Explosion and its control.

UNIT - IV

Wellness & Physical Fitness: Meaning, Scope of Wellness & Fitness, Components of wellness &

Fitness: Endurance, strength, speed, flexibility, agility, and balance - Natural fitness - Benefits of

Wellness & Fitness

UNIT - V

Yogic Rule for Good Health: Positive yogic principles of health living, Ashtanga yoga of Patanjali

for Healthy Living, Yogic Practices for Healthy Living, Relationship of Health, Fitness, Wellness,

Total – Wellbeing and Yoga.

References:

1. Hoger (1990) Fitness and wellness, Colorado: Moton publishing company.
2. Girija Shyamsundar (2007) Nutrition perspectives Chennai: University of Madras.
3. Swami Sivananda (2007) Health and Hygiene Sivanandanagar: The Divine life society.
4. Raghavan (1965) H and book of health education karaikudi: Meenal enterprises.



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127 YOGA THERAPY - I

UNIT I:

History of yoga therapy- Essence and Principles of Yoga therapy-Philosophy and pathology in the yoga- Shatra-Koshas-doshas-Pancha prana- Application of Yoga and its types-Methodology in Yoga Therapy- Factors (Heyam, Hetu, Hanam and Upayam)- Methods (Daraanam, Sparsanam, Prasanam, NadiPariksa) Examination of vertebra, Joints, muscles, Abdomen and Nervous system and therapeutic yoga practices- Modification of yogic practices- Yogic diet for Human systems- Yogic diet- Nadis and Chakras.

UNIT II:

Application of traditional Indian medical systems and therapies: Ayurveda – Doshas, Dinacharya, Ayurvedic diet, Panchakarma therapy, Siddha- Five elements theory, physical constituents, pathology (kayakalpa, kitchen, Herbal and other types of medicine) Varmam and Thokkanam, Exercise therapy, music therapy, cryo therapy, Acupressure, Acupuncture, Chromo therapy, Magneto therapy, Pranic healing, Naturopathy, Modalities of Naturopathy

UNIT III:

Therapeutic application in Yoga for High blood pressure, Obesity, Diabetes Mellitus, Asthma, Sinusitis, Migraine, Arthritis, Back pain, Thyroid problems, Constipation, Impotency, Infertility, Storke, Epilepsy, Parkinson's disease, Sleep disorders, Skin diseases, Insomnia, Anaemia.

UNIT IV:

Therapeutic applications in Yoga for psychological disorders: Neurosis: Stress, Depression, eating disorder, suicide, hysternia, Psychosis: Schizophrenia, Autism, Bipolar disorders, Dementia, Personality Disorders: Paranoid, histrionic, drug addicts- Smoking, Alcoholism, Gambling- Anti social activities.

UNIT V:

Therapeutic applications in Yoga for the problems of Women- Amenorrhea, Dysmenorrhoea, Menorrhagia, Metrorrhagia, Hypomenorrhoea, Oligomenorrhoea, Polymenorrhoea, Leucorrhoea, Uterus related problems, Miscarriage, Pregnancy- Pre and Post-natal care, PCOS.

Reference Books:

1. Balkrishna Acharya (2006) Ayurveda its principles and philosophies Hardwar: DivyaPrakashan
2. Atharale V.B (1980) basic principles of Ayurveda, Bombay: Pediatric clinics
3. Frawley David (2000) Yoga and Ayurveda Delhi: Motilal BanarsidasPublihers Pvt Ltd.



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128 STATISTICS IN YOGA

UNIT-I

Statistics-Basic Concept -Need and Importance of Statistics; Data-Raw and Grouped, Types of data;

Concept and Calculations of Measures of Central Tendency-Mean, Median and Mode; Measures of

Variability- Range, Mean Deviation, Quartile Deviation and Standard Deviation.

UNIT-II

Introduction To Normal Distribution - Normal Curve - Characteristics of Normal Curve - Properties

of Normal Curve - Standard Normal Curve - Problem Based on Normal Distribution - Uses of

Normal Distribution.

UNIT-III

Testing Of Hypothesis - Procedure, Types of Hypotheses, Level of Significance, One Tailed and

Two Tailed Test, Degrees of Freedom; Test of Significance for Difference of Means- t Test - Independence and Dependence Test, Z-Test; One Way Analysis of Variance.

UNIT-IV

Correlation- Pearson Product Moment Correlation, Spearman Rank Order Correlation, Phi Correlation, Biserial Correlation Partial and Multiple Correlation

UNIT-V

Non-Parametric: Chi Square Test - Equal Occurrence Test, Independence of Attributes, Contingency Coefficient; Graphical Representation - Line Diagram, Bar Diagram- Multiple Bar

Diagram, Pie Diagram.

.

References:

1. Blum, J.R., and Fattu, N.A. 1954. Nonparametric methods. Rev. Educ. Res., 24,467-487.
2. Conover, W.J. Practical Nonparametric statistics, 2nd edition. New York; John wiley& sons, 1980.
3. Owen, D.B. Handbook of Statiscal Tables. Reading, Mass; Addison- Wesley,1962.
4. Varma J. Prakash; Sports Statistics Copy wright 2000 by Venus Publication.



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129 PERSONALITY DEVELOPMENT

UNIT-I

Personality: Personality in psychology – Meaning, Definition, concept, need, nature, and scope of personality development- structure of personality.

UNIT-II

Stage of human development- determinants of human development of personality- developmental processes: physical, mental, moral, social, emotional and spiritual.

UNIT-III

Guidelines on personality – values and spirituality- developing good personality based on yoga and stress management- role of diet on personality.

UNIT-IV

Personality development with special emphasis on Pancha kosha- Ashtanga yoga- Factors of personality- Theories of personality- Attitude- Self-esteem, Memory-Concentration-creativityintelligence- Assessment of personality.

UNIT-V

Leadership- Qualities of leaders-Positive thinking- powers and effects of thoughts- career planning –career rules- Better human relations- time management

Reference Books:

1. Kamlesh M.L.(1988) Psychology in physical education and sports, New Delhi, Metropolitan,
2. Gita Mathew (1997) Sports Psychology Shejin and shiju brothers, Karaikudi.
3. Rishi Vivekananda (2006) practical yoga psychology Munger. Publication trust.
4. Abhedananda swami (2002) yoga psychology kolkatta:Ramakrishna Vedanta Math

130 STRESS MANAGEMENT

UNIT I:

Meaning, Concepts, levels, types, reaction, causes, symptoms, complications, remedies, stress, and yoga

UNIT II:

Sources of stress: internal and external, release of stress

UNIT III:

Texts on stress, Kleshas and stress, Stress, and koshas

UNIT IV:

Effective stress management- Diet, yogic practices- systems of medicine and therapies

UNIT V:

Frustration, conflicts and psychosomatic disorders, relationship between body and mind, mental health.



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3. Girija Shyamsundar (2007) Nutrition perspectives Chennai: University of Madras.
4. Lily Pritam TeluRam(1981) Health and Hygiene, Delhi: Vikas publishing House pvt ltd.
5. Ragavan (1965) Hand book of health education karaikudi: Meenal enterprises.
6. Syd Hoare (1986) Keep it, Hodder, and Stoughton: Teach yourself books
7. Swami Sivananda (2011) Health and Diet, Sivanandanagar: The Divine life society.



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131 CLASSICAL YOGA PRACTICES WITH PROPS (PRATICAL)

UNIT 1:

Essentials of Yogic Practices: Loosening Exercises - Pawanmuktasana series.

Suryanamaskar: Sivananda model, Chandra namaskar. Usage of props like wooden brick and foot

rest, Belts, Ropes, Slanting planks, Chair, Stool, Bench & box, The heart rack, Ladder stool and

drum, Bolsters and pillows, Bandage, Weights, Horse (big & small)

UNIT 2:

Asanas & Pranayama: Virabhadrasana, Parsvottanasana, Utthita Trikonasana,

Adhomukha Svanasana, Karnapitasana, Kandharasana, Tittibhasana, Padma Sarvangasana, Salamba

Sirshasana, Gomukhasana, Setu Bandhasana, Chakrasana, Trianga Mukhaikapada

Pachimottanasana, Marichyasana, Virasana, Svastikasana, Shashangasana, Garudasana,

Mayurasana, Padma mayurasana, Bhadrasana, Simhasana, Akarna Dhanurasana,

Parsvakonasana,

Savasana.

Usage of props like wooden brick and foot rest, Belts, Ropes, Slanting planks, Chair, Stool, Bench & box, The heart rack, Ladder stool and drum, Bolsters and pillows, Bandage,

Weights,

Horse (big & small).

Pranayama: Moorchapranayama, Anulomaviloma, Sadanta Pranayama, Pranayama with Kumbhaka and bandhas

UNIT 3:

Kriya: Shat Kriya (Kapalabhati, Trataka, Neti, Dauti, Nauli, Basti.)

UNIT 4:

Bandha and Mudra, Relaxation Technique: Bandha: Uddiyana bandha, Molabandha, Mudras: Yoni

mudra, Lotus mudra, Dhyani mudra, Sakthi mudra, Shambavi mudra, Pashinee mudra, MahaBheda

mudra, Ksepanamudra. QRT (Quick Relaxation Technique)

UNIT 5:

Meditation: Walking meditation, Vipasana meditation, nine centred meditation, yogic

sukshnavyayama, Sudharshana kriya, Zen meditation, Savita kidhyan Dharana, Mind Sound Resonance technique.

References:

1. Iyenger BKS (1976) Light on yoga, London, Unwin paperbacks.

2. Sivananda Sarawathi swami (1934) Yoga Asanas Madras: My magazine of India.



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132 ENVIRONMENTAL STUDIES

UNIT - I

Scope and importance- need for public awareness.

UNIT -II

Resources – Water – Forest – Minerals- Food Energy- land.

UNIT - III

Ron mental – pollution- definition – causes- Effects and control measure of Air pollution – Water-

Soil-Noise- Nuclear.

UNIT - IV

Social issues and the environment- Urban problems related to energy – Water conservation – Rainwater harvesting- Water shed management- Environment ethics- Climate change – Global

warning – Acid rain – Ozone layer deletion.

UNIT - V

Human Population and the Environment – population growth variation among Nation population

explosion –Family welfare program- Environment – and human wreath.

References:

1. C.R.B Environmental- Education Centre, Chennai: Environmental studies for until gladiate students.
2. K kainaraswamy, Environmental studies A text book for all under graduate course, Bharathidasan University, Tiruchirappalli.



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133 YOGA THERAPY AND PSYCHOLOGY

UNIT – 1

Psychology: Meaning, definitions, Nature, Need, scope of Psychology – Psychology and Yoga, role of Yoga on Heredity and Environment, learning, Emotions, memory, Cognition, Intelligence, Attention, Attitude, Personality.

UNIT – 2

Growth and Development: Life span periods, Yoga for different stages of life: infancy, early childhood, later childhood, Adolescence, adulthood, old age, women, Yoga for Professional people.

UNIT – 3

25 ELEMENTS, KOSHAS, Doshas, Gunas, Nadis and chakras, Mind, Types of mind, folded, mental faculties, stages, States, sources and powers of mind, unfolding powers of Mind, Yoga for super-consciousness.

UNIT – 4

Spirituality: meaning, definition, Role of Yoga Religion on Spirituality values, type of values, divine virtues.

Methods of developing spirituality

UNIT – 5

Role of Yoga on psychology qualities and psychological disorders Neurosis: Anxiety, Phobias,

obsessions, Compulsion, stress, hysteria, Depression, suicide, Eating disorders, Suicide.

Psychosis: schizophrenia, Autism, Dementia, Bipolar disorder, mental retardation Personality

disorder: paranoid, Histrionic, drug addicts, gambling, Alcoholism, smoking, anti-social personality disorders.

References:

1. Kamlesh, M.L (1988) Psychology in physical education and sports, New Delhi.
2. Elangovan. R (2001) UdrkalviUlaviyal, Thirunelveli: Aswin Publications.
3. Gita Mathew (1997) Sports Psychology, Shejin and Shiju Brothers, Karaikudi
4. Gidretal, (1989) Psychology, Glenview: scottforesman and company.
5. Bringle Robert etal, (1981) understanding psychology, Munger: Yoga Publications Trust



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134 PHYSICAL EXAMINATION METHODS OF YOGA THERAPY

UNIT-1: Examination of Spine

1. spine with respect to kyphosis
2. spine with respect to lordosis
3. spine with respect to scoliosis
4. Axial twists
5. examination of low back
6. examination of neck

Unit- 2: Examination of Joints.

1. Knee joint.
2. hip joint
3. shoulder joint
4. Ankle and foot

Unit-3: Examination of Muscles

1. Various group of muscle
2. Muscles tone
3. Muscle bulk
4. Strength of various groups of muscles

Unit- 4: Examination of Abdomen

1. Examination of abdominal organs
2. Interference of from examination
3. Examination of hernia sites

Unit-5: Examination of Nerves

1. Examination of the neurological system.
2. examination of tremor
3. examination of find tremor

References:

1. Rodger Watson, anatomy and physiology of nurse's 2000, USA, Harcourt Publishers
2. Stanley Hoppenfeld, physical examination of the spine 1976 USA Peter Hall,
3. WP Beetham, physical examination of joint, 1965, UK, WBSaunders& Co.
4. B.k.s. Iyanger. The path to holistic health 2002 1 UK Dorling Kindersley



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135 METHODOLOGY IN YOGA THERAPY

Unit 1 View in Yoga therapy

1. Hey I am on the symptoms
2. countering predisposing factors Hetu or the cause
3. aggravating factor
4. Hanam or the remedy
5. Relivering factors
6. Upayam or the tools Importance of regular reviews

Unit 2 Pariksha in Yoga therapy

1. In depth study of the Diagnostic tool
2. darshanam
3. sparsnam
4. prasnam
5. group classes vs individual classes

Unit 3 Nadi Pariksha in Yoga therapy

1. Nadi system-definition from text
2. The different type of Nadi and their significance
3. Methodology of Nadi Pariksha in Yoga therapy
4. Application of Nadi Pariksha in Yoga therapy
5. Differences between Nadi Pariksha and pulse reading

Unit 4 Application of Therapeutic tools

1. Extensive theoretical and practical learning about these Diagnostic tools, especially with respect to.
2. The prerequisites for using these tools.
3. The exact technique of using these tools.
4. The limitations of the tools.
5. The principals involved in in inferring information by using these tools
6. Application of these tools during therapeutic intervention.

Unit 5 Modification as applied to yoga therapy

1. Modification the adoption
2. Simplification vs intensification.
3. Form vs function.
4. Modification of asthma
- 42
5. Modification of Pranayama
6. Modification of meditation
7. modification of chanting

References:

1. Translated by TkvDesikachar; Patanjali's yoga Sutra. 1987 Chennai KYM Publications
2. Translated by TkvDesikachar; Nathamuni's yoga Rahasya 1998 Chennai Publication
3. TkvDesikachar; religiousness in Yoga 1980 USA University Press of American
4. B.k.s Iyengar the path of holistic health, 2001. UK,DorlingKindersley
5. TkvDesikachar; with kausthub and Frans moors. The
6. The viniyoga of yoga. 2001. Chennai KYM Publications.



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136 PSYCHOLOGICAL TESTING IN YOGA

1. Anxiety
2. Assertiveness
3. Study skill
4. Jobssatisfaction
5. Emotional maturity
6. General mental alertness
7. Attitude
8. Adjustment
9. Division of attention
10. Steadiness
11. Learning
12. Reaction time

References:

1. Kamlesh, M.L (1988) Psychology in physical Education and sports New Delhi
2. Metropolitan
3. Elangovan R. (2001) udarkalviulaviyal,thirunelveli: aswinPublication.
4. Gita Mathew (1997) psychology.glenview: scottforesman and company
5. Bringle Robert etal.(1981) understanding psychology New York Rendom House School Division New York
6. Rishi Vivekananda (2006) practical yoga psychology Munger yoga publication Trust.
7. abhedananda Swami (2002) Yoga psychology, Kolkta, Ramkrishna Vedanta math.
8. Mangal S.K (1991) psychological foundation of education Ludhiana prakash Brothers.
9. Elangovan R (2018) yogapsychology, Chennai Ashwin Publication



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137 YOGIC PRACTICE AND MODIFICATION - II

Unit 1: Loosening the joints

Surya Namaskara : for children(10 steps)

Bihar school of yoga Model

Viveka nanda Model

Unit 2: Asanas

Vrkshasna, parivirthatrikonasana, virbhadrāsana, garudāsana, padahastāsana, ushatrāsana, sirshāsana, halāsana, sarvangāsana, matsyāsana, bhujangāsana, Salabhasana, Dhunarasana, Navāsana, naukāsana, siddhāsana, siddhayoniasana, ardhāmatsyāsana, paschimouttanasana, Baddhkonasana, kukutasana, padmasana, vjrasana, siddhāsana, savāsna

Unit 3: pranayama

Yogic Breathing

Kapalabhati

Bharmri

Ujjayi, Sheetalī, sheetkari, Bhastrika, Nadisodhna

Unit 4:

Jalneti, sutraneti

Bandha:

JalandharaBandha ,MoolaBandha ,UddiyanaBandha

Mudra:

Chin mudra, chimya mudra, Adi Mudra, Brahma Mudra, BhiravaMudra, Bhairvi Mudra, shanmukhi Mudra, Vipareetakarni Mudra, Yoga Mudra, Ashwani Mudra, Nasiga mudUnit5
Yoga nidra, Rajyoga Meditation, Tratkameditation, Chakra Meditation, Nine Centerd meditition, Preksha Meditition, Mindfulness Based Strees Reduction technique



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138 PATHOLOGY AILMENTS AND YOGA THERAPY

UNIT-1 – Pathological Study – Yogic perspective

- Study of important pathological conditions as seen by allopathic system
- Basic understanding of pathological changes in ailments
- Yogic way of assessment and confirmation of these changes in an individual.
- Therapeutic application of yoga for the ailments with some important diseases as examples with particular reference to what to avoid, what to prescribe and how to modify them to suit the individual
- Study of the manifestation of these ailments and the effect of the ailment on the individual and the principles behind the individualistic approach of yoga
- Disease oriented approach vs. individual oriented approach.

UNIT-2-Therapeutic application of yoga in skeleton-muscular system

- Low back pain
- Sciatica
- Cervical spondylosis
- Ankylosing spondylosis
- Osteoarthritis
- Rheumatoid arthritis

UNIT-3- Therapeutic application of yoga in Digestive System

- Gastritis
- Peptic ulcer disease
- Hernia
- Constipation

UNIT-4-Therapeutic application of yoga in Respiratory and Cardio – Vascular System

- Allergic sinusitis
- Asthma
- COPD
- Hypertension
- Circulatory Insufficiency
- Varicose vein

UNIT-5-Therapeutic application of yoga in Nervous, Endocrine, Urinary, Lymphatic, Reproductive system and sensory conditions.

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- Migraine
- Epilepsy and stroke
- Hypo and hyperthyroidism
- Irregular periods
- Pregnancy-pre & post-natal care
- Urinary insufficiency
- Lymphatic edema
- Refractive errors in the eye

References:

1. Translated by TKV Desikachar, 'Nathamuni's Yoga Rahasya', 1998, Chennai, KYM Publications
2. Translated by TKV Desikachar , 'Yogayajnavalkyasamhita,' 2000, Chennai, KYM publications.
3. BKS Iyengar, 'The path to holistic health, '2001, UK, Korling Kindersley.



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4. Rogar Watson, 'Anatomy and Physiology for Nurses', 2000, USA, Harcourt Publishers
 5. Stanley Hoppen Feld, 'Physical Examination of the spine and extremities,' 1976, USA, Prentice Hall.
- WP Beetham, 'Physical examination of the joints,' 1965, UK, Saunders & co.



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139 YOGIC PRACTICES AND MODIFICATIONS - III

Unit-1: Loosening the joints

Pawanmuktasana series

Suryanamaskar: Sivananda Model, Chandranamaskar

Unit-2: Asanas

Virabhadrasana, Parsavottanasana, UthithaTrikonasana, AdhomukaSavasana, Karnapidasana, Kandharasana, Titibhasana, PadmaSarvankasana, SalambaSirasasana, gomukasana, Setubandhasana, Chakrasana, TriangaMukhaipadapaschimottanasana, Marichyasana, Virasana, Svastikasana, Shashangasana, Garudasana, Mayurasana, Padma Mayurasana, Bhadrasana, Simhasana, AkarnaDhanurasana, Parsvakonasana, Savasana.

Unit-3: Pranayama

Moorchapranayama

Anulomaviloma

Sadanta Pranayama

Pranayama with Kumbhaka and bhandhas

Kriya

Dhandadhauti, Vatsaradhauti, Nauli(Madhyama, Vama, Dakshina)

Unit-4

Mudras: Yoni Mudra, Lotus Mudra, Dhyani Mudra, Sakthi Mudra, Shambavi Mudra, Pashinee

Mudra, MahaBheda Mudra, Ksepana Mudra.

Unit-5

Meditation: DRT, Walking Meditation, Vipasana Meditation, Nine centered Meditation, Yogic

Sukshnavyama, Sudharsiya, Zen Meditation, SavitakidhyanDharana, Mind sound Resonance Technique.

References:

1. Iyenger B.K.S (1976) Light on yoga, London, Unwin Paperpacks.
2. Sivananda Saraswathi Swami (1934) yoga Asanas Madras: My magazine of india.
3. Satyananda Saraswathi Swami (2008) Asana, Pranayama, Mudra, Bandha, Munger, Yoga Publications Trust.
4. Iyenger B.K.S (2008) Light on Pranayama, New Delhi; Haper Collins Publishers India.



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140 RESEARCH PROCESS IN YOGA

Unit-1:

Research –Meaning, Definitions, Need, Nature and scope of research in yoga, Types of research-

Basic-Applied-Action – Qualities of a researcher-Criteria in locating and selecting a research problem- preparation of research proposal Mechanism of research proposal- formulation of hypothesis-variables and its types.

Unit-2:

Types of research design –Describe research –survey methodical study, method, Experimental

Method- Categories: Longitudinal design, Quasi Experimental design, cross sectional design, Double blind placebo design, Experimental Design Types: Single group Design Reverse group

design, Repeated measure design static group comparison design, Rotated group design, Random

group design, Equated group design, Factorial design.

Unit-3:

Data- Population- Sample-Subject- Sampling: Characteristics, Principles, steps, Determining the

sample size, criteria in selection, Types of sampling probability sampling methods- Random and

complex, non –Probability Sampling methods- Writing Synopsis and Research Report-Front Materials, Main Chapters and Back materials- Recent trends in yoga research, yoga research centers and their works in India.

Unit-4:

Statistics-Meaning- Need and importance in research – non-parametric statistics- Treatment of Ftest,

't' test one way- two way – testing- chi square-statistical packages- SPSS-SAS- data process, data analysis-Graphical Representation, Data interpretation.

Unit-5:

Types of Statistics- Parametric and non-parametric-Normality of data-Normal Curve – Data Analysis-'t' Test, F-test Type I Type II error-ANOVA-ANCOVA,(one way & two way)- Post

hoc test-person product moment correlation-Partial and Multiple Correlation- Regression simple

linear and multiple linear-Post hoc tests.

References:

1. Clarke David H and Clarke H, Harrsion (1984) Research process in Physical Education, New Jersey: Prentice Hall Inc.

2. Best john W and Kalm James, V (1980) research Education, New Delhi, Prentice Hall India.

3. Clarke H. Harrion and Clarke David H, (1972) Advanced Statistics, New Jerycy: Adnaced Statistics New jerycy Prentice Hall India.



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141 YOGA PRACTICES AND MODIFICATIONS – IV

Unit: I

Loosening the joints.

Pavanmuktasana series.

Suryanamaskar: kriya Suryanamaskar , Advance Suryanamaskar,

Unit: II

Ardha baddhapadmottaanasana. Utthita Hasta Padangusthasana. Vatayanasana. Hanumasana.

Padangushthasana. Padma Sarvangasana, kamaPidasana, Vrishchikasana ,

poornaBhujangasana,

poornasalabhasana, poornaDhanurasana, poornamatsyendrasana, Eak pada Sirsasana,

KOOrmasana, Padma Sirshasana, Ardha BaddhaPachimottanasana, Paryangasana,

Bhekasana,

Baddha Padmasana, Vamadevasana, ParivrittiJanusirshasana, Savasana.

Unit: III Pranayama

Kewali Pranayama (Soham)

Plawini Pranayama.

Kumbhaka and Bandhas with ratios.

Unit: IV Kriyas

Ghrta Neti, Dugdha Neti, Basti (Enema)

Bandhas: Maha Bandha.

Mudras

Kaki Mudra, Bhujangini Mudra, Vipareeta Karani Mudra, Kundalini Mudra, Mahavedha Mudra,

Vajroli/Sahajili Mudra, Manduki Mudra, Ashwini Mudra,

Unit: V

Meditation: Transcendental, Cyclic (S- vyasa), Guided Meditation, Dynamic Meditation, Tibetan

Meditation.

References:

1. Iyengar B.KS (1976) Light on yoga , London, Unwin Paperpacks.

2. Sivananda saraswathi swami (1934) Yoga Asanas Madras; my magazine of India.

3. Satyanandasaraswati swami (2008) ASANA Pranayama, Mudra, Bandha, mungar: Yoga publications lrust.

4. Iyenger .B.K.S (2008) Light on Pranayama, New Delhi: HAPER Collins publishers India.



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142 HEALTH AND YOGA THERAPY

Unit I

Health: Goals of life – adhi and vyadhi, Kleshas, Doshas, factors affecting Health – panchamabhudas, stages of development of disease- mental and emotional ill –health – yogic –

rules for good health, Dimension of health, causes of ill – health, pillars of health Role of yogic

positive attitudes (maître, karuna, Mudita and Upeksha) for health living, concept of Bhavas and

Bhavas with is's relevance in Health and well –being.

Unit II

Communicable diseases: Malaria, Typhoid, Cholera, Whooping cough, Tuberculosis, measles,

Venereal diseases, dysentery, Leprosy.

Unit III

Life style Diseases and yoga HBP, diabetes, obesity, cancer, Stoke, Diet and Nutrition.

Unit IV

Health and environment – mental health – Concepts of health: Air, Water, food clothing, exercise- rules OF health – sanitary laws- Personal hygiene of human systems- population explosion and it's control.

Unit V

Yogic rule for good health

Positive yogic principles of health living, ashtanga yoga of patanjali for healthy living, yogic practices for healthy living, relationship of health, fitness, wellness, total – wellbeing and yoga.

References:

1. Hoyer (1990) Fitness and wellness, Colorado: Moton publishing company.
2. Girija Shyamsundar (2007) Nutrition perspectives Chennai: University of Madras.
3. Swami Sivananda (2007) Health and Hygiene Sivanandagar: The Divine life society.
4. Lily Pritam Telu Ram (1981) Health and Hygiene, Delhi: Vikas publishing House Pvt Ltd.
5. Raghavan (1965) H and book of health education karaikudi: Meenal enterprises.



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143 WELLNESS AND YOGA THERAPY

Unit I

Wellness: Meaning and scope of wellness, components of wellness: fitness, nutrition, spirituality, smoking cessation, substance abuse control, stress management, environmental support, prevention and risk, reduction & disease - yogic management

Unit II

Physical fitness: Fitness: Meaning, Definitions, components and scope of fitness, yogic practices

for promoting the components of fitness: Endurance, strength, speed, flexibility, agility and balance - Natural fitness - Allround fitness - Benefits of fitness

Unit III

Nutrition: Macronutrients, micro nutrients, carbohydrates, fats, proteins, vitamins, minerals, water, balanced diet, benefits of vegetarian diet, gluten free and lactose free diet - composition of

the meal (Grains, dairy products, vegetables and fruits nut, pulses, oil and fat), Meditarrenian diet, Vegan diet, Low glycemic diet, DASH diet, yogic diet, principles of yogic diet, characteristics of sattvic, rajasic and tamasic diet, diet for yogic practitioners

Unit IV

Disease prevention: Health: Goals of life- Adhi and Vyadhi, Kleshas, Koshas, Doshas, factors affecting health- Panchamahabhudas, stages of development of disease- Mental and emotional

ill-health - Yogic rules for good health, Dimension of health, causes of ill-health, pillars of health. Role of yogic positive attitudes (Maitri, Karuna, Mudita and Upeksha) for healthy living,

concept of Bhavas and Bhavanas with its relevance in Health and well-being.

Smoking cessation -Substance abuse control - Health & safety - Life style diseases

Unit V

Stress management: Frustration, conflicts and psychosomatic disorders, relationship between body and mind, mental health

Spirituality: Methods to promote spirituality

References:

- 1) Hoyer (1990) Fitness and wellness, Colorado: Morton Publishing company
- 2) Girija Shyamsundar (2007) Nutrition perspectives Chennai: University of Madras
- 3) Swami Sivananda (2007) Health and Hygiene Sivanandanagar: The Divine life society
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144 NUTRITION AND YOGA THERAPY

Unit I

Nutrition: Macronutrients, micro nutrients, carbohydrates, fats, proteins, vitamins, minerals, water, balanced diet, benefits of vegetarian diet, gluten free and lactose free diet - composition of

the meal (Grains, dairy products, vegetables and fruits nut, pulses, oil and fat), Meditarrenian diet, Vegan diet, Low glycemic diet, DASH diet, yogic diet, principles of yogic diet, characteristics of sattvic, rajasic and tamasic diet, diet for yogic practitioners

Unit II

Food stuffs - Qualities of food - ancient thoughts on food - Guidelines of eating

Yogic diet: General introduction of Ahara; concept of Mitahara; Classification in yogic diet according to traditional Yoga texts; diet according to the body constitution (Prakriti) - Vata, Pitta

and Kapha Gunas

Concepts of Diet - Pathya and Apathya according to Gheranda Samhita, Hatha Pradeepika and Bhagavad gita; importance of yogic diet in Yoga Sadhana and its role in healthy living;

Unit III

Nutrition during various stages of life childhood, adolescence, adult hood, Middle aged & aged -

Nutrition during pregnancy & tips

Principles of weight control & Management

Unit IV

Nutrition therapy for infectious diseases: Malaria, Typhoid, cholera, whooping cough, tuberculosis, measles, venereal diseases, dysentery, leprosy

Unit V

Nutrition therapy for life style diseases: HBP, diabetes, obesity, cancer, stroke

References:

1. Raghavan (1965) Hand book of health education karai Kudi: Meenal enterprises
2. Yoga charya Sundaram (2004) diet and digestion Coimbatore: The yoga publishing house)
3. Swami Sivananda (2011) Health and diet, Shivananda Nagar: The divine life society
4. Arvind janar (2004) yoga diet, Bangalore: Sai towers
5. Krishna Raman (1998) A Matter of Health, Chennai: East West books (Madras) Pvt. Ltd



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ADVANCED GENERAL PSYCHOLOGY

PPS18CT101 - ADVANCED GENERAL PSYCHOLOGY

UNIT I

Introduction: Definition and Goals of Psychology: Approaches: Biological, Psychodynamic, Behaviorist, Cognitive, and Humanistic. Methods of Psychology: Experiment, Observation, Interview, Questionnaire and Case study. Fields and Scope of Psychology.

UNIT II:

The Sensory and Perceptual process: Some general characteristics of Five Senses – Perception: Determinants of Perception: Form, Space and Depth – Attention: determinants of attention.

UNIT III:

Learning, Memory and Forgetting: Learning: principles and methods – classical conditioning – operant conditioning – the principle for reinforcement – cognitive learning- Transfer of learning – reward and punishment in the control of learning. Memory and forgetting: Memory – Stages of Memory – Types of memory – Improving Memory – Forgetting: Theories of Forgetting, Kinds of Forgetting.

UNIT IV:

Intelligence, Thinking and Problem Solving: Definition, Theories of Intelligence, Measurement of Intelligence. Thinking and Reasoning: Concepts, Categories, Schemas and Scripts, Imagery and Cognitive Maps, Creative Thinking – Concepts, Problem Solving Approaches: Solution Strategies and Mental Sets.

UNIT V:

Motivation: Physiological Basis of Motivation, Theories of Motivation – Emotions : Facial Expressions – Theories of Emotions - **Personality:** Definition, Trait and Type Approaches: Biological and Socio-Cultural Determinants, Techniques of Assessment: Psychometric and Projective tests.

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Henry Gletman, James Gross, Daniel Reisberg (2011) – Psychology, 8th Edition, Norton and Company, ISBN: 978-0-393-93250-8

Ronald Comer, Nancy Ogden, Adrian Furnham (2013) Psychology – ISBN: 978-1-119-94126-2



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INTRODUCTION TO SPORTS SOCIOLOGY

PPS18CT102- INTRODUCTION TO SPORTS SOCIOLOGY

UNIT I

Introduction: Definition – Nature and Scope of Sociology and Sports Sociology – Relationship with other Social Sciences including Sports Sociology. Importance of sports sociology

UNIT II

Society and the place of sports and games: origin and development of sports in various societies (Greek & Roman) – Sports as social as group behavior – Sports as cultural activity: Sports culture - Sports and communities sports as community activity.

UNIT III

Sports as Social and a Group Process: Meaning and types of Social process – Sports in Social process frame work. Team spirit as supra – individual power: McDougals, Durkheim, Allports, Lewis.

UNIT IV

Socialization In and Social Control of Sports: Meaning of socialization Training and induction into sports as socialization – Role of parents and professionals in sports socialization – Meaning of social control – sports as a socially regulates activity – Sports as a social value – Sports and social rewards.

UNIT V

Social Stratification and Sports: Meaning and forms of stratification – Social class and sports – gender and sports – race and sports – Age and Sports – Globalization and Sports.

REFERENCES:

- 1) Fiehter, J.H. (1991), *Sociology 2nd Ed.* London. The University of Chicago Press.
- 2) Pascal, G. (1999) *Fundamental of Sociology, 3rd Rev.Ed.,* Bombay, Orient Longman.
- 3) Inkless.Alex,(1987) *What is Sociology, New Delhi Prentice Hall of India Pvt.*
- 4) Giddens A (1989) *Sociology, Cambridge, Polity Press.*
- 5) Harlambos, (1999) , *Introduction to Sociology, Oxford University Press.*



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RESEARCH METHODOLOGY

PPS18CT103- RESEARCH METHODOLOGY

UNIT I

Definition of research – meaning need, importance and scope of research in sports psychology and sociology. Classification of research Basic research, Action research, Applied research – Barriers in Research - Ethics in research. - Recent Research trends in Sports Psychology and Sociology.

UNIT II

Descriptive research methods – Need and importance of survey Study, case study, interview technique, Historical and philosophical research, observation, construction and standardization of Questionnaire – Problem and Hypothesis.

UNIT III

Research Design: Definition, Types of Research Design: Experimental design – Single group design – Reverse group design – Repeated measures design – Static group design – Factorial design – fixing the level of Significance and degrees of freedom for a research problem.

UNIT IV

Sampling: definition, sampling planning – components – sample methods – probability and non – probability methods – sampling distribution – determining sample size – sampling error.

UNIT V

Contents in the research report: Introduction – Hypothesis – Delimitation – Limitation - Review of related literature – Summary – Conclusion – Recommendations. Research format: Style of writing research report. Mechanism of writing Research Proposal - Abstract – Synopsis – References – Appendixes – Contents – Tables – figures – preliminary – end pages – Plagiarism.

REFERENCE:

Clarke David. H and Clarke H. Harrison (1984) Research process in Physical Education, New Jersey: Prentice Hall Inc.

Best, John W. and Kalm James, V. (1980) Research in Education, New Delhi: PrenticeHall of India.

Kothari C.R. (1985) Research Methodology 2nd revised ed., New Age International, Publisher; New Delhi.



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PSYCHOLOGY ASPECTS OF SPORTS PERFORMANCE

PPS18CT201- PSYCHOLOGICAL ASPECTS OF SPORTS PERFORMANCE

UNIT I

Bases of Psychological Preparation: Positive Attitude, Calmness, Self Confidence, Fighting spirit – Adapting to competitive situation, situational control , controlling the athletes state before competition - Overtraining, Physiological and Psychological Impact of Overtraining.

UNIT II

Cognition: Thinking- Strategic Thinking, Attention-Dimensions of Attention, Role of attention in Individual and Team Sports, Ways to improve attention and concentration skills, Discussion: Direct and Indirect Suggestions

UNIT III

Motivation: Motivation of children and Youth in sports - Extrinsic and Intrinsic Motivation in Sports – Perceived competence - Achievement Motivation and Competitiveness, Theories of Achievement Motivation

UNIT IV

Psychological Preparation of Training and Competition: Competition in sports – types of competition - Determinants of Competitive Behavior –Characteristics of pre-competition , competition and post competition -

UNIT V

Personality: Personality and Psychological characteristics of Athletes – Personality traits and sports - Mood states and athletic performance – Iceberg Profile – Mental Health and Sports.

REFERENCES:

1. Gangopadhyay, S.R. (2008) – Sports Psychology, Sports Publications, New Delhi.
2. Burton, D, Thomas D. (2008) – Sport Psychology for Coaches, Human Kinetics Publishers, UK.
3. Gurbakhsh S.Sandhu (2002) - Psychology in Sports – A Contemporary Approach' friends publications, New Delhi
4. Martens, R. (1987) – Coaches Guide to Sport Psychology, Human Kinetics Publishers, Champaign, Illinois



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SOCIAL AND BEHAVIORAL STATISTICS

PPS18CT203 – SOCIAL AND BEHAVIORAL STATISTICS

UNIT I - Introduction to statistics types, classification and basic concepts of statistics – Measures of central tendency – Mean, Median and Mode – Measures of variability: Range, Mean deviation Quartile Deviation and standard deviation.

UNIT II - Introduction to Normal distribution – Normal curve – Characteristics of Normal Curve – Standard Normal Curve - Problems Based on Normal distribution – Uses of Normal distribution.

UNIT III - Testing of Hypothesis: Hypothesis – Type I & II error – Acceptance and critical Region – Test of significance of a single Mean – Difference between two means for small and large sample tests – paired t – test for difference of mean.

UNIT IV Single Sample t-test, t-test distribution – Paired sample t-test, Independent sample t-test, - Between Group ANOVA – Within Group ANOVA – Two way between groups ANOVA.

UNIT V - Pearson product moment correlation – Rank order correlation – Partial and Multiple correlation – Chi square – Test for Independence – contingency coefficient.

REFERENCES:

Susan A. Nolan | Thomas E. Heinzen (2012) - Statistics for the Behavioral Sciences Second Edition Seton Hall University William Paterson University

Rand Wilcox (2012)– Modern Statistics for the Social and Behavior Sciences – A practical Introduction , CRC Press, Taylor and Francis Group.



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PPS18CT301: FUNDAMENTALS OF COUNSELING SKILLS

UNIT I

Introduction: Definition – Development and goals- History and Current trends in counseling – Counselor – the nature of counselor's work - counselee relationship - counseling process: Steps – purposes of counseling - scope of counseling – characteristics of effective counseling -

UNIT II

Approaches to Counseling: Directive, Non-directive, Psychoanalytic, Humanistic, Reciprocal inhibition technique, Eclectic approach - Basic Counseling Theories – Psychoanalytic theory, Adlerian theory, Existential theory, person centered theory, gestalt theory- Counselling in India - legal and ethical issues: ethical issues – ethical dilemmas – legal concerns of counselor.

UNIT III

Special areas: Family counseling, students counseling, parental counseling, educational, vocational and career counseling - Counseling Interview: Communication, verbal, nonverbal, interview, techniques of interview, relationship technique, problem identification and exploration, sharing, transference, counter transference. - Counseling the special population - global counseling and trauma counseling

UNIT IV

Professional Preparation & Training: Selection, skills, counseling as a profession, desirable characteristics - Modern Trends: Career guidance, Functions of counselor, stages of counseling - Techniques: Egan's Model, Interviews, testing— Mastering the techniques of counseling :

UNIT V

Group Counseling – Definitions — values of group Counseling - Group therapy – Training & Sensitivity groups – Group process and group dynamics - Group Counseling and Group therapy; Group vs. Individual Counseling; Types of groups - Issues in Group Counseling.



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PPS18CT302 - LIFE SPAN DEVELOPMENT

UNIT I: Life span development: issues and Theories: Introduction - Life span approach: The context of development – the impact of culture on development – the study of human development: The continuity of development – Determinants of Development – Major contemporary theories: Psychoanalytic, Cognitive and Behavioral

UNIT II: The Beginning Year: Genetics , Pregnancy , Birth and infancy : Genetic Foundations – The process of Conception – Prenatal Development – Stages of Prenatal development - Effects of prenatal environment – Birth : The Birth Process – Child birth methods – Complications – Infancy : Physical, perceptual, Cognitive , social and personality Development

UNIT III: Early childhood, Middle Childhood and Adolescence : Physical : Size and Proportion- Motor Development- Physical fitness – puberty- language – Structure of Language- language acquisition - concrete operational thought – Moral reasoning information processing : Attention- Memory – Disabilities in children- personality : The Development of self – Freud and Erikson's stage of personality – social : The child's Social world : Aggression, pro social behaviour - social play- self socialization

UNIT IV: Adulthood : Early, middle and late Adulthood – Physical, Cognitive, Personality, occupational , Family, Social relations and Adjustment – The impact of growing older- Mental health and aging – relations with grandchildren- retirement

UNIT V: Old Age : Death, Dying and Bereavement: Death: The Final Stage of life – The Dying Process: Kubler - Ross's Stage of Dying – Near Death Experiences – Issues in the care of Dying – Hospital Care – Bereavement.

References:

1. Gormly, A.V. and Brodzinsky, D.M. *Lifespan Human Development*. NY: Harcourt Brace College Publishers 1993
2. VendarZanden, J.W. *Human Development* . New Delhi: McGraw Hill. Inc. 1993
3. *Human Development – Elizabeth Hurlock*
4. *Human Development - Papalia*



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SOCIOLOGICAL THEORIES

PPS18CT303- SOCIOLOGICAL THEORIES

UNIT I: SOCIOLOGICAL THEORY: Definition of Theory, Characteristics of Sociological Theory, Types: Functions of Theories.

UNIT II: AUGUSTE COMTE: Beginning of Sociology. Methods of Inquiry. The Law of Human Progress. Hierarchy of Sciences. Social Statics and Dynamics.

UNIT III: HERBERT SPENCER: The Evolutionary Doctrine. The Organic Analogy. Social Types: Militant and Industrial Societies.

UNIT IV: KARL MARX: Dialectical materialism. Economic determinism. Class struggle. The Concept of Alienation. Theory of Social Change.

UNIT V: EMILE DURKHEIM: Methodology of Social Sciences. Individual and Society. The Sociology of Religion. Theory of Suicide. Division of Labour. Anomie.

REFERNCES:

1. Barnes, Harry Elmer "AN INTRODUCTION TO THE HISTORY OF SOCIOLOGY", Chicago, University of Chicago Press, 1948.
2. Coser, Lewis A. "MASTERS OF SOCIOLOGICAL THOUGHT" New York, Harcourt Brace Jovanovich, Inc., 1971.
3. Timasheff, Nicholas S. "SOCIOLOGICAL THOERY – ITS NATURE & GROWTH", New York, Random House, 1967.
4. Nisbet, Robert A. "THE SOCIOLOGICAL TRADITION", London, Heinemann, 1979.
5. Bogardus, Emory S. "THE DEVELOPMENT OF SOCIAL THOUGHT", Bombay, Vakils, Borrer and Simons Pvt. Ltd., 1960.
6. Aron, Raymond "MAIN CURRENTS IN SOCIOLOGICAL THOUGHT" Vol. 1&2, Hammondsworth, Middlesex, Penguin Books, 1965.
7. Abel, Theodore "THE FOUNDATION OF SOCIOLOGICAL THEORY" Indian ed., Jaipur, Rawat Publications, 1980.
8. Abraham, Francis M. "MODERN SOCIOLOGICAL THEORY: AN INTRODUCTION" "Delhi, Oxford University Press, 1982.



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COUNSELING AND BEHAVIOR MODIFICATION TECHNIQUES IN SPORTS

PPS18CT401: COUNSELING AND BEHAVIOR MODIFICATION TECHNIQUES IN SPORTS

UNIT I

Basic concepts – Meaning of Guidance and Counseling and their differences –Goals of counselling – counselling process – characteristics of counselor – Group counselling – special areas of counselling - applied areas multicultural counselling – Ethical issues- Psychotherapy – Effectiveness Of Psychotherapy

UNIT II

Approaches to counselling, person centered, Gestalt, Psychoanalytic, Cognitive, Trait factor, Behavioral and eclectic approach - Assessment Techniques - Important Factors – Tools of Assessment- Theories : Psychodynamic – Psychoanalytic and Adlerian Therapy Cognitive and Behavioural therapy: Behavioural Therapy – OCD, Cognitive: Beck's Cognitive Restructuring Therapy

UNIT III

Basic concepts of Behaviour Modification: Behaviour Counselling: Salient Features Enhancement of Client's Involvement – Some Misconceptions about Behavioral Approach. Relaxation Techniques: Jacobson's Deep Muscle Relaxation Training, Autogenic Training, Yoga and Meditation. Application of Behavior Therapy: Anxiety Disorders, Psychoactive substance use disorders, Sexual Disorders

UNIT IV

Assertion Training – Basic Dimensions – Training procedure – Components of Social Skill Training – Uses of social skill training – Precautionary points – systematic desensitization -. Operant Conditioning Techniques – Basic Paradigm – Schedules of Reinforcement – Aversive Conditioning and application – Token Economy – Shaping – Chaining – Other Operant Procedures, Premack's Principle and Prompting.

UNIT V



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Cognitive Behaviour Modification – Fundamental Aspects – Cognitive Restructuring – Meichenbaum's Self Instructional training – Beck's Model – Rational Emotive Therapy (Ellis) – Thought Stopping and Variations – Problem Solving Techniques.

REFERENCES:

1. Corey, G (2005), Theory and Practice of Counseling and Psychotherapy, 7th Edition, Scarborough, Brooks/Cole.
2. Martin, G & Pear J (2000) Behavior Modification (7edition), New Delhi, Prentice Hall of India Pvt. Ltd.
3. Wolpe, J (1982), Practice of Behavior Therapy (3rd edition), New York, Oxford Pergamon Press Inc.
4. Nelson-Jones, R. (1994). - The theory of practice of counseling psychology – Cassel London.
5. Rimm, D.C. and Masters, J.C. (1974), - Behaviour Therapy: Techniques and Empirical Findings. New York: John Wiley and Sons.
6. Robert C. Carson. James. N. Butcher and Susan Mincka (1996) - Abnormal Psychology and Modern Life, 10th Edition, New York; Harper Collins College Publishers.
7. Swaminathan V.D. and Kaliappan, K.V. (1997), Psychology for effective living – Behaviour modification, Guidance, Counselling and Yoga, Chennai. The madras Psychology society publication.



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SCIENTIFIC DIMENSIONS OF SPORTS PSYCHOLOGY

PPS18CT402 - SCIENTIFIC DIMENSIONS OF SPORTS PSYCHOLOGY

UNIT I - History, origin and development of sports psychology – meaning, definitions, nature, scope and sports psychology. Need – importance of sports psychology.

UNIT II - Sports Psychology Association of India – interdisciplinary approach – importance of sports psychology for physical educators, coaches and athletes – ethic in sports psychology. Scientific foundations of psychological study of sports – developmental sports psychology – cognitive sports psychology – clinical sports psychology.

UNIT III - Psycho-physiological phenomena – visual, auditory and tactual cues – reaction time and performance time, speed and accuracy, warming up for action, fatigue, learning and performance, psychological and physiological limits.

UNIT IV - Socio- psychological phenomena, Socio- cultural force and sports competition and cooperation in physical activities – socio-economic status and athletes – women in physical education and sports – competition for the young. Personality traits and athletic participation – leadership – internationalism in sports – sports and social changes.

UNIT V - Differently challenged/abled person – injuries and related psychological adjustments. The perceptually handicapped – adjustment to physical impairment – personal injuries and psychological adjustments – psychosomatic disorders.

REFERENCE:

Gangopadhyay, S.R. (2008) – Sports Psychology, Sports Publications, New Delhi.

Liukkonen, J. (2007) – Psychology for Physical Educators – Students in Focus, Human Kinetics, U.K.

Shaw, D.F., Gorely, T. Corban, R.M. (2005) - Sport and Exercise Psychology, BIOS Scientific Publishers, UK

Llewellyn, J.H., Blucker A.J (1989)- Psychology of Coaching, 2nd Edition, Surjeet Publications, New Delhi.



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INTERVENTION STRATEGIES AND SPORTS BEHAVIOR

PPS18CT403- INTERVENTION STRATEGIES AND SPORTS BEHAVIOR

UNIT I: Intervention strategies: introduction, mental skills training in sports, Sports Psychology : A clinician's perspective, action theory approach to applied sports psychology, eating disorders in sport: from theory to research to intervention, psychosocial antecedents of sport injury and intervention for risk reduction.

UNIT II : Intervention Strategies: Relaxation Procedures - Progressive Relaxation – Autogenic Training, Transcendental Meditation – Biofeedback, **Cognitive Strategies:** Imagery, Thought Stopping and Centering, Self – Talk, Psyching up strategies.

UNIT III : Overtraining: Performance focus, Psychological Well-being, Educating Coaches and Athletes about Overtraining, Physical Health, Increasing Coach-Athlete Communication, Developing Athlete Resources.

UNIT IV : Energy Management: Understanding Energy Management- Arousal affecting Performance, Effects of Under arousal and Over arousal in Performance, Developing Athlete Energy Management Skills – Phases in energy management - Education Phase, Acquisition Phase and Implementation Phase, athletes choking under pressure, preparatory routines in self paced events: Do they benefit the skilled athletes or the beginners helped.

UNIT V : Communication Process: Purposes, Types of Communication. Breakdown in Communication, Improving Communication, Confrontation.

REFERENCES:

1. Weinberg, R.S, Gould D (2003) – *Foundations of Sport & Exercise Psychology*, 3^d Edition, Human Kinetics, South Australia.
2. Gurbakhsh S.Sandhu (2002) - *Psychology in Sports – A Contemporary Approach*, Friends publications, New Delhi .
3. Murphy, S.M. (1995) *Sport Psychology Interventions*, Human Kinetics, Auckland.



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PSP18CT102: PRINCIPLES OF SPORTS PSYCHOLOGY

UNIT I

Introduction to Sport Psychology: Meaning and scope, Importance, relationship with other sport sciences, development of sport psychology in India and worldwide.- sports psychology for physical educators, coaches and athletes – ethics in sports psychology.

UNIT-II

Cognition – characteristics and cognitive process in sports – sensation and perception – Attention - strategies to develop attention – Reaction Time, Movement Time, Reflex time, Response Time - Flow – Experience of Flow- Dimension of flow – Flow in Sport – Measuring Flow.

UNIT III

Emotions – concepts - Influence of emotions on performance - Motivation in Sport: definition, (drive, need and motives, instinct, attitude, achievement motivation,) Techniques of motivating the Athletes . .

UNIT IV

Personality in Sport: Concept and definition, Modern perspective, (trait, humanistic, social cognitive and biological), Dynamics of personality in sport – Sports and Personality.

UNIT-V

Psychological Preparation and Competition: Phenomenon of competitive sport, long term Psychological preparation for competition (arousal regulation, imagery, self-confidence, goal setting, concentration.), short term psychological preparation (upcoming competition) .

REFERENCES:

Robert C. Eklund, Gershon Tenenbaum (2014) Encyclopedia of Sports & Exercise Psychology, Sage Publications, Los Angeles.

Weinberg RS and Gould D (2003). Foundations of Sport and Exercise Psychology. Human Kinetics. US



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BOPLOGICAL BASES OF BEHAVIOR

PSPI8CT202: BIOLOGICAL BASES OF BEHAVIOR

UNIT I

1/2 **Introduction:** The origins of biopsychology, Nature of biological psychology – Mind Brain Relationship , Methods of study of research in biopsychology – anatomical methods, degeneration techniques, lesion techniques, chemical methods, stereotaxic surgery, micro-electrode studies, oscilloscope, polygraph, scanning methods and ethical issues in research.

UNIT II

✓ **Neurons:** Neurons and Neuronal conduction – Structure of neurons, types, functions, neural conduction, communication between neurons, synaptic conduction , neurotransmitters.

1/2 UNIT III

Nervous System : The structure and functioning of the Nervous system- Basic features of Nervous System, Meninges, Ventricular System, Cerebrospinal fluid, Blood brain barrier, Peripheral Nervous System, Cranial Nerves, Spinal Nerves, Autonomic Nervous System: Major structures and functions, Spinal Cord. Brain: Forebrain, Mid brain, Hind brain, Cerebral cortex, temporal, Parietal and occipital lobes; prefrontal cortex.

✓ UNIT IV

Bio-Psychology of Cognitive Functions Learning : Neurophysiology of learning, Synaptic plasticity; Memory, Neurological basis of Memory, Brain damage and dysfunction of memory. Language: Lateralisation, Evolution and Neurophysiology of Speech. Disorders of Reading, Writing : Aphasia , Alexia and Dyslexia.

✗ UNIT V

Bio-Psychology of Arousal Physiological correlations of Arousal: Consciousness and Sleep, factors affecting Consciousness, Sleep: Rhythms of sleeping and waking , neural basis of biological clocks , stages of sleep, brain mechanisms of REM sleep and dreaming- Physiological mechanisms of Sleep and Waking, Disorders of Sleep.

Essential Reading:

Carlson, N.R. (2004) Physiology of Behavior (8th Edition), Boston: Alwyn and Bacon

Kalat, J.W (2004) Biological Psychology (8th edition) Belmont: Wadsworth/Thomson Learning.

REFERENCES:

1. Wagner, H. & Silber, K (2004) Physiological Psychology, Garland Science ,Abingdon : UK



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PSYCHOLOGY OF ATHLETIC INJURY AND REHABILITATION

PSP18CT302: PSYCHOLOGY OF ATHLETIC INJURY AND REHABILITATION

Unit I :

Injury – Concepts - causes of Injury – common sports injuries - factors contributing to injury in sports – psychological susceptibility to Injury - Rehabilitation – definition- types of rehabilitation – rehabilitation for athletes .

Unit II:

Psychological antecedents to Sports Injury – Stress and Injury model , Stress Response – Antecedents of Sports injury – Personality, Anxiety, Locus of Control, Mental and Emotional states – Stress History –Major life events, daily hassles, Prior injury history – Role of Psychological Interventions.

Unit III :

Models relating to Psychological responses to injury – Grief response models – Cognitive appraisal models – The integrated model of psychological response to sports injuries and rehabilitation process - A biopsychosocial model of sport injury rehabilitation.

Unit IV:

Burn out and Sports Injuries – Psychological issues of Injuries and sports –Psychological aspects of pain, Pain measurement and pain mediation - Psychological implications of long term rehabilitation for athletes

Unit V:

Psychological interventions in sports injury , Injury and Healing Process including Injury Management, recovery visualizations for sports , positive self talk, rational emotive therapy, goal setting relaxation and mindfulness.

REFERENCES:

Robert C. Eklundy and Gershan Tenenbaum (2014)-Encyclopedia of Sport and Exercise Psychology, Sage Publications

Monna Arvinen-Barrow and Natalie Walker (2013) – The Psychology of Sports Injury and Rehabilitation, Routledge



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PSYCHOLOGICAL PREPARATION AND MENTAL SKILLS TRAINING

PSP18CT303: PSYCHOLOGICAL PREPARATION AND MENTAL SKILLS TRAINING

UNIT I

Mental Toughness – A social Cognitive Personality construct : Mental Toughness is multidimensional, aspects of MT are inherited, aspects of MT are learned- Pillars of Mental Toughness : Motivation, Self-Confidence, Coping with Pressures.

UNIT II:

Stress in Sports – Anxiety Management Training – Applied Relaxation, Arousal Energising Techniques, Breath Control and Deep Breathing, Cognitive Affection, Stress Management Training, Cognitive Control, Hypnosis, Meditation, Performance and Competition Planning , Self Compassion , Stress Inoculation Training.

UNIT III

Relaxation : Physical Relaxation: Breathing Exercises, Progressive Muscle Relaxation , Biofeedback – Mental Relaxation Strategies : Transcendental Meditation , Mindfulness Meditation and Autogenic Training.

Unit IV:

Energizing (Activation) Strategies : Arousal and Activation, Visualization and Self Talk strategies, Mental Imagery and Visualization – Arousal and Performance relationship.

UNIT V:

Coping in Sports: Classifying coping in Sport ; Problem and emotion focused coping, Avoidance Coping Task, Distraction and Disengagement oriented Coping – Coping Effectiveness and Coping Self Efficacy. Psychological Skills Training (PST) Definition, Importance of PST, Myths about PST,

REFERENCES:

Robert C. Eklund and Gershan Tenenbaum (2014)-Encyclopedia of Sport and Exercise Psychology, Sage Publications



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SPORTS FOR THE CHALLENGED

PSP18CT402: SPORTS FOR THE CHALLENGED

UNIT I

Introduction – Sport in Society – Athletes with Disability - Historical context of Disability and Sports – Emergence and Development of Disability sports – Theories of Disability: Disability as a personal tragedy , Social model of Disability - Sports Current Challenges and Controversies in Disability Sports.

UNIT II

Adapted Sports – Brief history of Adapted Physical Education – Beginning of Adapted Physical Education - Shift to sports and the whole person - Emerging comprehensive sub-discipline – Recent and current status – Role of Physical Educationist in Adapted Sport.

UNIT III

Paralympics Games for people with Intellectual Disability – Coaching and training of athletes with disabilities – Disability Sports Movement - Special Olympics

UNIT IV

Sports activities for individuals with individual needs – Deaflympics, Paraplegic, Cerebral Palsy, Blind, Amputee, Down Syndrome, Autism Spectrum Disorder, Specific Learning Disability , Mentally challenged .

UNIT V

Inclusion and Integration – Equity Issues – Marketing Disability Sports – Future of Disability Sports.

REFERENCES:

John,P Winnick - Adapted Physical Education and Sport , Volume I , Human Kinetics, 2005

Nigel Thomas, Andy Smith – Disability, Sport and Society – An Introduction , Routledge,2008.

Steve Bailey - Athlete First – A history of the Paralympic Movement, John Wiley & Son



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ATHLETIC PSYCHOPATHOLOGY

PSP18CT403 : ATHLETIC PSYCHOPATHOLOGY

UNIT I

Definition of Psychopathology – Historical views of abnormal behavior – the stigma of abnormal behavior – Adaptive and maladaptive behavior - The concept of normality and abnormality - Theoretical Perspectives: Psychodynamic, Behavioral, Cognitive and Existential - Causal factors - types of treatment facilities – types of mental health specialists.

UNIT II

Systems of classification of maladaptive behavior - DSM – V, ICD-10, similarities differences – advantages and disadvantages of classification – major diagnostic categories - Theories and Models of Anxiety Disorder: a) Panic, Phobic, OCD b) Somatoform Disorders, c) Dissociative Disorders, Schizophrenia and other psychotic disorders, Mood Disorders: Depressive-unipolar and bipolar disorders.

UNIT III

The bio-psychosocial model – stress and illness – psycho-physiological disorders – classification of psychophysiological disorders: Theories: Personality disposition, rheumatoid arthritis, low back pain, Asthmatis, Allergy, Eczema, Itching, coronary heart disease – essential hypertension – headaches – migraine – tension headaches – peptic ulcers – colitis- genitor urinary disorders – Diabetes and menstrual disorders.

UNIT IV

Mood Disorders Mania, Hypomania, Depressive episode, Recurrent depression, Bipolar affective disorders, Dysthymia, Cyclothymia - Anxiety, Somatoform and Dissociative Disorders Anxiety Disorders: Panic Disorder, Phobic disorders, Obsessive Compulsive Disorder, Post traumatic stress disorder, Generalised Anxiety disorder

UNIT -V

Disorders of Personality: Adjustment disorder b) Impulse Control disorders c) Substance related disorders: Substance Abuse - Doping in Sports: History- stimulants, anabolic steroids



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PSYCHOPATHOLOGY - I

PPY18CT202 – PSYCHOPATHOLOGY -I

UNIT I : Introduction : Definition of psychopathology - Historical views of abnormal behavior - The stigma of abnormal behavior – Adaptive and Maladaptive behavior – Adaptation and Adjustment – Personal Maturity and Growth- Group well being and progress – Types of treatment facilities – Types of Mental Health specialists

UNIT II : Classification - Categories of Maladaptive Behaviour :
Systems of classification, basic features; DSM-V, ICD-10, similarities, differences – Advantages and Disadvantages of Classification – Major Diagnostic Categories –

UNIT III: Psychological factors and Physical Symptoms
The Bio- Psychosocial Model – Stress and illness – Psycho-Physiological Disorders- Classification of psycho physiological disorders – Rheumatoid Arthritis , low back pain, cancer, cardiovascular disorders- coronary heart disease – essential hypertension – headaches – migraine – tension headaches – asthma – eczema – peptic ulcers- colitis – genitourinary disorders – menstrual disorders

UNIT IV : Psychopathology of addiction and sexual disorders Substance use disorders – substance dependence – substance abuse – substance induced disorders – alcohol related disorders- other drugs. Sexual deviations- forms of sexual deviations - causes – treatment

UNIT V : Neuro psychological and somatoform and behavioural syndromes.
Dementia, delirium, head injury, epilepsy, other amnesic syndromes -Dissociative disorder, somatoform disorder- other neurotic disorder; Eating disorder : Anorexia, binge eating - sleep disorder - Clinical characteristics and etiology.

References:

1. Ahuja N (2002). *A short text book of Psychiatry (5th edition)*. New Delhi. Jaypee Brothers.
2. Sadock, B.J. & Sadock, V.A. (2003). *Kaplan & Sadock's Synopsis of psychiatry: Behavioral sciences/clinical psychiatry (9th. Ed.)*. Philadelphia: Lippincott Williams & Wilkins
3. Hecker, S.E. & Thorpe, G.L. (2005). *Introduction to clinical psychology: Science, practice & ethics*. Delhi: Pearson Education, Inc.
4. Adams, H.E., Sutker, P.B. (2001). *Comprehensive handbook of psychopathology (3rd Ed.)*. New York: Kluwer Academic publishers.
5. Millon, T., Blaney, P., & Davis, R.D. (1998). *The oxford textbook of psychopathology*.
6. London: Oxford University Press.



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PSYCHOPATHOLOGY - II

PPY18CT 303 - PSYCHOPATHOLOGY – II

UNIT I : Psychotic Disorder : Schizophrenic disorders – Definition – Characteristics- positive symptoms : Delusions, Hallucinations, Disorganized speech , disorganized and bizarre behavior - negative symptoms :Flat affect, poverty of speech, loss of directedness of motivation – loss of energy – loss of feelings of pleasure – Major subtypes of Schizophrenia – Therapeutic approaches

UNIT II : Anxiety Disorders : Anxiety Disorder - Causes of Anxiety neuroses: Emotional conflict, Repression of the self assertive tendency , mental conflicts and frustration – difference between normal anxiety and neurotic anxiety – treatment – Panic disorder – Obsessive – compulsive neuroses – Phobias – phobia fear differs from normal fear in several respects.

UNIT III: Personality Disorder : Major personality disorders – its characteristics – paranoid personality disorder – schizoid personality disorder- Schizotypal personality disorder- Narcissistic personality disorder – borderline personality disorder – Antisocial Personality disorder – Dependent personality disorder – OCD – Treatment

UNIT IV : Mood disorder : Types of Mood Disorder: Dysthymic disorder – major depressive disorder – Theoretical perspective of Depression: The psychodynamic view, the behavioral perspective , the cognitive perspective, the human existential perspective – treatment

UNIT V: Disorders of Infancy, Childhood and Adolescence : Specific developmental disorder of scholastic skills: Mental Retardation, Learning Disorders, ADHD, Pervasive developmental disorders; Behavioral and emotional disorders; Disorders of social functioning- etiology and treatment

REFERENCES:

1. Ahuja N (2002). *A short text book of Psychiatry (5th edition)*. New Delhi. Jaypee Brothers.
2. Sadock, B.J. & Sadock, V.A. (2003). *Kaplan & Sadock's Synopsis of psychiatry: Behavioral sciences/clinical psychiatry (9th. Ed.)*. Philadelphia: Lippincott Williams & Wilkins
3. Hecker, S.E. & Thorpe, G.L. (2005). *Introduction to clinical psychology: Science, practice & ethics*. Delhi: Pearson Education, Inc.
4. Adams, H.E., Sutker, P.B. (2001). *Comprehensive handbook of psychopathology (3rd Ed.)*.
5. New York: Kluwer Academic publishers.
6. Millon, T., Blaney, P., & Davis, R.D. (1998). *The oxford textbook of psychopathology*.
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ADVANCED SOCIAL PSYCHOLOGY

PPY18CT30 2- ADVANCED SOCIAL PSYCHOLOGY

UNIT I : Historical and Conceptual Issues in Social Psychology : The definition and nature of social psychology; Growth of social psychology; alternative conceptions of social psychology; Development of social psychology in India; Current status of the discipline; indigenization of social psychology; Issues in experimental social psychology; Emerging alternative methods in social psychology; Ethical issues in social psychological research.

UNIT II : Social Interaction : Social cognition and impression management Self and identity. Culture and Development of Self. Social Identity. Diverse identities; Attribution-theories, biases and errors; Organizing and Changing attitudes; persuasion and propaganda techniques ;The development of social representation; Prejudice, Stereotypes and Discrimination; Theories of inter-group relations;Reducing prejudice.

UNIT III : Inter personal attraction : Interpersonal attraction and altruism-the beginning of attraction: proximity and emotions-the need to affiliate and the effect of observable characteristics-altruism- why, when, whom do we help-increasing helping behavior

UNIT IV : Conflict and peacemaking : Conflict and peacemaking-conflict: social dilemmas, competition, perceived injustice, misperception, peacemaking - contact, cooperation, communication, conciliation - Aggression: Theories and individual differences in aggression; Violence- sexual harassment, genocide, terrorism

UNIT V : Social Issues :

Environmental stresses and social behavior; Social psychological perspectives on health and illness; Culture Cross- cultural aspects of coping ;Psychological effects of unemployment. Social and ethnic minorities and law; Cross-cultural psychology: Diversity in socialization: Individualistic vs. collectivistic culture: Poverty and deprivation- Application of social psychology to sports, military and media.

REFERENCES:

1. Myers David G.(2002). *Social Psychology*. 7thEdn., McGraw Hill Book Company
2. Baron A. And Byrne D. (2002). *Social Psychology*. TenthEdn. Prentice Hall Of India
3. Aronson, E., Wilson, T.D., and Akert, R.M. (1999). *Social Psychology* (3rd ed.). New York: Longman.
4. Fraser, C., and Burchell, B. (2001). *Introducing Social Psychology*. Cambridge: Polity.



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NATIONAL

UBK23CE 101 TEST, MEASUREMENT AND EVALUATION

Learning Objectives

1. To understand the importance of test, measurement and evaluation in sports
2. To acquire skills to construct norms, assess health and skill related fitness tests.
3. To learn and acquire the skills to conduct sports specific skill tests

Unit I

Test, measurement and evaluation: Definition and meaning of test, measurement and evaluation in Sports - Need and importance of test, measurement and evaluation in Sports science - Interrelationship between test, measurement and evaluation - Different types of testing procedure in sports - Factors affecting test, measurement and evaluation - Criteria for Test Selection—Scientific Authenticity - Meaning, definition and establishing Validity, Reliability, Objectivity, Norms—Administrative Considerations - Construction of physical fitness test, knowledge test, skill tests.

Unit-II

Motor Fitness Meaning and Definition of Motor Fitness- Test for Motor Fitness; Oregon Motor Fitness Test (Separately for boys and girls) – Motor Ability; Barrow Motor Ability Test– Newton Motor Ability Test–Muscular Fitness–Kraus Weber Minimum Muscular Fitness Test - Physical Fitness Tests - AAHPERD Health Related Fitness Battery (revised in 1984) - ACSM Health Related Physical Fitness Test, Roger's Physical Fitness Index. Motor Educability Tests: Metheny-Johnson motor educability test.

Unit-III

Anthropometry and Physiological testing: Anthropometric Measurements: Method of Measuring Height: Standing Height, Sitting Height. Method of measuring Circumference: Arm, Waist, Hip, Thigh. Method of Measuring Skin folds: Triceps, Sub scapular, Suprailiac. **Physiological Testing:** Treadmill test -cycle tests – Tests of Anaerobic Capacity and Anaerobic power – Lactic acid test – Hydration measurement.



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Unit-IV

TNPESU

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B.Sc Sports Biomechanics and Kinesiology 2023-2024

Fitness tests; Cardiorespiratory endurance test: distance test, step test and time test - speed tests - explosive power- agility - reaction time - static and dynamic balance tests – Coordination – strength and strength endurance – flexibility test – Questionnaires.

Unit-V

Specific Sports Skill Test: **Badminton:** Miller Wall Volley Test. **Basketball:** Johnson Basketball Test, Harrison Basketball Ability Test. **Cricket:** Sutcliff Cricket test. **Hockey:** Friedel Field Hockey Test, Harban's Hockey Test, **Volleyball:** Russel Lange Volleyball Test, Brady Volleyball Test. **Football:** Johnson Soccer Test, Mc-Donald Volley Soccer Test. **Tennis:** Dyer Tennis Test. **Handball:** Cornish Handball Test.

Reference:

1. **ACSM's Health/Fitness Facility Standards and Guidelines**, New York: Human Kinetics, 1992.
2. **ACSM's Health related Physical Fitness Assessment manual**, Lippin Cott, 2008.
3. Michael Boyle. **Functional Training for Sports**. Human Kinetics, 2004.
4. Clake, H. Harrison. **Application of Measurement to Health and Physical Education**, **New Jersey:** Prentice Hall Inc. 1976.
5. Jensen, Clayne, R & Cynthia C. Hirst. **Measurement in Physical Education and Athletics**, MacMillan Publishing co., Inc New York, 1982



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PHYSIOLOGY OF EXERCISE AND ERGOGENIC AIDS

COURSE CODE: UBK23CT404

PHYSIOLOGY OF EXERCISE AND ERGOGENIC AIDS

Learning objectives:

1. To understand basic sports physiology and the physiological factors affecting health, fitness and performance.
2. To familiarize with knowledge of health and skill related components of physical fitness.
3. To explore how the body adapts sports & exercise activities.
4. To identify exercise needs of a person/team and design appropriate exercise interventions.

Unit I

Exercise physiology- definition, need and importance. Energy, work and power - Forms of energy- chemical, kinetic and potential- **ATP** - role, breakdown, re-synthesis of ATP- The principle of coupled reactions; exothermic and endothermic reactions- **ATP resynthesis**: three energy systems – ATP/PC (alactic) – The lactic acid system – The aerobic system - Detail required to include the type of reaction (aerobic or anaerobic), the chemical or food fuel used, the specific site of the reaction, the controlling enzyme, energy yield, specific stages within a system, and the by-products produced

Unit II

Energy continuum

The type of exercise (duration and intensity) – the onset of blood lactate accumulation/OBLA) -The effect of the level of fitness, availability of oxygen and food fuels, and enzyme control on the energy system used - **The recovery process**: returning the body to its pre-exercise state - The oxygen debt / excess post exercise oxygen consumption (EPOC) - The alactacid and lactacid debt components, including the processes that occur and the duration of each component -Replenishment of myoglobin stores and fuel stores, and the removal of carbon dioxide - implications of recovery process to be considered when planning training sessions, for example training intensities, work/relief ratios.



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Unit III

Principles of training: Specificity, progression, overloads (FIT), reversibility, moderation, and variance - The physiological implications of a warm up and cool down (for example, reduce the delayed onset of muscular soreness – DOMS) - periodization of training to include the macro, meso and micro cycle- Awareness of the implications of the principles when applied to the candidate's own training.

Unit IV

Components of fitness

Aerobic capacity - Definition – factors affecting- training, age and sex - Methods of evaluating aerobic capacity (for example, multi-stage fitness test, PWC170 test) - Assessment of the candidate's own VO₂ max., matching their result against the aerobic demand of their chosen activity -Types of training- continuous running, repetition running, fartlek and interval training - - Energy system and food/chemical fuels used during aerobic work - Physiological adaptations after aerobic training- **Strength** - Definition- types of strength – Strength endurance – maximum strength – Explosive/elastic strength – Static and dynamic strength -Factors affecting strength-, -Types of training used to develop strength -The repetition, sets and resistance guidelines used to improve each type of strength - Use of multi-gym, weights, plyometrics and circuit/interval training (work intensity, work duration, relief interval, number of work/relief intervals)- Energy system and food/chemical fuels - physiological adaptations after training, including neural and physiological changes to skeletal muscle- physiological adaptation to flexibility , Body composition, Balance, coordination, Reaction time and speed training.

Unit V

Ergogenic aids - An awareness of current methods of performance enhancement - The effects of each aid - Which athletes would benefit from each aid - Nutritional aids: – Carbohydrate loading – Pre/post competition meals – Food/fluid intake during exercise: Use of creatine supplements -Blood doping and recombinant erythropoietin (Rh EPO) - Effects of caffeine -Effects of alcohol - Anabolic steroids (e.g., Nandrolone)- Human



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ENVIRONMENT STUDIES (FOUNDATION COURSE)

ENVIRONMENT & SUSTAINABILITY

1. Environmental Studies
2. Communication skill

Supportive document

ENVIRONMENTAL STUDIES (FOUNDATION COURSE)

Unit I:

Definition, types and elements of environment - Atmosphere, Troposphere, Hydrosphere, Lithosphere, Biosphere - Scope and importance - Need for public awareness.

Unit II:

Natural Resources - water - forest - minerals - Food Energy - land.

Unit III:

Environmental pollution - Definition- causes - effects and control measure of Air pollution – water - soil - Noise - Nuclear.

Unit IV:

Social issues and the environment - Urban problems related to energy - water conservation - Rainwater harvesting - Water shed management - Environmental ethics - Climate change - global warning - acid rain - ozone layer deletion.

Unit V:

Human Population and the environment - Population growth variation among nation - population explosion - Family welfare programme - Environment and human wealth.

REFERENCE BOOKS:

1. C.P.R Environmental Education centre, (2004), "Environmental studies for under graduate students", Chennai.
2. K.Kumaraswamy, (2004), Environmental studies A text Book for all under graduate courses, Bharathidasan University, Tiruchirapalli.



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COMMUNICATION SKILLS

MSBAEC 001- COMMUNICATION SKILLS

Learning objectives:

1. To develop communication skills by providing theoretical knowledge of the mechanism of effective communication
2. To impart advanced training in standard pronunciation, word stress and intonation
3. To train students in the correct use of English in a formal way
4. To improve the learners' vocabulary by familiarizing them with the ways of word formation

Unit I

Listening: Barriers of Listening skill-Approaches to Listening –How to improve Listening exercises. **Speaking:** Paralanguage: Sounds, stress, intonation- Art of conversation – Presentation skills – Public speaking- Expressing Techniques.

Unit II

Reading: Kinds of Reading – Causes of reading difficulties – Reading strategies – exercises. **Writing:** Effective writing – Paragraph – Essay- Reports – Letters- Articles – Notices, Agenda & Minutes.

Unit III

Communication: Modes of Communication- Barriers – **Interpersonal skills** – Negotiation skills – Non- Verbal communication – Etiquettes

Unit IV

Group Dynamic skills: Group Discussion – Team building & Team work – Be a manager or leader – Decision making – creativity – Time & Stress management skills.

Unit V

Interview skills: Types of Interviews – Preparing for interview – Preparing a CV – Structuring the interview - Mock Interview - Quick Tips.

Reference:

1. *Second Edition of "Communication Skills" Published by Carrier Skill Library.*



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5 BASIC ANATOMY & PHYSIOLOGY – I

UEN18CT101

UNIT-I

Cell – Definition, structure and function. Cell division- Mitosis and Meiosis. Tissues- Definition, classification and function- Epithelial tissue, Nervous tissue, Muscle tissue and Connective tissue.

UNIT-II

Blood –Definition and Functions- Composition of blood – Types and Functions of blood cell –RBC, WBC and platelets. Blood Grouping and Typing. Blood Clotting - Definition and Mechanism.

UNIT-III

Structure and Functions of Skeletal System. Bones –Types, Structure and functions. Sternum and Ribs. The curves of the vertebrae. Arches of the foot. Sex Differences in the Skeleton. Classification of Joints with examples. Movement- types and examples. Structure and movement of Hip, Knee, Shoulder and Elbow.

UNIT-IV

Structure and Functions of Upper and Lower Respiratory System. Physiology of respiration-Inspiration and Expiration. Mechanism and Control of respiration. Pulmonary Volumes- Definition of Tidal Volume, Inspiratory Reserve Volume, Expiratory Reserve Volume and Residual Volume. Pulmonary Capacities- Definition of Inspiratory capacity, Functional residual capacity, Vital capacity and Total lung capacity.

UNIT-V

Position, Structure and Function of the heart. Blood Vessel-Artery and Vein. Cardiac Cycle and Heart Sounds. Arterial Pulse and Blood pressure – Definition, Procedure to measure and its values. Types of circulation- Systemic, Pulmonary, Coronary and Portal circulation. Lymphatic system- structure and function.

TEXT BOOKS:

1. SurrinderH.singh, Krishna Garg, (2008), “Anatomy & Physiology for Nurses & Allied Health Sciences”. CBS.
2. Clancy, John & Andrew J.McVicar (1995), “Physiology & Anatomy – A Homestatic Approach”, London: Edward Arnold, A Division of holder head line PLC.



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REFERENCE BOOKS:

1. Larry G.Shaver (1981) "Essentials of Exercise Physiology", Surjeeth Publications, Delhi.
2. Clerk, D.H (1995) "Exercise Physiology" Prentice – Hall,Inc., Englewood Cliffs, New jersey.



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6 FUNDAMENTALS IN FOOD SCIENCE

UEN18CT102

UNIT -I

Definition of Food- Components of food -Nutrition, Health, Nutrients- History of Nutrition -Nutrients and Their Functions-Balanced Diet- Nutritional Status-Good Nutritional Status- Relation between Good Nutrition and Health- Poor Nutritional Status- Malnutrition- Concepts of Malnutrition - Food Groups to Encourage- Physiological functions of food - Nutrition Assessment.

UNIT –II

Cooking-Objectives of Cooking- Cooking Methods: Moist Heat Methods-Boiling-Simmering- Stewing-Steaming-Pressure cooking Merits-Demerits -Dry Heat Methods- Air as medium of cooking- Fat as medium of cooking-Combination of Cooking Methods- Merits and Demerits -Solar cooking – Microwave cooking – Food safety – Food preservation – Benefits of sprouting and fermentation.

UNIT –III

Cereal and Cereal Products: Structure, Composition- Nutritive Value of Cereals- Rice and Wheat, Ragi, Maize, and Jowar, Parboiling and Milling -Processing-Fermented Cereal Products-Breakfast cereals-Role of Cereals in Cookery-Pulses: Nutrient Content of Pulses- Germination-Factors Affecting Pulse Cookery-Role of Pulses in Cookery.

UNIT –IV

Vegetables and Fruits: Classification of Vegetables-Nutrient Content of Vegetables and Fruits-Pigments and Flavor Compounds-Need for inclusion of Fruits and Vegetables in the Days Menu-Conservation of Nutrients in Preparation and Cooking of Vegetables- Nuts and Oil Seeds: Nutritive Value of Nuts-Specific Nuts and Oil Seeds-Role of Nuts in Cookery Phytonutrients and polyphenols.

UNIT –V

Milk and Milk Products: Nutritive Value of Milk-Types of Processed Milk-Physical Properties of Milk-Pasteurization of Milk-Milk Products-Role of Milk and Milk Products in Cookery – Lactose Intolerance -Flesh Foods and Egg: Nutritive Value and Selection Criteria of Meat, Poultry, Egg and Fish-Use of Egg in Cookery-Fats and Oils: Nutritional Significance-Refined Oils-Hydrogenation – Vanaspathi and Margarine-Rancidity-Smoking Point-Role of Fat / Oil in Cookery.



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TEXT BOOKS:

1. Srilakshmi B (2013), 'Food Science' Fifth Edition, New Age International Publishers, New Delhi.
2. Manay S and Shadaksharaswamy M, (1997), 'Food Facts and Principles' New Age International Publishers, New Delhi.

REFERENCE BOOKS:

1. Srilakshmi B (2015), 'Nutrition Science' Fourth Edition, New Age International Publishers, New Delhi.



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7 HEALTH EDUCATION

UEN18DE103

UNIT-I

Health Education - Health Education: Meaning, Concept and Principles - Health – Importance, Components, Health Promoting Behaviours - Role of Personal Hygiene, Mental Hygiene, Sleep Hygiene, Occupational Hygiene in physical education and sports - Role of Different Agencies in Promoting Health (WHO, UNICEF, Local Bodies)

UNIT - II

Health hazards of modernization-pollution, effect of population explosion on health hazards, family and community life - Communicable and non-communicable diseases - role of host agent and environment in the spread and control of communicable diseases - body defenses - immunity-natural and acquired - importance of regular medical check-up in preventing the diseases - immunization schedule and importance of booster doses - Morbidity and mortality in India - National Health Programmes - Primary health care, meaning and scope - Health care set-up in rural and urban areas.

UNIT - III

Importance of international health - International health measures to check spread of communicable diseases form one country to another - quarantine measures - World Health Organization-its functions and activities - UNICEF functions and activities - Significance of World Health Day.

UNIT - IV

Approved systems of medicine being practiced in India - Prescription and non-prescription drugs - habit-forming drugs - dangers of self-medication and going to a quack- Health set-up at the village, town, district, state and country levels - voluntary agencies working in the field of health and health education.

UNIT - V

Awareness of HIV and AIDS - harmful effects of alcohol and tobacco - Evils associated with promiscuity - child and drug abuse - Adolescence education and sex-education – Birth Control Measures. Mental and Emotional Health: Hormones and Neurotransmitters - Common Stressors and Conditions – Bullying - Depression and Suicide - eating disorders.



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TEXT BOOKS:

1. Centers for Disease Control & Prevention. (2007). National Health Education Standards. Retrieved May 1, 2009,
2. Coalition of National Health Education Organizations. Health Education Code of Ethics. November 8, 1999, Chicago, IL. Retrieved May 1, 2009,
3. Donatelle, R. (2009). *Health: The basics*. 8th edition. San Francisco, CA: Pearson Education, Inc.
4. Joint Committee on Terminology. (2001). Report of the 2000 Joint Committee on Health Education and Promotion Terminology. *American Journal of Health Education*.

REFERENCE BOOKS:

1. McKenzie, J., Neiger, B., Thackeray, R. (2009). *Planning, Implementing, & Evaluating Health Promotion Programs*. 5th edition. San Francisco, CA: Pearson Education, Inc.
2. Simons-Morton, B. G., Greene, W. H., & Gottlieb, N. H.. (2005). *Introduction to Health Education and Health Promotion*. 2nd edition. Waveland Press.
3. Nash T.N. (2006). Health and physical education. Hydereabad: Nilkamal Publishers.
4. DandonPublication.Chandra, S., Sothi, &Krishnan.P. (2005). Health education and physical education. Delhi: Surject Publications. .
5. Mangal, S. K. (2005). Health and physical education. Ludhiana: Tandon Publication book market.



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8 BASIC ANATOMY & PHYSIOLOGY – II

UEN18CT201

UNIT-I

Digestive system - Mouth and its parts. Teeth- Classification, types and function. Salivary Glands – Position, types and function. Gastro Intestinal Tract - Esophagus, Stomach, Small intestine, Large intestine and Anus - Structure and function. Pancreas structure and Digestive function. Liver - structure and function. Secretion of Enzymes for Digestion in Gastro Intestinal Tract.

UNIT-II-

Endocrine systems- Definition and classification. Structure and Endocrine function of Pituitary Gland, Thyroid Gland, Parathyroid Gland, Adrenal Glands, Pancreas, Thymus Gland, Ovary and Testis.

UNIT-III

Nervous System-Definition and Classification. Neuron –Definition and types. Central Nervous Systems - Structure and Function of Cerebrum, Cerebellum, Pons, Hypothalamus, Medulla Oblongata and Spinal Cord. Peripheral Nervous Systems-Sensory and Motor nerves and impulses. Autonomic Nervous Systems- Sympathetic and Parasympathetic nervous systems. Cranial Nerves-Types and functions. Reflex action-Definition, Explanation and example.

UNIT-IV

Female Reproductive Organs- Structure and Function of External genitalia, Ovary, Uterus and Fallopian tubes. Ovum – Definition and Structure. Menstrual Cycle- Definition and Explanation. Male Reproductive Organs- Structure and Function of External genitalia, Epididymis, Vasdeferans, Prostate gland and Testis. Sperm - Definition and Structure.

UNIT-V

Excretory system – Kidney- Structure and functions. Nephron-structure and functions. Urine- Mechanism of formation. Skin- Structure and functions. Eye -Structure and functions. Ear -Structure and functions.

TEXT BOOK

1. SurrinderH.singh, Krishna Garg, (2008), “Anatomy & Physiology for Nurses & Allied Health Sciences”. CBS.



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2. Clancy, John & Andrew J.McVicar (1995), "Physiology & Anatomy – A Homestatic Approach", London: Edward Arnold, A Division of holder head line PLC.

REFERENCE BOOK

1. Larry G.Shaver (1981) "Essentials of Exercise Physiology", Surjeeth Publications, Delhi.
2. Clerk, D.H (1995) "Exercise Physiology" Prentice – Hall,Inc., Englewood Cliffs, New jersey.



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9 FLOOR AND STEP AEROBICS

UEN18DE506

UNIT - I

Aerobics - Benefits of Aerobics – Wellness –Music – Music understanding- music tempo variation – cueing – Use of floor, mirror – shoes – stepper –various height

UNIT - II

Warm Up – cardio workout - Low Intensity – high intensity - Cool Down – Flexibility – Posture – Duration – Heart rate – use of boarg scale (10 points) - Peak Maximal Heart Rate (MHR) Method-Ratings of Perceived Exertion Method-Talk Test Method.

UNIT - III

Rhythmic Aerobics: Variations and Styles – floor aerobics – Marching – Step touch – L- step – V- step – Diamond – Knee lift – Touch out – Grape vine –Turn step – chacha – A – step – arm variation - Combination of various steps

UNIT - IV

Step Aerobics – Marching – up and down - L- step – V- step – Straddle – Cross over – Turn step – Knee lift – Hop – Jump – Run Run – Arm Variation – Combination of various steps

UNIT - V

Major muscle groups strengthening –circuit training and interval training - Body Toning through Resistance; Weights, Bands and Resistance;

TEXT BOOK

1. Mazzeo, K.S.(2001). Fitness through aerobics and step training. Brooks/cole publishing Company
2. Kennedy – Ambrushter, C.,& Yoke, M.(2014). Methods of group exercise instruction. Human Kinetics

REFERENCE BOOK

1. Cooper Kenneth H.2013, Aerobic program for total well being: Exercise Diet and Emotional Balance. Bantam.



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10 OCCUPATIONAL AND FUNCTIONAL ASSESSMENT

UEN18DE602

UNIT – I

Occupational assessment – clinical assessment – early intervention and counselling – Job analysis – Traditional exercise testing – simulated work testing – on the job monitoring.

UNIT – II

Early rehabilitation – disability – new employment- non vocational activity – influence of environmental conditions- heat stress – cold stress – altitude – pollutants.

UNIT – III

History of Resistance training – Basic principles of resistance training – metabolic demands – biomechanical actions – injury potential.

UNIT – IV

Acute program variables – choice of exercises – order of exercises- split routines – number of sets – intensity of exercise – rest between sets and exercises.

UNIT – V

Chronic programming – periodization of Training – linear and non linear periodization – basic techniques in resistance training – breathing – full range of movement – movement speed – warm up- machine and free weight exercises- equipment – Flexibility training – types of flexibility – static- ballistic – dynamic – proprioceptive Neuromuscular Facilitation Techniques.

TEXT BOOK

1. ACSM (2014) ACSM's Resource Manual for exercise testing and prescription – Lippincott Williams and Wilkins
2. Kraemer WJ. Ratamess NA. Fundamentals of resistance training: progression and exercise prescription. Med Sci Sports Exerc, 2004; 36(4); 674-88.

REFERENCE BOOK

1. American College of Sports Medicine, American College of Sports Medicine position stand. Progression models in resistance training for healthy adults, Med Sci Sports Exerc. 2009; 41(3): 687-708.



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11STABILITY AND CORE TRAINING

UEN18DE606

UNIT – I

Science of Core stability – Tolerance and capacity –core function anatomy –anterior core muscle – posterior core muscletherapeutic/ corrective exercise – Injury prevention program reducing risk of injury

UNIT – II

Abdomen Revolution - components of Abdomen Revolution – back disorders - Back pain - Swayback and Facet Pain -Stenosis -Flat Back -Disc Pain – Spondylolisthesis-Mystery pain – flat belly and Abdomen revolution – osteoporosis and Abdomen exercise – Isometric Abdomen drill

UNIT – III

Spine organization –Posture control – Breathing – Diaphragm breathing –Lateral breathing – Activation – Mobilization - core stability – positions - core strength – power development

UNIT – IV

Designing core strengthening programme - Core strength and endurance training for performance – without equipment – with equipment (Swiss ball and Medicine ball) – Functional Training

UNIT – V

Stabilization progression - Hook-lying – hands and knees – face down – Bridging – Plank – sports specific.

TEXT BOOK

1. Brumitt, J. (2010) core assessment and training. Human Kinetics
2. Paul Collins (2009) “Core Strength” Sports publishers Association

REFERENCE BOOK

3. Jeffrey M. Willardson (2014) “Develop the core” Human Kinetics
4. www.nsc.com/PDF/coretraining



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12 ENVIRONMENTAL STUDIES (FOUNDATION COURSE)

UEN18AE201

Unit I:

Definition, types and elements of environment - Atmosphere, Troposphere, Hydrosphere, Lithosphere, Biosphere - Scope and importance - Need for public awareness.

Unit II:

Natural Resources - water - forest - minerals - Food Energy - land.

Unit III:

Environmental pollution - Definition- causes - effects and control measure of Air pollution – water - soil - Noise - Nuclear.

Unit IV:

Social issues and the environment - Urban problems related to energy - water conservation - Rainwater harvesting - Water shed management - Environmental ethics - Climate change - global warming - acid rain - ozone layer deletion.

Unit V:

Human Population and the environment - Population growth variation among nation - population explosion - Family welfare programme - Environment and human wealth.

TEXT BOOK

1. C.P.R Environmental Education centre, (2004), "Environmental studies for under graduate students", Chennai.

REFERENCE BOOKS:

2. K.Kumaraswamy, (2004), Environmental studies A text Book for all under graduate courses, Bharathidasan University, Tiruchirapalli.



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13 EXERCISE SCIENCE AND FUNCTIONAL ASSESSMENT

PEN18GE003

UNIT – I

Diagnostic testing - Pretesting Guidelines and procedure – Laboratory and Field testing – Cardiovascular and Pulmonary assessment – Treadmill and Ergometers – Metabolic measurement equipment – pulmonary function equipment – Electrocardiograph equipment – pulse oximeter – Blood pressure assessment

UNIT – II

Musculoskeletal Function assessment – Electromyography equipment – force platforms - Pressure Sensitive Insoles –Isokinetic Dynamometers. Magnetic Resonance Imaging – Magnetic Resonance Spectroscopy – Muscle Biopsy Equipment Computer Tomography – Dual Energy x- ray Absorptiometry.

UNIT – III

Energy Balance Assessment - Measuring energy intake – Measuring energy expenditure - Whole room indirect calorimeter – DoubleLabeled Water – other Assessment Instruments – Heart rate monitor – pedometer Accelerometers

UNIT – IV

Measuring Body Composition – Densitometry- Dual Energy x- ray Absorptiometry – Electrical Impedance – Skinfold assessments– Anthropometric measurements.

UNIT – V

Blood collection and analysis – General equipment – Common blood measures –routine check-up – haemoglobin- urine analysis- urea, uric acid and lipid profile.

TEXT BOOKS:

1. ACSM' S Introduction to Exercise Science, Jeffrey A. Potteiger: Wolters Kluwer/ Lippincott Williams & Wilkins.

REFERENCE BOOKS

2. American Heart Association. 2013 American Heart Association website [http:// www.Heart.org/ HEARTORG/](http://www.Heart.org/HEARTORG/) 2013.



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14 FLOOR AND STEP AEROBICS

PEN18GE004

UNIT - I

Aerobics - Benefits of Aerobics – Wellness –Music – Music understanding- music tempo variation – cueing – floor – Use of mirror – shoes – stepper –various height

UNIT - II

Warm Up – cardio workout - Low Intensity – high intensity - Cool Down – Flexibility – Posture – Duration – Heart rate – use of boarg scale (10 points) – talk test

UNIT - III

Rhythmic Aerobics: Variations and Styles – floor aerobics – Marching – Step touch – L- step – V- step – Diamond – Knee lift – Touch out – Grape vine –Turn step – chacha – A – step – arm variation

UNIT - IV

Step Aerobics – Marching – up and down - L- step – V- step – Straddle – Cross over – Turn step – Knee lift – Hop – Jump – Run Run – Arm Variation

UNIT - V

Major muscle groups strengthening – Introducing circuit training and interval training - Body Toning through Resistance; Weights, Bands and Resistance;

TEXT BOOKS:

3. Mazzeo, K.S. (2001). Fitness through aerobics and step training. Brooks/cole publishing Company
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REFERENCE BOOKS

5. Cooper Kenneth H.2013, Aerobic program for total wellbeing: Exercise Diet and Emotional Balance. Bantam.



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15 STABILITY AND CORE TRAINING

PEN18GE005

UNIT – I

Science of Core stability – Tolerance and capacity –core function anatomy –anterior core muscle – posterior core muscle therapeutic/ corrective exercise – Injury prevention program reducing risk of injury

UNIT – II

Abdomen Revolution - components of Abdomen Revolution – back disorders - Back pain - Swayback and Facet Pain -Stenosis -Flat Back -Disc Pain – Spondylolisthesis-Mystery pain – flat belly and Abdomen revolution – osteoporosis and Abdomen exercise – Isometric Abdomen drill

UNIT – III

Spine organisation –Posture control – Breathing – Diaphragm breathing –Lateral breathing – Activation – Mobilisation - core stability – positions - core strength – power development

UNIT – IV

Designing core strengthening programme - Core strength and endurance training for performance – without equipment – with equipment (Swiss ball and Medicine ball) – Functional Training

UNIT – V

Stabilization progression - Hook-lying – hands and knees – face down – Bridging – Plank – sports specific

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REFERENCE BOOK

3. Jeffrey M. Willardson (2014) “Develop the core” Human Kinetics

WEB SOURCE

4. www.nsc.com/PDF/coretraining



16 TRAINING AND PERFORMANCE

PEN18GE006

UNIT - I

Definition of training, performance, aerobic training, aerobic system, volume, Intensity – training principles – over load, specificity, reversibility – influence of Gender, Initial fitness level and Genetics – components of work session – Training to improve aerobic power - Interval training – long slow distance – High Intensity Continuous exercise - Training intensity and improvement in VO₂ max.

UNIT - II

Definition of Anaerobic training, Anaerobic system, Training for improved Anaerobic power and capacity - ATP – Pc System – Glycolytic System – muscle adaptation – adaptation in a Lactic Threshold.

UNIT - III

Definition of strength, muscular fitness, resistance training – classification of strength training – Isometric – Isotonic – Isokinetic – factors involved in muscular adaptation – principles of resistance training- physiological effects of strength training – neural and muscular adaptation to resistance training.

UNIT - IV

Definition of Overtraining – Symptoms of overtraining – effect of overtraining – overtraining syndrome – predicting the overtraining syndrome – treating the overtraining syndrome – tapering for peak performance.

UNIT - V

Definition of Retraining, muscular strength, power, muscular endurance, speed, agility, flexibility and cardio respiratory endurance – effect of retraining on muscular strength, muscular endurance, speed, agility, flexibility and cardio respiratory endurance.

TEXT BOOKS:

1. Scott K. Powers Edward T. Howley (2004) “Exercise Physiology- Theory and application to fitness and performance”, - Brown and Benchmark.
2. Diek, Frank W. (1978) “Sports training principles “, London: Lepus books.



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REFERENCE BOOKS

1. E.L.Fox(1979) "Sports Physiology halt: CBS College publishing.
2. Nieman, David C" "The Exercise Health Connection" champaign L: Human kinetics.
3. Jack. H Wilmore and David L. Costill (2004) "Physiology of Sports and Exercise", Human kinetics.



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17 LIFE SKILLS MANAGEMENT

PEN18SE301

Unit I:

Introduction: Soft Skills - Concepts and Definition- Need and importance of Soft Skills – Developing Soft Skills – Implications on Youth Development .

Unit II:

Behavioral Skills : Attitude, Lateral Thinking , Emotional Intelligence, Leadership, Team Building and Interpersonal Skills.

Unit III

Social Skills and Negotiation Skills: Self Awareness and Empathy , Influencing, - Effective Communication –Oral Presentation Skills – Interviewing – Delegating.

Unit IV:

Thinking Skills: Critical Thinking and Creative Thinking – Problem Solving and Decision Making skills.

Unit V:

Coping Skills : Coping with stress and Emotions – Conflict Resolution – Negotiating - Time and Stress Management Skills.

TEXT BOOKS:

1. G. Ravindran, S P Benjamin, Elango and R. Arokiam (2007) - Success through Soft Skills, ICT

REFERENCE BOOKS

1. Kamin M (2013) Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. ISBN: 978-1-118-10037-0



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18 BIOENERGETICS AND MUSCULAR PHYSIOLOGY

PEN18CT101

Unit I

Muscular System: Types of Muscles - Structure and biochemical properties of skeletal Muscle - Functions, Muscle fibers types – Fast twitch Muscles fibers and slow twitch Muscles fibers, Mechanism of Muscle Contraction: Sliding Filament Mechanism of Muscle Contraction-Types of Muscular contraction.

Unit II

Define Metabolism and Energy: Energy for Muscle Contraction - ATP-PCr system – Glycolytic system – Oxidative system – Fatigue types, Causes and recovery – Cori cycle - Oxygen debt.

Unit III

Neuroendocrine control of Energy metabolism: Glucose Homeostasis, Feed Forward control of Glycemia during exercise, Facilitated glucose transport, insulin and hepatic fat metabolism, insulin response to exercise, Glucagon- Insulin antagonist. Autonomic Nervous system and Catecholamine: Effect of exercise, intensity and training on Catecholamine responses. Growth hormone and exercise, Anti- Diuretic Hormone (ADH) and exercise.

Unit IV

Metabolic response to exercise: Lactate metabolism during exercise and recovery, Metabolic fate of Lactic acid after exercise- lactate as a carbon reservoir during recovery, Exercise related disturbances to mitochondrial function – Temperature, fatty acids and Ions, calcium ion, sympathetic stimulation. Lactic acid turns over during exercise: production, removal and clearance.

Unit V

Training adaptation: Aerobic and anaerobic trainings and their effects on muscles - Muscle Hypertrophy and Muscle Atrophy-Hyperplasia of Muscle Fibers - Muscle soreness - Muscle atrophy and detraining -Rigor Mortis.



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TEXT BOOKS:

4. William D.Mcardle, Frank I.Katch, Victor L.Katch, (2005), "Essentials of exercise physiology", Lippincott Williams and wilkins.
5. Victor L.Katch, Frank.I. Katch, William D.Mcardle, (2003), "Exercise physiology", Williams and wilkins.
6. Lorry G.Shaver(1981)"Essentials Of Exercise Physiology" Delhi: Surjeeth Publications.

REFERENCE BOOKS

5. William E.Garrett J.R., Donald T.Kirendall, (2000), "Exercise and sports science", Lippincott Williams and wilkins.
6. McArdle William D. (1998) "Essentials of Exercise Physiology" Malveern, Pennsylvania: Lea and Febiger.
7. Berger Richard A. (2003) "Applied Exercise Physiology" United States of America, Lea and Febiger, Philadeiphia.
8. Guyton,Arthur C.(2003) "Text Book of Medical Physiology",(7th edition),Philadelphia: Saunders Company.



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19 CARDIOVASCULAR AND RESPIRATORY PHYSIOLOGY

PEN18CT102

UNII - I

Components of Fitness – Cardiorespiratory endurance – muscular strength – Flexibility – Body Composition. Basic Cardiac Anatomy – structure and functions of Heart – coronary arteries- valves of the heart – cardiac physiology concepts – conducting system of the heart – cardiac cycle – during rest and exercise - redistribution of blood – heart rate variability – importance of sleeping heart rate.

UNII - II

Electrocardiogram – Cardio dynamics – cardiac output – blood pressure –Factors affecting stroke volume – factors affecting cardiac output – measuring blood pressure – blood pressure and venous return. cardiac adaptations in response to aerobic training.

UNII - III

Cardiac electro physiology and mechanics – membrane and cellular structure and function – action potential – cardiac tissue and bioelectricity – cardiac mechanics.

UNII - IV

Functional anatomy of the Bronchopulmonary system – Anatomy of the respiratory system – Internal and external respiration – respiration – mechanism of inspiration and expiration - alveolar ventilation – Dead space – diffusion and transport of gasses – lung volumes and capacities– O₂ – Haemoglobin – Dissociation curve in difference circumstances.

UNII - V

Lung function test – cardiorespiratory endurance test – laboratory tests– direct Method Assessment O₂ and CO₂ through gas analyser by using standard protocol and indirect Method - Harvard step test – field test- 12 minutes run and walk test – Queens college Step test and Beep test - effect of exercise on respiratory system.

TEXT BOOKS:

3. Irwin S. Techlin JS. Cardipulmonary physical therapy: a guide to practice. St. Louis, Mo, Mosby Co., 2004.2.
4. William D.Mcardle , Frank I. Katch, Victor L. Katch, (2005), “Essentials of exercise physiology”, Lippincott Williams and Wilkins.



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REFERENCE BOOKS

4. Mcardle , William D, Frank I. Katch, Victor L. Katch, (2005) “Essentails of Exercise Physiology”, Philadelphia: Lea and Febiger.
5. Larry G. Shaver (1981) “Essencials of Exercise Physiology”Delhi; Surjeeth Publication.
6. Amrit Kumar R. Moses, Introduction to Exercise Physiology, (1995), pumpugarpathipagam, Madras.



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20 ADVANCED HUMAN NUTRITION

PEN18CT103

UNIT - I

Structural features of Carbohydrates –Classification of carbohydrates: Simple Carbohydrates: Monosaccharide – Disaccharides – Complex Carbohydrates: Oligosaccharides – Polysaccharides – Digestion: Digestion of Polysaccharides - Digestion of Disaccharides – Absorption of Glucose and Galactose- Absorption of Fructose - Monosaccharide Transport and cellular Uptake- Glucose Transporter-Maintenance of Blood Glucose level – Glycemic response to carbohydrates: Glycemic Index - Glycemic Load.

UNIT - II

Proteins – Functional Categories: Catalysts- Messengers-structural elements- Immunoprotectors –Transporters - Buffers - Fluid balance - Other role-Protein Digestion and Absorption - Amino acids: Essential amino acids and Non-essential amino acids - Kinds of Proteins: Complete Proteins and Incomplete Proteins – Functions of Proteins in the body - Nitrogen Balance.

UNIT - III

Lipids - Kinds of Lipids: Simple Lipids: Fatty acids-Saturated fatty acids- Unsaturated fatty acids and Trans Fatty Acid - Essential Fatty acids: Linoleic acid (an omega-6 fatty acid) and linoleic acid (an omega-3 fatty acid) and Non-essential Fatty acids (omega-9 fatty acid) – Triglyceride – Sterols - Compound Lipids: Phospholipids – Glycolipids-Lipoproteins Derived Lipids: Cholesterol- Functions of Cholesterol - Total Cholesterol - High density lipoproteins - Low Density Lipoproteins-Lipids Digestion and Absorption.

UNIT - IV

Vitamins - Classification of vitamins: Fat soluble vitamins - A (Carotenoids), D, E and vitamins K - Water soluble vitamins: Vitamin C (Ascorbic Acid) and B complex group: Thiamine (Vitamins B₁)-Riboflavin (Vitamins B₂) - Niacin (Vitamins B₃)- Pantothenic Acid - Biotin - Folate -Vitamins B₁₂(Cobalamin) - Vitamins B₆ - Absorption, Transport and storage- Functions and mechanisms of action – Interaction with other Nutrients - Dietary sources - Recommended Dietary allowances (RDA)-Deficiency.



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UNIT - V

Minerals: Classification of Minerals: Macro minerals and Micro minerals: Calcium – Phosphorus – Magnesium- Sodium- Potassium- Chloride- Iron- Zinc- Copper- Selenium Iodine-Manganese - Absorption, Transport and storage- Functions and mechanisms of action – Interaction with other Nutrients - Dietary sources - Recommended Dietary allowances (RDA)- Deficiency.

TEXT BOOKS:

3. Sareen S. Gropper and Jack L. Smith (2009), Advanced Nutrition and Human Metabolism, Wadsworth, Cengage Learning, USA.
4. Heather Hedrick Fink, Lisa A. Burgoon, Alan E. Mikesky, (2006), "Practical Application In Sports Nutrition", Jones and Bartlett.

REFERENCE BOOKS

2. McArdle William D. et.al., (2005) "Exercise Physiology, Nutrition and Human Performance", Philadelphia: Lea and Febiger.
3. McArdle, William D., Katch, Frank I and Katch, Victor L (2005) "Exercise Physiology", Philadelphia, Lea and Febiger.



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21 NEURO PHYSIOLOGY

PEN18CT201

UNIT - I

Definition of Neurophysiology – structure and functions of neuron – degeneration and regeneration – receptors – reflex – Action potential – Depolarization – Repolarization – Synapse- Synaptic transmission – Neurotransmitters.

UNIT - II

Cutaneous and deep visceral sensation – Ascending and Descending tracts of spinal cord- Motor unit – organization of motor and sensory functions of CNS and Spinal cord – functions of Brain stem – cerebellum – Basal Ganglia - Hypothalamus – Thalamus- cerebral cortex.

UNIT - III

Higher function of Brain – Arousal – sleep, learning memory, speech – EEG – conditioned reflex – neural basis for instinctual and Behavior emotion – control of posture – equilibrium – muscle tone.

UNIT - IV

Diencephalon function – Hypothalamus and body's Homeostasis- the control of body temperature – appetite – defecation – micturition - heart rate-Sleeping- arterial Blood Pressure – Anterolateral system conducting afferent pain and temperature interacts with the thalamus.

UNIT - V

Brain imaging techniques – CT (Computerised Tomography) – MRI (Magnetic Resonance Image) - Use of CT and MRI for identifying deep brain structure, acute pain, hemorrhage, tumors, and edema. Effect of Exercise on Nervous System.

TEXT BOOKS:

3. Johnson and WU. Foundations of Cellular Neurophysiology.
4. Hille, Ionic Channels of Excitable Membranes, 3rd edition, Sinauer Associates, Inc.

REFERENCE BOOKS

3. Levitan and Kaczmarek, The neuron, Oxford University press.
4. William D.Mcardle, Frank I. Katch, Victor L. Katch, (2005), "Essentials of exercise physiology", Lippincott Williams and Wilkins.



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22 TRAINING AND COMPETITION NUTRITION

PEN18CT202

Unit I:

Sport Nutrition -Assessment of nutritional status: Three Day Food Record – Seven Day Food Record – 24 Hours Recall – Food Frequency - Diet History - Carbohydrate Diets for training – Muscle Glycogen - Liver Glycogen - Regulation of Glucose Concentration – Hypoglycemia - Carbohydrates Ingestion before Exercise - Carbohydrates Maintenance During exercise- Carbohydrates Replenishment After Exercise - Glycemic load – Carbohydrates loading.

Unit II:

Biology of protein and amino acid requirements: Body protein mass-Protein synthesis, degradation, and turnover- Protein Utilization in Athletic Performance- Protein requirements for Endurance Athletes - Protein requirements for Strength Athletes – Protein essential for before exercise, during exercise and in recovery from exercise - Benefits and Risks of a High-Protein Diet-Nitrogen Balance.

Unit III:

Weight management – Methods used to determine weight status: Body mass index – Waist-to-hip ratio - Body Composition and Performance - Changes in Body Composition - Methods for measuring body composition: Hydrostatic weighing - Bioelectric Impedance Analysis - Dual Energy X-ray Absorptiometry (DEXA) - Skin fold Thickness -Principles of healthy weight reduction - Making weight for weight category sports - Principles of healthy weight gain.

Unit IV:

Composition of Body Fluids: Intracellular Fluid - Extracellular Fluid - Fluid guidelines - Fluid need before exercise - Fluid need during exercise - Fluid need after exercise, Dehydration - Effects of dehydration and overhydration - Heat cramps, Sports drinks - Types of sports drinks - Energy drinks, Fluid and Electrolyte Management- Strategies to delay fatigue- Effects of hyperthermia and dehydration on performance.



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Unit V:

Planning Diets: Principles of Planning Diets - Steps involved in Planning a Diets -
Dietary guidelines for Eating Right - Food Guide Pyramid - Healthy Eating Pyramid -
Planning Diets for aerobic and anaerobic sports - Planning Diets for Intermittent sports -
Planning Diets for the traveling athlete - Planning diets for a vegetarian athlete.

TEXT BOOKS:

4. Heather Hedrick fink, Lisa A.Burgoon, Alan E.Mikesky, (2006), "Practical Application in Sports Nutrition", Jones and Bartlett.
5. Janice Thompson, Melinda Manore, (2005), "Nutrition: An Applied Approach", Pearson.
6. Robert E.C.Wildman, Barry S. Miller, (2004), "Sports and Fitness Nutrition", Thomson.

REFERENCE BOOKS

5. William D.Mcardle, Frank I.Katch, Victor L.Katch, (2000), "Essentials Of Exercise Physiology", Lippincott Williams and wilkins.
6. Steven B.Heymsfield, Timothy G.Lohman, Zimianwang, Scott B.Going, (2005), "Human body composition", Human kinetics.
7. Kevin Nortor and Tim olds (2006), "A Textbook of Body Measurements for Sports and Health Education- Anthropometric", CBS.
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23 STATISTICS IN EXERCISE PHYSIOLOGY AND NUTRITION

PEN18CT203

UNIT - I

Statistics-Basic Concept –Need and Importance of Statistics; Data-Raw and Grouped, Types of data; Concept and Calculations of Measures of Central Tendency-Mean, Median and Mode; Measures of Variability- Range, Mean Deviation, Quartile Deviation and Standard Deviation.

UNIT – II

Introduction To Normal Distribution – Normal Curve – Characteristics of Normal Curve - Properties of Normal Curve – Standard Normal Curve - Problem Based on Normal Distribution – Uses of Normal Distribution.

UNIT - III

Testing of Hypothesis - Procedure, Types of Hypotheses, Level of Significance, One Tailed and Two Tailed Test, Degrees of Freedom; Test of Significance for Difference of Means- t Test -Independence and Dependence Test, Z-Test; One Way Analysis of Variance.

UNIT - IV

Correlation- Pearson Product Moment Correlation, Spearman Rank Order Correlation, Phi Correlation, Biserial Correlation Partial and Multiple Correlation

UNIT - V

Non-Parametric: Chi Square Test – Equal Occurrence Test, Independence of Attributes, Contingency Coefficient; Graphical Representation – Line Diagram, Bar Diagram- Multiple Bar Diagram, Pie Diagram – SPSS Package.

TEXT BOOKS:

1. Blum, J.R., and Fattu, N.A. 1954. Nonparametric methods.Rev.Educ.Res., 24, 467-487.
2. Conover, W.J. Practical Nonparametric statistics, 2nd edition. New York; John wiley& sons, 1980.
3. Gibbons,J.D., and Chakraborti. S., Nonparametric Statistical Inference, 3d ed., New York, Marcel Dekker. 1992.

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1. Kraft, Charles H. and Van Eeden. Constance A Nonparametric Introduction to Statistics. New York: Macmillian, 1968.
2. Owen, D.B. Handbook of Statistical Tables. Reading, Mass; Addison- Wesley, 1962.
3. Siegel, Sidney. Nonparametric statistics for the behavioral Sciences. New York: McGraw-Hill, 1956.
4. VarmaJ.Prakash ; Sports Statistics Copyright 2000 by Venus Publication.



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24 COMPUTER APPLICATION IN EXERCISE PHYSIOLOGY AND NUTRITION

PEN18SE201

Unit-I:

Definition of Computers – Types of Computers – Microcomputer – Mini Computers, Mainframe Computers and Super Computers – Binary number system – Bits and Bytes – Hardware Input – Output – The arithmetic / Logic Unit – Control Unit. Computer Memory – Auxiliary Storage. The Punched Card – Magnetic & Tape – Disk oriented data entry system; Out-put devices

Unit-II:

MS-Word – Creating documents – Formatting, Editing, Deleting, Background and copying, Spelling checks and Thesaurus – Ms-Excel-Opening – Saving – Editing File – Basic Mathematical Problems – Addition, Subtraction, Multiplication, Division – Ms Power Point – Opening – Creating Saving – Deleting Slides / Templates – Slide Show – Important Feature of Power point Presentation.

Unit-III:

Background online designing - Scanning – Animation - slide sounds, Impact and non-impact printers-mobile devices to asses physiological parameters, Internet explorer – Different types of connections – Modem types - Network types, types of internet communications - e.mail - Text chatting - video chatting and calling.

Unit-IV:

Benefits and uses of biochips, heart rate monitor for team sports and individual events - Monitoring of 24h ECG - Caloric expenditure- workload- blood pressure – Circadian rhythms – methods of record sleeping stages- physiological monitoring devices.

Unit-V:

Role of computer in Exercise Physiology and Research- Assessment of Physiological parameters – Latest computer technology – Software involving interpreting variables in exercise physiology – Role of Nutrition software to boost the human longevity.



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TEXT BOOKS:

1. Abraham Silberchatz, Henry F. Korth and S.Sundarshan, (2002), "Data Z Base System concepts", 4th Edition, McGraw Hill.
2. Michael Halvorson, Michael.J Young. Microsoft Office XP Inside Out (paperback), Microsoft press.

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ITL Education Solutions Limited, (2005), "Introduction to Information Technology", Pearson Education (India).



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25 ENVIRONMENTAL PHYSIOLOGY

PEN18CT301

UNIT - I

Definition of Homeostasis, thermoregulation, metabolism – heat stress – Fundamental principles involved in thermoregulation – Conduction – Convection - - Radiation – Evaporation – Hypothalamus and heat losing mechanism- role of endocrine glands in regulating body temperature – temperature regulation during exercise.

UNIT - II

Temperature regulation in hot environment – Acclimatization to heat – sweating –increased plasma volume – increased stroke volume – improved cutaneous blood flow – heat exhaustion – heat cramps – heat stroke -precaution to be taken in hot environment-- precaution to be taken to avoid heat illness- Temperature regulation in cold environment – acclimatization to cold – fine motor activity – facilitation of metabolic heat production - precaution to be taken in cold environment.

UNIT - III

The environmental differences between High altitude and sea level – immediate physiological changes at high altitude - Acclimatization - in respiratory system – in cardiovascular system – long term adaptation - time of acclimatization – the importance of training at altitude- aerobic process – anaerobic process – performance at Altitude – Hypoxic training methods for improving endurance exercise performance.

UNIT – IV General characteristics of underwater environment – SCUBA diving –

physiology of underwater diving – physiological response to water immersion –exposure – breath hold limitations – Ambient pressure changes – breathing under pressure – physiology of decompression.

UNIT - V

Factors affecting physiological performance – skeletal system – muscular system – cardiovascular system – respiratory system –Bio-energetic system – lactate tolerance – maximum aerobic capacity – hormonal difference.



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TEXT BOOKS:

1. William D. Mcardle, Frank I. Katch, Victor L. Katch, (2005), "Essentials of exercise physiology ", Lippincott Williams and Wilkins.
2. Victor L. Katch, Frank. I. K atch, William D. Mcardle, (2003), "Essentials of exercise physiology ", Williams and Wilkins.
3. Lorry G. Shaver (1981) "Essentials of exercise physiology" Delhi:
SurjeethPuplications.

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1. William E.Garrett J.R., Donald T. Kirendall, (2000), Exercise and sports science",
Lippincott Williams and Wilkins.
2. McArdle William D. (1998) "Essentials of exercise physiology" Malveern,
Pennsylvania: Lea and Febiger.
3. Roger M. Enoka, (2002), "Neuromechanics of human movement", Human Kinetics.



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25 RESEARCH METHODOLOGY IN EXERCISE PHYSIOLOGY AND NUTRITION

PEN18CT302

UNIT – I

Definition of research – Meaning, Need, Important of research in Exercise Physiology and Nutrition, Qualities of good research, classification of research – Basic Research, Action Research, Applied Research, Philosophical Research, and Historical Research.

UNIT –II

Experimental Research – Comparative and Analytical Research – Descriptive Research Methods – Need, Importance and Tools of Survey, Case Study, Interview Technique.

UNIT – III

Experimental Design – Single Group Design – Reverse Group Design, Repeated Measures Design – Static Group Design, Equated Group Design, Random Group Design, Rotated Group Design, Static Group - Comparison Design, Repeated-Measures Design.

UNIT – IV

Sampling - Need for Sampling; Advantages – Disadvantages; Determining the Sample Size; Types of Sampling - Probability Sampling Method, Non- Probability Sampling Method, Random Sampling Design - Simple Random Sampling; Complex Random Sampling Design - Stratified Sampling-Proportionate Sampling-Cluster Sampling-Multistage Sampling, Systematic Sampling, Sequential Sampling

UNIT – V

Research format, Research proposal, Style of writing research, Objectives of the Study, The significance of the problem, Hypothesis, Delimitations, Limitations Review of Related Literature, Methodology, Results and Discussions, Method of writing Abstract



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TEXT BOOKS:

1. Taylor "Research Methodology guide for Research Management" Phi Publisher.
2. Berg, "Essential of Research Methods in health Physical education", Lippincott William and Wilkins Publisher.
3. Rothstein, Anne L. (2006), "Research Design and Statistics for Physical Education, Englewood Cliffs, and New Jersey: prentice Hall Inc.
4. Clarke, David H. Clarke, Harrison H. Research Process in Physical education, New Jersey: Prentice Hall Inc.1984.
5. Jerry R. Thomas, Jack K. Nelson and Stephen J. Silverman., Research methods in Physical Activity (5th Ed), New York: Human Kinetics, 2005.



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26 EXERCISE AND DIET PRESCRIPTION FOR SPECIAL POPULATION

PEN18CT401

UNIT - I

Definition of obesity - Prevalence of obesity - Factors that contribute to obesity - Assessment: Body mass index-Waist to Hip ratio (WHR) - Broka's Index-Types of obesity - Dietary Modification of obesity - Behavior Modification-III Effects of Obesity-Exercise Testing - Exercise prescription for obesity -Special Considerations-Recommended Weight Loss Programs.

UNIT - II

Definition of Diabetes Mellitus – Prevalence of Diabetes Mellitus – Etiology of Diabetes Mellitus – Types of Diabetes Mellitus – Signs and Symptoms - Diagnostic Tests- complications of Diabetes Mellitus – Healthy Approaches to Managing Diabetes: Focusing on Nutrition-Dietary Macronutrients -Fiber Intake-Carbohydrate Intake–Exercise Testing- Exercise and Diabetic Diet prescription for Diabetes Mellitus-Special Considerations.

UNIT - III

Definition of Hypertension - Prevalence of Hypertension - Etiology of Hypertension - Regulation of blood pressure-Causes of Hypertension-Classification of hypertension - complications of Hypertension - Prevention of Hypertension: Dietary Management -Sodium Restricted Diets-Exercise Testing-Exercise prescription for Hypertension -Special Considerations.

UNIT - IV

Definition of Coronary Heart Disease (CHD) - Prevalence and Risk factors of coronary heart disease - Sign and symptoms of coronary heart disease - Role of Fat in the Development of Atherosclerosis-Prevention of Coronary Heart Disease: Dietary Management - Heart-Healthy Diet Plans-Heart-Healthy Dietary Recommendations- Inpatient Rehabilitation Programs - Outpatient Exercise Programs -Exercise Prescription without a Preliminary Exercise Test -Exercise prescription for coronary heart disease

UNIT - V

Chronic Pulmonary Diseases - Chronic obstructive pulmonary disease –Types of Obstructive Pulmonary Disorders - Impairments and Impact on Function-Management Guidelines-Restrictive pulmonary disorders-Acute and Chronic Causes of Restrictive Pulmonary Disorders-Management Guidelines -Pulmonary function tests-Nutritional impact-



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Nutritional screening and nutritional assessment-Nutritional requirements-Breathing Exercises and Ventilatory Training-Guidelines for Teaching Breathing Exercises.

TEXT BOOKS:

1. Joan Gandy, (2014), Manual of Dietetic Practice Fifth Edition, The British Dietetic Association, John Wiley & Sons, Ltd, UK.
2. Carolyn Kisner and Lynn Allen Colby, (2007), Therapeutic Exercise Foundations and Techniques Fifth Edition, F. A. Davis Company 1915 Arch Street, Philadelphia.
3. Greg Mclatchie, Mark Harries, Clyde Williams, John king, (2003), "ABC of Sports Medicines", BMJ Books.

REFERENCE BOOKS

1. Barbara Herlihy, Nancy K. Maebius, Caithin Duckwall, (2003), "The human body in health and illness", Saunders.
2. Kate Woolf- May, Steve Bird, Polly Davey, Jane Fallows, (2006), "Exercise prescription physiological foundations", Churchill living stone.
3. Gordon Edlin, Eric Golanty (2004), "Health and wellness", Jones and Bartlett Publishers.



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27 ENDOCRINOLOGY

PEN18CT402

UNIT I:

Principles of Endocrinology. – Neuroendocrine interactions. – Endocrine glands and endocrine tissues. - Processes hormones regulate. – Definition of hormones. – Chemical classification of hormones and their synthesis. – Mechanism of hormone secretion. - Regulation of hormone secretion. Negative feedback loop. Positive feedback loop. Cyclic variations of hormones secretion.

UNIT II:

Hypothalamus and Anterior Pituitary. - Anterior pituitary hormones. Tropic hormones, hormones with direct effects on non-endocrine target tissues. - Releasing and inhibitory hormones of the hypothalamus. Hypothalamus and Posterior Pituitary. - Hormones of the posterior pituitary. Secretion and function of antidiuretic hormone (ADH) and oxytocin. - Signals generating stimuli for ADH (AVP) secretion. - The major actions of ADH. Target cells, intracellular mechanism.

UNIT III:

Thyroid Gland - Functional anatomy of the thyroid gland. - thyroid hormones (TH). Role of thyroglobulin. - Transport of TH by the blood. – Peripheral metabolism of TH. – TH receptors and action of TH on target cells. – Role of TH in normal body growth and development of CNS. - Effect on basal metabolic rate. - Cardiovascular system. - Respiration - GIT. – nervous system. - Other endocrine glands. - Carbohydrate, lipid and protein metabolism. - Regulation of TH secretion and synthesis.

UNIT IV:

Adrenal gland - Adrenal Cortex – Glucocorticoids. - Transport of glucocorticoids in blood. – Metabolic actions of cortisol, principal target tissues. Mineral corticoids. – Adrenal steroids with mineral corticoid activity. - Transport of aldosterone in the blood. - Target cells and cellular mechanism of aldosterone action. - Effect of aldosterone in tubular epithelium of the kidney, on extracellular fluid volume, and blood pressure. - Regulation of aldosterone secretion. Renin-angiotensin system, plasma potassium and sodium levels, ACTH. Adrenal Medulla. - Catecholamines, functions of Catecholamines and storage. Mechanism of the secretion and degradation of catecholamines.



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UNIT V:

Pancreas. – Islets of Langerhans, beta, alpha, delta, and PP cells. Secretion of pancreatic hormones. Neural and hormonal control of insulin secretion. - Insulin receptor and mechanism of cellular action. – Effect of insulin on carbohydrate, lipid, and protein metabolism in the liver, muscle, and adipose tissue- glucagon. Secretion and action of glucagon, effect of glucagon, role on metabolic process.

TEXT BOOKS:

1. Degroot LJ, Jameson JL (eds): Endocrinology, 5th ed. Philadelphia, Elsevier, 2006
2. Gereben B et al: Cellular and molecular basis of deiodinase-regulated thyroid hormone signaling. Endocr Rev 29:898, 2008

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1. Golden SH et al: Clinical review: Prevalence and incidence of endocrine and metabolic disorders in the United States: A comprehensive review. J Clin Endocrinol Metab 94:1853, 2009
2. Hammes A et al: Role of endocytosis in cellular uptake of sex steroids. Cell 122:751, 2005



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28 HEALTH, FITNESS AND PERFORMANCE ASSESSMENT

PEN18DE001

UNIT – I

Preliminary Health Evaluation: Physical Activity Readiness Questionnaire (PAR-Q)- Medical History Questionnaire-Signs and Symptoms of Disease and Medical Clearance- Coronary Risk Factor Analysis-Disease Risk Classification-Lifestyle Evaluation-Informed Consent-Clinical Tests: Physical Examination-Blood Chemistry Profile-Resting Blood Pressure-Graded Exercise Test.

UNIT – II

Meaning and Definition of Blood Pressure, Heart Rate, and Electrocardiogram: Testing Procedures for Resting Blood Pressure Measurement - Auscultation-Palpation-Heart Rate Determination by Palpation –Electrocardiogram Recordings- Twelve-Lead Electrocardiogram- Electrocardiogram Basics- Resting 12-Lead Electrocardiogram Procedures.

UNIT – III

Meaning and Definition of Physical Fitness-Types of Physical Fitness: Health-related fitness and Skill-related fitness- Health-related fitness components: Cardiovascular Endurance-Muscular strength and Endurance–Flexibility-Body composition-Pretest Instructions-Tests Administration and Interpretation-Skill-related fitness: Power-Speed-Agility-Balance and Coordination-Reaction time- Pretest Instructions- Tests Administration and interpretation.

UNIT – IV

Basic Training Principles for Exercise Program Design: Principle of Specificity- Principle of Overload-Principle of progression- Principle of initial values -Principle of individual variability-Principle of diminishing returns-Principle of reversibility- Basic Elements of the Exercise Prescription: Mode-Intensity-Duration-Progression of Exercise.

UNIT – V

Definition of Terms cardiorespiratory fitness or Maximum oxygen uptake (VO_2max): General Guidelines for Exercise Testing-General Procedures for Cardiorespiratory Fitness Testing- Maximal Exercise Test Protocols-Treadmill Maximal Exercise Tests-Graded Exercise protocol -Balke Treadmill Protocol-Bruce Treadmill Protocol.



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TEXT BOOKS:

1. ACSM (2014) ACSM's Resource Manual for exercise testing and prescription – Lippincott Williams and Wilkins
2. Kwok JM Miller TD, Hodge DO, Gibbons RJ. Prognastic value of the duke treadmill score in the Ilderly J Am CollCardiol 2002:39(9); 1475- 81

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Guidelines 2000 for cardiopulmonary resuscitation and emergency cardiovascular care, part 6: advanced cardiovascular life support: section7 algorithym approach to ACLS EMERGENCIES. The American Heart Association in coloborATION WITH THE International Liaison committee on resuscitation. Circulation2000:102 (8suppl); 1136-65.



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29 MUSCLE AND EXERCISE METABOLISM

PEN18DE002

UNIT - I

Define metabolism – Energy for muscular contraction – Aerobic metabolism – Anaerobic metabolism – Fat oxidation –

UNIT - II

Fuel stores in skeletal muscle – Regulator of energy metabolism – Intracellular factors – Hormones – Insulin – Glucagon – Catecholamines – Growth hormones and cortisol

UNIT - III

Metabolic response to exercise – Properties of muscle fibre types – Sarcoplasmic Reticulum and calcium release – Fuel utilization during exercise – Oxygen deficit – Oxygen Debt – Oxygen deficit and debt during light - Moderate and heavy exercise – Factors Contributing to excess post – Exercise oxygen consumption – Metabolic Response to exercise short term Intense exercise – Prolonged Exercise – Incremental exercise – Lactate threshold – Estimation of fuel Utilization during exercise – Exercise Intensity and Fuel selection – Source of Fuel during exercise - Cause of fatigue in High – Intensity exercise – prolonged exercise – Metabolic adaptation to training

UNIT - IV

Metabolic calculation – Importance of metabolic Calculation – Meta Calculation General principles - Expressions of energy expenditure – Relative oxygen consumption – Metabolic equivalents (METs) – Fat stores – Net versus gross V_{O_2}

UNIT - V

Metabolic formulae - Walking and running formulae – Leg and arm ergometry formulae.

TEXT BOOKS:

Astrand, P.O., K.Rodahl, H.Dahl, and S.Stromme. 2003 Textbook of Work Physiology. Physiological Basis of Exercise. Human Kinetics:Champaign, IL

REFERENCE BOOKS

1. Asker Jeukendrup and Michael Gleeson (2004) Sports nutrition. Introduction to energy production and performance Human Kinetics, inc
2. Heather Hedrick Fink (2018) Practical Application to Sports Nutrition, Jones and Bartlett Publishers, Sudbury, Massachusetts, 31 - 61



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30 EXERCISE BIO-CHEMISTRY

PEN18DE003

UNIT – I

Biochemistry – Definition and Importance. Composition of plasma. Energy and Calorie (Kilocalorie) - Definition. Free Energy- Definition and its units. Mitochondria- Structure and function of. ATP, ADP, AMP and Creatine Phosphate-Definition and its formation and breakdown. Role of Oxygen in Energy metabolism. Catabolism and Anabolism–Definition and its Process.

UNIT – II

Central Role of Glucose in Carbohydrate Metabolism. Transport of Glucose Through the Cell Membrane. Glycogenesis—The Process of Glycogen Formation. Glycogenolysis- Removal of Stored Glycogen. Role of Insulin, Epinephrine and Glucagon in glucose transport and metabolism. Glycolysis and the Formation of Pyruvic Acid. Citric Acid Cycle (Krebs cycle). Formation of ATP by Oxidation of Hydrogen (Oxidative Phosphorylation). Anaerobic Glycolysis (CORI Cycle). Pentose Phosphate Pathway (Phosphogluconate Pathway). Gluconeogenesis. Role of Carbohydrate (Breakdown of Glucose) In Energy Metabolism.

UNIT – III

Lipid - Basic Chemical Structure of Triglycerides. Lipoproteins-Classification, Importance, Functions and normal values. Absorption and Transport of Lipids. Fat Deposit in adipocytes. Triglycerides for Energy. Hydrolysis of Triglycerides. Degradation of Fatty Acids to Acetyl Co A by Beta-Oxidation and Oxidation of Acetyl-Co A. ATP Formation by Oxidation of Fatty Acids. Formation of Acetoacetic Acid in the Liver and Its Transport in the Blood. Synthesis of Triglycerides from Carbohydrates. Conversion of Acetyl-CoA into Fatty Acids. Combination of Fatty Acids with α -Glycerophosphate to Form Triglycerides. Importance of Fat Synthesis and Storage. Hormonal Regulation of Fat Utilization. Formation and Uses of Phospholipids. Formation and Uses of Cholesterol. Factors That Affect Plasma Cholesterol Concentration—Feedback Control of Body Cholesterol.



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UNIT – IV

Basic Chemical Structure of Amino Acids. Transport and Storage of Amino Acids. Functional Roles of the Plasma Proteins. Essential and Nonessential Amino Acids. Use of Proteins for Energy- Deamination, Urea Formation by the Liver and Oxidation of Deaminated Amino Acids Ketogenesis-Definition. Hormonal Regulation of Protein Metabolism. Effect of Starvation on Protein Degradation.

UNIT – V

Acid-base balance Hydrogen Ion and PH. Causes of Alteration in Acid-Base Balance- Volatile acids and Non-volatile acids. Regulation of Acid-Base Balance by Acid-Base Buffer System- Mechanism and Importance of Bicarbonate buffer system, Phosphate buffer system and Protein buffer system Regulation of Acid-Base Balance by Respiratory Mechanism. Regulation of Acid-Base Balance by Renal Mechanism. Acidosis and Alkalosis-Definition, Types (Respiratory and Metabolic) and its causes.

TEXT BOOKS:

1. Lorry G.Shaver(1981) "Essentials Of Exercise Physiology" SurjeethPublications, Delhi
2. Mcardle (2000) "Essentials of Exercise Physiology" 3rd edition, lippincoptwillams and wilkins publisher.
3. Sharon,(2003) "Exercise Physiology for Health Fitness and Performance" LippincoptWillams and Wilkins Publisher.

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1. Clerk, D.H (1975.)"Exercise Physiology" Prentice – Hall,Inc.,Englewood Cliffs ,New Jersey.
2. Michael j.Gibney ,Ian A. Macdonald and Helen M.Roche (2007), *Nutrition and Metabolism*. Publisher. Blackwell Science, Oxford. Pg 126-127,135, 137,277.



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31 RENAL PHYSIOLOGY

PEN18DE004

UNIT I:

Physiological Anatomy of the Kidney-Structure of the kidney.Cortex. Medulla. – Nephron-functional unit of the kidney. Cortical and juxtamedullary nephrons. – Anatomy of the nephron. Glomerulus. Tubule. – Bowman's capsule. Proximal tubule.Loop of Henle.Distaltubule.Collecting duct. – Kidney blood vessels. Afferent and efferent arterioles. Peritubular capillary network.Vasarecta.Juxtaglomerular apparatus. - Principles of urine formation.

UNITE II:

Glomerular Filtration. Glomerular filtration membrane. - Net filtration pressure. – Glomerular filtrate. Composition. Glomerular filtration rate. – Clearance. Definition. Calculation. Inulin clearance. Creatinine clearance. PAH clearance. – Renal plasma flow. Filtration fraction. – Physiological control of glomerular filtration and renal blood flow. Nervous regulation. Humoral regulation. Autoregulation. Tubuloglomerular feedback. Myogenic autoregulation.

UNIT III:

Excretion of Water. Reabsorption of water in tubular segments. – Excreting excess water by forming a dilute urine. – Conserving water by excreting a concentrated urine. Obligatory urine volume. Osmotic stratification of renal medulla. Countercurrent multiplier system (loop of Henle).Role of distal tubule and collecting duct. Contribution of urea. Recirculation of urea. Countercurrent exchange system (vasa recta). - Mechanism of water reabsorption. Role of antidiuretic hormone (ADH). Diabetes insipidus. – Water diuresis. Osmotic diuresis.

UNIT IV:

Excretion of Sodium, Chloride, Potassium and Other Ions. Reabsorption of sodium in tubular segments. Mechanisms of sodium reabsorption. Reabsorption of sodium in late distal tubule and in collecting duct.Role of aldosterone. – Excretion of potassium. Reabsorption of potassium.Secretion of potassium.Principalcells.Intercalated cells. Regulation of potassium secretion.– Excretion of chloride. – Excretion of calcium. Regulation of calcium reabsorption. – Excretion of phosphate. - Excretion of magnesium.



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UNIT V:

Acid-Base Balance and Kidney. Plasmatic pH. Acidosis, alkalosis. Sources of hydrogen ions.

- Acid-base buffer systems. Bicarbonate buffer system. – The role of kidney in the acid-base regulation. Secretion of hydrogen ions. Filtration and reabsorption of bicarbonate ions.

Generation of new bicarbonate ions. – Renal response to acidosis. Tubular buffers. The role of ammonium ion and ammonia. Renal response to alkalosis. – Respiratory acidosis and

alkalosis. Metabolic acidosis and alkalosis. Micturition. Ureter Ureterorenal reflex. – Bladder.

Detrusor muscle. Innervation of the bladder. Internal sphincter. External sphincter.

TEXT BOOKS:

1. Seldin, Donald W., and Giebisch, Gerhard. 1989. The Regulation of Acid-Base Balance. RavenPress.
2. Valtin, Heinz. 1983. Renal Function: Mechanisms Preserving Fluid and Solute Balance in Health.

REFERENCE BOOKS

1. Little, Brown. Vander, Arthur J., Sherman, James H., and Luciano, Dorothy S. 1985. Human Physiology: The Mechanisms of Body Function, 4th ed. McGraw-Hill.
2. Vander, Arthur J., Sherman, James H., and Luciano, Dorothy S. 1990. Human Physiology: The Mechanisms of Body Function, 5th ed. McGraw-Hill.



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32 SUPPLEMENTS AND ERGOGENIC AIDS FOR PERFORMANCE ENHANCEMENT

Unit: I Introduction to Ergogenic aids - History and development of Ergogenic aids - types of Ergogenic aids - Anabolic Steroids - Amphetamines -**Beta-2-Agonists**– health risk of steroid abuse - Effects of Anabolic Steroids abuse.

Unit: II WADA - IOC - Doping agency - Doping in sports - Blood Doping in sport – effects of blood doping - Erythropoietin – effects of exogenous administration of erythropoietin- Banned supplements in sports: Androstenedione - Dehydroepiandrosterone (DHEA) - 19-norandrostenedione and 19- norandrostenediol - Ephedrine.

Unit: III Diuretics - Target organ for Diuretic Action - Narcotic Analgesics & Athletic performance - mechanism of Action - Non-steroidal Anti - inflammatory Drugs & Corticosteroids, Narcoleptics: Beta – Adrenergic Antagonists.

Unit: IV Research and scientific evidence approved supplements: Supplements - Liquid meal supplements - Sports gels - Sports bars - Creatine - Creatine as Supplement - Mechanisms of Creatine action - Creatine and safety - Glycerol - Iron Supplement- BCAA Supplement.

Unit: V Supplements under consideration: Glutamine - Ribose - Colostrum - Beta-HydroxyBetaMethylbutyrate (HMB) - Carnitine - Carnitine in the body - Coenzyme Q10 - Ginseng – Pyruvate - Vitamin Supplement.

TEXT BOOKS:

3. Michael S. Beatrice, Charles E. Yesalis, (2002), “Performance Enhancing Substances in Sport and Exercise”, Human kinetics.
4. Melinda Manore, Janice Thompson, (2000), “Sport Nutrition for Health and Performance”, Human kinetics.

REFERENCE BOOKS

3. Asker Jeukendrup Michael Gleeson, (2004), “Sport Nutrition”, an introduction to energy production and performance.
4. Louise Burke, (2007), “Practical Sport Nutrition”.



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33 NUTRITIONAL PLANNING FOR SPORTS AND EXERCISE

PEN18DE006

Unit I-

Meal Planning and Preparation: Principles of meal planning-Planning and preparation of nutritionally adequate diets for adult man - Adult woman- Adolescent - School going child - Preschooler- Nutrition for Active Pregnant woman and Lactating woman- Special Nutritional Concerns: Vegetarian diets-The types of vegetarians: Flexitarian-Lacto-Ovo-Vegetarian-Lacto-Vegetarian-Ovo-Vegetarian-Vegan-Other Styles (Fruitarians)-Nutrition Challenges for Vegetarians.

Unit II-

Water Balance and imbalance: Euhydration, Hypohydration, and Hyperhydration- Thermoregulation-Hyponatremia-Dehydration-Rehydration- Fluid balance in sports and exercise, importance, symptoms and prevention of dehydration-Age-Related Fluid Needs - Sports Drink – Hypotonic, Isotonic and Hypertonic drink for hydration/ energy and recovery drink-Other Types of Drinks:Energy Drinks-Oral Rehydration Solutions (ORS)-Sports Waters-Vitamin Waters-Coconut Water-Alcohol-Tea, Coffee and Cola.

Unit III

Energy and Sports Performance: Dietary Carbohydrate and Sports Performance- Dietary Fat and Sports Performance-Dietary Protein and Sports Performance-Vitamins and Sports Performance-Minerals and Sports Performance-The Pre-competition Meal-Liquid Meals-Planning and preparation of Energy dense recipes- High fibre recipes- Low fat recipes- Low sodium recipes- Antioxidants, Exercise and freeradicals, Role of antioxidants in preventing damage and recovery time.

Unit IV

Meal planning for regular training- Balanced diet of different calorific value for specific sport and exercising person-Diet before competition-during Competition-after Competition (Basketball and Netball,Cricket,Cycling,Football,Hockey, Rugby,Swimming, Marathonand Endurance Running, Sprints and Power Sports)



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Unit V

Paralympic sports -Classification of disabilities-Physiology and metabolism-Physiological responses to exercise-Energy expenditure-Thermoregulation-Body composition-Bone density-Dietary issues for athletes with disabilities: Current dietary intakes-Fiber, timing of food intake and bowel control-Fluid intake-Body composition management-Nutritional supplements-Eating difficulties and behaviors observed in some athletes with disabilities

TEXT BOOKS:

1. Louise Burke and Vicki Deakin, (2010), Clinical Sports Nutrition, The McGraw-Hill Companies, Sydney New York.
2. Glenn Cardwell,(2012), Gold Medal Nutrition, Fifth Edition,Human Kinetics, 57A Price Avenue, Lower Mitcham, Australia.
3. Natalie DigateMuth,(2015), Sports Nutrition for Health Professionals,F. A. Davis Company, 1915 Arch Street, Philadelphia, USA.

REFERENCE BOOKS

1. Corinne H. Robinson, Emma S. Weigley Donna H. Mueller, Basic Nutrition and Diet Therapy 7 ed, Macmillon Publishing Company
2. L. Anderson Dibble P. R. Turkki H. S. Michael H. J. Ryribergen J. B, Nutrition in Health and Disease 17th ed , Lippincott Company, Philadelphia
3. Sumati R. Mudambi and M. V. Rajagopal , Fundamentals of Food & Nutrition, New Age International (P) Ltd. Bombay



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34 EXERCISE ASSESSEMENT IN SPECIAL POPULATION

PEN18DE007

UNIT - I

Health screening – importance of pre- exercise evaluation – Medical history, personal history, family history, physical examination, past medical history – for children and elderly

UNIT - II

Exercise assessment in Children's – exercise testing considerations – Hemo dynamic and pulmonary characteristic of children response to exercise –equipment used in testing - exercise equipment -Cycle ergometer – treadmill – ECG recording equipment Comparison of treadmill versus cycle ergometer for pediatric exercise testing– exercise protocol- Indications and Contra indication for stress testing – relative risks for Stress testing – Lower risk and Higher risk.

UNIT - III

Exercise assessment in Elderly - clinical evaluation - practical considerations of Routine exercise testing- Exercise testing Consideration - prognostic assessment with exercise testing – exercise protocol – Special consideration for older than 75 years.

UNIT - IV

Definition of Preeclampsia – Post partum –Exercise and pregnancy - Exercise testing – Exercise assessment in pregnancy – Pre testing screening - PAR Med-X for Pregnancy- physical activity readiness examination – Patient information – Pre exercise testing checklist – general health status – Status of current pregnancy – activity habits during pregnancy period – Contra indication to exercise to be recommended by the healthcare provider Medical and safety Concerns for mother and foetus Maximal exercise testing – fetal response to maximal exercise – submaximal exercise - Aerobic capacity testing, strength testing.

UNIT - V

Emergencies – information pertinent to the information report – emergency equipment and supplies for a health/ fitness facility.Sudden cardiac arrest – Automated External Defibrillators – Implantable Cardio inverter Defibrillators and Sudden cardiac Arrest. Other medical concerns – First aid kits – Blood borne pathogens – first aid kit for a fitness facility.



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TEXT BOOKS:

1. ACSM (2014) ACSM's Resource Manual for exercise testing and prescription – Lippincott Williams and Wilkins
2. Artal R, OToolwe M. Guidelines of the American college of obstetricians and gynaecologist for exercise during pregnancy and post-partum period – BrJSportsmed: 37 (i:6-12)
3. HebestreitH.Exerise testing in children – what works and what does not and where to go? Paediatr-Respir – Rev 2004:suppl A S 11 – 4

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1. Kwok JM Miller TD, Hodge DO, Gibbons RJ. Prognastic value of the duke treadmill score in the lderly J Am CollCardiol 2002:39(9); 1475- 81
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34 EXERCISE ASSESSEMENT IN SPECIAL POPULATION

PEN18DE008

35 EXERCISE AND SPORTS FOR WOMEN

Unit I :

Structural and Physiological differences between male and female – Body size & Composition, strength, metabolic function, Bone mass – Muscle mass – Fat mass- Heart – Blood Volume – RBC and respiratory difference –Gonadal hormones and Sports performance.

Unit II:

Menstrual cycle – Physiology of menstrual cycle – Exercise during menstrual cycles – Female athletic triad: Disorder of Eating- Amenorrhea – osteoporosis, menstrual cycle and Physical performance.

Unit III:

Pregnancy – Physiological changes during pregnancy – Lactation – Indications and Contraindications to exercise during Pregnancy - Guidelines for exercise during and after pregnancy.

Unit IV:

Hormonal Disorders - Physiological changes – Pre menopause, Menopause and Post menopause - Osteoporosis and its pathophysiology due to lack of exercise – Effect of exercise to prevent Osteoporosis – Anemia – Iron supplements.

Unit V:

Mechanism of hormone action – Gonadal Hormones - Women and weight training – hormonal responses to exercise - Masculinization due to exercise, Hormonal effects on fluid and electrolyte balance during exercise – aldosterone – renin- ADH - Doping and performance – women participation in contact and non-contact sports.



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TEXT BOOKS:

1. Mary Lloyd Ireland, Aurelia Nattiv, (2002), "The Female Athlete", Saunders
2. Kate Woolf- May, Steve Bird, Polly Davey, Jane Fallows, (2006), "Exercise Prescription Physiological Foundations", Churchill living stone.
3. William D.Mcardle, Frank I.Katch, Victor L.Katch, (2000), "Essentials Of Exercise Physiology", Lippincott Williams and Wilkins
4. Victor L.Katch, Frank.I. Katch, William D.McArdle, (1996), "Exercise physiology", Williams and Wilkins.

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1. William E.Garrett J.R., Donald T.Kirendall, (2000), "Exercise and sports science", Lippincott Williams and Wilkins.
2. Greg McLatchie, Mark harries, Clyde Williams, John king, (2003), "ABC of sports medicines", BMJ Books
3. Barbara Bushman, J.C.Young (2005), Action Plan for Menopause, Human Kinetics.
4. Peter J.Maud and Carl Foster (1995), Physiological Assessment of Human Fitness,Champaing, IL:Human Kinetics.



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36 EXERCISE PHYSIOLOGY

PEN18GE001

Unit- I

Structure and functions of heart- cardiac cycle- Blood pressure- cardiac output- Heart Rate- Stroke volume- Structure and Functions of respiratory system-Lung volumes and capacities- BMR- Regulation of body temperature- Physiological responses to Heat and Cold- Effect of exercise on cardiac respiration system.

Unit- II

Types of Muscles- Muscles fiber types- Mechanism of Muscles contraction- Sliding filament theory- structure of Neuron- central neurons- brain and spinal cord-peripheral neurons- Automatic Ns- Motor unit- Action potential- depolarisation- Reflex are- proprioceptors- Effect of Exercise on Muscular and Neuron System.

Unit- III

Energy Metabolism - ATP- PC System - Glycolytic and Oxidative system- Oxygen debt and deficit- Aerobic and anaerobic training and their effects on Aerobic and Anaerobic System.

Unit- IV

Structure and Secretion of Pituitary gland- Thyroid Gland- Liver- Adrenal Gland and pancreas- Structural and Physiological differences between Male and Female- Menstrual Cycle- Physiological changes during pregnancy- Guidelines for Exercise during and after pregnancy effect of exercise on Endocrine System.

Unit- V

Immunity- definition and classification- physiology of sleep- Cardiac rhythm- obesity- Exercise perception for obesity- Diabetes mellitus- Exercise Perception- Hyper tension- Exercise Perception- coronary heart disease- Exercise Prescription- pulmonary disease- Exercise Prescription.



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1. William D.Mcardle, Frank I.Katch, Victor L.Katch, (2005), "Essentials of exercise physiology", Lippincott Williams and wilkins.
2. Victor L.Katch, Frank.I. Katch, William D.Mcardle, (2003), "Exercise physiology", Williams and wilkins.
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3. Berger Richard A. (2003) "Applied Exercise Physiology" United States of America, Lea and Febiger, Philadeiphia.



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37 SPORTS NUTRITION

PEN18GE002

Unit- I

Basic Nutrition- classification of carbohydrates- Proteins- Essential and Nonessential – Lipids- classification- Vitamins- classification- Minerals- classifications.

Unit- II

Sports Nutrition- Assessment of Nutritional status- carbohydrate diets for training- Muscles and Liver Glycogen- carbohydrate loading- Carbohydrate intake before, during and after exercise.

Unit- III

Protein requirement for training for Endurance, Strength- Protein essential for before, during after Exercise- Dehydration- strategies to delay fatigue.

Unit- IV

Nutritional need for Special population- Nutrition need for young and Ageing athletics- Athletics with diabetes- Glucose monitoring during exercise- Preventing and managing Hypoglycemia- Physical activity for people type with II diabetes.

Unit- V

Dietary guideline for eating right- Food Plate - Functional food pyramid- Planning Diets for aerobic and anaerobic sports- Planning for vegetarian athlete and vegan athlete, overweight and obesity, Hyper tension, Coronary Heart Disease and Lung disease.

TEXT BOOKS:

5. Sareen S. Gropper and Jack L. Smith (2009), Advanced Nutrition and Human Metabolism, Wadsworth, Cengage Learning, USA.
6. Heather Hedrick fink, Lisa A. Burgoon, Alan E. Mikesky, (2006), "Practical Application In Sports Nutrition", Jones and Bartlett.

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7. McArdle William D. et.al., (2005) "Exercise Physiology, Nutrition and Human Performance", Philadelphia: lea and Febiger.
8. Mcardle, William D., Katch, Frank I and Katch, Victor L (2005) "Exercise Physiology", Philadelphia, lea and Febiger.



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38 EXERCISE SCIENCE AND FUNCTIONAL ASSESSMENT

PEN18GE003

UNIT – I

Diagnostic testing - Pretesting Guidelines and procedure – Laboratory and Field testing – Cardiovascular and Pulmonary assessment – Treadmill and Ergometers – Metabolic measurement equipment – pulmonary function equipment – Electrocardiograph equipment – pulse oximeter – Blood pressure assessment

UNIT – II

Musculoskeletal Function assessment – Electromyography equipment – force platforms - Pressure Sensitive Insoles –Isokinetic Dynamometers. Magnetic Resonance Imaging – Magnetic Resonance Spectroscopy – Muscle Biopsy Equipment Computer Tomography – Dual Energy x- ray Absorptiometry.

UNIT – III

Energy Balance Assessment - Measuring energy intake – Measuring energy expenditure - Whole room indirect calorimeter – DoubleLabeled Water – other Assessment Instruments – Heart rate monitor – pedometer Accelerometers

UNIT – IV

Measuring Body Composition – Densitometry- Dual Energy x- ray Absorptiometry – Electrical Impedance – Skinfold assessments– Anthropometric measurements.

UNIT – V

Blood collection and analysis – General equipment – Common blood measures –routine check-up – haemoglobin- urine analysis- urea, uric acid and lipid profile.

TEXT BOOKS:

ACSM' S Introduction to Exercise Science, Jeffrey A. Potteiger: Wolters Kluwer/
Lippincott Williams & Wilkins.

REFERENCE BOOKS

American Heart Association. 2013 American Heart Association website [http:// www.Heart.org/ HEARTORG/](http://www.Heart.org/HEARTORG/) 2013.



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39 STABILITY AND CORE TRAINING

PEN18GE005

UNIT – I

Science of Core stability – Tolerance and capacity –core function anatomy –anterior core muscle – posterior core muscle therapeutic/ corrective exercise – Injury prevention program reducing risk of injury

UNIT – II

Abdomen Revolution - components of Abdomen Revolution – back disorders - Back pain - Swayback and Facet Pain -Stenosis -Flat Back -Disc Pain – Spondylolisthesis-Mystery pain – flat belly and Abdomen revolution – osteoporosis and Abdomen exercise – Isometric Abdomen drill

UNIT – III

Spine organisation –Posture control – Breathing – Diaphragm breathing –Lateral breathing – Activation – Mobilisation - core stability – positions - core strength – power development

UNIT – IV

Designing core strengthening programme - Core strength and endurance training for performance – without equipment – with equipment (Swiss ball and Medicine ball) – Functional Training

UNIT – V

Stabilization progression - Hook-lying – hands and knees – face down – Bridging – Plank – sports specific

TEXT BOOKS:

1. Brumitt, J. (2010) core assessment and training. Human Kinetics
2. Paul Collins (2009) “Core Strength” Sports publishers Association

REFERENCE BOOK

Jeffrey M. Willardson (2014) “Develop the core” Human Kinetics

WEB SOURCE

www.nscs.com/PDF/coretraining



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40 TRAINING AND PERFORMANCE

PEN18GE006

UNIT - I

Definition of training, performance, aerobic training, aerobic system, volume, Intensity – training principles – over load, specificity, reversibility – influence of Gender, Initial fitness level and Genetics – components of work session – Training to improve aerobic power - Interval training – long slow distance – High Intensity Continuous exercise - Training intensity and improvement in VO₂ max.

UNIT - II

Definition of Anaerobic training, Anaerobic system, Training for improved Anaerobic power and capacity - ATP – Pc System – Glycolytic System – muscle adaptation – adaptation in a Lactic Threshold.

UNIT - III

Definition of strength, muscular fitness, resistance training – classification of strength training – Isometric – Isotonic – Isokinetic – factors involved in muscular adaptation – principles of resistance training- physiological effects of strength training – neural and muscular adaptation to resistance training.

UNIT - IV

Definition of Overtraining – Symptoms of overtraining – effect of overtraining – overtraining syndrome – predicting the overtraining syndrome – treating the overtraining syndrome – tapering for peak performance.

UNIT - V

Definition of Retraining, muscular strength, power, muscular endurance, speed, agility, flexibility and cardio respiratory endurance – effect of retraining on muscular strength, muscular endurance, speed, agility, flexibility and cardio respiratory endurance.

TEXT BOOKS:

1. Scott K. Powers Edward T. Howley (2004) “Exercise Physiology- Theory and application to fitness and performance”, - Brown and Benchmark.
2. Diek, Frank W. (1978) “Sports training principles “, London: Lepus books.



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REFERENCE BOOKS

1. E.L.Fox(1979) "Sports Physiology halt: CBS College publishing.
2. Nieman, David C" "The Exercise Health Connection" champaign L: Human kinetics.
3. Jack. H Wilmore and David L. Costill (2004) "Physiology of Sports and Exercise", Human kinetics.



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41 LIFE SKILLS MANAGEMENT

PEN18SE301

Unit I:

Introduction: Soft Skills - Concepts and Definition- Need and importance of Soft Skills – Developing Soft Skills – Implications on Youth Development .

Unit II:

Behavioral Skills : Attitude, Lateral Thinking , Emotional Intelligence, Leadership, Team Building and Interpersonal Skills.

Unit III

Social Skills and Negotiation Skills: Self Awareness and Empathy , Influencing, - Effective Communication –Oral Presentation Skills – Interviewing – Delegating.

Unit IV:

Thinking Skills: Critical Thinking and Creative Thinking – Problem Solving and Decision Making skills.

Unit V:

Coping Skills : Coping with stress and Emotions – Conflict Resolution – Negotiating - Time and Stress Management Skills.

TEXT BOOKS:

G. Ravindran, S P Benjamin, Elango and R. Arokiam (2007) - Success through Soft Skills, ICT

REFERENCE BOOKS

Kamin M (2013) Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. ISBN: 978-1-118-10037-0



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42 FINANCIAL AND MANAGEMENT ACCOUNTING

Unit-I: Management Accounting: Nature and Scope

Meaning Functions and Scope of Management Accounting; The Management Accountant; Management Accounting and Financial Accounting; Limitations of Management Accounting; Tools of Management Accounting.

Unit-II: Preparation of Trading and Profit & Loss Account; Manufacturing Account; Balance Sheet; Adjustment Entries; Worksheet

Unit-III: Ratio Analysis

Interpretation and Analysis of Financial Statements - Comparative Statement, Common Size Statement, Trend Analysis, Ratio Analysis- Liquidity, Profitability, Turnover and Proprietary Ratios - Interpretation of Ratios - Application to Decision Making - Uses and Limitation.

Unit-IV: Marginal Costing

Marginal Costing; Absorption Costing; Difference between Absorption Costing and Marginal Costing; Cost Behavior and Impact on Marginal Costing; Segregation of Semi-Variable Costs; Profit Planning.

Unit-V: Budgets and Budgetary Control

Definition and Objectives; Meaning of Budget; Meaning of Control; Meaning of Budgetary Control; Types of Budgets; Budgetary Control.

References

1. Management Accounting - R.P. Rustogi.
2. Cost and Management Accounting by M.E. Thukaram Rao, New age International Publication
3. Cost and Management Accounting - Saxena & Vashist.
4. Accounting Management - Bhattacharya S.K. and Dearden I.
5. Accounting for Management-Test and Cases -Bhattacharya S.K. and Reardon J



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43 BUSINESS ENVIRONMENT

Unit-I: Nature of Business Environment: Components of Environment, Micro Environment; Macro Environment; Need for Environmental Scanning; **Industry:** Public Sector in India, Evolution, Rationale and Performance of Public Enterprises - **Industrial Policy:** An Instrument of Industrial Development.

Unit-II: Business Environment in India: Political Environment – Legal Environment – Economic Environment; Banking and Financial Institutions: Financial Systems, Overview of Financial Institutions, and Objectives of Financial Institutions; Insurance: Overview of Insurance Companies, Types, and Regulations of the Insurance Industry.

Unit-III: Socio-Cultural Environment – Social concerns, such as the role of business in society, environmental pollution, corruption, use of mass media, consumerism, changing lifestyle patterns; **Technological Environment** – Technological Change, Product and Process – Technological Factors Affecting business all over the world.

Unit-IV: Management of Multinational Corporations; The International Monetary Fund (IMF); The General Agreement on Trade and Tariffs (GATT); The World Trade Organization (WTO): India's Commitments to WTO; The United Nations Conference on Trade and Development (UNCTAD), Managing World Trade.

Unit V: Sociology of Sports

Genesis of Sport; The nature of Sport in the Human Psyche; Anthropological context of Sport; Sport & Society

Reference

1. Business Environment by Francis Cherunilam
2. Business Environment by K Aswathappa
3. Business Environment by Raj Agarwal.
4. Principles & Practice of Management – M.D. Kakade.



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44 LEGAL ASPECTS IN BUSINESS

Unit-I: The Contract Act

Meaning and Formation of a Contract and its Essentials; Definition of Contract; Essential Elements of a Valid Contract; Types of Contracts; Offer and Acceptance; Consideration; Void Agreements; Performance of Contract; Discharge of Contract; Discharge by Operation of Law; Discharge by Breach of Contract; Remedies for Breach.

Unit-II: The Sale of Goods Act, 1930

Definition of Contract of Sale; Kinds of Goods; The Price; Document of Title to Goods; Conditions and Warranties, Transfer of Title; Rules regarding Transfer of Property; Definition and Rights of an Unpaid Seller.

Unit-III: The Negotiable Instruments Act, 1881

Negotiable Instruments: Definition - Characteristics of Negotiable Instruments; Promissory Note – Definition and Essentials of a Promissory Note; Bill of Exchange – Definition and Essentials of a Bill of Exchange; Cheque – Definition, Distinction between a Cheque and a Bill of Exchange - Bank Draft - Parties to Negotiable Instruments.

Unit-IV: Laws pertaining to Business Organizations:

Types of Business Organizations - Types of Companies according to the Mode of Incorporation; Types of Registered Companies - Partnership Firms - Formation and Registration of Partnership Firms; Duties and Liabilities of Partners; Dissolution of a Partnership Firm; Distinction between a Firm and a Company.

Unit-V: Application of law in sports: Case Studies in India and Abroad:

IPL Controversies; - **Agreements & protection of Intellectual property within the sports industry:** Footage limitation rights with Indian News Television- Terrestrial Vs Broadcast Rights in Sports – Image Rights of Athletes- Trademarks & Copyright Issues.

References

1. N.D. Kapoor-Elements of Mercantile Law - S. Chand & Co.
2. K.R. Bulchandani - "Business Law for Management"-Himalaya Publishing House.
3. M.C. Kutchal - "Mercantile Law"-Vikas Publishing



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45 FINANCIAL MANAGEMENT

Unit-I: Aims and objectives of Financial Management

Definition of Financial Management; Financial Functions; Role of a Financial Manager: Profit Maximization vs. Wealth Maximization; Financial analysis and Control: Funds Flow Statement; Ratio Analysis; Types of Ratios; Comparative Statements Analysis.

Unit-II: Investment Decisions

Investment Decisions; Types of Investment Decisions; Capital Budgeting Process and techniques.

Unit-III: Capital Structure Decisions

Capital Structure; Relevance of Capital Structure: Capital Structure Theories; Determinants of Capital Structure.

Unit-IV: Instruments of Long-term Finance

Sources of Long-Term Finance; Rights Issue of Equity Shares; Preference Shares; Debentures; Fixed Deposits from Public; Lease Financing; Factors affecting Long-Term Funds.

Unit-V: Working Capital Management

Working Capital Management; Factors Influencing Working Capital; Sources of Working Capital; Financing of Current Assets; Short-Term vs. Long-Term Financing; Factoring; Inventory Management - Inventory Management Techniques - Inventory Control Systems.

References

1. Financial Management – Text, problems and cases M.Y.Khan and P.K Jain,
2. Financial Management – Prasanna Chandra, Tata McGraw Hill.
3. Financial Management – I.M. Pandey
4. Financial Management – Rastogi.
5. Financial Management – P.V. Kulkarni.



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46 BUSINESS LAWS

UNIT I

Indian Contract Act 1872: Contract – Meaning – Essential elements – Nature of contract – Performance of contract – Discharge of contract – Remedies for breach of contract – Quasi contracts. Indemnity and guarantee – Bailment and Pledge.

UNIT II

Law of Partnership: Introduction – Formation – Kinds of Partners – Authorities, Rights and Liability of Partners – Dissolution of Firm.

UNIT III

Sale of Goods Act: Sale and Agreement to sell. Condition and Warrantee, Transfer of Ownership – Performance of Contract of Sale – Remedies for Breach of Contract. Negotiable Instruments Act: Kinds of Negotiable Instruments – Dishonor and discharge of Negotiable Instrument.

UNIT IV

Company Law – Meaning, Definition, Formation of Company, Rights, Duties and Liabilities of Directors, Winding up of Company.

UNIT V

The Consumer Protection Act 1986. The Information Technology Act 2000 - Right to Information Act. Securities and Contracts Regulations Act 1956 - SEBI Act 1992. Depository Act 1996 - Foreign Exchange Management Act 1999. Competition Act 2005

Reference Book:

1. N.D.Kapoor, Mercantile Law – Sultan & Sons
2. Vakul Sharma, Cyber Law – Mac Milan
3. Akhileshwar Pathak, Legal aspects of business- Tata McGraw-Hill
4. Relevant Bare Acts



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47 MANAGEMENT ACCOUNTING

UNIT I

Basics of accounting – concepts and conventions – Management Accounting– Definition, Nature and Scope – Functions – Role of Management Accounting – Tools of Financial Analysis and Planning.

UNIT II

Preparation of Trial Balance, Trading Account, Profit and Loss Account and Balance Sheet of Business units.

UNIT III

Interpretation and Analysis of Financial Statements - Comparative Statement, Common Size Statement, Trend Analysis, Ratio Analysis– Liquidity, Profitability, Turnover and Proprietary Ratios – Interpretation of Ratios – Application to Decision Making – Uses and Limitation – Fund Flow and Cash Flow Statement

UNIT IV

Concept of Marginal Cost – Contribution – Applications of Marginal Cost, Cost Volume Profit analysis -decision making- make or buy, own or lease. Activity – Based Costing (ABC).

UNIT V

Standard costing and variance analysis- material and labour overhead- Budget and Budgetary control reporting various budgets - flexible budgets - ZBB.

Note: The Proportion between theory oriented and Problem oriented questions in the University examination shall be 20:80.

Reference Books:

1. Manmohan &S.N.Goyal, Principles of Management Accounting, Sahitya Bhavan Agra, 2000.
2. Jain & Narang – Advanced Accounting, Kalyani Publishers New Delhi
3. M.Y.Khan and Jain – Management Accounting, Tata McGraw Hill Publishing Co Ltd.,
4. T.Ramachandran – Accounting & Financial Management, Scitech Publications Chennai
5. S.N.Maheswari – Management Accounting, Sultan Chand & Sons, New Delhi



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48 FINANCIAL MANAGEMENT

PSM18CT109-

UNIT I

Nature, Scope and Objectives of Finance Function — Role of finance Manager.
Sources of long term finance-Equity Shares, Preference shares, Debentures, borrowing from lending institutions- short term financing through money market, International sources of Financial Instruments.

UNIT II

Capital budgeting- Concept- Significance- Methods of appraisal- Pay back method, Average return, Net present value, Internal rate of return - Simple Problems.

UNIT III

Cost of Capital- Significance-Concept-Cost of debt, Equity, Preference share Capital, Retained Earnings, and Weighted Average cost of Capital.

UNIT IV

Capital Structure- Determinants - Optimal Capital Structure- Capital Structure theories- Net income approach- Net operating income approach - MM approach - Dividend policies- Types – Dividend theories - Valuation under Gordon and Walter Theory - MM theory - Factors affecting dividend decisions.

UNIT V

Working Capital Management-Definition –Types of Working Capital, Factors affecting working. Capital requirements - Management of cash - optimum level of cash - stochastic model. Management of receivables. Inventory Management-Inventory Level and Techniques.

Reference Books:

1. IM Pandey – Financial Management, Vikas Publishing Co, New Delhi.
2. S.N.Maheswari – Financial Management, Sultan & Sons, Delhi
3. M Y Khan & P K Jain - Financial Management, Tata McGraw Hill, New Delhi.
4. Prasanna Chandra – Financial Management, Tata McGraw Hill, New Delhi.
5. Van Horne J. Financial Management & Policy Pearson Education, Delhi 2002.



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49 Research Methodology and IPR

PST18MC101

Course Outcomes:

At the end of this course, students will be able to

Understand research problem formulation.

Analyze research related information

Follow research ethics

Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.

Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasize the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.

Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

Syllabus Contents:

Unit 1:

Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations

Unit 2:

Effective literature studies approaches, analysis Plagiarism, Research ethics,

Unit 3:

Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee

Unit 4:

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

Unit 5:

Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent

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information and databases. Geographical Indications.



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Unit 6:

New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

References:

- Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students"
 - Wayne Goddard and Stuart Melville, "Research Methodology: An Introduction"
 - Ranjit Kumar, 2nd Edition, "Research Methodology: A Step by Step Guide for beginners"
 - Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd, 2007.
 - Mayall, "Industrial Design", McGraw Hill, 1992.
 - Niebel, "Product Design", McGraw Hill, 1974.
 - Asimov, "Introduction to Design", Prentice Hall, 1962.
 - Robert P. Merges, Peter S. Menell, Mark A. Lemley, "Intellectual Property in New Technological Age", 2016.
 - T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2008
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50 SURVEYING AND CONSTRUCTION MATERIALS

PST18DE010

UNIT I – INTRODUCTION AND CHAIN SURVEYING 8

Definition - Principles - Classification - Field and office work - Scales - Conventional signs - Survey instruments, their care and adjustment - Ranging and chaining - Reciprocal ranging - Setting perpendiculars - well - conditioned triangles - Traversing - Plotting - Enlarging and reducing figures.

UNIT II – COMPASS SURVEYING, LEVELLING AND APPLICATIONS 12

Prismatic compass - Surveyor's compass - Bearing - Systems and conversions - Local attraction - Magnetic declination - Dip - Traversing - Plotting - Adjustment of errors - Level line - Horizontal line - Levels and Staves - Spirit level - Sensitiveness - Bench marks - Temporary and permanent adjustments - Fly and check levelling - Booking - Reduction - Curvature and refraction - Reciprocal levelling - Longitudinal and cross sections - Plotting - Calculation of areas and volumes - Contouring - Methods - Characteristics and uses of contours - Plotting - Earth work volume

UNIT III – ENGINEERING SURVEYS 12

Reconnaissance, preliminary and location surveys for engineering projects - Lay out - Setting out works - Route Surveys for highways, railways and waterways - Curve ranging - Horizontal and vertical curves - Simple curves - Setting with chain and tapes, tangential angles by theodolite, double theodolite - Compound and reverse curves - Transition curves - Functions and requirements - Setting out by offsets and angles - Vertical curves - Sight distances

UNIT V – CONSTRUCTION MATERIALS 9

Stone as building material – Criteria for selection – Tests on stones – Deterioration and Preservation of stone work – Bricks – Classification – Manufacture of clay bricks – Tests on bricks – Compressive Strength - Water Absorption – Efflorescence – Bricks for special use – Refractory bricks – Cement and Concrete hollow blocks – Light weight concrete blocks - Lime – Preparation of lime mortar – Cement. Ingredients – Manufacturing process – Types and Grades – Properties of cement and Cement mortar – Aggregates – Natural stone aggregates – Industrial by products – Crushing strength – Impact strength – Grading – Sand – Bulking

TEXT BOOKS:

- 1) R. K. Rajput, "Engineering Materials", S. Chand & Company Ltd., 2000.
- 2) M. S. Shetty, "Concrete Technology (Theory and Practice)", S. Chand & Company Ltd., 2003
- 3) Kanetkar T.P., Surveying and Levelling, Vols. I and II, United Book Corporation, Pune, 1994.
- 4) Punmia B.C. Surveying, Vols. I, II and III, Laxmi Publications, 1989



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51 BASIC RELEVANT OF YOGIC SCIENCE - I

UNIT - I

Basic Sanskrit – I: Orthography of Devanagari Varnamala, classification of varnas, Purnakshara, Samyuktakshara, Karakas and Mrduvyanjanas, writing of Varnamala using Roman transliteration - Sanskrit words – classification of Sanskrit words, Subantas - AjanthaandHalanta words, Genders, Vachanas, cases of subanta words.

UNIT - II

Declaration -of the following words in cases – Rama, Hari, Guru,Lata, Mati, Dhenu, Phala, Vari, Gau,Asmad, Yushmad, Tad, Kim.Kriyapada in Sanskrit – Classification, Lakaras, Purushas, Vachanas. Declaration of the following root words in Lat, Lan, Lrt, Lot and Vidhi Lin –Bhu, Khad, Vad, Dhyai, Path, Sev, Kshi, Pracch, Tus, Kath, Chint, Kr.

UNIT - III

Basic Sanskrit – II: Avyayas in Sanskrit – Ca, Api, Va, Na, Vina, Saha, Tu, Kintu, Eva, Evam, Iti, Ittham, Athra, Iha, Tada, Gatva, Krtva, Labdhwa, Jitva.Upasargas – Pra, Para, Apa, Sam, Anu, Ava, Nis, Nir, Dus, Dur, Vi, Aa, Ni, Adhi, Api, Ati, Su, Abhi, Prati, Pari, Upa, Antar, Avir, Tiras.Sandhis –Savarnadhirgha, Vrddhi, Guna, Ayadhi, Stutva, SchutvaNipatas-Cha, Va, Api, Kim, Chiat, Ma Chana, Sma.Elementary knowledge of voices in Sanskrit – Active, Passive, Impersonal. Compound words – Tatpuruasha, Karmadharaya, Dvigu, Dvandva, Bhahuvrihi, Avyayibhava, Karakas – its use in Sanskrit.

UNIT - IV

Study of the following chapters of Bhagavad-Gita: Sankhya yoga according to Bhagavad-GitaChapterII - Karma yoga according to Bhagavad-Gita Chapter II - Karma yoga according to Bhagavad-Gita Chapter VI - Dhyana yoga according to Bhagavad-Gita Chapter VI.

UNIT - V

Schools of Yoga: Rajayoga, Hathayoga, Jnanayoga, Karmayoga, Mantra yoga, Bhaktiyoga.

Reference Books:

1. Anantarama Sastri, Shabda Manjari, R.S.Vadhyar& Sons, Palghat -678003.
2. L.Anantarama Sastri, Dhatu Manjari, R.S.Vadhyar& Sons, Palghat -678003.
3. Appayyadikshitha, LaghusiddhantaKaumudi, Chaukamba Oriental Series, Varanasi221001
4. Omananda Tirtha, Patanjala Yoga Pradeepa, Geeta Press, Gorakhpur.273005.
5. H.Kumar Kaul(1994), Aspects of Yoga, B.R.Publishing Corporation, Delhi 700014.



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52 METHODS OF NATUROPATHY

UNIT - I

Yoga philosophy; The four streams of yoga; Concept of yoga and health; Yoga posture for health;

Pranayama and its Medical significance; Meditation and mind; Kriyas and their Medical Significance.

UNIT - II

Philosophy of Naturopathy; Principles of Naturopathy; methods and practice of treatment in Naturopathy; Fasting, Hydrotherapy –spinal bath, hip bath, steam bath, enema, and full wet pack.

UNIT - III

History of Naturopathy; Role of Yoga and Naturopathy in the prevention and treatment of disorders

of the present times. Methods of Naturopathy; Control of diet; Fasting; Mud therapy; Magneto therapy.

UNIT - IV

Special Features of Colour Therapy; Effects of colours on the Mind and body; Preparation and use

of Colour charged Medicines; and Massage therapy- Natural method of cleaning the body natural

and health preserving dress- natural and healthy sleeping places.

UNIT - V

The basic knowledge of Acupressure-theory of Acupressure-identification of points Acupressure-

Therapeutic use of Acupressure; benefits of acupressure; Acupressure treatment for common diseases.

Reference Books:

1. Prof. M. Venkata Reddy (3008): Scientific Studies on Yoga, Hyderabad, A P Yogadhyayana Parisad.
2. V.M.Kulkarni (1986), Naturopathy the art of drugless healing, Srisatguru publication, Delhi.
3. Dr.Tulasirao Ratti(3012), Philosophy of Yoga and Naturopathy, Lambert academic publication, Germany,
4. Swami Satyananada Saraswati(1992), Yogic Management of Common Diseases, Bihar School of Yoga, Munger, Bihar.
6. Swamy Kuvalyananda-: Principles of Yoga therapy, SMYMSamathi, Kaivalyadhama,



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53 CLASSICAL YOGIC PRACTICES AND APPLIED PHYSIOLOGY PRACTICUM - I

UNIT – I

Loosening Exercise Loosening the joints, Joint freeing series - Surya Namaskar: (Bihar school of

yoga 12 Steps) – Prayer, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness, Contra-indication, and Benefits. Procedure, Breathing technique, Awareness, Contraindication,

Benefits, Type and Category of each asana. Ardha chakrasana, Padma hastasana,

Trikonasana, Ekapadasana. Padmasana, vajrasana, Ustrasana,

Pachimotanasana. Utthanapadasana,

Arthahalasana, Savasana. Bhujangasana, Shalabasana, Makrasana.

UNIT – II

Pranayama: Name, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness,

Contra-indication, Benefits, Type and Category of each one - Pranayama: Surya nadi, Chandra nadi,

suryabhedhana, Chandra bhedhana, Nadisudhi.

Kriyas and Bandha: Name, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness, Contra-indication, Benefits, Type and Category of each one

Kriya – Kapalabhati, Vamanadhauti.

Bandha: Jalandhara Bandha, Moola Bandha, Uddiyana Bandha.

UNIT – III

Mudra and Relaxation Technique: Name, Meaning, Definition, Guidelines, Procedure, Breathing

technique, Awareness, Contra-indication, Benefits, Type and Category of each one - Mudras: Chin

mudra, Chin maya mudra, Adi mudra, Brahma mudra, Bhairava mudra,

Bhairavimudra. Relaxation

Technique: Instant Relaxation Technique, Quick Relaxation Technique.

UNIT – IV

Measurement of Temperature, Pulse rate, Respiratory rate - Measurement of Blood Pressure - Muscle Examinations

UNIT – V

Sensory functions – Examinations, Identification of a specimen organ and explain its functions.

Reference Books:

1. Arthur C. Guyton & John Edward Hall (2006) Textbook of Medical Physiology, Florida, United States, Elsevier Standards

2. Surinder H Singh & Krishna garg, (2008) Anatomy and Physiology for nurses & allied health sciences, New Delhi CBS publishers

3. Sivarama Krishnan S (2006) Anatomy and Physiology for Physical Education, New Delhi, Friends Publications.



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54 PROFESSIONAL PREPARATION FOR COMPETITIVE EXAMS

UNIT-1

Teaching and Research Aptitude: Concept, Objectives, Levels of teaching (Memory, Understanding and Reflective), Characteristics and basic requirements. Learner's characteristics: Characteristics of
ado• Research: Meaning, Types, and Characteristics, Positivism and Post- positivistic approach to research. Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods. Steps of Research adolescent and adult learners (Academic, Social, Emotional and Cognitive), Individual differences.

UNIT-2

Communication: Communication: Meaning, types and characteristics of communication. Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication. Barriers to effective communication, Mass-Media, and Society. Information and Communication Technology: ICT: General abbreviations and terminology, Basics of Internet, Intranet, E-mail, Audio and Video-conferencing. Digital initiatives in higher education. ICT and Governance.

UNIT-3

Mathematical and Logical Reasoning: Types of reasoning: Number series, Letter series, Codes and Relationships. Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition. Evaluating and distinguishing deductive and inductive reasoning Analogies.

UNIT-4

Data interpretations: Sources, acquisition, and classification of Data. Quantitative and Qualitative Data. Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart, and Line-chart) and mapping of Data. Data Interpretation. Data and Governance.

UNIT-5

Higher Education System: Institutions of higher learning and education in ancient India. Evolution of higher learning and research in post-Independence India. Oriental, Conventional and Nonconventional learning programmes in India. Professional, Technical and Skill Base dedication. Value education and environmental education. Policies, Governance, and Administration.



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55 PATANJALI YOGA SUTRAS

UNIT: I

Introduction to Samadhi Pada Sadhana Pada Vibhuti Pada Kaivalya Pada. Concept of Chitta, Chitta-Bhumis, Chitta-Vrittis. Abhyasa and Vairagya as the tools, Concept of Bhavapratyaya&Upaypratayaya, SadhanPanchak, Chitta-Vikshepas (Antaraya), EktattvaAbhyasa,Chitta-prasadanam. Concept of Ishwara and attributes of Ishwara, Process of Ishwarapranidhana.

UNIT: II

Concept of Kriya Yoga, theory of Kleshas; Concept of Karmashaya and Karmvipaka, Nature of dhukha, Concept of Chaturvyuhavada, DrishyanirupanaDrasthanirupanam, Prakriti-Purusha Samyoga.

UNIT: III

Ashtanga Yoga; Yama- Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi.

Concept of Vitarka&Mahavrata.

UNIT: IV

Nature of Sanyama; Concept of Chitta samskara, Parinamatrayaandvibhutis.Five means of Siddhis, concept of NirmanChitta,

UNIT: V

Importance of siddhis achieved through Samadhi, Four types of Karmas; Concept of Vasana; Dharmamegha Samadhi and its result, VivekaKhyatiNirupanam, Kaivalya Nirvachana.

Reference Books:

1. Desikachar (1995) The heart of yoga Researcher: Inner Traditions International.
2. Desikachar (2008) Reflections of yoga sutras of patanjali, Chennai:T. Krishnamacharya yoga mandiram.
2. Swami prabhavananda (2002) patanjali yoga sutras madras: sri Ramakrishna math.



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56 TRADITIONAL INDIAN SYSTEMS OF MEDICINE AND THERAPIES

UNIT-1

Origin of Ayurveda – Aim and importance of Ayurveda , Philosophy and goals of Ayurveda, Unique

Approach of Ayurveda – Ayurveda texts, chakra samhita, Sushruta Samhita, Kashyapa Samhita,

Rasatantra, Unique features of Ayurveda – Hygienic principles of Ayurveda (Dhinacharya)- Five

elements of Ayurveda Doshas, Gunas, Dhatus, Upahatus, Eight Categories or branches of treatment

– Nadisvijana – Nadis and Chakras,- Characteristics of different prakritis- causes of diseasemethod

of disease examination – Ayurveda diet.

UNIT II:

Ayurveda effects of yogic principles & therapies – Ayurvedic purification practices – Panchakarmavamanam,

virechanam, basti, Anuvasana, Nasya, Rakta Moksana- Abhyanga, Swedanam, Nasayam, Njavarakizhi, Pizhichil.

UNIT III:

History and concepts of Siddha medicine: Principles of Siddha Medicine System, Five Elements

Theory, Three Biological Humors, Seven Physical Constituents, Panchabhudas, Pancha Koshas,

Types of Siddhas Medicine, Importance of Karakalpak, Kitchen and herbal medicine, Diet Regulations, Varmam and Thokkanam, Treatment of siddha Medicine for life style diseases.

UNIT IV:

Concept of Naturopathy, Principles of Naturopathy, Methods of Naturopathy: Diet, Fasting, Treatment by earth, water treatment, Treatment by rays, Massage.

UNIT V:

Acupuncture, Acupressure, Exercise therapy, Physiotherapy, Music therapy, Color therapy, Magneto Therapy, Reiki.

Reference Books:

1. Balakrishnan Acharya (2006) Ayurveda its principles and philophies, Hardwar, Divya Prakashan.
2. Atharale V. B. (1980) basic principles of Ayurveda, Bombay, Pediatric Clinics.
3. Frawley David (2000) Yoga and Ayurveda Delhi: Motialbanarsidass publishers Pvt Ltd.
4. Balakrishnan Acharya (2012) A practical approach to the science of ayurveda, Haridwar: Divya prakashan
- 5, Frawley David and Sandra summer field kazak (2011) yoga for you type new delhi: new agebooks.



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57 CLASSICAL YOGA PRACTICES – III

UNIT I:

Essentials of Yogic Practices: Emptying the bowels and stomach counter pose, contra-indications,

duration, straining, special provisions for women and patients, fitness, posture, side effects, pregnancy women, Group yoga, Individual yoga.

UNIT II:

Loosening Exercise (Pawanamuktasana series 2) and Surya Namaskar (Surya Namaskar: for children 10 Steps, Vivekananda Kendra Model) -Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness, Contra-indication, and Benefits.

UNIT – III

ASANA: Name, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness,

Contra-indication, Benefits, Type and Category of each asana.

Garudasana, Utkarasana, Arthabathapadahastana, Nadrajasana, Utkatasana,

Arthachandrasana, Matsyendrasana, **AkarnaDhanurasana, Vajra**

KapotasanaPadmaMatsyendrasana, Lingasana, Koormasana, Kandarasana, Sarvangapadmasana, Savasana, Poovabujangasana, Adhomukhamandukasana, ParsvaDhanurasana.

UNIT - IV

Pranayama and Kriyas: Name, Meaning, Definition, Guidelines, Procedure, Breathing technique,

Awareness, Contra-indication, Benefits, Type and Category of each one.

Pranayama: Seetali, Seethkari, Sadhantha, Dog Breathing, Murcha Pranayama, Nadisudhi, ujjayi

pranayama.

Kriya: laghuprakshalana, laghushankhaprakshalana.

Bandhas: Jalandhara Bandha, Moola Bandha, Uddiyana Bandha, Maha Bandha.

Mudras: Ganeshamudra, Ashwini mudra, Vipareetakarani Mudra, Nasiga mudra, Mahamudra.

UNIT V:

Meditation: Rajayoga meditation, Trataka Meditation, Soham Meditation, Walking Meditation.

Reference Books:

1. Iyenger B.K.S (1976) Light on yoga, London, Unwin paperbacks
2. Sivananda Sarawathi swami (1934) Yoga Asanas Madras: My magazine of india.
3. Satyanadasarawari swami (2008) Asana, Pranayama, Mudra, Bandha, munger: Yoga publications trust.
4. Iyenger B.K.S (2008) Light on pranayama, New Delhi Haper Collins publishers India.
5. Yogeshwaranandsaraswathi swami (1975) First steps to higher yoga, Gangothari: Yoga nicketan trust.



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58 CLINICAL APPLICATIONS IN TRADITIONAL SYSTEMS OF MEDICINES AND THERAPIES

UNIT-I

Methodology in yoga therapy- Factors (Heyam, Hatu, Hanam and Upayam), Methods (Darsanam, Sparsanam, Prasnam and Nadipariksa) Examination of Vertebra, Joints, muscles, Abdomen and Nervous System and therapeutic yoga practices-Modification of Yogic practices.

UNIT-II

Application of traditional Indian medical systems and therapies: Ayurveda- Doshas, Dinacharya, Ayurvedic Diet, panchakarma therapy, Siddha – Five elements theory, Physical constituents' pathology (Kayakalpa, kitchen herbal and other types of medicine) Varmam and Thokkanam: Exercise therapy Music therapy, Pranic Healing, Magnetotherapy, Naturopathy and Modalities of Naturopathy, Reflexology.

UNIT-III

Therapeutic Applications for High Blood Pressure, Obesity, Diabetes, Mellitus, Asthma, Sinusitis, Migraine, Arthritis, Back pain, Thyroid problems, Constipation, Impotency, Stroke, Epilepsy, Parkinson's disease, sleep disorders, skin diseases, insomnia, Anaemia.

UNIT-IV

Therapeutic applications for psychological disorders: Neurosis: Stress, Depression, autism, eating disorders, Psychosis: Schizophrenia, autism, bipolar disorders, dementia, Personality Disorders: Paranoid, histrionic, drug addicts-Smoking, Alcoholism, Gambling-Anti-social activities.

UNIT-V

Therapeutic applications for the problems of women-Amenorrhoea, Dysmenorrhoea, Menorrhagia, Hypomenorrhoea, Oligomenorrhoea, Polymenorrhoea, Leucorrhoea, uterus related problems, miscarriage, pregnancy- pre and post-natal care, PCOS.

Reference Books:

1. Balkrishna Acharya (2006) Aayurveda is principles of and philophies, Hadwar: DivyaPrakashan.
2. Atharale V.B. (1980) basic principles of Ayurveda, Bombay: Pediatric clinics.
3. Frawley David (2000) yoga and Ayurveda Delhi: Motilalbanarsidass publishers pvt .Ltd,
4. Balkrishna Acharya (2012) A practical approach to the Ayurveda, Harida: DivyaPrakashan.
5. Frawley David and Sandra Summerfield kozak (2011) Yog For Your Type New Delhi: New Age Books,



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59 HATHA YOGA TEXT - II

UNIT- I

Aim & objectives, misconceptions about Hatha yoga, prerequisites of Hatha yoga (dashayama and dasa niyama), Sadhaka and Badhaka tattvas in Hatha yoga; Concept of Ghata, Ghatashuddhi, Concept and importance of Shodhana kriyas in Hatha yoga; Importance of Shodhana kriyas in health and disease; Concept of Matha, Mitahara, Rules & Regulations to be followed by Hatha Yoga Sadhakas.

UNIT – II

Asanas in Hatha Texts: Definition, pre requisites and special features of Yoga-asana; Asanas in Hatha Pradeepika, Hatha Ratnavali, Shiv Samhita, Vasishtha Samhita, Gheranda Samhita-benefits, precautions, and contra indications of different Asanas;

UNIT- III

Pranayama in Hatha Texts: Concept of Prana and Pranayama; Pranayama-its phases and stages; Prerequisites of Pranayama in Hathayoga Sadhana; Pranayama in Hatha Pradeepika, Gheranda Samhita; Shiv Samhita, Vashishtha Samhita-benefits, precautions, and contra indications of different Pranayama.

UNIT- IV

Mudras and Bandhas: Concept and definition of Bandha and Mudras in Hatha Pradeepika, Hatha Ratnavali and Gheranda Samhita; Shiv Samhita, Vashishtha Samhita- benefits, precautions, and contra indications.

UNIT- V

Other Practices: Concept, definition, benefits, and Techniques of Pratyahara, Dhyana in Gheranda Samhita; Concept and benefits of Nada and Nadanusandhanain Hatha Pradeepika, Four (stages) Avasthas of Nadanusandhana; Relationship between Hatha Yoga and Raja Yoga; Goal of Hatha Yoga. Relevance of Hatha Yoga in contemporarytimes.

References:

1. Brahma kumaries Jagdish Chander Mount Abu: PBK Ishwarlyavishwavidyalaya.
2. Desikachar (2003) Nathamuni's yoga Rahasya, Chennai: Krishnamacharya yoga Mandiram.
3. Desikachar (2004) Yoga Yajnavalkya Samhita, Chennai: Krishnamacharya yoga Mandiram.
4. HausthulDesikachar (2016) The Hota yoga pradipika,'Chennai: Madia Garuda.



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60 APPLIED YOGA

UNIT I:

Yoga: Nature, Need, Philosophy, History and Scope of Yoga - Modern Developments- Misconceptions and clarifications of Yoga- Paths of Yoga- Ashtanga yoga- Schools of Yoga

-

Importance of yogic practices - Benefits of Yoga on human systems Yoga for Super-consciousness

- Computer Applications in Yoga

UNIT - II

Contributions of texts to Yoga: Vedas, Upanishads, Tantra, Bhagavad Gita, Yoga vasishtha, Prasthanatrayee, PurusharthaChatushtaya, Yoga Sutras, Thirumandiram, Yoga Yajnavalkya Samhita, Goraksataka, Hatha Yoga Pradipika, Gheranda Samhita, Siva samhita, Hatha Ratnavali,

Siddha SiddhantaPaddhati, NaradaBhakthi Sutras, YogaRahasya

UNIT III:

Contributions to yoga by Ramakrishna, Swami Vivekananda, Sivananda, Sri Aurobindo, Maharishi

Mahesh Yogi, Swami Rama, Krishnamacharya, Swami Kuvalayananda, Ramana Maharishi, Vcthathiri Maharishi, Swami Dayanand Saraswati, B.K.S.Iyengar

UNIT IV:

Spirituality- Role of yoga on Religions and Spirituality, Value Education, Values- Types of Values

- Methods to promote Values and Spirituality- Methods of teaching: Lesson plans, teaching aids -

usage of props- Guru-Shishya Parampara.

UNIT V:

Yoga and Psychology- Facets of psychology and yoga - Yoga for psychological qualities - Yogic

practices for various age groups - Yogic practices for various professionals - Yoga and Women -

Yoga and Sports - Yoga and Mind - Nadis and chakras - Role of Yoga on personality development.

Reference Books:

1. Brahma Kumaris Jagdish Chander Mount Abu: PBK Ishwariyavishwavidyalaya.
2. Desikachar (2004) Yoga Yajnavalkya Samhita, Chennai: Krishnamacharya Yoga Mandiram
3. HaustulDesikachae (2016) The Hatha Yoga Pradipika, Chennai: Madia Garuda
4. Subramanian (2003) The Yoga vasishta, Chennai: Sura Books (Pvt) Ltd
5. Swami Gambirananda (2008) Eight Upanishads Kolkata: Advaita Ashrama



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61 AREA OF DISSERTATION

UNIT - I

Front materials of the research work: Title, front page, certificate by the supervisor, declaration by the scholar, curriculum vita, dedication, acknowledgements, Table of contents, list of tables, list of illustrations, list of appendices. Introductory chapter: justification and usefulness of the topic, objectives of the study, statement of the problem, hypothesis, significance of the problem, delimitations, meaning and the definitions of the terms.

UNIT - II

Review of related literature: types of reviews, studies on independent and dependent Variables, methodology; selection of subjects (sampling, sampling design selected), selection of variables (justification for selecting independent and dependent variables), experimental design selected, pilot study, criterion measures, reliability of data, reliability of instruments, tester's reliability, subject reliability, orientation of subjects, training procedure, scheduling, tests administered.

UNIT - III

Collection of data, statistical techniques used, data process, analysis, and interpretation. test of significance, level of significance, results of dependent variables, discussions on hypothesis.

UNIT - IV

Criteria (validity, reliability, representatives, generalizability) fulfilled summary, conclusions and recommendations for practitioners, government and society, back materials; bibliography, appendix.

UNIT - V

Mechanics of writing the research report: font size, space, paper, margin, pagination, numbers and symbols, binding, language, grammar, spelling, uses of computer, qualities of the scholar improved, supervisor's role, experience gained in doing the research work.

References:

1. Best w john and james v leahn(1996) research in education, new Delhi: prentice_ hall of India pvt. Ltd,
2. Kothari C. R. (1985) research methodology new delhi: wiley eastern limited.
3. Clarke david. H and Clarke H, Harrison (1984) research processes in physical education, new jersey: prentice hall inc.,
4. Thirumalaisamy(1998) statistics in physical education, karaikudi: senthilkumar publishers'
5. Thomson AL, (1986) the art of using computers, boyd&frasherboston: publishing co.,



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YOGA IN EDUCATION

UNIT-I

Education Meaning- Definition- Need, Aim and Objectives- Ways for Education- Pillars- Scope.

UNIT-II

Education in ancient times Modern Education- Sex Education- Relationships of Education. Yoga

Physical Education and Psychology.

UNIT-III

Education Psychology

Pedagogy – Theories of pedagogy

UNIT-IV

Life Skills

UNIT-V

Basic and Higher Education, Issues and Challenges in Indian Education, Careers of Yoga Field –

Avenues of Placements – Teaching Career – Coaching Career – Fitness and Health related Career

– Therapy related Career – Research Laboratories - Fellowship – UGC – State Cooperation.

References:

1. Swami Sivananda (2007) Health and Hygiene Sivanandangar: The Divine life society.
2. Lily Pritam Telu Ram (1981) Health and Hygiene Delhi: Vikas publishing House Pvt Ltd.
3. Raghavan (1965) Hand book of health education karaikudi: Meenal enterprises.
4. Sunitha pant Baasal (2008) Diet in diseases Delhi: pustak mahal.
5. Yoga charyasundaram (2004) diet and digestion Coimbatore; The yoga publishing house.
6. Syd Hoare (1986) keep fit, Hodder and Stoughton: Teach yourself book.
7. Swami Sivananda (2011) Health and diet, shivananda Naga: The divine life society.



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62 COMPUTER PROGRAMMING

UNIT – I

MS-WORD: Create advertisement in MS WORD, to illustrate the concept of mail merging in word.

Document creation with scientific notation, Text manipulation with scientific notation, Table creation, table formatting and conversion. Mail Merger and letter preparation, Drawing and Flow

Chart. Show the different effect for the given text in the document. Create a table of employee and

calculate the next salary. Design a table with merge cells and split cells technique.

UNIT - II

SPREAD SHEET: To create a Spread Sheet to analyze the marks of the students in class and to

create appropriate charts. Charts in Spread Sheets Formula and Formula Editor, Inclusion of objects,

pictures and graphics protecting the document and sheet. Sorting and import/export features. Create

suitable chart to show the census data in Indian Sports. Create a suitable chart to show the students

average in the class. Create an electronic spread sheet of student marks, and find the total, average

and respective class secured by each student. Generate the numbers vertically starting from 10 to

100 with step value 5.

UNIT - III

POWER POINT: To create the presentation for the department using the power point.

Animation

in Power point Presentation, Designing the Power point Presentation, Timing for the slides in Power point Presentation, Back ground designing in Power point Presentation. Designing the Power point Presentation using audio and Video.

UNIT – IV

INTERNET LAB: Browsing a Web Site. Composing and sending a mail

UNIT – V

Forwarding and replying to mails. Downloading Articles / Web content. Literature survey using

search enquires

References:

1. Venugopal " Fundamentals of Prentice All India.
2. Sudharsan C & John Manojkurnar Computer Fundamentals., RBA publication, Chennai
3. Dromwey, how to solve it by computer, Tata Mcgraw, Gill.



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63 FUNDAMENTALS OF YOGA THERAPY

UNIT-1

Therapy: Meaning – Classification-Benefits – Paths of Yoga Therapy – Goal – Principles – Essence – Nature of Yoga Therapy.

UNIT-2

Origin of Yoga Therapy – History of Yoga Therapy – Evolution of Yoga Therapy – Foundation of Yoga Therapy.

UNIT-3

Health: Goal of Life – Adhi and Vyadhi – Klesha – Factors affecting health – Stages of development of disease – Yogic rules for good health – Dimension of Health – Causes of ill – health – Pillars of health.

Ailments – Pillars of Yoga Therapy – How the Therapy works – Yogic practices and health – How Yogic practices heal.

UNIT-4

Fitness: Meaning, Components and Scope of Fitness – Metabolic Fitness – Role of yoga on Fitness.

Wellness: Meaning & Scope – Components – Yogic Management

UNIT-5

Nutrition – Nutrients – Types of diet – Good and Bad diets – Sattvic diet.

Relationship of health, Fitness, Wellness, Nutrition and Yoga.

References:

1. Brahma kumaries Jagdish Chander Mount abu: PBK Ishwariya vishwavidyalaya.
2. Desikachar (2003) Nathamuni`s yoga Rahasya, Chennai: Krishnamacharya yoga mandiram.
3. HausthulDesikachar (2016) The Hata Yoga pradipika, Chennai: Madia Garuda.
4. Meena Ramanathan (2006) grandasamihitaLonavla: Kaivalyadama S.M.Y.M. Samiti.



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64 FUNCTIONAL ANATOMY AND PHYSIOLOGY

UNIT-1

Tissue cell: Cell structure – group of Tissue – Epithelial tissue, muscular tissue. Connective tissue their functions

The skeletal system – Bones, Joints and Muscles of the skeleton – Tendons and ligaments – their functions.

UNIT-2

The circulatory system – structure of the heart – the cardiac cycle – composition of blood – Blood pressure – Blood vessels – Hematological system – their functions – arteries, veins & capillaries. The Digestive system – alimentary canal – mouth – pharynx – esophagus – stomach –

small and large intestine – the peritoneum- Liver – gall bladder – Pancreas – their functions – metabolism – physiology of digestion. The Respiratory system – The respiratory passages – nose, pharynx, larynx, bronchi, lungs, their functions- oxygen consumption.

Physiology of Respiration

The Endocrine system – Hypothalamus, Pituitary gland – thyroid gland, Parathyroid glandsthymus

gland – adrenal gland – Pineal gland – their functions.

UNIT-3

The Nervous system – The central nervous system – autonomic nervous system – atomic nervous

system – Brain – spinal cord – Sympathetic and parasympathetic systems – their functions – sensory organs.

Skin – eyes – ear – tongue – nose – their functions

Posture – active posture - inactive posture – ideal posture – control of posture

UNIT-4

The urinary system – Kidneys, ureters, bladder, urethra, renal function.

The reproductive system – puberty – menopause – testes, uterus, ovaries – their functions.

UNIT-5

Impact of yogic practices on the anatomy and physiology of different systems of human body –

cells. Bones, joints and muscles, skin.

Hematological and immune system, glands, nervous system, body metabolism. Special senses,

locomotor system.

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1. Arthur C. Guyton & John Edward Hall (2006), Textbook of Medical Physiology, Florida, United States, Elsevier Standards.
2. Surninder H Singh & Krishna Garg, (2008), Anatomy and Physiology for nurses & allied health sciences, Newdelhi CBS Publishers.
3. Sivaramakrishnan S (2006) Anatomy and Physiology for Physical Education, New Delhi, Friends Publishers.
4. Anne Waugh & Alson Graunt (2005) Anatomy and Physiology in Health and Wellness, Allahabad, ChurhcillLivingtone.
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6. Shri Krishna (1985) Notes on Structure and Functions of Human body & Effects of Yogic practices in ti, Mumbai. ICYHC Kaivalyadhama.
7. Dutta Ray (2001) Yogi Exercises, New Delhi: Jaypee Brothers.
8. Shirley Telles (2006) yoga anatomuy, champaign; Human Kinetics
9. Peter L Williams & Roger Waswie (1988) Gray`s Anatomy, Edinburgh: Churcill Livingstone.
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65 BASIC PRINCIPLES OF YOGA THERAPY

UNIT-1 – Principles of ViniYoga

- Definition of ViniYoga
- Srsti Karma
- Siksana Krama
- Rakshana Krama
- Cikitsa mode of application

UNIT-2 – Fundamental Principles of Yoga therapy

- Definition of cikitsa
- Medical System vs Health Management
- Its exact role in health management
- The focus of cikitsa
- Relationship
- Acharya

UNIT-3 – Basic Concepts of Yoga therapy

- Physiology and Pathology in the Yoga – Shastra
- Ahimsa
- Union
- Work with the mind
- Important of breath
- Body – the power tool
- Technique vs effect

Unit-4 – Progression and Individual focus in Yoga therapy

- Starting Point
- Fixing the goal
- Progression
- Coming out of practice
- Yogam and Ksemam
- Kala, desa, vaya, vrtti, sakti
- The nature of ailment
- Isvarapranidhana

UNIT-5 – Basic principle of other alternative medicalsystems

- Physiology and Pathology of Ayurveda
- Ayurveda – fundamental principles, PancaMahabhuta&Tridosas.

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- Ahara niyama; Dietary principles and guidelines for health
- Assesment of Ayurvedic Constitution
- Dinacharya
- Siddha, Acupressure, Pranic healing, Naturopathy, Yogic diet, Physiotherapy, Massage, Acupuncture
- Color therapy, Magneto therapy, Hydro therapy, Fasting therapy.



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1. Translated by TKV Desikarchar, 'Nathamuni's Yoga Rahasya' 1998, Chennai, KYM publications
2. Translated by TkvDesikachar, 'Patanjali's Yoga Sutra'.1987, Chennai, KYM publications
3. TKV Desikarchar with KausthubDesikachar and Frans Moors, 'The Viniyoga of Yoga' 2001, Chennai, KYM Publications.
4. Gopi Warriar and Deepika Gunawant, 'The complete Illustrated guide to Ayurveda' 2000, Elemetn Books Ltd.
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66 YOGIC PRACTICES AND MODIFICATIONS – 1

UNIT – 1

Loosening the joints

Joint freeing series

Suryanamaskar : Vinyasa Suryanamaskar (Kneeling, Lunge, Jumping)

UNIT – 2

Tadasana, Trikonasana, ArdhaChandrasana, UtthitaParshvakonasana, UrdhvaDhnurasana, Utkatasana, Moordhasana, Dhandasana, Pavanamuktasana, Hamsasana, ArdhaSirasana, Ardha

Kati Chakrasana, Ardachakrasana, Veerasana, Namaskarasana, Vakrasana, Malasana, Merudandasana, Janusirasana, Bharadvajasana, Suptavajrasana, Makrasana, ArdhaPadmasana,

Sukhasana, Natrajasana, Savasana.

UNIT – 3 Pranayama: Sectional breathing

Viloma (Surya, Chandra), Anuloma (Surya, Chandra), Pratiloma Pranayama, Surya Bhedana and

Chandra Bhedana

UNIT – 4 Kriya

Shankhprakhshalana, LaghooShankhprakhshalana, Agnisar kriya,

Bhandas:

Jalandhara Banda, MoolaBandha, UddiyanaBhanda

Mudras:

Chin mudra, Chinmaya mudra, Adhi mudra, Bhrma mudra, Bairava mudra, Nasiga mudra, Ganesha mudra, Bhudi mudra, Varuna mudra, Mukula mudra, Khechari mudra, Tadagi

mudra, Shanmuki mudra.

UNIT – 5 Meditation

Japa, Soham&pranavaJapa, Ajapajapa, Anatarmouna, OM meditation, Nadanusandhana

References:

1. Iyengar B.K.S (1976) Light on =Yoga, London, Unwin paperpacks.
2. Sivananda Sarawathi Swamy (1934) Yoga Asanas Madras : My magazine of India.
3. SatyanandaSarawari swami (2008) Asana, Pranayama, Mudra, Bandha, munger: Yoga Publications trust.;
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67 APPLIED PHYSIOLOGY PRACTICALS

UNIT – 1

Measurement of Temperature, Pulse rate, Respiratory rate

UNIT – 2

Measurement of Blood Pressure

UNIT – 3

Sensory functions – Examinations

UNIT – 4

Muscle Examinations

UNIT – 5

Identification of a specimen organ and explain its functions

References:

1. Arthur C. Guyton & John Edward Hall (2006) Textbook of Medical Physiology, Florida, United States, Elsevier Standards
2. Surinder H Singh & Krishna garg, (2008) Anatomy and Physiology for nurses & allied health sciences, New Delhi CBS publishers
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68 COMPUTER APPLICATIONS

UNIT-1

Introduction to computer- definition- type of computer- basic parts - hardware -software - input

and output devices and arithmetic & logic unit control unit -CPU -comparison of human being and

computer

Unit 2

Microsoft Word: title Bar, Menu bar, Standard toolbar bar - formatting toolbar bar - format status bar –task bar creating document -formatting editing – deleting - copying - saving .

Unit 3

Microsoft Excel: title bar- menu bar- standard toolbar- formatting toolbar- format bar creating -

Ruler status bar – task bar – creating document - formatting -editing –deleting- saving -chart and

mathematical operations

Unit4

Microsoft PowerPoint: preparing a slide - animation -clipart -pictures from file background designing- computer and communication – copying- saving- presentation- working with slide adding life printing running a slideshow presentation

Unit 5:

Internet: introduction - History - uses – connection - worldwide web– usage of Internet Explorer -search box -email id - Outlook Express - inbox outbox, sent items draft- sending messages , save, print, reply, forward, previous message and text chatting - role of computer in

teaching the techniques of yoga Research, and data analysis literature collection through internet

References:

1. Venugopal fundamentals of computers practice all India
2. Sudarshan C John Manoj Kumar computer fundamentals RBF Publication
3. Dromwey how to solve it by computer tata Mcgraw, Gill
4. Computer for beginners Vikas publishing house New Delhi



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69 TEXT IN YOGA THERAPY

Unit-1:

Veda

Upanishads

Ishasyopnshad, kena, kath, Mundaka, Mandukya, Aitareya, Taittriya,

Chandongya, Brihadaryanaka, Upanishad

Bhagwadgita

Yoga in Bhagwatgita (chapter 2), Karma yoga (chapter 3), Yoga in (chapter 6), Bhaktiyoga (chapter 12), yogic diet (chapter 14-16), Moksha (chapter 18)

Unit 2:

Yoga sutra, thirumandiram yoga, yajnavalkyasamhitha, yoga rahasya

Unit 3:

Goraksataka, Hatha yoga pradipeeka, Gherandasamhita, Siva samhita, Hatha Ratnavali

Unit 4:

Sushrut Samhita, Charaka Samhita, Manusmriti, Sankhya Darshana, Vyasa Bhashaya,

Vairagyashatak Dhyana yoga prakasa.

Unit 5:

Yoga therapy in swami ramdev's book, mukunda stile's structural yoga therapy, B.K.S.

Iyengar's yoga, the path of Holistic Health, Bihar school of yoga's yogic management of

common disease, krishnamacharya yoga makaranda, chandrashekarana's yoga therapy, swami

sivanandasaraswati, yoga therapy swami kuvaalyananda, yoga therapy svyasa's collection

References:

1. Shenmathakaminninarendhan et al (2008) yoga and pregnancy, Bangalore swami vivakanandayagaprasna

2. Nagrathna & nagendra (2008) Yoga for Bronchial asthma, Bangalore swami vivakananda yagaprasna

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70 TRADITIONAL INDIAN SYSTEMS OF MEDICINE AND THERAPIES

UNIT-1

Origin of Ayurveda – Aim and importance of Ayurveda , Philosophy and goals of Ayurveda, Unique Approach of Ayurveda – Ayurveda texts, chakra samhita, Sushruta Samhita, Kashyapa

Samhita, Rasatantra, Unique features of Ayurveda – Hygienic principles of Ayurveda (Dhinacharya)- Five elements of Ayurveda Doshas, Gunas, Dhatus, Upahatus, Eight Categories

or branches of treatment – Nadis vijnana – Nadis and Chakras,- Charecteristics of different prakritis- causes of disease- method of disease examination – Ayurveda diet.

UNIT-2

Ayurveda effects of yogic principles &theraopies – Ayurvedic purification practices – Panchakarma- vamanam, virechanam, basti, Anuvasana, Nasya, Rakta Moksana- Abhyanga, Swedanam, Nasayam, Njavarakizhi, Pizhichil.

UNIT-3

History and concepts of Siddha medicine: Principles of Siddha Medicine System, Five Elements

Theory, Three Biological Humars, Seven Physical Constituents, Pancha Bhudas, Pancha Koshas,

Types of Siddhas Medicine, Importance of Kayakalpa, Kitchen and herbal medicine, Diet Regulations, Varmam and Thokkanam, Treatment of siddha Medicine for life style diseases.

UNIT-4

Concept of Naturopathy – Principles of Naturopathy – Methods of Naturopathy: Diet, Fasting,

Treatment by earth, water treatment, Treatment by rays, Massage.

UNIT-5

Acupuncture, Acupressure, Exercise therapy, Physiotherapy, Music therapy, Color therapy, Magneto Therapy, Reiki.

References.

1. Balakrishnan Acharya (2006) Ayurveda its principles and philophies, Hardwar, Divya Prakashan.
2. Atharale V. B (1980) basic principles of Ayurveda, Bombay, Pediatric Clinics.
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4. Balakrishnan Acharya (2012) A practical approach to the science of ayurveda, Haridwar: Divya prakashan
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71 CLINICAL APPLICATION IN TRADITIONAL INDIAN SYSTEMS OF MEDICINE AND THERAPIES

UNIT-1

Application of traditional Indian medical systems and therapies.

Ayurveda – Doshas, Dinacharya, Ayurvedic Diet, panchakarma Therapy,

Siddha – Five elements theory, physical constituents, pathology (Kayakalpa, Kitchen Herbal and

other types of medicine), Naturopathy and Modalities of Naturopathy.

UNIT-2

Varmam and Thokkanam, Exercise therapy, Cryo therapy, Acupressure, Acupuncture, Chromo

Therapy, Magneto Therapy, Music Therapy, Pranic healing, Magnetotherapy, Reflexology

UNIT-3

Therapeutic application for: High Blood Pressure, Obesity, Diabetes Mellitus, Asthma, Sinusitis,

Migraine, Arthritis, Back pain, Thyroid Problems, Constipation, Impotency, infertility, stroke,

epilepsy, Parkinsons disease, sleep disorders, skin diseases, insomnia, Anaemia.

UNIT-4

Therapeutic applications for psychological disorders:

Neurosis: Stress, Depression, eating disorders,

Psychosis: Schizophrenia, autism, bipolar disorders, dementia

Personality Disorders: Paranoid, histrionic, drug addicts, smoking alcoholism, gambling, antisocial activities.

UNIT-5

Therapeutic applications for the problems of women- Amenorrhea, Dysmenorrhea, Menorrhagia

Hypomenorrhoea, Oligomenorrhoea, polymenorrhoea, leucorrhoea, uterus related problems, miscarriage, pregnancy-pre and post-natal care, PCOS.

References:

1. Balakrishna Acharya (2006) Ayurveda its principles and philosophies, Haridwar:
2. Divya prakashan.
3. Atharale V.B (1980) basic principles of ayurveda, Bombay: Pediatric Clinics
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72 YOGA THERAPY IN YOGA SUTRAS

Unit: I

Basics and date of the yoga sutra –Raja yoga – notable commentaries- Ashtanga yoga

Yoga- mind – psychic powers.

- 1) Samadhi pada
- 2) Sadhana pada
- 3) Vibhuti pada
- 4) Kaivalya pada

Unit: II

1:1-2, 1:5 to 7, 1:12, 1:17 to 18, 1:30 to 51.

Unit: III

2:1 to 11, 1:23 to 24, 2:28 to 55.

Unit: IV

3: 1 to 9, 3:25 to 38, 3:41, 3:56.

Unit: V

4:1, 4:7, 4:19, 4:34.

References:

1. Desikachar (1995) The heart of yoga Researher: Inner Traditions International.
2. Desikachar (2008) Reflections of yoga sutras of patanjali, Chennai:T. Krishnamacharya yoga mandiram.
3. Swami prabhavananda (2002) patanjali yoga sutras madras: sri Ramakrishna math.
4. Swami :satyanandasarawathi (2005)Four chapters on Freedom, munger; yoga publications Trust.



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73 CLINICAL APPLICATION OF YOGA THERAPY

Unit I

- Vyuham in yoga therapy
- Heyam or the symptoms
- Countering predisposing factors.
- Hetu or the cause
- ❖ **Aggravating factors**
- Hanam or the remedy
- Rellieving factors
- Upayam or the tools
- Importance of regular reviews
- ❖ **Pariksa in yoga therapy**
- In depth study of the diagnostic tools
- Darsanam
- Sparsanam
- Prasanam
- Neetakanta Model; The idel teacher student relationship
- ❖ **Nadi pariksa in yoga Therapy**
- Group classes vs. Individual classes.
- Nadi system- Definition from texts.
- The diffrent of nadipariksa in yoga therapy.
- Methodology of nadipariksa in yoga therapy
- Differences between Nadi pariksa and pulse reading

Unit II Application of Yoga Therapy

Extensive theoretical and practical learning about these dia Gnostic tools.

Specially with respect to:

- The pre requisites for using these tools.
- The exact technique of using these tools
- The limitations of these tools
- The principles involved in inferring information by using these tools
- Application of these tools during therapeutic intervention.

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❖ **Modification an applied to Therapy**

- Modification vs adaptation
- Simplification vs intensification
- From vs function
- Modification of asana
- Modification of meditation
- Modification of chanting.

Unit III

❖ **Therapeutic application of yoga in skeleton- muscular system**

- Low back pain
- Cervical spondylosis
- Spondylosis
- Ankylosing spondylosis
- Osteoarthritis
- Rheumatoid arthritis.



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Unit IV

❖ Therapeutic application of yoga of in digestive system

- Gastritis
- Peptic ulcer disease
- Hernia
- Constipation

❖ Therapeutic application of yoga of in Respiratory system

- Allergic sinusitis
- Asthma
- COPD

❖ The Therapeutic application of yoga in cardiovascular system

- Hypertension
- Circulatory insufficiency
- Varicose veins

Unit V

The Therapeutic application of yoga in Nervous, Endocrine, Urinary, Lymphatic, Reproductive system and sensory Conditions.

- Migraine
- Epilepsy and stokes
- Hypo and Hyperthyroidism
- Irregular periods
- Pregnancy – pre & post-natal care
- Urinary insufficiency
- Lymphatic Edema
- Refractive errors in the eyes.

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1. Balkrishna Acharya (2006) Aayurveda is principles of and philophies , Hadwar:Divya Prakashan.
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6. Vasant Duttatray Lad (2007) Secrets of the pulse The Ancient art of Ayurvedic pulse Diagnosis Delhi: MotilalBanarsidass Publishers Pvt. Ltd.
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74 APPLIED YOGA

Unit I:

Yoga: Nature, Need, Philosophy, History and Scope of Yoga - Modern Development s- Misconceptions and clarifications of Yoga- Paths of Yoga- Ashtanga yoga- Schools of Yoga

- Importance of yogic practices - Benefits of Yoga on human systems Yoga for Superconsciousness

- Computer Applications in Yoga

Unit II:

Contributions of texts to Yoga:

Vedas, Upanishads, Tantra, Bhagavad Gita, Yoga vasishta, Prasthanatrayee, Purushartha Chatushtaya, Yoga Sutras, Thirumandiram, Yoga Yajnavalkya Samhita, Goraksataka, Hatha Yoga Pradipika, Gheranda Samhita, Siva samhita, Hatha Ratnavali, Siddha Siddhanta Paddhati,

Narada Bhakthi Sutras, YogaRahasya

Unit III:

Contributions to yoga by Ramakrishna, Swami Vivekananda, Sivananda, Sri Aurobindo, Maharishi Mahesh Yogi, Swami Rama, Krishnamacharya, Swami Kuvalayananda, Ramana Maharishi, Vcthathiri Maharishi, Swami Dayanand Saraswati, B.K.S.Iyengar

Unit IV:

Spirituality- Role of yoga on Religions and Spirituality, Value Education, Values- Types of Values - Methods to promote Values and Spirituality- Methods of teaching: Lesson plans, teaching aids - usage of props- Guru-Shishya Parampara.

Unit V:

Yoga and Psychology- Facets of psychology and yoga - Yoga forpsychological qualities - Yogic

practices for various age groups - Yogic practices for various professionals - Yoga and Women -

Yoga and Sports - Yoga and Mind - Nadis and chakras - Role of Yoga on personality development.

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References:

- 1) Brahma Kumaris Jagdish Chander Mount Abu: PBK Ishwariya vishwavidyalaya.
- 2) Desikachar (2003) Nathamuni's Yoga Rahasya, Chennai: Krishnamacharya Yoga Mandiram
- 3) Desikachar (2004) Yoga Yajnavalkya Samhita, Chennai: Krishnamacharya Yoga Mandiram
- 4) HaustulDesikachae (2016) The Hatha Yoga Pradipika, Chennai: Madia Garuda
- 5) Meena Ramanathan (2006) Grandasamihita Lonavala: KaivalyadhamaS.M.Y.M.Samiti
- 6) Subramanian (2003) The Yoga vasishta, Chennai: Sura Books (Pvt) Ltd
- 7) Swami Gambirananda (2008) Eight Upanishads Kolkata: Advaita Ashrama
- 8) Swami Ranganathananada (2001) The message of the Upanishads, Mumbai: Bharatiya Vidhya Bhavan
- 9) Venkata Reddy (1932) Hata ratnavali, Arthameru. M.S.R.Memorial Yoga series
- 10) Elangovan R (2016) Fundamentals of Yoga, Chennai: Ashwin Publications



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75 METHODS OF TEACHING YOGA THERAPY

Unit I

Education

Yoga Education, Goal, Scope and importance, Principles of Teaching Yoga- Yogic, psychological, Physiological, Pedagogical, sociological

Meaning of methodology of teaching- factors influencing Methodology, Presentation technique

Role of language, Voice, fluency, clarity and body language in Teaching

Factors of Yoga Education: Teacher, Student and Teaching- Guru- Shishya Parampara

Types of students and teachers- promotion of leadership qualities

Unit II

Methods of Teaching in Yoga Therapy

Lecture method

Response to instruction method (method)

Individualized Instructional Method

Group discussion Method

Directed Practice Method

Project method

Demonstration Method

Lecture cum Demonstration Method

Imitation Method

Dramatization Method

Sources of teaching methods

Unit III

Teaching aids:

Audiovisual aids

Visual aids

Audio aids

Models

Props

Wooden brick and foot rest belt, ropes, slanting plank, chair, stool, bench, Box, the heart rate, ladder stool and drum, bolster and pillow, bandage, weight, the horse, big and small.

Unit IV

Preparing lesson plan- Essentials of a good lesson plan

Advantages of preparing a lesson plan

Contents of a lesson plan

30

Class management- formation of the class

Conducting yoga practical lessons: Precautions and contra-indications of practices

Lesson plan in Yoga Therapy:

Assembly and roll call

Relaxation & prayer

Loosening the joints

Introduction of the practice

Demonstration

Individual practice



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Group practice

Yoga game (if time permits)

Question and answer session

Relaxation

End prayer

Unit V

Organizing yoga class, Yoga therapy camp, workshops in yoga therapy,

Yoga tours

Evaluation

Advantages

Devices of evaluation

References:

1. Gharote M.L and Ganguly S.K (2001) Teaching Methods for yogic practices Lonavla: Kaivalyadhama

2. Sivananda () Yoga teachers training Manual, val morin: Sivananda Ashram Yoga camp

3. Anandamitra (1991) Teachers' Manual Calcutta: Ananda Marga Pracaraka Samgha

4. Thirunarayanan and Hariharan (1975) Methods in Physical Education, Karaikudi

5. Basavaraddi Ishwar (2010) Yoga Teacher's Manual for school teachers, New Delhi: Morarji

Desai National Institute of Yoga



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77 METHODS OF NATUROPATHY

Unit I

Meaning - Definitions - Scope - Principles and Philosophy of Naturopathy- Modalities of Naturopathy: Diet therapy, fasting therapy, mud therapy, hydro therapy, colon hydrotherapy, Massage therapy, air therapy, chromo therapy, Magento therapy, Sun rays

Unit II

Mud therapy: Mud pack, Chest pack, Mud Bath, Mud pack for face, Knee mud pack, Wet-sheet

pack for the whole body, Banana leaf bath

Unit III

Hydro therapy: Enema, Hip Bath, alternative hip bath, Stiz Bath, Spinal Bath, Spinal spray bath, Foot and arm bath, Hot foot bath, Arm bath.

Unit IV

Steam bath

Sunna bath, Sponge bath, immersion bath, Friction bath

Under water massage,

Wet sheet pack, chest pack, knee pack,

Local steam, steam inhalation, Jet spray massages

Color Hydro therapy, Whirlpool bath.

Unit V

Naturopathy Diet (Eliminative, soothing constructive)

Fasting, Sunbath, Air bath, massage

References:

1. Johi, K.S (2008) Speaking of yoga nature-cure Therapy, New Delhi: New dawn press group
2. Bakhren H.K (2011) The complete hand book of Nature cure, Ahmadabad: Jaico publication house
3. Chidarard da Murthy (2011) Yoga and Naturopathy, New Delhi: Central council for research in yoga and Naturopathy



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78 STRESS MANAGEMENT

Unit I

Meaning, Concepts, levels, types, reaction, causes, symptoms, complications, remedies, stress and yoga

Unit II

Sources of stress: internal and external, release of stress

Unit III

Texts on stress

Kleshas and stress

Stress and koshas

Unit IV

Effective stress management- Diet, yogic practices- systems of medicine and therapies

Unit V

Frustration, conflicts and psychosomatic disorders, relationship between body and mind, mental health.

References:

1. Hoyer (1990) Fitness and wellness, Colorado: Morton Publishing company
2. Swami Sivananda (2007) Health and Hygiene Sivanandanagar: The Divine life society.
3. Girija Shyamsundar (2007) Nutrition perspectives Chennai: University of Madras.
4. Lily Pritam Telu Ram (1981) Health and Hygiene, Delhi: Vikas publishing House pvt ltd.
5. Ragavan (1965) Hand book of health educationkaraikudi: Meenal enterprises.
6. Sunita Pant Bansal (2008) Diet in diseases Delhi: Pustak Mahal:



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79 TRADITIONAL INDIAN SYSTEMS OF MEDICINE AND THERAPIES

Unit I

History of yoga therapy- Essence and Principles of Yoga therapy-Philosophy and pathology in the yoga- Shatra-Koshas-doshas-Pancha prana- Application of Yoga and its types- Methodology in Yoga Therapy- Factors (Heyam, Hetu, Hanam and Upayam)- Methods (Daraanam, Sparsanam, Prasanam, Nadi Pariksa) Examination of vertebra, Joints, muscles, Abdomen and Nervous system and therapeutic yoga practices- Modification of yogic practices- Yogic diet for Human systems- Yogic diet- Nadis and Chakras.

Unit II

Application of traditional Indian medical systems and therapies: Ayurveda – Doshas, Dinacharya, Ayurvedic diet, Panchakarma therapy Siddha- Five elements theory, physical constituents, pathology (kayakalpa, kitchen, Herbal and other types of medicine) Varmam and Thokkanam, Exercise therapy, music therapy, cryo therapy, Acupressure, Acupuncture, Chromo therapy, Magneto therapy, Pranic healing, Naturopathy, Modalities of Naturopathy

Unit III

Therapeutic application in Yoga for High blood pressure, Obesity, Diabetes Mellitus, Asthma, Sinusitis, Migraine, Arthritis, Back pain, Thyroid problems, Constipation, Impotency, Infertility, Stroke, Epilepsy, Parkinson's disease, Sleep disorders, Skin diseases, Insomnia, Anaemia.

Unit IV

Therapeutic applications in Yoga for psychological disorders: Neurosis: Stress, Depression, eating disorder, suicide, hysteria Psychosis: Schizophrenia, Autism, Bipolar disorders, Dementia Personality Disorders: Paranoid, histrionic, drug addicts- Smoking, Alcoholism, Gambling- Anti social activities.

Unit V

Therapeutic applications in Yoga for the problems of Women- Amenorrhea, Dysmenorrhoea, Menorrhagia, Metrorrhagia, Hypomenorrhoea, Oligomenorrhoea, Polymenorrhoea, Leucorrhoea, Uterus related problems, Miscarriage, Pregnancy- Pre and Post natal care, PCOS.

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References:

- 1) Balkrishna Acharya (2006) Ayurveda its principles and philosophies Hardwar: Divya Prakashan
- 2) Atharale V.B (1980) basic principles of Ayurveda, Bombay: Pediatric clinics
- 3) Frawley David (2000) Yoga and Ayurveda Delhi: Motilal Banarsidas Publishers Pvt Ltd.
- 4) Balkrishna Acharya (2012) A practical approach to the science of Ayurveda Hardwar: Divya Prakashan



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- 5) Frawley David and Sandra Summerfield kozak(2011) Yoga for your type New Delhi: New age books.
- 6) Vasant Dattatray Lad (2007) Secrets of the pulse the ancient art of Aurvedic Pulse Diagnosis Delhi: Motilal Banarsidass publishers Pvt.ltd.
- 7) Ashwni Yogi (2011) sanatan kriya. The Ageless Dimension, New Delhi: Dhyana Foundation.
- 8) Stiles Mukunda (2009): Ayurvedic Yoga therapy New Delhi: New age books
- 9) Sivananda Swami (2006): Practice of Ayurveda Shivanandanagar: The divine life society.
- 10) Atreya (2000) Ayurvedic Healing for women, Delhi, Motilal Beharsidas.



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80 STATISTICS IN YOGA THERAPY

UNIT-I

Statistics-Basic Concept -Need and Importance of Statistics; Data-Raw and Grouped, Types of data; Concept and Calculations of Measures of Central Tendency-Mean, Median and Mode; Measures of Variability- Range, Mean Deviation, Quartile Deviation and Standard Deviation.

UNIT-II

Introduction To Normal Distribution - Normal Curve - Characteristics of Normal Curve - Properties of Normal Curve - Standard Normal Curve - Problem Based on Normal Distribution - Uses of Normal Distribution.

UNIT-III

Testing Of Hypothesis - Procedure, Types of Hypotheses, Level of Significance, One Tailed and Two Tailed Test, Degrees of Freedom; Test of Significance for Difference of Means- t Test - Independence and Dependence Test, Z-Test; One Way Analysis of Variance.

UNIT-IV

Correlation- Pearson Product Moment Correlation, Spearman Rank Order Correlation, Phi Correlation, Biserial Correlation Partial and Multiple Correlation

UNIT-V

Non-Parametric: Chi Square Test - Equal Occurrence Test, Independence of Attributes, Contingency Coefficient; Graphical Representation - Line Diagram, Bar Diagram- Multiple Bar Diagram, Pie Diagram.

References:

1. Blum, J.R., and Fattu, N.A. 1954. Nonparametric methods. Rev.Educ.Res., 24,467-487.
2. Conover, W.J. Practical Nonparametric statistics, 2nd edition. New York; John wiley& sons, 1980.
3. Gibbons,J.D., and Chakraborti. S., Nonparametric Statistical Inference, 3d ed., New York, Marcel Dekker. 1992.



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81 YOGIC PRACTICES

Unit I:

Essentials of yogic practices, cleanliness and food,bath, time ,sun,closing eyes, place,mirror,breathing,awreness,agelimitation, sequence,blanket,clothes,position ,emotyping the

bowels and stomach counter pose, pregnancy , contra –indication,duration, straining,special provisions for women and patients,fitness,posture , side effects.

Loosening the joints

Surya Namaskar: for children (10 steps)

Bihar School of yoga model

Vivekananda Kendra model

Unit II:

Asanas: Vrksasana, ParivrttaTrikonasana, Virabhatrasana, Garudasana, Padahatasana,Ushtrasana, sirshasana,Halasana, Sarvangasana,Matsyasana,Bhujangasana, Salabhasana, Dhanurasna, Navasana, Nouhasana, Siddha Yoniasana, Artha Matsyendrasana, Pachimottanasana, Baddhakonasana,kukutasana, Padmasana, Vajrasana, Siddhasana, Savasana

Unit III:

Pranayama

Yogic Breathing

Kapalbhati,Bhramari

Ujjayi, Sheetal, Sheetkari, Bhastrika, Nadi Shodhana

Unit IV: Kriyas

Jalaneti, Sutraneti

Bandhas

Jalandhara Bandha, Moola Bandha, Uddiyana Bandha

Mudras

Chin mudra,Chinmaya mudra, adhi mudra, Brama mudra , Bhairava mudra, Bhairavi mudra , Shanmuki mudra, vipareetakarani mudra, yoga mudra ,ashwini mudra, nasiga mudra.

Unit V: Meditation

Yoga nidra, Rajayoga Meditation, Tratakameditation,Chakra Meditation, Nine-centered meditation, Preksha meditation, Mindfulness based stress Reduction Technique.

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References:

- 1) Brahmakumarisjagdishchander mount Abu:PBK Ishwariya Vishwa vidyalaya
- 2) Desikachar (2003) Nathamuni's Yoga Rahasya, Chennai: Krishanmacharya Yoga Mandiram.
- 3) Desikachar (2004) Yoga Yajnavalkya Samhita, Chennai: Krishanmacharya Yoga Mandiram
- 4) HausthulDesikachae(2016) The Hatha Yoga Pradipika, Chennai : Madia Garuda
- 5) Meena Ramanathan (2006) GrandasamhitaLonavala:Kaivalyadhama S.M.Y.M . Samiti.
- 6) Subramanian (2003) The Yoga Vasishta, Chennai: Sutra Books (Pvt) Ltd.
- 7) Swami Gambirananda (2008) Eight Upanishads, kolkatta: Advaita Ashrama
- 8) Swami Ranganathannada(2001) The message of the Upanishads,Mumbai: Bharatiya Vidhya Bhavan.
- 9) Venkata Reddy (1932) Hata ratnavali, Arthameru. M.S.R.Memorial Yoga series.
- 10) Elangovan R (2016) Fundamentals of Yoga, Chennai: Ashwin Publications



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82 APPLIED YOGA

Unit I:

Yoga: Nature, Need, Philosophy, History and Scope of yoga-Modern Development- Misconceptions and clarifications of Yoga- Paths of Yoga-Ashtanga Yoga-School of yoga- Importance of yogic practices – Benefits of Yoga on human systems Yoga for Super-Consciousness-Computer Applications in yoga.

Unit II:

Contributions of texts to yoga:

Vedas, Upanishads, Tantra, Bhagavad Gita, Yoga vasistha, Prasthanatrayee, Purushartha Chatushtaya, Yoga sutra, Thirumandiram, Yoga Yajnavalkya Samhita, Goraksataka, Hatha Yoga

Pradipika, Gheranda Samhita, Siva Samhita, Hatha Ratnavali, Siddha siddhantaPaddhati, Narada Bhakthi Sutras, Yoga Rahasya.

Unit III:

Contributions to yoga by Ramakrishna, Swami Vivekananda, Sivananda, Sri Aurobindo, Maharishi Mahes yogi, Swami Rama, Krishnamacharya, Swami Kavalayanda, Ramana Maharishi, Vethathri Maharishi, Swami Dayanand Saraswati, B.K.S. Iyengar.

Unit IV:

Spirituality- Role of yoga Religions and Spirituality, Value Education, Values- Types of Values-

Methods to promote Values and Spiritually- Methods of teaching: Lesson plans, teaching aids usage of props-Guru-Shishya Parampara

Unit V:

Yoga and Psychology- Facets of psychology and yoga – yoga for psychological qualities- Yogic

practices for various age groups- Yogic practices for various professional- Yoga and Sports- Yoga and Mind- Nadis and Chakras- Role of Yoga on personality development.

References:

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Mandiram. Desikachar (2004) Yoga Yajnavalkya Samhita, Chennai: Krishnamacharya
Yoga Mandiram Haushul Desikachae (2016) The Hatha Yoga Pradipika, Chennai : Madia
Garud



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PSYCHOLOGICAL TESTING AND ASSESSMENT – I

PPS18CP104 - PSYCHOLOGICAL TESTING AND ASSESSMENT - I

Students are required to conduct and record any 08 experiments.

1. Competitive State Anxiety
2. Psychological Performance
3. Locus of Control –Internal/External
4. Life Skills
5. Mental Imagery
6. Extrinsic/Intrinsic Motivation
7. Depth Perception
8. Concentration
9. Sports Specific Personality Inventory
10. Sports Achievement Motivation
11. Reaction Time

REFERENCES:

1. Woodworth, R.S. and Scholsberg (1972), Experimental psychology. Holt, Rinehart & Winston.
2. Anastasi & Susana Urbina (2004) 7th Edition, Psychological Testing, Pearson Education Inc, New Delhi..
3. Parameswaran & Ravichandran. (2003). Experimental psychology. Neel Kamal Publications.



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METHODS AND MEASUREMENT IN PSYCHOLOGY

PPS18DSE01 - METHODS AND MEASUREMENT IN PSYCHOLOGY

UNIT I

Introduction of psychological tests – meaning and nature of psychological testing – defining a psychological test – types of tests – individual vs. group – uses of tests – characteristics of good test – misuse of psychological tests and safeguards to avoid them.– Record writing procedure.

UNIT II

Measurement of educational achievement, intelligence – tests of educational achievement, proficiency tests, diagnostic, tests- tests of intelligence – scales of Stanford- Binet and Wechsler – group tests of intelligence – verbal, non verbal performance tests.

UNIT III

Aptitudes and their testing – meaning global and unitary approaches of aptitude testing, multifactor test batteries – DAT, GATB, other tests of special abilities and professional aptitudes.

UNIT IV

Tests of interest ,values – nature of interest, kinds of interest, different approaches for the assessment of interest, relation between interest and aptitude, Kuder's and strong interest inventories, information about measurement of interest – Types of values and their measurement

UNIT V

Different approaches to the personality, assessment of personality - rating scales, inventories, projective techniques, situational tests.

REFERENCES:

1. Anastasi & Susana Urbina (2004) 7th Edition, *Psychological Testing*, Pearson Education Inc, New Delhi..
2. Parameswaran & Ravichandran. (2003). *Experimental psychology*. Neel Kamal Publications.
3. Woodworth, R.S. and Scholsberg (1972), *Experimental psychology*. Holt, Rinehart & Winston



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SOCIOLOGY OF HEALTH

PPS18DSE03- SOCIOLOGY OF HEALTH

UNIT I - Concept of Health and Illness: Definition of health, Aspects of health – Physical, Social, emotional and spiritual. Definition of disease, natural history of disease, disease classification. Social and preventive medicine, Community health.

UNIT II - Social epidemiology: The development of epidemiology, principles and methods of epidemiology, epidemiological measures. Epidemiology of disease – Man and his environment. Social etiology – Social epidemiology and ecology of disease – Microbial theory – Process of transmission.

UNIT III - Social and cultural context of health behavior: Home remedies – local community healers – traditional health care institutions. Family and health care decisions – women and elderly as health care givers – the traditional support networks and involvement of supportive ties.

UNIT IV - Health Care delivery system: Traditional – Native medicine – Alternate medicine and integrated approach. Health care and agencies: Primary health care centers and sub centers providing primary health care in rural communities. Counseling and counseling techniques.

UNIT V - Policies and Programmes: National health policy, provision of health care in rural and urban communities, Public health programmes; special teams and integrated health and family welfare approach: multipurpose health workers. Medical benefits – ESI, Maternity benefits, death benefit, medical insurance. Integrated programmes for rehabilitation, effective treatment and disability limitation, Immunization.

REFERNCES:

1. Albrecht, Gary L. and Fitzpatric, R. 1994. *Quality of life in Health care: Advances in Medical Sociology*. Mumbai: Jai Press.
2. Andie L. Knuston. 1965. *The Individual, Society and Health Behaviour*. New York: Sage.
3. Coe, Rodney. M. 1970 *Sociology of medicine*. New York: Mc Graw Hill
4. Cockerham, William C. 1997. *Medical sociology*. New Jersey: Prentice Hall.
5. Dak T.M. (Ed.) 1991. *Sociology of Healthin India*. Delhi. Rawat.
6. Fox, Renee C. 1988. *Essays in Medical Sociology: Journeys into the field*. New York: Transaction Publishers.



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ENVIRONMENTAL SOCIOLOGY

PPS18DSE07 - ENVIRONMENTAL SOCIOLOGY

UNIT I - Environment and Society: Population, environment and technology. Poverty and environment.

UNIT II - Gender and Environment – Eco-feminism- Women and water resource management.

UNIT III - Environment and Health: Environmental deterioration and health problems, environmental degradation and diseases.

UNIT IV - Environmental Problems: Land degradation – Deforestation and consequences.

UNIT V - Environmental Pollution: Noise Pollution, air Pollution and water pollution. Environmental protection: Environment movement in India, Environmental laws in India.

REFERENCES:

1. John A. Hannigan, *Environmental Sociology*, Rutledge, London, 1995.
2. Ramachandra Guha (Ed), *Social Ecology*, Oxford University Press, Bombay, 1994.
3. Carolyn Merchant (Ed), *Ecology, Key concepts in critical theory*, Rawat Publications, New Delhi, 1996.



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MOTOR LEARNING AND PSYCHOLOGY OF COACHING

PSPI8DSE05- MOTOR LEARNING AND PSYCHOLOGY OF COACHING

UNIT I

Motor learning Defined: Motor learning as a set of process, learning produces and acquired capability for movement, motor learning is not directly observable, motor learning is relatively permanent – measuring motor learning - performance curves – conditions of practice: distribution of practice, part vs. whole practice.

UNIT II

The Learning Process: Characteristics of the learning process – the law of practice – stages of motor learning – individual differences and motor learning – two theories of motor learning: closed-loop theory, schema theory – factors affecting motor learning: body build, height and weight, strength, endurance, flexibility, balance.

UNIT III

Characteristics of Coach: Personal factors – Knowledge, Philosophy, Role frame- Coaching Context: contextual factors – cultural factors, Resources, and Extraneous factors – Coaching Efficacy and Coach-Athlete relationship

UNIT IV

Philosophy of Coaching: Principles of coaching –different style in coaching – Autonomy Supportive Coaching - Self Determination Theory – The essence of coaching: effective messages sending systems, effective messages receiving systems.

UNIT V

Facilitating Psychological Growth and Development: Psychology of the Young Athlete - Strategies for Structuring Sport Situations to meet the needs of Young Athletes – Character and Sportspersonship: Fairplay, Sportspersonship, Character, Enhancement of Character Development through Sports and Physical Education.

REFERENCES:

1. Paul A. Davis (2016) The Psychology of Effective Coaching and Management, Nova Publishing, New York.
2. Weinberg, R.S., Gould, D (2003) - Foundations of Sport and Exercise Psychology. 3rd Edition, Human Kinetics, Australia.
3. Richard A.S, Lee, T.A (1982)- Motor Control and Learning – A Behavioral Emphasis, 3rd Edition,



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TEAM AND GROUP DYNAMICS

PSP18DSE06 - TEAM AND GROUP DYNAMICS

UNIT I:

Introduction What is team – team Development, team Goals – what is Cohesiveness – team cohesiveness – measurement of cohesiveness – cohesiveness and performance – group cohesion – characteristics of group cohesion – factors affecting group cohesion.

UNIT II:

Groups and Teams What is a group – evaluation structure – communication structure – role structure – group development – intra & inter group processes – group and team dynamics.

UNIT III:

Building a Great Team Create a mission – Team Building – Team Communication - Assessing team qualities & responsibilities – create a motivational action plan – evaluate a team work through constructive feedback – trait of an effective team.

UNIT IV:

Group interaction and integration Cooperation and competition – leadership – group interaction & communication – personal social factors – cohesiveness and group development – achievement factors – attribution for causality – achievement rewards – decision making groups.

UNIT V:

The Sport Team Systematic model for group interaction – personal factors – personality, interpersonal compatibility, individual ability, motivation – environmental factors – nature of tasks – behavioral norms of the group – performance norms in the group.

REFERENCES:

1. Daisy S. (2007) – Psychology of Team Sports, Sports Publications, New Delhi.
2. Mark R. Beachang and Mark A. Eys (2014) –Group Dynamics in Exercise and Sports Psychology, 2nd Edition, Routledge, Taylor and Francis Group, London & New York.
3. Martens, R. (1987) – Coaches Guide to Sport Psychology, Human Kinetics Publishers, Champaign, Illinois



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PPY18DSE02 - SOCIAL PROBLEMS AND ISSUES

- UNIT I Social Problems, Theoretical approaches to Social Problems; Social Problems and Disorganization.
- UNIT II Social Deviance - Crime – Meaning – Types – Theories of Crime – Confinement and Correction of Criminals. Juvenile Delinquency – Meaning – Types – Causes – Characteristics – Factors Involved – Methods of treating delinquents-Corruption
- UNIT III Poverty & Unemployment-Conceptual debate-causes-Rural poverty-Effective measures in poverty alleviation-Unemployment in India-Types-Causes-Consequences-Remedies
- UNIT IV Terrorism – Characteristics – Objective – Origin and Development – Terrorism in India – Terrorism in other countries – Theoretical explanation of - Terrorism – Sociology of Terrorism.
- UNIT V Female foeticide, Female infanticide and Domestic Violence
-Female foeticide –Female infanticide - Causes and Consequences - Possible Solution
- Domestic Violence-Causes-Effects of Domestic Violence

REFERENCES:

1. Robert K. Merton and Robert Nisbet, (ed.) *Contemporary social problems*, Harcourt Brace, New York. 1971
2. Madan G.R. *Indian Social problems* Allied Publisher, New Delhi. 1976
3. Ahuja Ram. *Social problems in India* Rawat Publication, New Delhi. 1999
4. Elliot, Mabel A and Merrill, Francis E., *Social Disorganization*, Harper and Brothers, New York, 1950
5. Gurr, Ted Robert, *Why Men Rebel*, Princeton: Princeton University Press, 1970



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POSTIVE PSYCHOLOGY

PPY18DSE08 - POSTIVE PSYCHOLOGY

Unit I: Positive Psychology : Introduction, Importance of Positive Emotions, Emotions and Motivation, The Evolutionary Need, Biology of Positive Emotions and Pleasure, Emotional Intelligence, Moods and Psychological Well-Being,

Unit II: Positive Emotional States: Subjective well being-, The science of happiness and life satisfaction, Resilience in Development, Concept of flow, Positive affectivity, Social construction of self-esteem -Optimal Experience and Peak Performance,

Unit III: Health and Wellness : Interpersonal relationship - Enhancement of closeness, compassion, forgiveness and gratitude, love, empathy and altruism. Wellness, Health Psychology, and Positive Coping -: Role of personal control in Adaptive functioning Optimism, Hope, Self efficacy, goal-setting for life and happiness

Unit IV: Positive Traits :, Excellence, Aesthetics, Creativity, and Genius, The Pursuit of Excellence, The Foundations of Excellence, The Creative Person, Process, Environments,. Interventions for Enhanced Well-Being, Dimensions of Positive Mental Health - Positive Psychology Interventions, Positive Psychotherapy, Positive Psychology in Educational Settings.

Unit V: Religion and Spirituality and Future : Religion, Spirituality, and Well-Being, Religiosity and Health, Cognitive-Developmental Perspectives on Faith, Psychodynamic Perspectives on Religion, Work, Community, Culture, and Well-Being, Future Applications of Positive Psychology.

Reference:

1. C.Synder and Shane, J.Lopez, (2007), *Positive Psychology The Scientific and Positive Explorations of Human Strengths*, Sage Publications, Haryana.
2. Shane. J. Lopez, *The Handbook of Positive Psychology*, Newyork: Oxford University Press



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PSYCHOMETRICS

PSP18DSE04 PSYCHOMETRICS

Unit I:

Introduction – Psychological Measurement and Tests – Tests and Samples of Behavior – Types of Tests – Origin of Psychometrics – Measurement – Measuring Behavior – Psychometrics and its importance to Research and Practice.

Unit II:

Measurement and Statistical Concepts – Numbers and Measurements – Units of Measurement – Levels of Measurement : Nominal, Ordinal, Internal Ratio.

Unit III:

Scaling – History of Scaling – Psychophysical Vs Psychological Scaling- Scaling Models: Stimulus Centered, Response Centered, Subject Centered – Data organization and Missing Data – Incomplete and Missing Data.

Unit IV:

Guidelines for Test and Instrument Development – 10 Guidelines – Item Analysis – Item Discrimination – Point Biserial – Biserial Correlation – Phi Coefficient – Tetrachoric Correlation – Item Reliability and Validity.

Unit V:

Standard Setting: Standard Setting Approaches : The Nedelsky Method, The Ebel Method - The Angoff Method and Modification – The Bookmark Method.

REFERENCES:

Larry R. Price (2017) Psychometric Methods – Theory into Practice , Guilford Press, New York, New York.



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SPORTS IN INDIAN SOCIETY

PSP18DSE01: SPORTS IN INDIAN SOCIETY

Unit I

Society: Meaning & structure, types of society, historical development of sports in different types of societies, types of Indian societies and development of sports. Sociological perspectives in sports & physical education (functionalism, conflict, critical, interactionist)

Unit-II

Culture and sport sub-culture, elements of Indian culture and sports – Sports and community sports - cultural lag - . Meaning and concept of socialization and sports socialization, types of socialization, agencies of socialization, role of family, school, college and peer group in sports socialization

Unit-III

Meaning and concept and forms of stratification – Stratification and sports – Social control – Sports as a socially regulating activity – Gender and sports - gender inequality in sports, need of women participation in sports, alternative program of sports for women

Unit-IV

Aggression and deviance and sports, Positive and negative deviance in sports - Spectators, spectators as crowd, types of spectators, effect of spectators on sports structure and organization – Violence behavior in Sport - causes of violence, hooliganism in sports - violence on field and off field

Unit V:

Media and sports, types of media and sports, ethical issues of media and sports, role of media in shaping the sports. Origin of club culture in sports, role of club on development of modern sports, club sports status in India

REFERENCES:

Rawat HK (2007). Sociology Basic Concepts. Rawat P. Jaipur,

Sharma NP (2005). Khel Aur Samaaj Shastra. Khel Saahityaa Kendra. Delhi.

Sharma PD (2008). Khel Samajshastra. Friends Pub. India. New Delhi.



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EMOTIONAL INTELLIGENCE

PSP18DSE02 - EMOTIONAL INTELLIGENCE

Unit 1 - Understanding the Self a) The self-concept and self-esteem b) Facilitating self-awareness through reflective exercises, JOHARI window, personal SWOT analysis, self-awareness questionnaires/inventories

Unit 2: Emotional Intelligence; Models of Emotional Intelligence; EQ competencies: self-awareness, self-regulation, motivation, empathy, and interpersonal skills; Importance of Emotional Intelligence

Unit 3: KNOWING ONE'S AND OTHERS' EMOTIONS: Levels of emotional awareness; Recognizing emotions in oneself; the universality of emotional expression; Perceiving emotions accurately in others

Unit 4: MANAGING EMOTIONS: The relationship between emotions, thought and behaviour; Techniques to manage emotions

Unit 5: APPLICATIONS: Workplace; Relationships; Conflict Management; Effective Leadership

Readings:

Bar-On, R., & Parker, J.D.A.(Eds.) (2000). The handbook of emotional intelligence. San Francisco, California: Jossey Bros.

Goleman, D. (1995). Emotional Intelligence. New York: Bantam Book.

Goleman, D. (1998). Working with Emotional Intelligence. New York: Bantam Books.

Singh, D. (2003). Emotional intelligence at work (2 nded.) New Delhi: Response Books.



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MANAGERIAL PSYCHOLOGY

PPY18DSE01 - MANAGERIAL PSYCHOLOGY

Unit I: Human resource management: Nature, Function, Personnel Management vs. HRM, HRD vs. HRM, Context and issues in HRM.

Unit II: Human Resource Planning: Importance, process, Forecasting Demand, Estimating Supply, Effective HRP, Human resource accounting. Job Analysis: Uses, Process, Methods, job description & job specifications

Unit III: Recruitment: Objectives & Constraints, Sources, Methods, Selection: Process, Tests for Selection (Cognitive Ability, Motor & Physical Ability, Personality, Achievement), Interview as selection Device.

Unit IV: Job Evaluation: Uses, Methods, job evaluation and Establishing pay structure. Performance Appraisal: Comparing with Performance Management, Methods, Challenges, Legal implications

Unit V: (i) Employee compensation: Incentive Plans: Individual Employee, Team/Group, organisation-wide. Employee Benefits: Pay for time not worked, Insurance benefits, Retirement benefit, Personal & Family friendly benefits. (ii) Health & Safety: Legal Provisions, Measures, Accidents, Safety Management. Grievance & Discipline: Features & Forms, Model Grievance Procedure, Approaches to Discipline, Disciplinary Action, Essentials for a Good Disciplinary System.

References

Decenzo, D.A. & Robbins, S.P. (2004). Personnel and human resource management. New Delhi

Dessler, G. (2005). Human resource management. New Delhi: PearsonPrentice Hall.

Rao V.S.P. (2007). Human resources management: Text and cases. New Delhi: Excel Books .

Bernardin, H.J. (2007). Human resource management. New Delhi: Tata McGraw Hill.

Greenberg & Baron (2008). Behavior in organizations. 9th edition. NJ. Prentice Hall. *



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MEDICAL SOCIOLOGY

PSO18DSE02 - MEDICAL SOCIOLOGY

- UNIT I** Emerging relationship between medicine & sociology-Definition, scope & aims of medical sociology-Concept & Dimensions of Health
- UNIT II** Basic concepts- Disease, Illness, Sickness- The Sick Role- Social etiology and social epidemiology and its variables- Preventive and social medicine
- UNIT III** Causes of Illness, Modes of Therapy & systems of Medicine – Social causes of illness:Attitudes, Beliefs & Values associated with diseases and illness-Mode of therapy: Curative, Preventive and rehabilitative-System of Medicine in India: Ayurveda, Unani, Allopathy, Homeopathy and their different approaches to health
- UNIT IV** Hospital as a Social Organization- Meaning & function of Hospital-Types of Hospital : General, Specialty, Sanatoria, Dispensaries, teaching & Corporate Hospitals- Interpersonal relationship in hospital settings: Doctors, Nurses, Paramedical & their relationship with Patients
- UNIT V** The State & Health : Health Problems in India :Mental disorder, Aging, Reproductive Health – Health Policy & Programmes in India – Ethical Issues in Medical and Health care

REFERENCES:

1. Cockerham William C. *Medical Sociology*, Prentice Hall, N.J.1978
2. Howard E Freeman /Soilevine ,*Handbook of Medical Sociology* ,N.J
3. Park & Park, *Preventive & Social Medicine*
4. Prabhakaran C.N. *Preventive and Social Medicine*, Jaypee Brothers, Medical Publishers, 2004



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INDIAN SOCIAL SYSTEM AND SPORTS

PPS18CT202- INDIAN SOCIAL SYSTEM AND SPORTS

UNIT I - Indian Society: Indian society as a multicultural society - Multiculturalism and its implication for Indian Sports. Age and Sex Structure of India's population and its implication for sports. Stages of life and its implication.

UNIT II - Village Community and Sports: Village as a community and a social system – Village Social Life and the place of games and sports: Sports as divisive and cohesive social activity of the villages – Rural religion, festivals and sports – Rural family, leisure and recreation activities – Traditional competitive sports events of rural India – Recent initiatives to promote rural talents in sports in India.

UNIT III - Traditional Institution and Sports in India: Family and Sports – Tennis, equestrian, cricket – Caste and Sports – Religion and Sports – Region and Sports

UNIT IV - Social change and sports in Modern India: Emergence of sports as a profession and vocation in modernization and parochialization – Emergence of traditional sports as universalization - Corporatization of sports in India - Institutionalization of traditions sports of India.

UNIT V - Politics of Sports in India: Organizational structure of sports in India: Ministry, Boards, Authorities, Universities, Associations, Clubs challenges facing sportsman in India.

REFERENCES:

1. **Mandelbun, D.G.L. (1990),** *Society in India, Berkerley, and University of California Press, Vol 1 Parts 24 & 4.*
2. **Singh, Yogendra, (1993)** *Modernization of Indian Tradition, a Systematic Study of Social Cahange, New Delhi, Thompson Press.*
3. **Srinivas M.N. (1962),** *Caste in Modern India and other essay, Bombay, Asia Publishing House.*
4. **Nicholas B.Dirks. (1996)** *Castes of mind permanent block D-28, Oxford Apartments, 11, 1.p.extention, Delhi. 110 092.*



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GENDER AND SOCIETY

PSO18DSE04- GENDER AND SOCIETY

UNIT I The social construction of Gender: Defining Sex and Gender - Gender and Biology - Gender identity and self image - Socialization and Gender roles - Gender inequality - Sex Preference - Sex Ratio.

UNIT II Theoretical Perspectives: - Liberal Feminism - Radical Feminism, - Marxist Feminism, -Socialist Feminism.

UNIT III Women in Family and Marriage: Gender Role Division - Invisible Role - Dual Role - Role Conflict and Coping Mechanism - Network and support for Working and Non-working Women - Gender and Health.

UNIT IV Women and Development - Women's work and Technology - Impact of Development Policies, Liberalization and Globalization on Women - The role of women in Development - Sustainable Development

UNIT V Empowerment of Women: Concept of Empowerment - Indicators of Empowerment - Facilitating and constraining factors of Empowerment.

REFERENCES:

1. Myers, K.A., Anderson, C.D and Risman, B.J. 1998. *Feminist Foundations*, Sage Publications, London, United Kingdom.
2. Whyte, R.O and Whyte, P. 1982. *The Women of Rural Asia*: Westview Press, Inc, Colorado.
3. Altekhar, A.S. 1983. *The position of Women in Hindu civilization*, Delhi: Motilal Banarasidass, Second Edition.
4. Desai, N and M. Krishnaraj. 1987. *Women and Society in India*. Delhi: Ajantha.
5. Forbes, G. 1998. *Women in Modern India*. New Delhi: Cambridge University Press.
6. Maccoby, E and Jacklin, C. 1975. *The Psychology of Sex Differences*, Stanford: Stanford University Press.
7. Sharmila Rege (ed), 2003. *Sociology of Gender*, Sage Publications, London.
8. MoCormark, C and M. Strathern. 1980. *Nature, Culture and Gender*, Cambridge: Cambridge University Press.
9. Oakely, A. 1972. *Sex, Gender and Society*. New York, Harper and Row.
10. Antony Giddens. *Sociology*, Cambridge, Polity Press



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HEALTH PSYCHOLOGY

PDSPS18G01- HEALTH PSYCHOLOGY

Unit I: Introduction to health psychology. Concept of health, models of health with special reference to bio-psychosocial model of health

Unit II: Health behavior and belief: Factors predicting health behavior and beliefs, health awareness and health seeking behavior Theories of health behavior (Protective motivation theory, theory of reasoned action)

Unit III: Reproductive health: Reproductive health and its components, risk behavior, early pregnancy and its implication, family planning methods and management of reproductive health, mental disposition of women after the reproductive phase, Adolescent reproductive health and its importance, Reproductive and Child Health Policy, Govt. of India.

Unit IV: Chronic illness: Causes and consequences, management of health problems like obesity and chronic illness like cancer, cardiac problems and diabetes.

Unit V: Health assessments and promotion: Quality of life scales, health indices checklist, lifestyle evaluation and coping scales, health promotion strategies:- Exercise, nutrition, psychological intervention, lifestyle modification techniques, utility of relaxation and bio-feedback methods.

Readings:

Allen, F. (2011). Health psychology and behavior. Tata McGraw Hill Edition.

Brannon, L. & Feist, J. (1989). Health Psychology: An Introduction. 4th Edition, Wordsworth.

Dimmates, M.R. & Martin, L.R. (2007). Health Psychology. Pearson.

Dimatteo, M. R., & Martin L. R. (2011). Health psychology. India:

Dorling Kindersley Snyder, C.R., Lopez S. J., & Pedrotti, J. T. (2011). Positive psychology: The scientific and practical explorations of human strengths. New Delhi: Sage.

Taylor, S.E. (2006). Health psychology, 6th Edition. New Delhi: Tata McGraw Hill.

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PSYCHOLOGY OF INTERPERSONAL RELATIONSHIP

PPY18DSE06 - PSYCHOLOGY OF INTERPERSONAL RELATIONSHIP

Unit I: Concept and Types of Interpersonal Relationship: Interaction: the essence of a relationship – Theories of Social Interaction, Interpersonal Attraction, Transactional Analysis- types of relationship. *

Unit II: Romantic and Marital Relationship: Taxonomies of love- Psychometric approaches to love theories of Love- passionate and companionate Love- theoretical approaches to mating relationships. Nature of marital relationships- distinction from romantic relationships- factors associated with satisfaction- happy and unhappy marriages- distress in marital relationships, therapeutic interventions for distressed paths to divorce and separation- bereavement.

Unit III: Relationship at Work: Nature, purpose and importance of human relations at work- forces influencing behavior at work- development of human relations movement- team work and team building- social loafing- leader-follower, formal and informal relationship at work.

Unit IV: Interpersonal Communication: Basic nature and forms of communication- verbal and nonverbal communication- communication channels, process and barriers- communication through body language- improving personal communication.

Unit V: Conflicts in Relationship and Strategies for Improving Human Relationship: Self disclosure: JOHARI window- SWOT Analysis- barriers to self disclosure- improving self perception- positive strokes and relationship building. Prosocial behavior- factors involved in co- operation- selfishness and altruism- Conflict: nature and major causes of conflict in relationships- individual level conflict group conflict- conflict management techniques.

References

1. Berscheid, E., & Regan (2005). The Psychology of Interpersonal Relationships. Englewood Cliffs, NJ: Prentice Hall
2. Reece & Brandt (2007). Effective Human Relations. Personal and Organizational Applications. 10th Edition. New York. Houghton Mifflin Company.
3. Duck (2007). Human Relationships. 4th Edition. Thousand Oaks, CA: Sage Publications.
4. Hendrick & Hendrick (Eds) (2000). Close Relationships: A Sourcebook 2nd ed. London: Sage Publications.



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ORGANIZATIONAL BEHAVIOUR

PPY18CT402: ORGANIZATIONAL BEHAVIOUR

UNIT I:

Introduction to the field of OB – Definition of OB - Various disciplines contributing to OB – Need, Scope and Importance of OB – Foundations of Individual Behavior – Framework of Organisational Behavior Models.

UNIT II:

Motivational Process: Motivation at workplace - Kinds of Motives – Theories: Maslow's, Herzberg two factor theory, ERG theory, Theory X and Y, McClelland's need theory – Goal Setting – Emotional Intelligence – Meaning and Components - Emotional Intelligence at workplace-

UNIT III:

Groups and Communication: Role of communication – Communication channels – Communication barriers – Non-verbal Communication – Upward and Downward communication . Groups : Group Dynamics – Group Behaviour – Formation – Types of Groups, Stages of Group Development.

UNIT IV:

Leadership – Meaning – Importance in Organisations – Theories – Leadership styles – Leaders V/s Managers : Conflict- Nature – Types of Conflict – Management of Conflict – Transactional Analysis.

UNIT V:

Organisational Structure and Design – Organisational Climate – Factors affecting the climate – Importance – Job Satisfaction – Organisational Development – Organisational Culture – Organisational Change – Current trends in OB>

REFERENCE:

- Stephen Robbins – Organisational Behavior, Prentice Hall of India
Udai Pareek - Understanding Organisational Behavior, Oxford University Press.
L M Prasad – Organisational Behavior, Sultan Chand and Sons.
Fred Luthans - Organisational Behavior, McGraw Hill Book Company.



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