

# **SGRR UNIVERSITY**

**Brochure of Value-Added Courses  
SGRRIM&HS School of Paramedical  
Sciences  
2022-2023**

## ABOUT THE UNIVERSITY

Shri Guru Ram Rai University was established by a religious and philanthropic leader, Shri Mahant Devendra Dass Ji Maharaj in the year 2017. It is situated in the heart of city, Uttarakhand. We are extremely privileged to extend the values and ethos of the Shri Guru Ram Rai Education mission through SGRR University to impart quality education and in successfully placing more than 80% students in various companies across the globe. SGRR University has humongous campus spread over 80 acres of land. Its state-of-art facilities give opportunities to develop leadership skills and to achieve professional excellence. It has 8500+ students from different countries, 29 states and Union Territories and providing cultural melange and global exposure to our students. One of the biggest boosts from University is its unmatched experience of 67 years of in delivering quality education that helps to develop confidence and will give you more knowledge, industry exposure, building good networking and high self-esteem. This will change your overall personality and develop you into a complete professional to face any challenge.

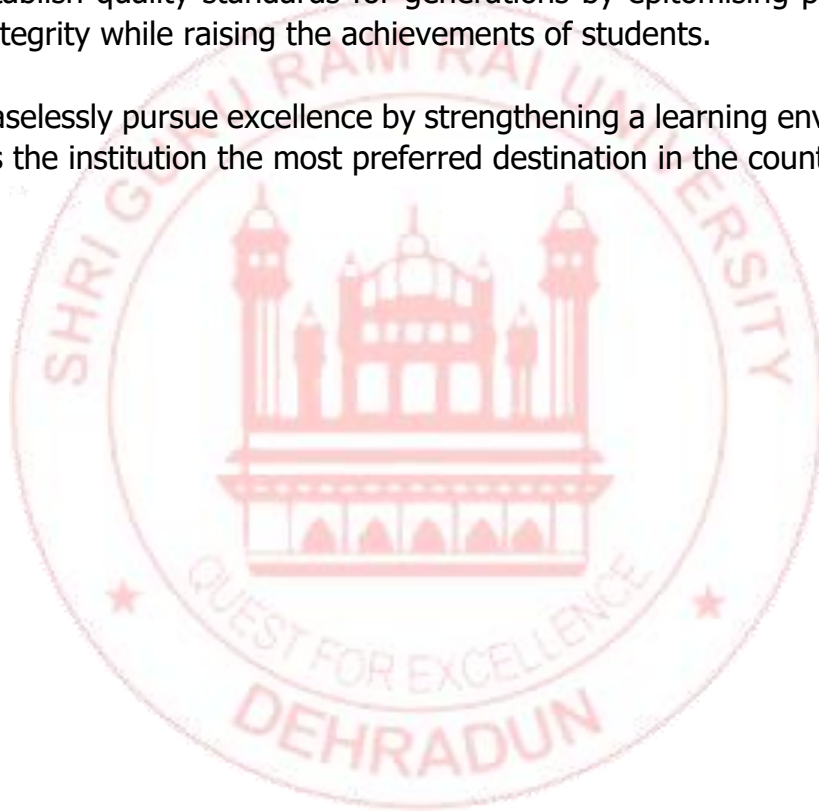
### Vision

“To establish Sri Guru Ram Rai University to be a Center of Excellence in higher education, innovation and social transformation by nurturing inquisitive and creative minds and by enabling the stakeholders to become committed professionals and educators of national and global relevance.”

### Mission

- ❖ To provide a comprehensive and sustainable educational experience that fosters the spirit of enquiry, scientific thinking and professional competence along with ethical and spiritual values
- ❖ To deliver a classic, well rounded learning experience that is distinctive and impactful on the young generation preparing them for a successful career
- ❖ To engage, inspire and challenge the stakeholders to become leaders with ethics and positive contributors to their chosen field and humane citizens
- ❖ To attract, train and retrain qualified staff to work efficiently to bring forth the maximum resource potential

- ❖ To develop committed and responsible professionals who work for the welfare of the society by providing innovative and efficient solutions and creating long term relationship with the stakeholders
- ❖ To create a sustainable career, by collaborating with stakeholders and participating in community partnership for life and livelihood in the local society in a responsive and dynamic way
- ❖ To make our students globally competent by introducing specialized training leading to professional capabilities and developing diverse skills in them for competitive advantage.
- ❖ To establish quality standards for generations by epitomising professionalism and integrity while raising the achievements of students.
- ❖ To ceaselessly pursue excellence by strengthening a learning environment that makes the institution the most preferred destination in the country.



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# INTRODUCTION

The ever-changing global scenario makes the world more modest and needs high levels of lateral thinking and the spirit of entrepreneurship to cope up with the emergent challenges. Many a times, the defined skill sets that are being imparted to students today with Programme Specific Objectives in educational institutions become redundant sooner or later due to rapid technological advancements. No university curriculum can adequately cover all areas of importance or relevance. It is important for higher education institutions to supplement the curriculum to make students better prepared to meet industry demands as well as develop their own interests and aptitudes.

## **Objectives The main objectives of the Value-Added Course are:**

- ✓ To provide students an understanding of the expectations of industry.
- ✓ To improve employability skills of students.
- ✓ To bridge the skill gaps and make students industry ready.
- ✓ To provide an opportunity to students to develop inter-disciplinary skills.
- ✓ To mould students as job providers rather than job seekers.

Course Designing The department interested in designing a Value Added Course should undertake Training Need Analysis, discuss with the generic employers, alumni and industrial experts to identify the gaps and emerging trends before designing the syllabus.

## **Conduction of value added courses :**

Value Added Course is not mandatory to qualify for any programme and the credits earned through the Value-Added Courses shall be over and above the total credit requirement prescribed in the curriculum for the award of the degree. It is a teacher assisted learning course open to all students without any additional fee.

Classes for a VAC are conducted during the RESERVED Time Slot in a week or beyond the regular class hours The value-added courses may be also conducted during weekends / vacation period. A student will be permitted to register only one Value Added Course in a Semester.

student will be encouraged to opt for the VAC offered by his/her parent Department/Faculty. Industry Experts / Eminent Academicians from other Institutes are eligible to offer the value-added course. The course can be offered only if there are at least 5 students opting for it. The students may be allowed to take value added courses offered by other departments after obtaining permission from Dean offering the course. The duration of value added course is 30 hours with a combination 18 hours (60%) of theory and 12 hours (40%) of practical. However, the combination of

theory and practical shall be decided by the course teacher with the approval of the Dean

## **GUIDELINES FOR CONDUCTING VALUE ADDED COURSES**

- ❖ Value Added Course is not mandatory to qualify for any program.
- ❖ It is an instructor supported learning course open to all students without any added fee.
- ❖ Classes for VAC will be conducted during the **RESERVED** Time Slot in a week or beyond the regular class hours.
- ❖ The value-added courses may be also conducted during weekends / vacation period.
- ❖ A student will be permitted to register only one Value Added Course in a Semester.
- ❖ Students may be permitted to enrol in value-added courses offered by other departments/ Schools after obtaining permission from the Department's Head offering the course.

## **DURATION AND VENUE**

- ❖ The duration of value-added course should not be less than 30 hours.
- ❖ The Dean of the respective School shall provide class room/s based on the number of students/batches.
- ❖ VAC shall be conducted in the respective School itself.

## **REGISTRATION PROCEDURE**

The list of Value-Added Courses, along with the syllabus, will be available on the University Website. A student must register for a Value-Added Course offered during the semester by completing and submitting the registration form. The Department Head shall segregate according to the option chosen and send it to the Dean of the school offering the specific Value-Added Courses.

- ❖ Each faculty member in charge of a course is responsible for maintaining Attendance and Assessment Records for candidates who have registered for the course.
- ❖ The Record must include information about the students' attendance and Assignments, seminars, and other activities that were carried out.
- ❖ The record shall be signed by the Course Instructor and the Head of the Department at the end of the semester and kept in safe custody for future verification.
- ❖ Each student must have a minimum of 75% attendance in all courses for the semester in order to be eligible to take certificate.

- ❖ Attendance requirements may be relaxed by up to 10% for valid reasons such as illness, representing the University in extracurricular activities, and participation in NCC.
- ❖ The students who have successfully completed the Value Added Course shall be issued with a Certificate duly signed by the Authorized signatories.



## Basics of Laboratory Practice

### Course Objective:

- Significance of Laboratory Safety practices, General and legal aspects.
- Emphasis on Sample preparation and Processing.
- Documentation of specimen and identification.

### Course Content:

#### Module I: General aspects of laboratory safety

Ethics of laboratory practice. Laboratory safety – Common lab accidents their prevention and their first aid. Bio-Medical Waste Management - Legal Aspects and Environment Concern.

#### Module II: Sample preparation and processing

Clinical sample- collection, transport and processing, Examine and analyze body fluids, tissues and cells. Examination of urine, pus, blood, stool and CSF. Culture media preparation. Various methods of blood collection - Venipuncture and collection of blood samples, Preparation of blood films, staining of blood smears, Manual count of blood cells. Blood components separation – serum and plasma. Functions of RBC, WBC and platelets.

#### Module III: Sample Documentation

Preparation of container and swabs for collections of specimens for microbial examinations. Portal regulation and transport of specimen. Flowchart of lab diagnostic procedures. Documentation of specimen in laboratory. Preservation of Micro-organisms.

### References:

- Text Book of Pathology Harsh Mohan VIII Edition Bloom Taxonomy
- Text Book of Pathology by Dr. A K Mandal.
- Text Book of Microbiology by Dr. C P Baveja VIII Edition.
- Text Book of Microbiology by Apurba S Sastry & Sandhya Bhat.



## Basics of Sanitation, Safety and Hygiene

Course Code: VCSPMS 004

### Course Objective:

- Introduction the causes and prevention of food poisoning and introduce the requirement of safety in the workplace.
- To study the control, elimination and eradication of disease and focus on screening and diagnostic test for pathogens.
- Present the rules of personal hygiene and the importance of adhering to safety rules and regulation.

### Course Content:

#### Module I: The concept of food safety

The concept of food safety in the business environment. Modes of transmission and natural history of a disease. The definition of "micro-organism". Factors that influence the growth of micro-organism. The definition of food borne illness.

#### Module II: Concepts of Disease Occurrence.

Natural History and Spectrum of Disease. Infection agents (pathogens). Mode of transmission of infection. Chain of Infection. Epidemic Disease Occurrence. Need and uses of screening tests. Accuracy and clinical value of diagnostic and screening tests (sensitivity, specificity, & predictive values).

#### Module III: Principles of personal hygiene.

The linkage between personal hygiene and food safety. Characteristics of food contamination.

### References:

- Centers for disease Control and Prevention, Hepatitis A outbreak associated with green onions at a restaurant- Monaca, Pennsylvania, 2003. MMWR 2003.
- Cobb S, Miller M, Wald N. On the estimation of the incubation period in malignant disease, J Chron Dis 1959;9:385-93. Last JM, editor. Dictionary of epidemiology, 4th ed. New York: Oxford University Press.
- Principles of Food Sanitation (Food Science Text Series), 5th Edition 2006, Marriott & R B Gravanni, published by Springer
- Food Poisoning and Food Hygiene. London: Arnold, 1998. Hobbs, Betty C. and Roberts, Diane

# Fundamental of Mechanics

## Course Objectives:

Gain fundamental knowledge of Thermodynamics, Fluid Mechanics, and I.C. Engines. Develop skills for material selection for different devices/ components. Understand the force systems and draw free body diagram to analyze rigid body equilibrium.

## Course Outcome:

- It is designed to provide students with the knowledge of movements of the body.
- In this course, the student will learn the about role of force and motion on the human beings.
- Understand the concept of Surface anatomy and palpations of muscles.

## Course Content:

### Module I: Introduction to Biomechanics

- Basic Concepts in mechanics: Kinematics and Kinetics: Mechanics - Definition of mechanics and Biomechanics
- Motion: Definition, types of motion, plane and axis of motion, factor determining the kind and modification of motion.
- Force: Definition, diagrammatic representation of force, point of application, classification of forces, concurrent, Force of Gravity, Reaction forces, coplanar and co-linear forces, composition and resolution of forces, angle of pulls of muscle, Force of friction, Concurrent force systems, Parallel force systems, Work, Moment arm of force, Force components
- Momentum - Principles and Practical application

### Module II: Friction, Levers and equilibrium Friction

- Gravity - Definition, line of gravity, Centre of gravity
- Equilibrium - Supporting base, types, and equilibrium in static and dynamic state
- Levers - Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body, Equilibrium of levers

### Module III: Surface anatomy and palpations of muscles.

- Muscular system -Definition, properties of muscle, muscular contraction, structural classification, action of muscle in moving bone, direction of pull, angle of pull, functional classification, coordination of muscular system.

Mobility and stability functions of muscles, Elements of muscle structure, Muscle function, Effects of immobilization, injury and aging.

- Aims and scope of various biomechanical modalities – shoulder wheel, shoulder ladder, shoulder pulleys, pronator-supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, and weights.
- Joint structure and Function
- Joint design, Materials used in human joints, General Properties of connective tissues, Human joint design, Joint function, Joint motion, General Effects of disease, injury and immobilization.
- Mechanical behavior of connective tissue contractile & non-contractile, Stress -Strain Curve, Elasticity, Plasticity, Creep, Hysteresis.
- Biomechanics of the Thorax and Chest wall
- General structure and function, Rib cage and the muscles associated with the rib cage. Ventilator motions: Its coordination and integration, Developmental aspects of structure and function, Changes in normal structure and function I relation to pregnancy, scoliosis and COPD.

### **References:**

- Joint Structure and Function – A comprehensive Analysis, JP Bros Medical Publishers, NewDelhi.
- Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore
- Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalo.

# Disease Epidemiology

## Course Objective:

Interpret and calculate basic epidemiological measures used to describe the health of a population including measures of morbidity and mortality. Interpret and distinguish between incidence and prevalence.

## Course Outcome:

- Discuss the key concepts of infectious disease transmission and control, and the differences with non-infectious diseases.
- Apply biological principles to development and implementation of disease prevention, control or management programs.
- Apply epidemiologic tools and methodologies to understand the transmission dynamics and control of infectious diseases

## Course Contents

### Module I:

Introduction to Infectious Disease Epidemiology, Introduction to Concepts in Transmission and Dynamics. Measuring the Effectiveness of HIV Prevention Interventions in Generalized and Concentrated Epidemics

### Module II:

Epidemiologic Methods for Measuring Transmission and Control of Respiratory Infections: Influenza. Assessing the Epidemiological Burden of TB and the Impact of TB Control: Population-based TB Prevalence Surveys. Epidemiology and Control of Sexually Transmitted Infections and Viral Hepatitis. Surveillance and control of healthcare-associated infections

### Module III:

Epidemiology and Control of Vector-borne Diseases. Epidemiologic Methods in Vaccinology. Epidemiologic Methods for Foodborne and Waterborne Diseases

## References:

- Groseclose SL, Buckeridge DL. Public Health Surveillance Systems: Recent Advances in Their Use and Evaluation. *Annu Rev Public Health* 2017;38:57-79
- Riley RW, Blanton RE. Advances in Molecular Epidemiology of Infectious Diseases: Definitions, Approaches, and Scope of the Field. *Microbiol Spectr* 2018;6. doi: 10.1128/microbiolspec.AME0001-2018.

## Physical Fitness and Wellbeing

**Course Code: VCSPMS 007**

### Course Objectives:

The course aims to identify the fundamental concepts, importance, and principles of human body training related to sports performance. The students will be able to demonstrate the skills to train different fitness components and related planning.

### Course Outcome:

- It is designed to provide students with the health and fitness among people.
- To enable the students to: Teach the students about the body and how it works. Understand the relationship between fitness and wellness.
- To know the behaviour changes needed to ensure a good quality of life Evaluate health related fitness in order to make changes in lifestyle

### Course Content:

#### **Module I: INTRODUCTION TO PHYSICAL FITNESS & WELL BEING. THEORY:**

- Concept of Fitness & Wellness
- Definition and meaning of Fitness,
- Different Kinds of Fitness - Physical Fitness, Skill Related and Health Related Physical Fitness
- Relationship of fitness and health Basic concept of wellness
- Role of various factors in wellness, components of wellness
- Physical fitness and wellness
- Daily routine for fitness and good health. Health benefits of Exercise. Exercise prescription.
- Nutrition and Health: Classification of foods, Nutritional profiles of principal foods, Contents of the healthy diet, Diet for fitness, Diet management for the obesity.

#### **Module II:**

- Daily routine for fitness and good health
- Practical based on diet management in different condition
- Fitness Evaluation and Activities (Practical)
- General Warm up, Limbering down exercises.
- Free hand exercises, Stretching exercises Swiss ball exercises Fitness.
- Evaluation –Measuring Cardio respiratory fitness, 1.5 mile run test, 1mile walk test.

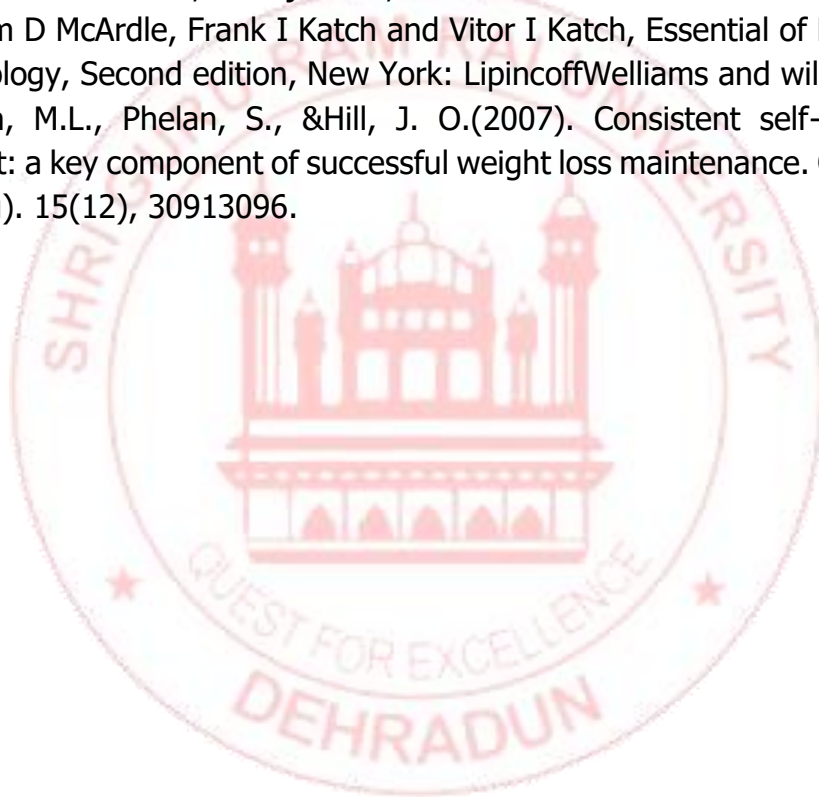
#### **Module III:**



- The Step test, Assessment of Flexibility.
- Skinfold test, BMI Aerobic activities – Walking, Jogging, cycling etc.
- Anaerobic Activities – Circuit Training, Strength Activities, Agility and Coordinative activities, Body conditioning activities like Calisthenics, Flexibility exercises.
- Physical Activity for Special population.

### References:

- Harrold M Barrow "Man and Movement: Principles of Physical Education" published in Great Britain by Henry Kimpton Publishers, London
- Jesse Peoring Williams "The Principles of Physical Education" Published by College Book House, Shivaji Road, Meerut
- William D McArdle, Frank I Katch and Vitor I Katch, Essential of Exercise Physiology, Second edition, New York: LipincoffWelliams and wilkins, 2000
- Butryn, M.L., Phelan, S., & Hill, J. O.(2007). Consistent self-monitoring of weight: a key component of successful weight loss maintenance. Obesity (Silver Spring). 15(12), 30913096.



# Myofascial Release Therapy

**Course Code: VCSPMS 008**

## **Course Objective:**

The therapist will apply hands-on massage strokes in order to release tension from the fibrous bands of the muscles, bones, nerves and joints, by unblocking any scar tissue or adhesions due to injury or surgery in the muscles and surrounding tissues.

## **Course Outcome:**

- Understand the concepts of Myofascial release Technique.
- To acquire knowledge of Myofascial Meridians.
- Gain knowledge about upper limb and Lower Limb MFR techniques.

## **Course Contents:**

### **Module I: INTRODUCTION TO BASIC MYOFASCIAL RELEASE TECHNIQUES (MFR).**

- History of soft tissue release. History of Myofascial Release Techniques (MFR)
- Principles of Myofascial Release Techniques (MFR).

### **Module II: BASIC REVIEW ABOUT MYOFASCIAL MERIDIANS (FASCIAL LINES)**

- Superficial Front Line, Superficial Back Line, Lateral Line (two sides), Spiral Line, Arm Lines (four), Functional Lines (two – front and back), Deep Front Line.

### **Module III: UPPER LIMB MYOFASCIAL RELEASE TECHNIQUES,**

- Pectoralis Major, Pectoralis Minor, Subscapularis, Para Scapular Muscles. LOWER LIMB MYOFASCIAL RELEASE TECHNIQUES, Piriformis, Gluteus Maximus, Quadriceps, Hamstring, Calf.

## **References:**

- Fascial release for structural balance – James Earls & Thomas Myers
- Myofascial Release: A Step-by-step Guide to More Than 60 Techniques
- The Myofascial Release Manual, Fourth Edition – Carol
- Myofascial Release Healing Ancient Wounds: The Renegade's Wisdom
- Myofascial Release: The Search For Excellence
- Fascial release for structural balance – James Earls & Thomas Myers
- Myofascial Release: A Step-by-step Guide to More Than 60 Techniques

- The Myofascial Release Manual, Fourth Edition – Carol
- Anatomy Trains: Myofascial Meridians for Manual and Movement Therapist



## Exercise and Fitness

### Course Objectives:

Students will participate in physical activities and assess their fitness status. Students will be introduced to proper nutrition, weight management, cardiovascular health, flexibility, and strength training. Enhance the physical quotient of the students by making them physically fit, strong, healthy, and dexterous, while preparing them for growth and survival in a competitive world.

### Course Outcome:

- Gain knowledge regarding various aspects and its practical implication fitness and Wellness.
- Understand the role of exercise in fitness.
- It is designed to provide knowledge of Exercises regimens & Physical Fitness

### Course Content:

#### Module I: Role of Exercises in fitness.

Physical fitness: Dimensions for physically fit individual, Parameters for the measurements of the fitness, Calculation of the BMI rate, Calculation of the fat ratio.

- Role of gym in fitness
- Role of sports in fitness
- Role of aerobics in fitness

#### Module II: Role of slimming machines in fitness: Slimming programs, Obesity

- programs, Weight reduction programs, Overall fitness programs
- Practical based on Calculation of the BMI rate
- Practical based on parameters for measurement of fitness.

#### Module III:

- Exercises regimens & Physical Fitness:
- Warm up Exercises: why warm up is so important before exercises, role of warm up in preventing soft tissues injuries.
- Stretching Exercises: Effects of stretching, Determinants of stretching exercise, techniques of stretching and Stretching for a particular muscle.
- Strengthening Exercises: Core strengthening exercises, Strengthening exercises for individual body part or muscles.
- Role of yoga and relaxation techniques in fitness and health

- Relaxation -Methods & techniques of relaxation, Principles & uses of relaxation exercises: -Deep breathing exercises.
- Yoga- Principles & uses of yoga, Techniques or Asana of yoga
- Practical based on different Exercises regimens Practical based on Relaxation techniques.

## References:

- Harrold M Barrow "Man and Movement: Principles of Physical Education" published in Great Britain by Henry Kimpton Publishers, London
- Jesse Peoring Williams "The Principles of Physical Education" Published by College Book House, Shivaji Road, Meerut.
- Melwin H. Williams. Nutrition for Health Fitness and sport. McGraw Hill Company, Newyork: 1995
- Bradfird B, Strand and Others. Fitness Education Arizona Gorsuch Seani; sbrick Publishers, 1997.
- Scott K. Powers and Stephen L. Dodd. Total Fitness: Exercise, Nutrition and wellness, Boston: Allyn and Bacon, 1999.
- Thomas D. Fahey and Others. Fit and Well 6th Edition; Newyork: MCGraw Hill Publishers, 2005.
- Chu, S.Y. & Kim, L. J. (2007). Maternal obesity and risk of stillbirth: a meta analysis. Am J Obstet Gynecol, 197(3), 223-22



## Snapping Moves

### Course Objective:

Objective of this course is to understand process of capturing patient photographs and videos using digital cameras or mobile phones Learn to capture photographs and videos of healthy participants while performing activities of daily living, walking, stair climbing, running.

### Course Outcome:

- Understand the concepts of Manipulation Techniques.
- To review about anatomical surfaces
- Gain knowledge about upper limb and Lower Limb manipulation techniques.

### Course Contents:

#### Module I:

INTRODUCTION TO BASIC MANIPULATION TECHNIQUES: History of manipulation techniques. History & principles of Maitland manipulation technique. History & principles of Cyrix's manipulation technique.

#### Module II:

BASIC REVIEW ABOUT ANATOMICAL SURFACES: Types of joint, Anatomical Landmarks, Palpation of Anatomical Landmarks.

#### Module III:

UPPER LIMB, LOWER LIMB AND VERTEBRAL JOINTS MANIPULATION TECHNIQUES: Phalangeal Joints, Wrist Joint Complex, Elbow Joint Complex, and Shoulder Joint Complex. Hip Joint, Knee Joint, Ankle Joint Complex. Vertebral Manipulation Techniques: Cervical, Thoracic, Lumbar.

### References:

- B D Chaurasia's Human Anatomy
- Maitland's Vertebral Manipulation: Management of Neuromusculoskeletal Disorders - Volume 1
- Maitland's Peripheral Manipulation: Management of Neuromusculoskeletal Disorders - Volume 2
- Cyriax's Illustrated Manual of Orthopaedic Medicine

# Functional Ergonomics

## Course Objectives:

An ergonomics program is a systematic process that communicates information to ensure that adequate and feasible solutions to ergonomic risks can be implemented to improve the workplace. The two most essential pieces of a successful ergonomics program are management commitment and employee involvement.

## Course Outcome:

- It is designed to provide students a comprehensive understanding of ergonomics in different settings, focusing on its significance in hospitals, study environments, and leisure activities.
- In this course, the student will learn the principles of ergonomics, its application in optimizing workspaces, and the promotion of well-being in various daily activities.
- Understand the concept of Role of Ergonomics in Leisure Activities.

## Course Content:

### Module I:

#### **Ergonomics I: Introduction to Ergonomics and its Role in Hospital Setup**

- Introduction to Ergonomics
  - Definition and principles of ergonomics.
  - Historical background and evolution of ergonomics.
- Ergonomics in Healthcare
  - Importance of ergonomics in the healthcare sector.
  - Case studies on ergonomic improvements in hospitals.
- Application of Ergonomics in Different Hospital Settings
  - Ergonomic considerations in patient rooms, operating rooms, and administrative areas.
  - Strategies for improving ergonomics in healthcare delivery.

### Module II:

#### **Ergonomics II: Ergonomics of Teacher and Students in Calls Room during Study. Advice and Exercise to Avoid Stress**

- Ergonomic Needs in Educational Settings
  - The impact of ergonomics on the teaching-learning process.
  - Common ergonomic challenges in study environments.
- Creating an Ergonomic Study Environment
  - Designing ergonomic call rooms and study spaces.

- Utilizing technology for ergonomic study practices.
- Stress Prevention through Ergonomic Practices
  - Ergonomic exercises for teachers and students.
  - Strategies to minimize stress and discomfort during prolonged study sessions.

## **Module III:**

### **Ergonomics III: Role of Ergonomics in Leisure Activities**

- Ergonomics in Recreation and Leisure
  - Understanding the ergonomic considerations in different leisure activities.
  - Examining the impact of ergonomics on the enjoyment and safety of leisure pursuits.
- Ergonomic Considerations for Various Leisure Pursuits
  - Case studies on ergonomic design in sports, gaming, and outdoor activities.
  - Recommendations for creating ergonomic spaces for leisure.
- Preventing Injuries through Ergonomics
  - Identifying potential ergonomic hazards in leisure activities.
  - Providing guidelines for injury prevention through ergonomic practices.

### **References:**

- "Ergonomics: Design, Integration and Application"
  - Author: Mark S. Sanders and Ernest J. McCormick
- Human Factors and Ergonomics"
  - Author: Neville A. Stanton, Mark S. Young, Catherine Harvey, and Kim-Phuong L. Vu
- "Ergonomics: How to Design for Ease and Efficiency"
  - Author: Karl H.E. Kroemer, Hildegarde Mosenthal, and Brian Mital
- "Applied Ergonomics Handbook"
  - Editor: William S. Marras and Waldemar Karwow.

## Clinical Biomechanics

### Course Objectives:

This course is designed to explore the theoretical basis of clinical biomechanics and develop hands-on skills necessary to work in the area. Special emphasis will be in the areas of: Posture and Balance, Gait, and Orthopaedic Biomechanics.

### Course Outcome :

- It is designed to provide students with the knowledge of the Biomechanics.
- In this course, the student will learn the about palpations and surface landmarks
- To study Friction, Levers and equilibrium.

### Course Content:

#### Module I: Introduction to Biomechanics Basic Concepts in Biomechanics

- Kinematics and Kinetics: Mechanics - Definition of mechanics and Biomechanics
- Motion: Definition, types of motion, plane and axis of motion, factor determining the kind and modification of motion.
- Force: Definition, diagrammatic representation of force, point of application, classification of forces, concurrent, Force of Gravity, Reaction forces, coplanar and co-linear forces, composition and resolution of forces, angle of pulls of muscle, Force of friction, Concurrent force systems, Parallel force systems, Work, Moment arm of force, Force components
- Momentum - Principles and Practical application

#### Module II: Friction, Levers and equilibrium Friction

- Gravity - Definition, line of gravity, Centre of gravity
- Equilibrium - Supporting base, types, and equilibrium in static and dynamic state
- Levers - Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body, Equilibrium of levers

#### Module III: Surface anatomy and palpations of muscles

- Muscular system -Definition, properties of muscle, muscular contraction, structural classification, action of muscle in moving bone, direction of pull,

angle of pull, functional classification, coordination of muscular system.  
Mobility and stability functions of muscles, Elements of muscle structure,  
Muscle function, Effects of immobilization, injury and aging.

- Aims and scope of various biomechanical modalities – shoulder wheel, shoulder ladder, shoulder pulleys, pronator-supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, and weights.
- Joint structure and Function
- Joint design, Materials used in human joints, General Properties of connective tissues, Human joint design, Joint function, Joint motion, General Effects of disease, injury and immobilization.
- Mechanical behavior of connective tissue contractile & non-contractile, Stress -Strain Curve, Elasticity, Plasticity, Creep, Hysteresis.
- Biomechanics of the Thorax and Chest wall
- General structure and function, Rib cage and the muscles associated with the rib cage. Ventilator motions: Its coordination and integration, Developmental aspects of structure and function, Changes in normal structure and function I relation to pregnancy, scoliosis and COPD.

### References:

- Joint Structure and Function – A comprehensive Analysis, JP Bros Medical Publishers, New Delhi.
- Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore
- Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore



## Road Safety and Traffic Rules

### Course Objectives:

Road safety education plays an important role in shaping the attitudes and behaviour of children, ensuring they become in their future responsible drivers, pedestrians, cyclists and passengers. The objective of this activity was to give students knowledge about traffic lights, safety rules and all road signals.

### Course Outcome:

- Traffic Management is based upon the Safe Systems Approach which inculcates in individuals the understanding to manage complex and dynamic interaction between operating speeds, vehicles, road infrastructure and road user behaviour in a holistic and integrated manner so that road traffic moves in the most disciplined manner.
- In this course, the student will learn traffic management and develop scientific basis of comprehensively integrating the subject areas through the process of research, globally applied best practices and recognising the national and local needs.
- Understand the basic concept of Road Safety and Traffic Rules.

### Course Content:

#### Module I: Introduction To Prosthetics And Orthotics.

- Laws pertaining to traffic and vehicles
- Systems of traffic safety and control
- Driver education
- School students' education
- traffic regulation and road safety signs

#### Module II: Importance of Road Safety Road Safety

- Causes of road accidents are as follows.
- Role of Government and Public Sector
- Role of General Community
- Role of Education Sector
- Role of Media
- Hurdles in Road Safety
- Road Safety Tips
- Safe and Responsible Driving
- Physical and Mental Alertness
- Seating Position

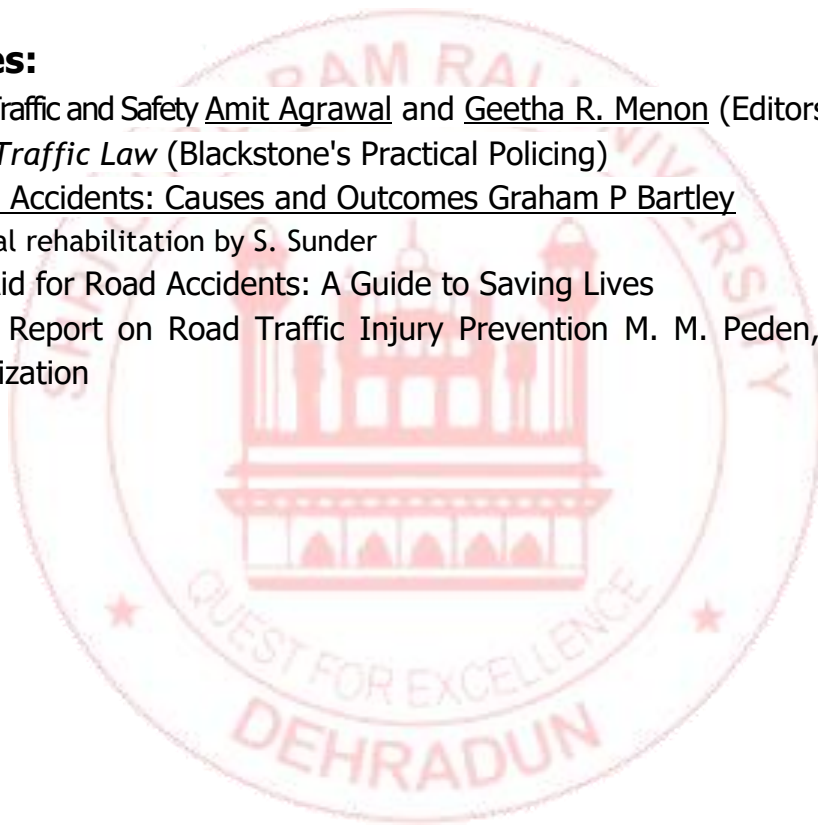
- Seat Belt
- Turn on Headlights at Night and in Poor Light Conditions
- Road Signs
- Types of Driving Licence in India

### **Module III: injuries, first aids & their management**

- Head injuries
- Upper Limb Fracture
- Lower Limb Fracture
- Soft Tissue Injuries
- Spinal cord Injuries

### **References:**

- Road Traffic and Safety Amit Agrawal and Geetha R. Menon (Editors)
- *Road Traffic Law* (Blackstone's Practical Policing)
- Traffic Accidents: Causes and Outcomes Graham P Bartley
- Physical rehabilitation by S. Sunder
- First Aid for Road Accidents: A Guide to Saving Lives
- World Report on Road Traffic Injury Prevention M. M. Peden, World Health Organization



## Quality Control in Laboratory

### Course Objective:

The course address on identification, evaluation and control of laboratory crucial quality issues. To understand the needs of the quality control program and its documentation. Apply appropriate statistical QC practices to monitor the performance of test procedures.

### Course Outcome:

- The basics of quality management system.
- To acquire the knowledge of Biosafety management.
- Adequate knowledge about improvement of laboratory processes.

### Course Contents

#### Module I:

Overview of the quality management system: Facilities and safety overview: Equipment management. Purchasing and Inventory: Sample management: Process Control Quality control for quantitative tests. Documents and Records: Information management & Statistical Analysis

#### Module II:

Biosafety Management: Equipment Failure, QC Procedures and QC for serology EQA and Processing Proficiency Testing Samples, Preparations Needed for a Laboratory Accreditation.

#### Module III:

Improving Laboratory Processes: Differentiating Documents from Records and the Quality Manual. Assessing the Relevancy of a Computerized Laboratory Information System and Developing a System for Assigning.

### References:

- Crosby PB. Quality without tears: the art of hassle-free management. New York, McGraw-Hill, 1995.
- Deming WE. Out of the crisis. Cambridge, MIT Press, 1982.
- ISO 9000:2005. Quality management systems –fundamentals and vocabulary. Geneva, International Organization for Standardization, 2005.
- CDC and NIH. Biosafety in microbiological and biomedical laboratories, 4th ed. United States Government Printing Office, United States Department of Health

and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health, 1999.

- Collins CH, Kennedy DA. Laboratory-acquired infections. In: Laboratory-acquired infections: history, incidence, causes and preventions, 4th ed. Oxford, United Kingdom, Butterworth - Heinemann, 1999:1–37.

