

**SEVA MANDAL EDUCATION SOCIETY'S
DR. BHANUBEN MAHENDRA NANAVATI COLLEGE OF HOME SCIENCE
(AUTONOMOUS)
NAAC Re-accredited 'A+' Grade with CGPA 3.69 / 4 (3rd Cycle)
UGC Status: College with Potential for Excellence
BEST COLLEGE AWARD 2016-17: Adjudged by S.N.D.T. Women's University
338, R.A. Kidwai Road, Matunga, Mumbai – 400019**

APPROVED SYLLABUS UNDER AUTONOMY

Department of Post Graduate Studies

PROGRAMME: P.G. DIPLOMA in SPORTS SCIENCE, FITNESS & NUTRITION

Semester: I & II

ELIGIBILITY:

- The minimum percentage is 50% or B grade for students who have the following degrees: B.Sc. Foods and Nutrition, B.Sc. Food Science and Nutrition, B.Sc. Clinical Nutrition and Dietetics/Nutrition and Dietetics, B.Sc. Public Health and Nutrition, B.Sc. Applied Nutrition.
- The minimum percentage is 55% or B grade for students with a degree in Pure Sciences: B.Sc. Life Sciences, B.Sc. Biochemistry, B.Sc. Biotechnology, B.Sc. Physiology, B.Sc. Zoology, B.Sc. Molecular Biology, B.Sc. Clinical and Laboratory Sciences.
- Minimum 50% or B grade for students with Postgraduate Diplomas in Dietetics, Applied Nutrition, Sports Sciences Fitness and Nutrition, Public Health, Clinical Research.
- NOTE: Applicants who do not have specialization in Foods and Nutrition at Undergraduate level should have completed a total 32 credits under the semester pattern or 600 marks under the annual pattern in the following subjects:
 - Chemistry
 - Biology
 - Physiology

Program Objectives

- ❖ To train and develop students with expertise in fitness and nutrition management for services in wellness/fitness centers, weight management programmes, and into school/college/university teams, health centers and sports academies.
- ❖ To develop capabilities to provide individual counseling and group education in nutrition, exercise and fitness.
- ❖ To prepare students for careers as entrepreneurs in organizing, directing or managing physical fitness programmes with a holistic approach to fitness and wellness.
- ❖ To counsel sports person under different sports category.

Program Specific Objectives:

After successful completion of the course, the learner will be able to:

- ❖ Develop expertise in fitness and nutrition management for services in wellness/fitness centers, weight management programmes, and into school/college/university teams, health centers and sports academies.
- ❖ Design and provide diet plan for individual counseling and group education in nutrition, exercise and fitness.
- ❖ Understand the unique but important concept of sports psychology which plays an impact on the performance of the athletes.
- ❖ Construct their careers as entrepreneurs in organizing, directing or managing physical fitness programmes with a holistic approach to fitness and wellness.
- ❖ Counsel sports person under different sports category as per their body composition and nutritional needs.
- ❖ Analyze and evaluate recent research advances in the field of sports nutrition.

Semester I

Sr. No.	Course	No of lecture	T.C.	Th Cr.	Pr. Cr	Internal marks	External marks	Total marks
<i>Core component</i>								
1	Human Physiology	60	4	4	-	50	50	100
2	Human Nutrition Pr	120	4	-	4	50	50	100
3	Sports and Exercise Science Th	60	4	4	-	50	50	100
4	Sports and Exercise Science Pr	120	4	-	4	50	50	100
5	Anatomy, Kinesiology and Ergonomics	60	4	4	-	50	50	100
6	CBCS: Human Nutrition and Metabolism/ Functional Foods	60	4	4	-	50	50	100
<i>Value-Added Courses</i>								
1	Nutritional Biochemistry	30	2	2	-	50	50	100
2	Bridge Course*	60	4	4	-	50	50	100

*Compulsory for students from non-nutrition background

CBCS: Choice Based Credit System

Course Title: HUMAN PHYSIOLOGY**Course Code: SSFN101**

Course Description: This course introduces students to the physiology of the human body. Students understand the mechanisms of body function, organized around the central theme of homeostasis – how the body meets changing demands while maintaining the internal constancy necessary for all cells and organs to function.

Course outcomes:

At the end of the course, the learner will be able to:

- Discuss the fundamental & physiological processes of homeostasis, cell physiology, nervous system, urinary system, digestive system, respiratory system, circulatory and immune system.
- Explain the alteration in structure and function of normal physiology that takes place due to clinical disorders and vice versa.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN101	Human Physiology	60	4	4	-	50 M	50 M	100 M

Contents:

Levels of organization for Human Anatomy and body fluids (15 Lectures)

Module No	Objectives	Content	Evaluation
1	The module enables students to: a. Understand basics of human cell structure and levels of organization for human anatomy b. Understand types, distribution and specific	<p>1. Cell Structure</p> <p>a) Levels of cellular organization b) Types of cell organelles, tissues, organs and systems c) Regulation of cell Multiplication</p> <p>2. Tissues</p> <p>Structure, physiological properties and function of:</p> <p>a) Epithelial tissue b) Muscle tissue c) Nervous tissue d) Skeletal tissue (bone and cartilage)</p>	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/

Module No	Objectives	Content	Evaluation
	<p>functions of tissues in human body</p> <p>c. Understand composition, location and functioning of different fluids present in human body</p>	<p>3. Body Fluids</p> <p>a) Lymph b) CSF c) Ocular d) Interstitial e) Pleural f) Pericardial g) Synovial fluids h) Blood: Blood formation, composition, coagulation, factors affecting coagulation, hemostasis. Blood groups and histocompatibility, blood indices, Anemia.</p>	<p>conducted for each module</p>

Focus on Homeostasis: cardio-respiratory system & Gastro-intestinal system (10 Lectures)

Module No	Objectives	Content	Evaluation
2	<p>The module will enable students to:</p> <p>a. Understand structure, location and functions of cardiac and respiratory systems in human body</p> <p>b. Understand the regulatory mechanism of cardio-respiratory system</p> <p>c. Understand the mechanism of breathing</p> <p>d. Understand the normal ECG pattern and the concept of blood pressure</p> <ul style="list-style-type: none"> Understand various pathological conditions that can be manifested by individuals due to changes in structure and functioning of these organs/ systems 	<p>2.1. Heart and Circulation</p> <p>a) Basic Structure, special junctional tissues, cardiac muscle properties</p> <p>b) Cardiac cycle, cardiac output, factors affecting cardiac output</p> <p>c) Normal ECG, heart failure</p> <p>d) Systematic, pulmonary, coronary and portal circulation</p> <p>e) Blood pressure, control and factors affecting blood pressure.</p> <p>2.2. Respiratory System</p> <p>a) Structural components of Respiratory System</p> <p>b) External and Internal respiration</p> <p>c) Mechanical control of respiration</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews</p> <p>Assignments/ Presentations assigned/ conducted for each module</p>

		d) Chemical control of respiration e) Neural control of respiration	
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Focus on Homeostasis: gastro-intestinal, excretory & reproductive system (15 Lectures)

Module No	Objectives	Content	Evaluation
3	a) Understand structure, location and functions of gastro-intestinal, hepatic-biliary system, excretory and reproductive system in human body and its regulatory mechanism • Understand various pathological conditions that can be manifested by individuals due to changes in structure and functioning of these organs/ systems	<p>3.1 Gastrointestinal system and Hepato biliary system</p> a) Structure, physiology and functions of the GI tract and accessory organs and role of hormones and enzymes involved in digestion process <p>3.2 Excretory System</p> a. Components of Excretory System, Kidney: Structural and functional relation b. Overview of urine formation process c. Regulation of water balance, excreting dilute or concentrated urine d. Regulation of acid base balance e. Blood supply to kidney <p>3.3 Reproductive System</p> a. Female Reproductive System – Structure and function of Ovary, Uterus b. Hormonal control of menstrual cycle c. Male reproductive system – Structure and Function of Testis, hormonal control of spermatogenesis.	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

Focus on Homeostasis: Endocrine and nervous system & Biological aspects of Immunity
(15 Lectures)

Module No	Objectives	Content	Evaluation
4	<p>This module enables students to:</p> <ul style="list-style-type: none"> • Understand advances in molecular biochemistry • Understand structure, metabolism of nucleotides and its related disorders • Understand gene expression and factors involved in its regulation. 	<p>Biochemical aspects of purine and pyrimidines</p> <ol style="list-style-type: none"> a. Metabolism of purines b. Metabolism of pyrimidines c. Role of purine and pyrimidine nucleotides in metabolism. <p>Biochemistry of Nucleic Acids</p> <ol style="list-style-type: none"> a. Metabolism of DNA b. Metabolism of RNAs c. DNA replication, mutation, repair and recombination concepts d. Disorders of nucleic acid metabolism <p>Protein Biosynthesis</p> <ol style="list-style-type: none"> a. Gene expression and its regulation, transcription, translation, post-translational modification b. Inhibitors of protein biosynthesis c. Gene expression in mitochondria d. Systems Biology including Metabolomics and Proteomics 	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

EVALUATION

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

References:

1. West, J.B.: Best and Taylor's Physiological Basis of Medical Practice, 11th Edition.
2. Chatterjee, C.C. (2002): Human Physiology: Medical Allied Agency, Calcutta.

3. Guyton and Hall (2003): Text Book of Medical Physiology, 9th Edition, Prism Books Pvt. Ltd., W.B. Sanders Company, USA.
4. Tortora (2003) Principles of Anatomy and Physiology.. John Wiley and sons.
5. Keel and Neil: Samson and Wright's Applied Physiology (12th edition), Oxford University Press. London.
6. Ross and Wilson: Anatomy and physiology in Health and Illness, 8th Edition, Church Hill Livingstone, N.Y

Course Name: HUMAN NUTRITION PRACTICALS**Course Code: SSFN102****Course Description:**

The course is designed to introduce students to the concept of meal planning and to design meals for specific life stages.

Course Outcome

At the end of the course, the learner will be able to:

- Explain the concept of standardization, food groups and their application in daily meal plans.
- Develop a basic diet plan for different life stage population and make necessary changes in the dietary habits needed.
- Evaluate and alter basic recipe in a healthy preparation by introducing minor changes.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN102	Human Nutrition (P)	60	4	-	4	50	50	100

Human Nutrition: Basics and Introduction (20 lectures)

Module No.	Objectives	Content	Evaluation
1	This module enables students to: a) Gain an understanding of the fundamentals of Nutrition Understand the portion control and thereby the basics of standardization	i. Basic five food groups, dietary guidelines and food pyramid Standardization of common recipes	Students will be evaluated on basis of diet plan submission/ journal competition/ assignments/ planning exams

Principles of meal planning & nutrition for different age groups (40 lectures)

Module No.	Objectives	Content	Evaluation
2	This module enable students to: a. Understand basic principles of meal planning b. Prepare a basic meal plan which is nutritionally adequate for all the age groups of the general population.	Meal Planning and Preparation: (a) Principles of meal planning (b) Planning and preparation of nutritionally adequate diets for - Adult man - Adult woman - Adolescent - School going child - Preschooler - Pregnant woman - Lactating women	Students will be evaluated on basis of diet plan submission/ journal competition/ assignments/ planning exams

MODULE 3: planning of different recipes (60 lectures)

Module No.	Objectives	Content	Evaluation
3	This module enable students to: • Plan and prepare simple recipes rich in particular nutrient which can be used during specific conditions.	Planning and preparation of: - Energy dense recipes - High fibre recipes - Low fat recipes - Low sodium recipes - Micronutrient dense recipes	Students will be evaluated on basis of diet plan submission/ journal competition/ assignments/ planning exams

EVALUATION

Evaluation	Details	Marks
Internal	Journal work & assignment/ project submission	50
External	Practical examination test & Viva Voce	50
	Total marks	100

Course Name: SPORTS AND EXERCISE SCIENCE (TH)**Course Code: SSFN103****Course Description**

This course provides instruction and the opportunity for participation in a variety of lifetime sports and physical fitness activities. Skills, strategies, rules, and personal wellness of sports person.

Course Outcome

At the end of the course, the learner will be able to:

- Understand the scientific background of exercise and sport activities.
- Develop and monitor the athletic and fitness programmes for individuals and groups.
- Construct appropriate health and fitness goals for athletes

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN103	Sports & Exercise Science	60	4	4	-	50	50	100

Contents**Body composition, types and principles of exercise (10 lectures)**

Module No	Objectives	Topics	Evaluation
1	This module enable students to: a) Understand the basics of various sports, games and exercise and their role in athletes.	Sports, Games and Exercise, Types and description. Principles of exercise, importance, advantage and disadvantages of types of exercises including Aerobics, yoga, Resistance exercise, isometric and isotonic exercise etc. Body composition: Body cell mass, Lean body mass, direct and indirect techniques for	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/

	a. Understand various components and techniques used to assess body composition.	determining body composition; Body types, Kinanthropometry.	Presentations assigned/ conducted for each module
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Functional tests of health & Fitness (20 lectures)

Module No	Objectives	Topics	Evaluation
2	This module enables students to: a) Understand the working of cardio respiratory system in the body of an athlete and the effect of exercise on these systems. b) Understand the various methods available to assess energy expenditure in sports and exercise athletes.	The Cardio Respiratory system –Athletic heart. Acute and chronic adaptation (effect of different types of exercise), Index of training, Importance of heart rate monitoring, over training and detraining. Respiratory system- control during physical exercise. Effect of training on heart and lung performance, chronic and acute adaptation, Hypoxia and hypercapnia. Lung function test and its importance, Spirometry Determination of energy expenditure in sports and exercise using various methods.	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

Musculo-skeletal and nervous system (15 lectures)

Module No.	Objective	Content	Evaluation
3	This module enable students to: a) Understand the different types of muscle in the human body and their role in various activities. b) Understand the effect of over training on the human body with	Skeletal muscle types, relation with different types of activities. Physiological adaptations to strength training. Effects of over training and detection, Muscle fatigue, prevention and recovery. Effects of exercise on nervous system.	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations

	measures for its prevention and recovery. Understand the effect of exercise on nervous system.		assigned/ conducted for each module
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Sports related issues, injury & Doping (15 lectures)

Module No.	Objective	Content	Evaluation
4	<p>This module enable students to:</p> <p>a) Understand the problems associated with female athletes, its causes and curative and preventive measures.</p> <p>b) Understand the basics of various injuries a sports person faces with its preventive and curative measures.</p> <p>Understand doping as a legal matter and various policies associated with doping.</p>	<p>Menstrual problems of female athletes. Female athletic triad.</p> <p>Sports injury and rehabilitation. Stress and strain, Basic injuries in upper and lower limb, neck, trunk and hip joint and nerve injuries, acute and chronic back ache, foot problem in sports, role of physiotherapy and yoga, preventive exercise program.</p> <p style="text-align: center;">Doping and its control.</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

EVALUATION

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

REFERENCES

1. Fox EL (1983).Sports Physiology.Holt-Saunders International Editions,
2. McArdle, W.D.; Katch, F.I and Katch V.I.(eds)..Exercise Physiology, Energy, Nutrition and Human performance. Latest edition
3. McArdle, W.D.; Katch, F.I and Katch V.I. (eds).Essentials of Exercise Physiology. Latest edition
4. Satyanarayan, K; Nageshwar Rao. C; Narsinga Rao,B.S.; Malhotra, M.S. (1985). Recommended Dietary Intakes for Indian Sportsman and Women, Hyderabad, National Institute of Nutrition.
5. Bloomfield J, Ackland TR. and Elliot BC (1994). Applied Anatomy and Biomechanics in Sportsssss. Blackwell Scientific Publications.
6. Kirkendall D, Gruber J J and. Johnson R E. (1987). Measurement and evaluation for Physical Educators -. Human Kinetics Publishers Inc.

Course Name: SPORTS AND EXERCISE SCIENCE (Pr)
Course Code: SSFN104

Course Description :

This course provides theoretical knowledge with the practical application of scientific principles and technology to help individuals maximize their sports performance.

Course Outcome

At the end of the course, the learner will be able to:

- Design, administer, and evaluate different type of exercise techniques for individuals and group.
- Assess the physiological and functional capacity of individual and groups.
- Discuss the possibility and prevention of any contradictions for exercise and create appropriate solutions for the same

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN104	Sports & exercise Science (P)	120	4	-	4	50	50	100

Contents**Functional tests (40 lectures)**

Module No	Objectives	Content	Evaluation (50 M)
1	This module will enable students to: a) Gain knowledge for assessing cardiac functioning, and application of ergometer.	Physiological tools for testing and monitoring of training-Blood pressure, Heart rate, Calculating Training heart rate. Exercise ergometry- Cycle ergometer, treadmill	Students will be evaluated on basis of journal competition/ assignments/ execution of activities assigned

Physical fitness assessment (40 lectures)

Module No.	Objective	Content	Evaluation
2	This module will enable students to: Gain knowledge and skills to interpret body composition of an individual and its implication for human health	Physical fitness assessment- Body composition, and other indices for assessment of obesity, body fat percentage by skinfold method and Somatotyping. BMI, Ideal body weight. Assessment of Muscle Mass and Bone mass	Students will be evaluated on basis of journal competition/ assignments/ execution of activities assigned conducted for each module

Aerobic fitness tests (40 lectures)

Module No.	Objective	Content	Evaluation
3	<p>This module will enable students to:</p> <ol style="list-style-type: none"> Gain knowledge and skills to assess methods used for cardio-respiratory fitness and its interpretation Gain knowledge about components of fitness and its application on field 	<p>Cardio-respiratory fitness - Max aerobic capacity using modified Harvard test (Queens college test) , Nine minute walk / run test, One mile walk Assessment of Physical work capacity (PWC) Physiological response on Bicycle ergometer/ treadmill. Anaerobic threshold.</p> <p>Assessment of Flexibility, Muscular endurance, Strength and Power.</p>	<p>Students will be evaluated on basis of journal competition/ assignments/ execution of activities assigned conducted for each module</p>

EVALUATION

Evaluation	Details	Marks
Internal	Journal work & assignment/ project submission	50
External	Practical examination test & Viva voce	50
	Total marks	100

Course Name: ANATOMY, KINESIOLOGY AND ERGONOMICS**Course Code: SSFN105****Course Description.**

The course begins with core topics from anatomy, kinesiology and the physiology of work as applied to human abilities and limitations. It also explores biomechanics, anthropometry, physical and psychosocial ergonomic risk factors and analytic methods to mitigate risk exposure.

Course Outcome

At the end of the course, the learner will be able to:

- Explain and discuss with sportsmen/athletes and physically active individuals who exercise to use optimum energy to maximize performance under normal and stressed conditions while minimizing injury
- Provide the essential inputs for design of sports and exercise equipment.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN105	Anatomy, kinesiology & Ergonomics	60	4	4	-	50	50	100

Basics of human anatomy (10 lectures)

Module No	Objectives	Content	Evaluation (50 M)
1	This module will enable students to: a) Understand the basics of Human Anatomy and its applied aspects in human body movement. a) Understand the basics of Kinesiology and its relation to basis of human movement.	Introduction, definition and scope Human anatomy and its applied aspects in body movement. Musculoskeletal system, general anatomy of bones, joints and muscular attachments, joints and their kinds. Muscle structure, functional units , their function, muscle types, recruitment and contraction of muscle fibre, neuromuscular structure. Introduction, definition and scope of Kinesiology.	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

		Axis and planes, levers, kinematics (osteo and ortho), kinetics, Types of contraction, motion, velocity, development of force and its relation to muscular contraction, basis of human movement.	
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Biomechanics (20 lectures)

Module No.	Objective	Content	Evaluation
2	This module will enable students to: Understand and apply knowledge of basics of biomechanics in various sports.	Basic rules of mechanics and its application in sports, external and internal forces, principles of stability, whole body centre of gravity, movement of inertia, dynamometry, static and dynamic forces, joint motion study. Posture, concepts, principles and adjustments	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

Factors affecting performance (15 lectures)

Module No.	Objective	Content	Evaluation
3	This module will enable students to: Understand the role of different kind of work environment on an athlete performance.	Effect of work environment on health, safety and performance. Altitude, different climatic condition. Body temperature control and its importance in sports and performance. Process of heat transfer, thermal stress on physiological variables at rest and during activity. Heat tolerance, precautionary	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews

		measures during the training in adverse conditions.	Assignments/ Presentations assigned/ conducted for each module
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Sports ergonomics (15 lectures)

Module No.	Objective	Content	Evaluation
4	This module will enable students to: Understand the basics of ergonomics and its need in sports.	Definition of and need for sports Ergonomics Principles of ergonomics (Basic human factors and MME system). Cumulative traumatic disorders, types, risk factors and prevention. Principle of designing protective equipments in sports -shoes, helmets, shoulder pads, braces etc.	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

EVALUATION

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

References

1. Joint structure and Function - Pamela K. Levangie and Cynthia Norkin ; 4th edition
 2. Sports Injuries - Christopher Noriris
 3. Industrial Therapy - Glenda Key
 4. Ergonomics Edge - Dan Macloid
 5. Sports Physiology, by Edeard L. Fox, Holt-Saunders International Editions, PP418, 1983.
 6. The Physiological Basis of Physical Education and Athletics, by E. L. Fox and D.K..Mathews, Published by Holt-Saunders, 1981.
 7. Text Book of Work Physiology, by P. Astrand and K.Rodahl, Published by McGraw-Hill, 1970.
 8. Textbook of Medical Physiology, by A.C.Guyton, Published by W.B.Saunders Co., PP1014, 1991.
 9. Fitting the task to the man, by E.Grandjean, Published by Taylor & Francis Ltd.1980.
 10. Indian Anthropometric Dimensions: for ergonomics design practice, by D.Chakrabarti, Published by National Institute of Design, 1997.
 11. The Mechanics of Athletics by G. Dyson, Published by Dover Publications Inc., 1962.
- An Introduction to Measurement in Physical Education, by H. J. Montoye, Published by Allyn and Bacon Inc., 1978

Course Name: HUMAN NUTRITION AND METABOLISM**Course Code: SSFN106 A****Course Description**

The course is designed to provide information about principles of Human Nutrition and an integrated overview of the physiological requirements and functions of protein, energy, and the major vitamins and minerals that are determinants of health and diseases in human populations.

Course Outcome:

At the end of the course, the learner will be able to:

- Explain major properties, functions, and important food sources of the nutrients;
- Discuss the human nutrient and energy needs throughout the life span and in physical training.
- Translate human nutrient and energy needs into daily food selection utilizing appropriate standards and guidelines;
- Evaluate meal plans for nutritional adequacy, nutrient density, balance, variety, and calorie control.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN106 A	Human Nutrition & Metabolism	60	4	4	-	50	50	100

EVALUATION

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

Module 1:**Introduction to human nutrition and carbohydrates****(15 lectures)**

OBJECTIVES	CONTENTS	EVALUATION
<p>This module enable students to:</p> <p>a) Understand the various factors influencing the food intake</p> <p>b) Understand the basics of metabolism of Carbohydrates Know the functions, deficiencies and toxicity of carbohydrates</p>	<p>Nutrition and its relation to health</p> <p>Food Acceptance and Food Behavior</p> <p>Internal and external factors influencing the intake of food</p> <p>Digestion of Food- Role of gastrointestinal tract, hepatobiliary system and pancreas</p> <p>Absorption- mechanisms of transport</p> <p>Digestion, Absorption and metabolic conversions (in brief), functions, sources, requirements effects of deficiencies and excess of</p> <p>Carbohydrates: sugar, starches, fiber</p> <p>Metabolic conversions to include utilization of glucose(postabsorptive), conversion to glycogen and fat</p> <p>Glucose Homeostasis and role of Hormones (in brief)</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews</p> <p>Assignments/ Presentations assigned/ conducted for each module</p>

Module 2:**Proteins and Lipids****(15 lectures)**

Objectives	Content	Evaluation
<p>This module enable students to:</p> <p>a) Understand the basics of metabolism of Lipids</p> <p>b) Understand the role of lipoprotein and its implications on health.</p> <p>c) Understand the basics of metabolism of Proteins and its requirements during different stages of life cycle</p>	<p>Digestion, Absorption, Transport (in brief), functions, sources, requirements, effects of deficiencies and excess of</p> <p>Lipids : fatty acids, fat, cholesterol</p> <p>Role of lipoproteins and implications for health (in brief)</p> <p>Digestion, Absorption and metabolic conversions (in brief), functions, sources, requirements during different stages of life cycle, effects of deficiencies and excess of</p> <p>Protein and amino acids- essential and non-essential amino acids</p> <p>Disposal of nitrogenous wastes – role of liver and kidney</p> <p>Protein synthesis and breakdown vis-à-vis the intake</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Module 3:
Vitamins
(15 lectures)

Objectives	Content	Evaluation
<p>This module enable students to:</p> <p>a) Understand the basics of metabolism of fat soluble and water soluble vitamins</p> <p>b) Understand the various functions and sources of fat soluble and water soluble vitamins.</p> <p>c) Identify the deficiencies and potential toxic effects of fat soluble and water soluble vitamins leading to various disorders.</p>	<p>Absorption and transport, functions(physiological and biochemical), sources, requirements during different stages of life cycle, effects of deficiencies and excess of :</p> <p>Fat soluble vitamins</p> <ul style="list-style-type: none"> - Vitamin A - Vitamin D - Vitamin E - Vitamin K <p>Water soluble vitamins</p> <ul style="list-style-type: none"> - Vitamin C - Thiamin - Riboflavin - Niacin - Pyridoxine - Folic acid - Vitamin B12 - Pantothenic acid - Biotin 	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Module 4:**Minerals****(15 lectures)**

Objective	Content	Evaluation
<p>This module enable students to:</p> <p>a) Understand the basics of metabolism of minerals and trace elements</p> <p>b) Understand the various functions and sources of minerals and trace elements.</p> <p>c) Identify the deficiencies and potential toxic effects of minerals and trace elements leading to various disorders.</p>	<p>Absorption and transport, functions(physiological and biochemical), sources, requirements during different stages of life cycle, effects of deficiencies and excess of</p> <p>Minerals and trace elements</p> <ul style="list-style-type: none"> - Calcium and phosphorus - Iron - Zinc - Fluoride - Iodine - Selenium - Copper Sodium, Potassium and Chloride 	<p>Students Will be evaluated based on their performance in Quizes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

REFERENCES:

1. Groff, James L & Gropper, Sareen S: Advanced nutrition and human metabolism. 3rd ed. Stamford : Wadsworth Publ, 1999.
2. Barasi, Mary E : Human nutrition : a health perspective. London : Arnold, c1997.
3. Present Knowledge in Nutrition. International Life Sciences Institute.
4. Eastwood, Martin & Edwards, Christine & Parry, Doreen : Human nutrition : a continuing debate. London : Chapman & Hall, c1992.
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6. Guthrie Helen (1986) Introductory Nutrition. Times Mirror/ Mosby College Publishing.
7. Mudambi, S.R., Rajgopal, M.V.(1990) Fundamentals of Foods and Nutrition, New Age International Pvt. Ltd.
8. Nutrient Requirements and Recommended Dietary Allowances for Indians- I.C.M.R. Publication 1999.
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11. Wardlaw (1993): Perspectives in Nutrition, Paul Insel Mosby.
12. Bhatia Arti: Nutrition & Dietetics- Anmol Publication Pvt. Ltd.- New Delhi.
13. C. Gopalan, B.V. Ramasastri and S.C. Balasubramanian (1989)- Nutritive Value of Indian Foods. NINICMR Hyderabad 500 007

Course Title: FUNCTIONAL FOODS**Course Code: SSFN106 B**

Course Description: This course is designed to explore research based knowledge about specific food products or nutrients having health benefits that can prevent, manage clinical conditions

Course outcomes:

At the end of the course, learners will be able to:

- Understand the concept of functional food and active components of food.
- Apply research-based knowledge and evidence-based facts of functional foods for preventive and therapeutic nutrition.
- Discuss the mechanism of action for functional food and its safe intake levels.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN106 B	Functional Foods	4	4	4	-	2/50	2/50	100 Marks

EVALUATION

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

Contents:

Module 1:
Prebioic, Probiotic & Symbiotics
(15 lectures)

Objective	Content	Evaluation
<p>a. To learn about the functioning and benefits for prebiotics, probiotics and symbiotics</p>	<p>Introduction: Definition, history, classification – Type of classification (Probiotics, probiotics and synbiotics; Nutrient vs. Non-nutrient; according to target organ; according to source or origin).</p> <p>Probiotics</p> <p>a. Taxonomy and important features of probiotic micro-organisms.</p> <p>b. Health effects of probiotics including mechanism of action.</p> <p>c. Probiotics in various foods: fermented milk products, non-milk products etc.</p> <p>d. Quality Assurance of probiotics and safety.</p> <p>Prebiotics</p> <p>Unit 1. Definition, chemistry, sources, metabolism and bioavailability, effect of processing, physiological effects, effects on human health and potential applications in risk reduction of diseases, perspective for food applications for the following:</p> <ul style="list-style-type: none"> • Non-digestible carbohydrates/oligosaccharides: • Dietary fibre • Resistant starch • Gums <p>Application for gut microflora, GI dysfunctions, Immune related disorders and infections</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Module 2:
Biodynamic compounds
(15 lectures)

Objective	Content	Evaluation
<p>To understand plant based functional ingredients and food's chemistry and benefits</p> <p>To learn their application in suitable clinical conditions</p>	<p>Potential health benefits of the following biodynamic principles:</p> <p>Definition, chemistry, sources, metabolism and bioavailability, effect of processing, physiological effects, effects on human health and potential</p> <ul style="list-style-type: none"> • Polyphenols: Flavonoids, catechins, isoflavones, tannins Curcumin, Resveratrol • Phytoestrogens/ Isoflavones • Phytosterols • Glucosinolates • Pigments : Lycopene, Carotenoids • Organo sulphur compounds • Other components – Phytates, Protease inhibitors, saponins, Amylase inhibitors, haemagglutinins 	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews</p> <p>Assignments/ Presentations assigned/ conducted for each module</p>

Module 3:**Spices & herbs : Application of functional food in therapeutic conditions****(30 lectures)**

Objective	Content	Evaluation
a. To learn about the active ingredient, present naturally in spices, herbs and other plant based foods, their implication and benefits for clinical conditions, sports etc.	<p>Active biodynamic principles in spices, condiments and other plant materials and their evidence-based effects</p> <p>Application of functional food(s) for:</p> <ol style="list-style-type: none"> 1. Communicable and infectious diseases AIDS/ HIV, air-borne, vector-borne, food-borne, water- borne diseases 2. Non communicable diseases: obesity and metabolic syndrome, cardiac disorder, liver and kidney issues, endocrine abnormalities 3. Cancer prevention and management of symptoms 4. At different life stages 5. Sports athletes 6. Neurological health 	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

References

1. Bucci, L., 1993 Nutrients as Ergogenic Aids for Sports and Exercise. Boca Raton, FL.:CRC Press.
2. Advances in Sport and Exercise Science : Nutrition and Sport , Edited by Don MacLaren. , ChPublished by Churchill Livingstone, Elsevier. 2007
3. Sports Medicine: The school age athlete by Bruce Reider. 1996. Published by W.B. Saunders.
4. Nutrition for Serious Athletes. Dan Banardot. 2000; Human Kinetics.
5. Energy-Yielding Macronutrients and Energy Metabolism in Sports Nutrition. Edited by Judy A Driskell , Ira Wolinsky, CRC Press 2000.
6. Recommended Dietary Intakes for Indian Sportsman and Women. Satyanarayan, K; Nageshwar Rao. C; Narsinga Rao,B.S.; Malhotra, M.S. (1985)., Hyderabad, National Institute of Nutrition.

BRIDGE COURE**Course Title: BASICS IN FOOD SCIENCE, NUTRITION AND DIETETICS**

Course Description: This course is designed to impart knowledge to students who are graduate from other than nutrition field and have enrolled for M.S in Clinical Nutrition and Dietetics course. the course shall provide students with required knowledge and skills required for competition of the curriculum.

Objectives:

This course will enable the students to:

- Gain knowledge about the basics of human nutrition
- Understand the basics of meal planning and diet therapy.
- Understand the importance of nutritional requirement for an individual in different life stages

Learning outcomes:

After completion of the course students are expected to:

- Have basic knowledge about nutrition and dietetics which will enable them to understand the advanced syllabus offered in the M.Sc. course.
- Have practical knowledge which will be useful for planning therapeutic diet for different clinical conditions

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
	Bridge Course - Basics in Food Science, Nutrition and Dietetics	60	4	3	1	50	50	100

EVALUATION:

- 1) Internal-50 marks – class tests and quiz, journal submissions and lab work
- 2) External- 50 marks- planning exam and theory exam

MODULE 1: Basics in Human Nutrition

Objectives	Content	No. of Lectures	Evaluation
<p>This module will enable students to:</p> <ul style="list-style-type: none"> • Understand basic terminologies and concepts related to nutrition • To understand types of nutrients which are vital for human life and also their basic metabolic pathway • Students will also understand the role of each nutrient and effects of its deficiency or toxicity on human health. 	<ul style="list-style-type: none"> • Understanding basics: Nutrition, Nutrients, health, food pyramid, my plate, ICMR, RDA, units of energy, components of energy and factors affecting the components. • The structure and role of enterocytes • Process of digestion & absorption of nutrients across the gastrointestinal tract • Transportation of nutrients across the brush border membrane • Macronutrients: types, function, metabolic pathways, deficiency and toxicity effects • Micronutrients: types, function, overview of deficiency and toxicity • Overview for nutritional assessment techniques and their application 	15	Students will be evaluated based on class test, quizzes and assignments completed.

Module 2: Basics of meal planning & food science (T)

Objectives	Content	No. of Lectures	Evaluation
<p>This module will enable students to:</p> <ul style="list-style-type: none"> Understand food groups, food pyramid and procedure of diet planning for general population. will also introduce students to basic concept of food principle related to each food group 	<ul style="list-style-type: none"> Concept of nutritive value of food and development of exchange list Principle of planning diet. Modification of normal diets with special emphasis on macronutrients and micronutrients. Menu planning with nutrient distribution <p>Basic concept of food science:</p> <ul style="list-style-type: none"> Basics of heat transmission & its type, methods of cooking. 5 basic food groups: cereals, pulses, milk & milk products, eggs, poultry, fish, sugar and fats & oils Effect of processing on the food groups Overview of preservative technique used for perishable food products 	15	Students will be evaluated based on class test, quizzes and assignments completed.

Module 3: basics of meal planning & food science (P)

Objectives	Content	No. of Lectures	Evaluation
<p>This module will enable students to:</p> <ul style="list-style-type: none"> Understand and develop exchange list for practical use. Understanding the concept of portion size by developing standardised recipe which will help them for meal planning It will also enable students to plan appropriate diet for healthy population/ 	<ul style="list-style-type: none"> Development of exchange list Standardization of common recipe belonging to different food groups and applying their food properties modification of normal diet for consistency and texture planning diet for different age groups: Childhood, adolescence, adult, elderly. Pregnancy & lactation 	15	Students will be evaluated based on class test, quizzes and assignments completed.

individuals belonging to different life stage.			
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Module 4: nutrition throughout life stages

Objectives	Content	No. of Lectures	Evaluation
<ul style="list-style-type: none"> This module will enable students to understand the basic nutritional requirement for individual belonging to different age groups 	<p>Understand the nutritional requirements based on growth and development / changes taking place in the following life stages:</p> <ul style="list-style-type: none"> • Infancy • Childhood • Adolescence • Adulthood • Elderly • Pregnancy • Lactation 	15	Students will be evaluated based on class test, quizzes and assignments completed.

Semester II

Sr. No.	Course	No of lecture	T.C.	Th Cr.	Pr. Cr	Internal marks	External marks	Total marks
<i>Core Component</i>								
1	Nutrition in Health and Disease	60	4	4	-	50	50	100
2	Nutrition for Sports and Exercise Th	60	4	4	-	50	50	100
3	Nutrition for Sports and Exercise Pr	120	4	-	4	50	50	100
4	Weight Management, Rehabilitation and Fitness Th	60	4	-	4	50	50	100
5	Weight Management, Rehabilitation and Fitness Pr	120	4	-	4	50	50	100
6	CBCS: Sports Psychology and Counseling/ Research Methodology/ SWAYAM	60	4	-	4	50	50	100
<i>Value Added Courses</i>								
1	Scientific Writing	60	4	-	4	50	50	100

Course Name: NUTRITION IN HEALTH AND DISEASE**Course Code: SSFN201****Course Description**

The course is designed to provide concepts of an intermediate study of nutritional therapy of disease. Course content includes evidence based practice in prevention and nutritional management of diseases

Course Outcome

At the end of the course, the learner will be able to:

- Describe the role of diet in disease prevention and treatment across the continuum of diet-related health conditions from primary, secondary and tertiary care.
- Apply all elements of nutrition screening and assessment within context of the Nutrition Care process for identifying the diseased condition.
- Design and implement appropriate communication, counseling and education skills to patient care with specific disease conditions

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN201	Nutrition in Health & Disease	60	4	4	-	50	50	100

Contents:**Water regulation in human body, fluid imbalance & Body composition (15 lecture)**

Module No	Objectives	Contents	Evaluation
1	This module will enable students to: a) Understand the concept of fluid balance electrolyte balance and acid base balance in the human body and various disorders	Fluid balance, electrolyte balance and acid-base balance Body composition- changes through the lifecycle	Students Will be evaluated based on their performance in Quizes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/

	<p>caused due to their imbalance.</p> <p>b) Understand the changes in body composition in the human body throughout the life cycle.</p> <p>Understand the basics of Dehydration and Diarrhea.</p>	Diarrhoea and dehydration	Presentations assigned/ conducted for each module
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Energy Metabolism (15 lectures)

Module No.	Objective	Content	Evaluation
2	<p>This module will enable students to:</p> <p>a) Understand the concept of Energy Metabolism, Energy Balance and changes in energy requirements throughout the life cycle.</p> <p>b) Understand the basics of nutritional care in weight management.</p>	<p>Energy Metabolism:</p> <p>1. Energy: Metabolic Concept and Measurements</p> <p>Body's need of energy</p> <p>Metabolic processes to yield energy (in brief)</p> <p>Units of Energy</p> <p>2. Energy Needs of the Body: BMR, REE, Voluntary activities, Influence of food, Energy requirements across the life span and during exercise. Energy requirements across the life span, Meeting energy needs (in brief)</p> <p>Energy Balance- Maintaining body weight Under nutrition and Obesity – causes and consequences</p> <p>Basic Principles of nutritional care in weight management.</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Diabetes Mellitus (15 lectures)

Module No.	Objective	Content	Evaluation
3	This module will enable students to: Understand the basics, etiological factors and principles of nutritional care involved in Diabetes Mellitus and various Heart Disease.	Diabetes Mellitus Definition, Classification and indicators, etiological factors, basic principles of nutritional care Dyslipidemias, Hypertension and Heart disease Definition and indicators, etiological factors, principles of nutritional care	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

Introduction to renal disorder, Bone health, Cancer (15 lecture)

Module No.	Objective	Content	Evaluation
4	This module will enable students to: Understand the basics, etiological factors and principles of nutritional care involved in Renal disorders, Cancer and Bone disorders.	Introduction to renal diseases Nomenclature, definition, indicators and basic principles of nutritional care Nutrition and Bone health (preventive aspects) Nutrition and Cancer (preventive aspects)	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

Evaluation

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

References:

1. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
2. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
3. Escott-Stump, S. (1998): Nutrition and Diagnosis Related Care, 4th Edition, Williams and Wilkins.
4. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.
5. Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.
6. Davis, J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd Edition, W.B. Saunders Co.
7. Walker, W.A. and Watkins, J.B. (Ed) (1985): Nutrition in Pediatrics, Boston, Little, Brown & Co.
8. Guyton, A.C. and Hall, J.E. (1999): Textbook of Medical Physiology, 9th Edition, W.B. Saunders Co.
9. Ritchie, A.C. (1990): Boyd's Textbook of Pathology, 9th Edition, Lea and Febiger, Philadelphia.
10. Fauci, S.A. et al (1998): Harrison's Principles of Internal Medicine, 14th Edition, McGraw Hill.
11. World Cancer Research Fund (1997). Food, Nutrition and the Prevention of Cancer- A Global perspective, Washington E.D. WCRF.

Journals and Other Reference Series

1. Nutrition Update Series
2. World Review of Nutrition and Dietetics
3. Journal of the American Dietetic Association
4. American Journal of Clinical Nutrition
5. European Journal of Clinical Nutrition
6. Nutrition Reviews

Course Name: NUTRITION FOR SPORTS AND EXERCISE (TH)**Course Code: SSFN202****Course Description**

The course is designed to examine the application of nutritional regimens to meet exercise requirements and improve athletic performance. Current practice and recommendations for different types of sports will be examined

Course Outcome:

At the end of the course, the learner will be able to:

- Describe energy intake, expenditure, and recommendations as it relates to energy balance of athletes.
- Explain the effect of exercise on fluid balance and outline strategies for maintaining fluid balance before, during, and after exercise.
- Understand the role of exercise, weight, and body composition on the performance, health, and disease of sports athlete.
- Explain the loss, intake, and recommendations for minerals, vitamins, and supplements for athletes.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN202	Nutrition for Sports & exercise (Th)	60	4	4	-	50	50	100

Energy system, fluid balance and fuel metabolism (10 lectures)

Module No	Objectives	Contents	Evaluation
1	<p>This module will enable students to:</p> <p>a) Understand the different energy systems required during different sports activities.</p> <p>b) Understand the basics of fluid balance, its importance and preventive measures during the course of dehydration.</p>	<p>Introduction, Nutritional considerations for sports / exercising person as compare to normal active person.</p> <p>Energy substrate for activities of different intensity and duration, aerobic and anaerobic activities.</p> <p>Fluid balance in sports and exercise, importance, symptoms and prevention of dehydration, Sports drink.</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Carbohydrates in sports (20 lectures)

Module No.	Objective	Content	Evaluation
2	<p>This module will enable students to:</p> <p>a) Understand the basics of metabolism of carbohydrate and its requirement during pre and post exercise.</p>	<p>Macro Nutrients-Carbohydrate as an energy source for sport and exercise. Carbohydrate stores, Fuel for aerobic and anaerobic metabolism, Glycogen re-synthesis, CHO Loading, CHO composition for pre exercise, during and recovery period.</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Proteins and fat in sports (15 lectures)

Module No.	Objective	Content	Evaluation
3	<p>This module will enable students to:</p> <p>a) Understand the basics of metabolism of fat and protein and its requirement during pre and post exercise.</p>	<p>Role of Fat as an energy source for sports and exercise. Fat stores, regulation of fat metabolism , factors affecting fat oxidation (intensity, duration , training status, CHO feeding) , effect of fasting and fat ingestion</p> <p>a) Protein and amino acid requirements, Factors affecting Protein turnover, Protein requirement and metabolism during endurance exercise, resistance exercise and recovery process. Protein supplement.</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Micronutrients, ergogenic aid and eating disorder in sports (15 lectures)

Module No.	Objective	Content	Evaluation
4	<p>This module will enable students to:</p> <p>a. Understand the role of micronutrients in the body of the sports individual.</p> <p>b. Understand the concept of chronic dieting and eating disorder commonly seen in sports individual and common dietary supplements and ergogenic aids available and used by sports individual.</p>	<p>Important micronutrients for exercise. B complex vitamin and specific minerals. Exercise induced oxidative stress and role of antioxidants</p> <p>Chronic dieting and eating disorder. Female athletic triad, sports anemia</p> <p>Dietary supplements and ergogenic aids (nutritional, pharmacological and physiological)</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Evaluation

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

References

7. Bucci, L., 1993 Nutrients as Ergogenic Aids for Sports and Exercise. Boca Raton, FL.:CRC Press.
8. Advances in Sport and Exercise Science : Nutrition and Sport , Edited by Don MacLaren. , ChPublished by Churchill Livingstone, Elsevier. 2007
9. Sports Medicine: The school age athlete by Bruce Reider. 1996. Published by W.B. Saunders.
10. Nutrition for Serious Athletes. Dan Banardot. 2000; Human Kinetics.
11. Energy-Yielding Macronutrients and Energy Metabolism in Sports Nutrition. Edited by Judy A Driskell , Ira Wolinsky, CRC Press 2000.
12. Recommended Dietary Intakes for Indian Sportsman and Women. Satyanarayan, K; Nageshwar Rao. C; Narsinga Rao,B.S.; Malhotra, M.S. (1985)., Hyderabad, National Institute of Nutrition.

Course Name: NUTRITION FOR SPORTS AND EXERCISE PRACTICALS**Course Code: SSFN203****Course Description**

The course is designed to examine the application of nutritional regimens to meet exercise requirements and improve athletic performance. Current practice and recommendations for different types of sports will be examined

Course Outcome:

At the end of the course, the learner will be able to:

- Assess the nutritional status and body composition of athletes to understand their nutritional requirements.
- Design a plan tailored for the athlete as per their dietary habits, nutritional needs and sports type.
- Evaluate and monitor the effectiveness of the dietary plan on the performance of athletes and people involved in fitness exercises.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN203	Nutrition for Sports & Exercise (P)	120	4	-	4	50	50	100

Principles of meal planning for different sports (40 lectures)

Module No.	Objective	Content	Evaluation
1	<p>This module will enable students to:</p> <p>a) Plan meal and recipes of different caloric values required by a sports individual for various sports activities.</p> <p>b) Gain knowledge about various sports supplements available in the market and their use in sports industry.</p>	<p>Meal Planning for regular training, balance diet of different caloric value for specific sports and exercising person (gymnast, runner, swimmer, sprinter, middle/distance/long distance marathon, weight lifter, boxer, cricketer, golfer, archery, throwing events, hockey, football and aerobic and strength training exercise)</p> <p>Market survey on various sports supplements and ergogenic aids.</p>	<p>Students will be evaluated on basis of diet plan submission/ journal competition/ assignments/ planning exams</p>

Macronutrient planning (40 lectures)

Module No.	Objective	Content	Evaluation
2	<p>This module will enable students to:</p> <p>Understand and prepare carbohydrate and protein rich meal keeping in mind their specific roles during pre and post event.</p>	<p>Carbohydrate rich diet, cyclic menu, low glycemic load and high glycemic load</p> <p>CHO loading</p> <p>Pre event meal and liquid meal.</p> <p>Post event meal, high energy meal</p> <p>Protein rich meal.</p>	<p>Students will be evaluated on basis of diet plan submission/ journal competition/ assignments/ planning exams</p>

Sports bars & Drinks (40 lectures)

Module No.	Objective	Content	Evaluation
3	<p>This module will enable students to:</p> <p>1. Plan and prepare bar and drinks required by a sports person during various sports activities</p>	<p>Sports Bar-energy bar, protein bar and Nutri bar</p> <p>Sports drink- Hypo, iso and hypertonic drink for hydration/ energy and recovery drink</p> <p>Antioxidant rich diet</p>	<p>Students will be evaluated on basis of diet plan submission/ journal competition/ assignments/ planning exams</p>

EVALUATION

Evaluation	Details	Marks
Internal	Journal work & assignment/ project submission	50
External	Practical examination test & Viva voce	50
	Total marks	100

Course Name: WEIGHT MANAGEMENT, REHABILITATION AND FITNESS (TH)**Course Code: SSFN204****Course Description:**

The course includes theoretical knowledge of Health, Anatomy, Physiology, Fitness, Medicine, Nutrition and Psychology which influences decision regarding improvement of fitness and performance level of athletes. It also renders its influence on the activity level and fitness of individuals of all ages.

Course Outcome

At the end of the course, the learner will be able to:

- Explain the dynamics of exercise and its role in fitness.
- Enable sportsmen/athletes and individuals who exercise to use optimum energy to maximize performance under normal and stressed conditions while minimizing injury
- Develop professional expertise in weight management, rehabilitation and fitness students can understand the psychological problems during extreme physical and mental stress
- Discuss the therapeutic benefits of exercise and Students can utilize knowledge of biomechanics
- Understand the physiological effects of exercise on human body composition.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN204	Weight Management & Rehabilitation (Th)	60	4	4	-	50	50	100

Energy homeostasis (15 lectures)

Module No	Objectives	Contents	Evaluation
1	This module will enable students to: a) To understand the feeding behavior,	Regulation of energy intake and expenditure, control of appetite and food intake,	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature

	energy homeostasis and regulation of food intake	Foods selection and consumption pattern Hormonal control: Insulin , Thyroid & estrogen,	reviews Assignments/ Presentations assigned/ conducted for each module
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Nutrition for weight management (15 lectures)

Module No.	Objective	Content	Evaluation
2	This module will enable students to: a) Understand the types of obesity, theories related to obesity and a multi-dimensional approach for its management.	Adult and Childhood obesity, Prevalence, Types, etiology, Theories of obesity, Factors affecting, Co-morbidity. Management through- Long term and short term measures, Nutrition, Exercise, pharmaceutical, Surgical, Stress Mgt. & Lifestyle modification.	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

Principles of nutrition care for weight watchers (15 lectures)

Module No.	Objective	Content	Evaluation
3	This module will enable students to: a) Evaluation of various weight loss diets followed by weight watchers, its curative and preventive measures.	Critical evaluation of standard weight loss diets commonly followed by weight watchers. Care and cure in rehabilitation, precaution. Necessity of continuous monitoring and necessary emergency procedures.	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

Components of fitness (15 lectures)

Module No.	Objective	Content	Evaluation
4	This module will enable students to: Understand the various components of fitness and its co relation in an athletic life.	Components of fitness- Total Fitness (health related fitness) and Athletic fitness. Body Composition and types, Cardiorespiratory Fitness, Muscular endurance and power, Flexibility. Athletic Fitness- Balance, Coordination, Agility, reaction Time etc.	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module

EVALUATION

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

References

1. Edward L. fox and Donald K Mathews (1985). CBS College Publishing. Japan
2. Present Knowledge in Nutrition; Ed, Myrtle L. Brown, ILSI Press.
3. David C. Nieman , Fitness and Sports Medicine, A Health related Approach (3rd edition, 1995
4. Bases of fitness- Edward L. fox , Timothy E. Kirby and Ann Roberts Fox (1987)
5. Measurement and evaluation for Physical Educators - Don Kirkendall, Joseph J Gruber and Robert E. Johnson. 1987. Human kinatics Publishers Inc.
6. The Physiological Basis of Physical Education and Athletics, by E.L.Fox and D.K.Mathews, Holt-Saunders, 1981

**Course Name: WEIGHT MANAGEMENT, REHABILITATION AND FITNESS
PRACTICALS**

Course Code: SSFN205

Course Description:

The course includes practical knowledge of Health, Anatomy, Physiology, Fitness, Medicine, Nutrition and Psychology which influences decision regarding improvement of fitness and performance level of athletes. It also renders its influence on the activity level and fitness of individuals of all ages

Course Outcome

At the end of the course, the learner will be able to:

- Assess the physical fitness of individuals and group by using different physical fitness tests and techniques.
- Discuss various ways to improve the basic components of physical fitness: cardiovascular condition, muscle flexibility, muscle strength and endurance, and body composition.
- Explain the importance of correct method of implementation of exercise to acquire maximum output and minimum risk of any injury.
- Apply the knowledge to prevent and manage injury done to the individual at a primary level during exercise.

	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN205	Weight management & Rehabilitation (P)	120	4	-	4	50	50	100

Detailed discussion for obesity (30 lectures)

Module No.	Objective	Content	Evaluation
1	<p>This module will enable students to:</p> <ul style="list-style-type: none"> a) Gain an understanding of the different equipment's used in fitness industry. b) Understand the concept of obesity and calculation of desirable body weight. c) Understand the various types of exercise available with their role in fitness. 	<p>Equipment's commonly used in Fitness Industry, their advantages and limitation.</p> <p>Classification of obesity according to BMI. Assessment of body fat by different method, Fat distribution, Ideal body weight calculation using BMI, Body fat % and Broca's Index. Calculation of desirable body weight.</p> <p>Types of Exercise including Aerobics, spinning, Tai Chi, Yoga, Power Yoga , Pilate, Strength training, Pyramid training, Circuit training, etc</p>	<p>Students will be evaluated on basis journal assignments/ activities performed</p>

Cardiorespiratory fitness (30 lectures)

Module No.	Objective	Content	Evaluation
2	<p>This module will enable students to:</p> <ul style="list-style-type: none"> a. Understand and perform the basic exercises required for cardio respiratory fitness and strengthening of joints and bones. 	<p>Exercise for : Cardio-respiratory fitness</p> <p>Strengthening the joints and bones and increasing flexibility.</p>	<p>Students will be evaluated on basis journal assignments/ activities performed</p>

Exercise for weight management (30 lectures)

Module No.	Objective	Content	Evaluation
3	This module will enable students to: Understand and perform the basic exercises required for toning of muscles as well as for weight loss.	Exercise for weight gain / muscle development and improving muscle tone Exercise for weight loss	Students will be evaluated on basis journal assignments/ activities performed

The exercise prescription (30 lectures)

Module No.	Objective	Content	Evaluation
3	This module will enable students to: a) Understand and perform the basic exercises required for certain therapeutic conditions.	Therapeutic exercise and program designing for specific demands including specific joint problems, osteoporosis, arthritis, blood pressure, PCO, Diabetes and Cardio Vascular Disease. Precaution and indicators for stopping exercise and necessary emergency procedures..	Students will be evaluated on basis journal assignments/ activities performed

EVALUATION

Evaluation	Details	Marks
Internal	Journal work & assignment/ project submission	50
External	Practical examination test & Viva voce	50
	Total marks	100

COURSE TITLE: SPORTS PSYCHOLOGY & COUNSELING**COURSE CODE: SSFN 206 A****Course Description**

The course is designed to facilitate in learning about factors that affect sport and performance.

- It will enable the students to understand how sports psychology influences sports, athletic performance, exercise and physical activity.
- Use of psychological approach in sports can improve motivation to the sports person

Course Outcome

At the end of the course, the learner will be able to:

- Describe the nature of sports psychology and identify psychological traits which can be useful for athletic performance.
- Recommend and advice ways of maintaining or increasing motivation in an athlete
- Differentiate between positive and negative application of aggressive emotions in sports
- Explain the impact on performance of psychological interactions within a team.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN206 A	Sports Psychology	60	4	4	-	50	50	100

EVALUATION

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

Module 1:**Emotion in Sports****(15 lectures)**

Objective	Content	Evaluation
<p>This will enable students to :</p> <p>Understand the emotional content of sports</p>	<p>a. Sports Psychology Importance and need of Psychological Training in Sports.</p> <p>The Emotional Contents of Sports: Intrinsic Pressures, Social Pressures & Personal Pressure.</p> <p>Mind- The mechanics of Flight or Fight Response, The Physical Disruptions and the Mental Disruptions.</p> <p>The Sports Emotional – Reaction profile: Factors affecting performance like Desire, Assertiveness, Sensitivity, Tension Control Personal Accountability, Self-discipline, Confidence, Concentration, Consistency, Commitment and Trait Interaction.</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Module 2:**Addressing the problem****(15 lectures)**

Objective	Content	Evaluation
<p>This will enable students to understand</p> <p>a. Understand the type of problems that a sport-person undergoes and its impact on sports performance</p>	<p>Understanding the problems of Sportsman - Lack of adequate motivation and concentration, Fear of Insecurity & Rejection, Fear of Making a wrong move, Not able to make the use of maximum available resources (Physical & Mental) Psychological Barriers between student & teacher and Drugs</p>	<p>Students Will be evaluated based on their performance in Quizes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Module 3:
Counselling
(15 lectures)

Objective	Content	Evaluation
<p>This module will enable students to:</p> <p>a. understand the methods and techniques to be used for counselling a sports person</p>	<p>Counselling in sports: Importance & Need of Psychological Counselling, Types of Counselling like Individual, Group, Team etc.</p> <p>Effective Counselling Methods & Techniques, Case studies, Role Plays and Discussion.</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Module 4:
Overcoming Challenges
(15 lectures)

Objective	Content	Evaluation
<p>This module will enable students to:</p> <p>a. develop effective strategies and plan to help a sport person to overcome psychological challenges</p>	<p>Mental Preparation for the Game and Mental Practice for the play.</p> <p>Rational Emotive Mental Training Programme' for sportsman using Mind-Body co-ordination</p> <p>Techniques to Improve Performance - creative Visualisation, Desensitization, Auto-suggestion Therapy, Rational Thinking for specific purpose and Progressive Relaxation procedure</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

References

1. Sports Psychology by Yadvinder Singh, Publisher: Sports Publications
2. Sports Psychology Basics Andrew Caruso Publisher: Reedswain
3. Key Concepts In Sports Psychology by Ellis Cashmore Publisher: Routledge Foundation
4. A Comparative Study Of Sports Psychology by Dharmendra P Bhatt Publisher: Sports Publications
5. Basic Aspect Of Sport Psychology by D C Lal Publisher: Sports Publications
6. Essential Sport Psychology by Murphy Shane Publisher: Human Kine
7. Doing Sport Psychology by Andersen Mark Publisher: Human Kine
8. Sport Psychology: Contemporary Themes by Lavallee David Publisher: Palgrave M
9. Sport Psychology Interventions by Murphy Shane M Publisher: Human Kine
10. Sport Psychology (with Infotrac) by Arnold D Leunes Publisher: Wadsworth Publishing Company
11. Coaches Guide To Sport Psychology by Rainer Martens Publisher: Human Kinetics Publishers
12. Learning Experiences In Sport Psychology Publisher: Human Kine
13. Sport Psychology: The Key Concepts by Cashmore Ernest Publisher: Routledge
14. Applied Sport Psychology: Personal Growth To Peak Performance by 4th Edition Williams Publisher: Academic Internet Publishers

COURSE TITLE: RESEARCH METHODOLOGY (Th)**Course Code: SSFN206 B****Course Description:**

The course designed to impart education in the foundational methods and techniques of academic research in social science context.

Course Outcome:

At the end of the course, the learner will be able to:

- Understand the of the basic framework of research process.
- Students will understand various research designs and techniques. •
- Students will identify various sources of information for literature review and data collection.
- Students will develop an understanding of the ethical dimensions of conducting applied research.

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
SSFN206 B	Research Methodology	60	4	4	-	50	50	100

EVALUATION

Evaluation	Details	Marks
Internal	Unit test (offline/ online)	25
	Continuous evaluation: Projects/ Quiz/ Class tests/ Assignment & Presentations.	25
External	Written examination test	50
	Total marks	100

Contents

Module 1:
The research process: Steps, Elements & Ethics
(15 lectures)

Objectives	Topics	Evaluation
<p>This module enables student to:</p> <p>a. understand the entire process of research in a systematic manner</p> <p>b. Understand concepts, procedure, hypothesis formulation and other necessary components required for designing research project.</p>	<p>The Research Process</p> <p>a. Scientific approach to enquiry in comparison to native, common sense approach</p> <p>b. Knowledge, theory and research</p> <p>c. Role, need and scope of research in the discipline of Home Science</p> <p>Assignment: <i>Differentiate between investigative reporting and research report (with examples to be brought by students as exercise)</i></p> <p>Steps in Research Process and Elements of Research</p> <p>a. Identifying interest areas and prioritizing Selection of topic and considerations in selection</p> <p>b. Review of related literature and research variables- types of variables including discrete and continuous variables Conceptual definitions and operational definitions</p> <p>d. Concepts, hypotheses and theories</p> <p>e Hypothesis- meaning, attributes of a sound hypothesis, Stating the hypothesis and types of hypothesis Hypothesis testing- null hypothesis, sample distribution, level of significance, critical regions, Type I and Type II errors</p> <p>f. Research Design Research questions, objectives and assumptions</p> <p>Assignment: <i>Types of variables Hypothesis formations and research questions from Research readings – students identify hypothesis/research questions – Discussion</i></p> <p>Ethics in Research</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Module 2:**Research types****(15 lectures)**

Objectives	Topics	Evaluation
<p>This module enables students to:</p> <p>understand various types of research design that can be implemented in a research project</p>	<p>Types of Research</p> <p>a. Basic and Applied research, Qualitative and Quantitative research (brief review of differences)</p> <p>b. Historical research</p> <p>c. Descriptive research methods – survey, case study, correlational study, content analysis, causal-comparative research</p> <p>d. Analytic studies- pre-experimental, experimental research, quasi experimental research</p> <p>e. Qualitative research, Ethnography</p> <p>f. Evaluative research- general characteristics, use of qualitative methods in enquiry</p> <p>Scope and importance in Home Science</p> <p>Assignment: <i>Differentiate between (a) basic and applied research (Exercise to be based on actual research papers published in accredited journals)</i></p> <p style="padding-left: 100px;"><i>(b) qualitative and quantitative research</i></p> <p><i>Based on Journal contents undertake a critical appraisal of studies/research papers and discuss types of Research with examples</i></p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews</p> <p>Assignments/ Presentations assigned/ conducted for each module</p>

Module 3:**Sampling: Types & techniques****(15 lectures)**

Objective	Content	Evaluation
<p>This module enables student to:</p> <p>understand sampling procedure in detail</p>	<p>Sampling</p> <p>a. Rationale, characteristics- meaning, concept of population and sample, and utility</p> <p>b. Types of sampling and generalizability of results</p> <p>c. Probability sampling - simple random sample, systematic random sample, stratified random sampling etc - random and non-random samples, random numbers and use</p> <p>d. Non-probability sampling - purposive samples, incidental samples, quota samples, snowball samples</p> <p>e. General consideration in determination of sample size</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

Module 4:**Data collection****(15 lectures)**

Objective	Content	Evaluation
<p>This module enables students to:</p> <p>Understand various tools that are available and can be used for data collection for research work.</p>	<p>Tools for Data Collection</p> <p>a. Primary and secondary methods of data collection</p> <p>b. Different types of questionnaires, rating scales, check lists, schedules, attitude scales, inventories, standardized tests, interviews, observation</p> <p>c. Development of tools, estimation of reliability and validity of tools</p> <p>d. Procedure for preparation of the tool, administration of tools for data collection</p> <p>e. Procedure for data collection</p> <p>f. Planning for data analysis-coding of responses</p>	<p>Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module</p>

References

1. Bell, J. (1997): *Doing Your Research Project: A Guide for First-time Researchers in Education and Social Science*, Viva Books, New Delhi
2. Bell, J. (1997): *How to Complete Your Research Project Successfully: A Guide for First-time Researchers*, UBSPD, New Delhi.
3. Bulmer, M.C. (1984): *Sociological Research Methods: An Introduction*, Macmillan, Hong Kong.
4. Festinger, L. and Katz, D. (ed.) (1977): *Research Methods in the Behavioral Sciences*, Amerind Publishing, New Delhi.
5. Holloway, I. (1997): *Basic Concepts of Qualitative Research*, Blackwell Science, London.
6. Jain, G. (1998): *Research Methodology: Methods and Techniques*, Mangal Deep, Jaipur.
7. Kothari, C.R. (2000): *Research Methodology: Methods and Techniques*, Wishwa Prakashan, New Delhi.
8. Kumar, A. (1997): *Social Research Method (The Art of Scientific Investigation)*, Anmol Publication, New Delhi.
9. Kumar, A. (2002): *Research Methodology in Social Sciences*, Sarup and Sons, New Delhi.
10. McBurney, D.H. (2001): *Research Methodology*, Thomson-Wadsworth, Australia.
11. Pande, G.C. (1999): *Research Methodology in Social Sciences*, Anmol Publication, New Delhi.

VALUE ADDED COURSE**Course Title: SCIENTIFIC WRITING**

Course Description: This is a skill-based course which exposes students to various forms of writing styles and recommendations in science.

OBJECTIVES:

This course will enable students to:

- Appreciate and understand the importance of different types of scientific writing /documentation.
- Develop competence in writing and abstracting skills.

Learning outcomes:

After completion of the course, students will be able to:

1. Understand the writing types and styles for scientific data
2. Review a book and summarize it effectively
3. Write thesis in an appropriate format
4. Write and publish research papers

Code No.	Course	No of lec	T.C.	Th Cr.	Pr. Cr	Internal	External	Total
	Scientific Writing	4	4	4		2/50	2/50	100 Marks

EVALUATION (100 Marks):

Evaluation	Details	Marks
Internal	Unit test, presentation/ class quizzes/ projects/ assignments	50
External	Written Examination	50
	Total marks	100

Contents:

Module No	Objective	Topic and Details	Evaluation
1 (15 lectures)	To learn how to use database efficiently To understand the style of writing references/ bibliography To gain knowledge for writing review of a book	Literature search and use of databases Styles and formats for writing references Writing a Book review	Students Will be evaluated based on their performance in Quizzes/ Class tests/ Unit test/ Projects/ literature reviews Assignments/ Presentations assigned/ conducted for each module
2 (15 lectures)	To learn the skills and guidelines for writing a review on a specific scientific topic and also for review paper	Writing review of literature on an upcoming area Review paper including bibliography	
3 (15 lectures)	To learn the skill of writing a scientific paper for scientific presentation or publication	Writing a scientific paper including abstract and identification of key words	
4 (15 lectures)	To learn the skill of writing a research proposal, essential to gain ethical clearance, justifying the need of research, enlisting benefits of the research for society	Writing a research proposal for various funding agencies	