Dr. BMN College of Home Science (Autonomous)

Smt. Manjulaben Gunvantrai Shah Department of Post Graduate Studies

PG Diploma in Sports Science, Fitness & Nutrition

Syllabus as per the National Education Policy 202

SN	Courses	Type of Course	Credits	Marks
	Semester I			
PG3.1	Human Physiology (Th)	Major (Core)	4	100
PG3.2	Human Nutrition & Metabolism (Th)	Major (Core)	4	100
PG3.3	Sports & Exercise Science (Th)	Major (Core)	2	100
PG3.4	Sports & Exercise Science (Pr)	Major (Core)	2	50
PG3.5	Meal Planning (Pr)	Major (Core)	2	50
PG3.6	Nutritional Biochemistry or SWAYAM	Major (Elective)	4	100
PG3.7	Research Methodology	Minor Stream (RM)	4	100
			22	**550**
	Semester II			
PG4.1	Anatomy, Kinesiology & Ergonomics	Major (Core)	4	100
PG4.2	Nutrition for Sports & Exercise (Th)	Major (Core)	4	100
PG4.3	Nutrition for Sports & Exercise (Pr)	Major (Core)	2	50
PG4.4	Sports Psychology and Nutrition Counselling	Major (Core)	2	50
PG4.5	Nutrition for Special Conditions in Sports	Major (Core)	2	50
PG4.6	Food Service Management or Introduction to Food Entrepreneurship	Major (Elective)	4	100
PG4.7	Internship and Project	OJT	4	100
			22	**550**

Exit option: (44 credits) after Three-Year UG Degree

Course Syllabus

Semester I

1.1 Major (Core)

Course Title	***Human Physiology***
Course Credits	***4 (Theory)***
Course Outcomes	After going through the course, learners 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.
Module 1 (Credit 1): Cells, Tissue, and Organization of human anatomy & Gastro-Intestinal System	
Learning Outcomes *(Specific related to the module.* *e.g. Define, Differentiate, Carry out, Design, etc)*	After learning the module, learners will be able to
	1. Understand the basics of human cell structure and levels of organization for human anatomy
	2. Understand types, distribution, and specific functions of tissues in the human body **3.** Understand the structure, location, and functions of gastro-intestinal in the human body and its regulatory mechanism
Content Outline	**1. Cell Structure** ● Levels of cellular organization ● Types of cell organelles, tissues, organs, and systems **2. Tissues** Structure, physiological properties, and function of: ● Epithelial tissue

	● Muscle tissue ● Nervous tissue ● Skeletal tissue (bone and cartilage) **Gastrointestinal system and Hepatobiliary system** ● Structure, physiology, and functions of the GI tract and accessory organs and the role of hormones and enzymes involved in the digestion process
Module 2 (Credit 1): Cardio-respiratory system	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. ...)*	After learning the module, learners will be able to 1. Understand the structure, location, and functions of the Cardio-respiratory system in the human body and its regulatory mechanism
Content Outline	**Heart and Circulation** ● Basic Structure of the heart ● Cardiac cycle, cardiac output, factors affecting cardiac output ● Normal ECG ● Systematic, pulmonary, coronary, and portal circulation ● Blood pressure, control, and factors affecting blood pressure. ● Blood – composition, formation, and anemia **Respiratory System** ● Structural components of the Respiratory System ● External and Internal respiration ● Mechanical control of respiration ● Chemical control of respiration ● Neural control of respiration

Module 3 (Credit 1): Excretory, Reproductive system	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to 1. Understand the structure, location, and functions of the excretory & Reproductive system in the human body and its regulatory mechanism
Content Outline	**Nervous System** ● Basic Structure of Brain ● Organization, Structure, and properties of nerve ● Transmission of impulse, resting and action potential, Reflex action, reflex arc. **Reproductive System** ● Structure and Functions of the female reproductive system ● Structure and Functions of the male reproductive system ● Mechanism of the female reproductive cycle
Module 4 (credit 1): Immunity & Endocrine System	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to 1. Understand the different types of immunity and its functioning in the human body 2. Understand the structure and functioning of endocrine system
Content Outline	**Immunity** ● Innate, acquired, and active immunity ● Cell-mediated immunity ● Humoral immunity and complement system ● Autoimmune disease and Immune deficiency disorders **Endocrine System** ● Structure and Functioning of the endocrine system

	• Mechanism of hormonal functioning in the body

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

1. Individual and group assignments.
2. Flipped learning & Peer Teaching
3. Quizzes & Class tests

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): Test 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.

1.2 Major (Core)

Course Title	***Human Nutrition and Metabolism***
Course Credits	***4 – Theory***
Course Outcomes	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.
Module 1 (Credit 1): Food Behavior & Carbohydrates	
Learning Outcomes *(Specific related to the module.. e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	1. Understand the various factors influencing the food intake 2. Understand the basics of the metabolism of Carbohydrates, their functions, deficiencies and toxicity of carbohydrates
Course Outline	Nutrition and its Relation to health Food Acceptance and Food Behavior Internal and external factors influencing the intake of food Digestion of Food- Role of the gastrointestinal tract, hepatobiliary system, and pancreas Absorption- mechanisms of transport Digestion, Absorption, and metabolic conversions (in brief), functions, sources, requirements effects of deficiencies, and excess of Carbohydrates: sugar, starches, fiber Metabolic conversions include utilization of glucose(post-absorptive), conversion to glycogen and fat Glucose Homeostasis and Role of Hormones (in Brief)
Module 2 (Credit 1): Importance of Proteins and Lipids	
Learning Outcomes *(Specific related to the module.. e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	Understand the basics of the metabolism of Lipids Understand the role of lipoprotein and its implications on health.
	Understand the basics of the metabolism of Proteins and their requirements during different stages of the life cycle

Content Outline	**Lipids:** Digestion, Absorption, Transport (in brief), functions, sources, requirements, effects of deficiencies and excess of ● Lipids: fatty acids, fat, cholesterol ● Role of lipoproteins and implications for health (in brief) ● Digestion, ● Absorption and metabolic conversions (in brief), functions, sources, requirements during different stages of the life cycle, effects of deficiencies, and excess of **Protein and amino acids** ● Essential and non-essential amino acids ● Disposal of nitrogenous wastes – the role of liver and kidney ● Protein synthesis and breakdown vis-à-vis the intake
Module 3 (Credit 1): Vitamins	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to 1. Understand the basics of the metabolism of fat-soluble and water-soluble vitamins 2. Understand the various functions and sources of fat-soluble and water-soluble vitamins. **3.** Identify the deficiencies and potential toxic effects of fat-soluble and water-soluble vitamins leading to various disorders.
Content Outline	Absorption and transport, functions(physiological and biochemical), sources, requirements during different stages of life cycle, effects of deficiencies and excess of : **Fat soluble vitamins** - Vitamin A - Vitamin D - Vitamin E - Vitamin K **Water soluble vitamins** - Vitamin C - Thiamin - Riboflavin - Niacin - Pyridoxine - Folic acid - Vitamin B12 - Pantothenic acid

	- Biotin
Module 4 (Credit 1): Minerals	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	The course will enable the students to:
	Understand the basics of metabolism of minerals and trace elements Understand the various functions and sources of minerals and trace elements.
	Identify the deficiencies and potential toxic effects of minerals and trace elements leading to various disorders.
Content Outline	Absorption and transport, functions(physiological and biochemical), sources, requirements during different stages of life cycle, effects of deficiencies and excess of Minerals and trace elements ● Calcium and phosphorus ● Iron ● Zinc ● Fluoride ● Iodine ● Selenium ● Copper ● Sodium, Potassium and Chloride

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

1. Group Discussions
2. Individual and group presentations
3. Market survey
4. Quizzes and MCQ

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.

5. The Role of Fats in Human Nutrition/edited by F B Padley and Podmore. Chichester: Ellis Horwood, c1985.(Ellis Horwood Series in Food Science and Technology, edited by I D Morton)
6. Guthrie Helen (1986) Introductory Nutrition. Times Mirror/ Mosby College Publishing.
7. Mudambi, S.R., Rajgopal, MV (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.
9. Robinson, and Lawler. (1986) Normal and Therapeutic Nutrition. Mac Millan Pub. Co.
10. Eleanor N., Whitney S., Rady R. (1993): Understanding Nutrition, West Publishing Company, Minneapolis.
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

1.3 Major Core

Course Title	***Sports & Exercise Science***
Course Credits	***2 – Theory***
Course Outcomes	After going through the course, learners will be able to
	1. Understand the scientific background of exercise and sports activities.
	2. Develop and monitor athletic and fitness programs for individuals and groups.
	3. Construct appropriate health and fitness goals for athletes
Module 1 (Credit 1): Activity types, Body Composition & Energy	
Learning Outcomes *(Specific related to the module.* *e.g. Define, Differentiate, Carry out, Design, etc)*	After learning the module, learners will be able to
	● Understand the basics of various sports, games, and exercise and their role in athletes. ● Understand various components and techniques used to assess body composition. ● Understand the working of the cardio system in the body of an athlete and the effect of exercise on these systems.

Content Outline	● Sports, Games, and Exercise, Types and Description. Principles of exercise. ● Body composition: Body cell mass, Lean body mass, direct and indirect techniques for determining body composition, Somatotyping. ● Determination of energy expenditure in sports and exercise using various methods.
Module 2 ***(Credit 1): Cardiorespiratory and skeleton-muscular system***	
Learning Outcomes *(Specific related to the module.. e.g. Define, Differentiate, Carry out, Design, etc. …)*	**After learning the module, learners will be able to** This module enables students to: **1.** Understand the working of cardiorespiratory system in the body of an athlete and the effect of exercise on these systems. **2.** Understand the various methods available to assess energy expenditure in sports and exercise athletes.
Content Outline	● The Cardio-Respiratory system –Athletic heart. Acute and chronic adaptation (effect of different types of exercise), Importance of heart rate monitoring, overtraining and detraining. ● Respiratory system- control during physical exercise, chronic and acute adaptation, Hypoxia, and hypercapnia. ● Lung function test and its importance, Spirometry ● Skeletal muscle & Nervous system - Physiological adaptations to strength training. ● Muscle fatigue, prevention and recovery. ● Sports injury and rehabilitation & preventive exercise program.

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

- Group discussions
- Individual assignments

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.

1.4 Major Core

Course Title	***Sports & Exercise Science***
Course Credits	***2 – Practical***
Course Outcomes	After going through the course, learners will be able to
	1. Evaluate different types of exercise training and assessment for individuals, and groups.
	2. Assess the physiological and functional capacity of individuals and groups.
	3. Discuss the possibility and prevention of any contradictions for exercise and create appropriate solutions for the same
Module 1 (Credit 1): Physical Fitness Assessment – I	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	Gain knowledge and skills to interpret the body composition of an individual and its implication for human health
Content Outline	● 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 ● Physiological tools for testing and monitoring training ● Blood pressure, Heart rate, Calculating Training heart rate.
Module 2 (Credit 1): Physical Fitness Assessment- II	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	a. Gain knowledge and skills to assess methods used for cardio-respiratory fitness and its interpretation b. Gain knowledge about components of fitness and their application in the field.

Content Outline	● 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. ● Assessment of Flexibility, Muscular endurance, Strength, and Power

1.5 Major Elective

Course Title	***Meal Planning***
Course Credits	***2 – Practical***
Course Outcomes	After going through the course, learners will be able to
	1. Explain the concept of standardization, food groups and their application in daily meal plans.
	2. Develop a basic diet plan for different life stage populations and make necessary changes in the dietary habits needed.
	3. Evaluate and alter basic recipes in a healthy preparation by introducing minor changes.
Module 1 (Credit 1): Basics of Meal Planning	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	Gain an understanding of the fundamentals of Nutrition Understand the portion control and thereby the basics of standardization Understand the basic principles of meal planning Prepare a basic meal plan which is nutritionally adequate for all the age groups of the general population.

Content Outline	● Basic five food groups, dietary guidelines, and food pyramid Standardization of common recipes ● 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
Module 2 **(Credit 1): Recipe Planning**	
Learning Outcomes *(Specific related to the module.. e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to Plan and prepare simple recipes rich in particular nutrients that can be used during specific conditions.
Content Outline	Planning and preparation of: ● Energy-dense recipes ● High-fibre recipes ● Low-fat recipes ● Low sodium recipes ● Micronutrient-dense recipes

1.6 Major Elective

Course Title	***Nutritional Biochemistry***
Course Credits	***4 (Theory)***

Course Outcomes	After going through the course, learners will be able to
	1. Analyze and identify the structure and related biochemical properties of nutrients, DNA & RNA compounds.
	2. Develop an insight into interrelationships between various metabolic pathways of nutrients and other related compounds.
	3. Understand and implement the integration of cellular-level metabolic events to nutritional disorders and imbalances.
Module 1 (Credit 1): Introduction to Biochemical Processes	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	4. Apprehend the basic biochemical mechanism of the metabolism of nutrients.
	5. Understand the structure, functioning, and regulation of Enzymes. 6. Identify the homeostatic mechanism of acid-base balance in the body and the biochemistry of free radicals.
Content Outline	**Biochemistry of Cell Membrane** ● Membrane structure, composition, and Transport of metabolites across membranes **Enzymes** ● Kinetics of mono substrate and bisubstrate catalyzed reactions (including inhibition) ● Enzyme specificity, regulation of enzyme activity, and synthesis ● Enzymes in clinical diagnosis ● **Acid-base balance** ● **Free radicals, ROS, and oxidative damage**
Module 2 (Credit 1): Biochemistry of Carbohydrates	
Learning Outcomes	After learning the module, learners will be able to

(Specific related to the module.. e.g. Define, Differentiate, Carry out, Design, etc. …)	2. Understand the classification, structure, metabolic pathways of Carbohydrates. 3. Understand the disorders related to carbohydrate mechanism
Content Outline	**Carbohydrate Metabolism**: ● Intestinal transport of carbohydrates, Transport of glucose across various cells, ● Cellular metabolism of carbohydrates Glycogen metabolism Regulation of carbohydrate metabolism at substrate level, enzyme level, hormonal level, and organ level ● Definition, classification, structure, and properties of glycoproteins and proteoglycans ● Disorders of carbohydrate metabolism.
Module 3 (Credit 1): Biochemistry of Lipids	
Learning Outcomes *(Specific related to the module.. e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to 2. Understand the classification, structure, and metabolic pathways of Lipids. 3. Understand the disorders related to Lipid metabolism and its regulation.
Content Outline	**Metabolism of Lipids** ● Metabolism is to be discussed concerning Intestinal transport of lipids, Cellular uptake, and metabolism of lipids(beta-oxidation, de-novo synthesis of fatty acids, synthesis and breakdown of unsaturated fatty acids, cholesterol, phospholipids, and triacylglycerol) ● Lipoprotein metabolism, VLDL and LDL ('Forward' Cholesterol transport)VLDL and LDL (Endogenous TAG transport), HDL ('Reverse' Cholesterol transport) ● Regulation of lipid metabolism at substrate level, enzyme level, hormonal level, and organ level, ● Disorders of lipid metabolism, Dyslipidemias, and Lipid storage diseases.

	Biological Oxidation: ● Electron transport chain and oxidative phosphorylation
Module 4 (Credit 1): Biochemistry of Proteins and Nucleic Acids	
Learning Outcomes *(Specific related to the module.* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	3. Understand the classification, structure, and metabolic pathways of Proteins and related disorders.
	4. Understand Intermediary Metabolism and biochemistry of Purine and Pyrimidines
Content Outline	**Protein Metabolism**: ● Metabolism of amino acids- biosynthesis and catabolism ● Energy, glucose and ketone bodies, protein amino acids, non-protein amino acids (including urea cycle, transamination, one-carbon metabolism) ● Creatine and creatinine, Plasma proteins – Nature, properties, and functions, ● Biologically active peptides, polypeptides, and transport proteins, Inborn errors of amino acid metabolism **Intermediary Metabolism:** ● Review of the regulation of intermediary metabolism- equilibrium and non-equilibrium reactions, committed steps, allosteric modifications, covalent modulation, ● Hormonal induction and repression, cross-over theorem, starve-feed cycle, caloric homeostasis and futile cycles, Tricarboxylic acid cycle

Assignments/Activities towards Comprehensive Continuous Evaluation (CCE)

4. Individual and group assignments.
5. Formative assessment through quizzes and MCQ
6. Concept Mapping

References:

1. Murray, R.K., Granner, D.K., Mayes, P.A., and Rodwell, V.W. (2000): 25th Ed. Harpers Biochemistry. Macmillan Worth Publishers.
2. Nelson, D.L. and Cox, M.M. (2000): 3rd Ed. Lehninger's Principles of Biochemistry, Macmillan Worth Publishers.
3. Devlin, T.M. (1997): 4th Ed. Textbook of Biochemistry with Clinical Correlations, Wiley LissInc
4. Stryer, L. (1998): 4th Ed. Biochemistry, WH Freeman and Co.
5. Conn, E.E., Stumpf, P.K., Bruening, G. and Doi, R.H. (2001): 5th Ed. Outlines of Biochemistry, John Wiley and Sons.
6. Voet, D. Voet, J.G. and Pratt, C.W. (1999). Fundamentals of Biochemistry.
7. Tietz, N.W. (1976) Fundamentals of Clinical Chemistry. WB Saunders Co.
8. King, E.J. and Wootton, I.D.P. (1956). 3rd ed. Micro-Analysis in Medical Biochemistry. J and A Churchill Ltd.
9. Plummer, D.T. (1987). 3rded. An Introduction to Practical Biochemistry. McGraw-Hill Book Co.

1.7 Minor Core

Course Title	***Research Methodology***
Course Credits	***4 (Theory)***
Course Outcomes	After going through the course, learners will be able to
	1. Students will develop an understanding of the basic framework of the research process.
	2. Students will understand various research designs and techniques.
	3. Students will identify various sources of information for literature review and data collection. 4. Students will develop an understanding of the ethical dimensions of conducting applied research.
Module 1 (Credit 1): Understanding Research Process and Ethics in Research	
Learning Outcomes *(Specific related to the module.* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to
	a. understand the entire process of research in a systematic manner b. Understand concepts, procedures, hypothesis formulation, and other necessary components required for designing a research project
Content Outline	**The Research Process** ● Scientific approach to inquiry in comparison to native, common sense approach ● Knowledge, theory, and research ● The Role, need, and Scope of Research in the Discipline of Home Science **Steps in Research Process and Elements of Research** a. Identifying interest areas and prioritizing Selection of topic and considerations in the selection b. Review of related literature and research

	variables- types of variables including discrete and continuous variables Conceptual definitions and operational definitions d. Concepts, hypotheses, and theories 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 f. Research Design Research questions, objectives, and assumptions ● **Ethics in Research**
Module 2 (Credit 1): Types of Research	
Learning Outcomes *(Specific related to the module.* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to Understand various types of research designs that can be implemented in a research project
Content Outline	**Types of Research** ● Basic and Applied Research, Qualitative and Quantitative research (brief review of differences) ● Historical research ● Descriptive research methods – survey, case study, correlational study, content analysis, causal-comparative research ● Analytic studies- pre-experimental, experimental research, quasi-experimental research ● Qualitative research, Ethnography ● Evaluative research- general characteristics, use of qualitative methods in inquiry ● Scope and Importance in Home Science
Module 3 (Credit 1): Sampling: Types and Techniques	
Learning Outcomes *(Specific related to the module..* *e.g. Define,*	After learning the module, learners will be able to Understand the types of sampling, and method of sampling in detail

Differentiate, Carry out, Design, etc. …)	
Content Outline	• Rationale, characteristics- meaning, the concept of population and sample, and utility • Types of sampling and generalizability of results • Probability sampling - simple random sample, systematic random sample, stratified random sampling, etc - random and non-random samples, random numbers, and use • Non-probability sampling - purposive samples, incidental samples, quota samples, snowball samples • General consideration in the determination of sample size
Module 4 (credit 1): Data Collection	
Learning Outcomes *(Specific related to the module..* *e.g. Define, Differentiate, Carry out, Design, etc. …)*	After learning the module, learners will be able to Understand various tools that are available and can be used for data collection for research work.
Content Outline	**Tools for Data Collection** • Primary and secondary methods of data collection • Different types of questionnaires, rating scales, checklists, schedules, attitude scales, inventories, standardized tests, interviews, observation • Development of tools, estimation of reliability and validity of tools • Procedure for preparation of the tool, administration of tools for data collection • Procedure for data collection • Planning for data analysis-coding of responses

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 Qualitiative 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.

Assignments*:* Flipped learning, tests and quizzes, individual/ group assignments.