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**Semester wise syllabus for Post Graduates**  
**As recommended by board of studies**  
**Govt. K.R.G. P.G. Autonomous College Gwalior M.P.**

**M.Sc. (Home Science)**

**Food and Nutrition**

**SEMISTER-I**

**PAPER-I**

**Applied Physiology**

~~20-18-19~~ 2021-22

M.M. 100

**Objectives**

This course will enable students.

1. To understand the integrated functions of all systems in the science of physiology.
2. To understand the structure and functions in various organs and systems in relation to the diseased conditions.
3. To understand the advance issues to the relevant topics of Human physiology.

**UNIT-I**

1. **Cell and Tissues:** Structure and function of cell, structural organization of cell, organelle. **Tissues** - Formation of tissues, organ and system, elementary tissues in Human body.
2. **Musculoskeletal System:** Types of muscles (Skeletal, smooth, and cardiac muscles) their properties, characteristics, structure and functions, fatigue, exercise mechanism of contraction.  
Structure and function of Bone, cartilage and connective tissue. Disorders of skeletal muscle.

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**UNIT-II**

1. **Blood:** Formation, Functions and composition of blood, Hematopoiesis erythropoiesis, leukopoiesis, Formation and functions of plasmaproteins, Factors influencing erthropoiesis, RBC indices, Blood groups, Blood clotting, Hemoglobin synthesis, Blood abnormalities.
2. **Immune system:** Natural immune system cell mediated and humoral immunity components of immune mechanism (cellular and chemical), Role of Inflammation/defense (acute and chronic). Activation of WBC and production of anti bodies. Disorders - Immune deficiency, Hypersensitivity.
3. **Reproductive System:** Male and female reproductive organ, menstrual cycle spermatogenesis.

**Unit-III**

1. **Circulatory System:** Structure and functions of heart and blood vessels, cardiac output and blood pressure, cardiac cycle, Heart rate and heart sound conditions affecting the heart rate, Heart failure, Hypertension, Mechanism of cardiovascular system.
2. **Respiratory system:** Structure and functions of respiratory tree, Mechanism of Breathing. Ventilation and its control. Exchange of gases and role of lungs in exchange of gases. Transport of O<sub>2</sub> and CO<sub>2</sub>. Role of Hemoglobin and Buffer system Cardio respiratory response to exercise.

**Unit-IV**

1. **Digestive system:** Introduction of digestive system structure of digestive tract functions of digestive system, Salivary glands and its secretion. Stomach and its section, pancreas, Bile, small intestine, Large intestine, Digestive juices. Gastrointestinal Hormones.

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- 2. **Excretory system:** Structure and function of kidney, nephron, Role of Kidney in maintaining pH of blood, Mechanism of urine formation, Mechanism of filtration Electrolyte and acid-base balance. Renal function tests (Urine and blood) Diuretics.

#### Unit-V

- 1. **Endocrine glands:** Structure function and classification according to chemical signals. Hormones, role of hormone, regulation of hormonal secretions and its control, Disorders of endocrine glands.
- 2. **Nervous system:** Structure and function of Brain, spinal cord, neuron. Reflex and its classification; nerve impulse - Afferent and efferent nerves. Hypothalamus and its role in various body functions - Obesity sleep and memory.
- 3. **Sense organs:** Structure and functions: General Senses and special senses, Receptors of sensory nerves and perception of stimuli.

#### References:

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- 3. Guyton, A.C. (1985): Function of Human Body, 4th Edition, B. Sanders Company, Philadelphia.
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- 5. Wilsion, K.J.W. and Waugh, A. (1996): Ross and Wilson Anatomy and Physiology in Health and illness, 8th Edition, Churchill Livingstone.
- 6. McArdle, W.D., Katch, F.I. and Katch, V.L. (1996): Exercise Physiology, Energy Nutrition and Human Performance, 4th Edition, Williams and Wilkins Baltimore.
- 7. Jain, A.K. Textbook of Physiology, Vol I and II. Avichal Publishing Co. New Delhi 8. Text book of physiology Vol. I & II.

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**M.Sc (Home Science)**  
**Food and Nutrition**  
**SEMISTER-I**  
**PAPER-II**

**Advanced Nutritional Biochemistry**

~~20-18-19~~ 2021-22

**M.M. 100**

**Objectives**

1. Augment this biochemistry knowledge acquired at the undergraduate level.
2. Understand the mechanism adopted by the human body for regulation of metabolic pathways.
3. Get on insight into interrelationship between various metabolic pathways.
4. Become proficient for specialization in nutrition.
5. Understand integration of cellular level metabolic events to nutrition disorders and imbalances.

**UNIT-I**

Plasma protein - nature, properties and functions, Purines, and pyrimidines: synthesis and breakdown.

**UNIT-II**

Intermediary metabolism an overview and its regulation. Equilibrium and Non-equilibrium reaction, committed steps, allasteric modification, covalent modulation, hormonal induction and repression, cross over theorem, starve feed cycle, calorie homeostasis and futile.

**UNIT-III**

1. **Carbohydrates:** Glycolysis, gluconeogenesis, citric acid cycle, hexone monophosphate pathways and gluconeogenesis.
2. **Lipids:** Beta-oxidation, de novo synthesis of fatty acids. Synthesis and breakdown of unsaturated fatty acids. Cholesterol, phospholipids and triacylglycerol significance.

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**UNIT-IV**

Major alterations in protein, carbohydrates and fat metabolism and chronic nutritional related degenerative diseases e.g. diabetes and hypertension.

**Nucleic acids:** DNA replication and transcription. DNA repair system, DNA recombination, genetic mutation, regulation of gene expression and protein biosynthesis.

**UNIT-V**

**Hormones:** Mechanism of action. Negative feedback, hormone receptor, intracellular messengers.

Conversion of amino acids to specialized.

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**M.Sc. (Home Science)  
Food and Nutrition  
SEMISTER-I  
PAPER-III- Public Nutrition**

~~20-18-19~~ 2021-22

M.M. 100

**Objectives**

1. Develop a holistic knowledge base and understanding of public nutrition concept.
2. Understand the health economic, food situations and determinations of nutritional status.
3. Be familiar with various approaches to nutrition and health interventions, programmes and policies.

**UNIT-I**

1. Concept of Public Nutrition.
2. Definition and concept of health, Determinations of Health
3. Relationship with health and nutrition.
4. Role public nutritionists the health care delivery.
5. Population dynamics: Demographic transition population structures fertility behavior. Nutrition and quality of life.

**UNIT-II**

1. **Food and Nutrition security**  
(a) Food production. Access, Distribution, Losses and consumption.
2. **Nutritional Status:**  
(a) Determinants of nutritional status  
(b) (i) Nutrition Indicators - Functional indicators such as grip strength respiratory fitness Harvard step test, squatting test.  
(ii) Non-nutritional indicators of nutritional status (Sociocultural, biological, environmental and economic)  
(c) Monitoring & Evaluation
3. **Health Economics and Economics of Malnutrition.** Its impact on productivity and national development.

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**M.Sc. (Home Science)  
Food and Nutrition  
SEMISTER-I  
PAPER-III- Public Nutrition**

~~20-18-19~~ 2021-22

M.M. 100

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**UNIT-III**

1. **National Food and Nutrition Policy, Plan of Action**
  - (a) Sector and public relevant to nutritional - National and International organization of nutrition. Specific community nutrition programmes in India. Case studies of selected strategies and programmes.

**UNIT-IV**

1. **Approaches and strategies for improving nutritional status**
  - (a) Programmable Option: Health and nutrition based interventions, supplementary feeding, fortification and genetic improvement of foods.
  - (b) Merits and demerits of these options
  - (c) Factors in feasibility of these programmes i.e. political support. Available resource (human infrastructural, financial)
2. **Programme Planning, implementation, operation, monitoring surveillance and evolution.**
3. **Nutrition Education:**
  - (a) Definition, purpose, importance
  - (b) Methods and tools
  - (c) Channels of nutrition education
  - (d) Evaluation of nutrition education

**UNIT-V**

1. **Public Health administration**
  - (a) Central and state health organizations
  - (b) Primary Health Care in India
    - (i) Elements of Primary Health Care
    - (ii) Principles of Primary Health Care
    - (iii) Primary-Health Care of village level sub centre level and primary health centre level, community health centres.
  - (c) Health Care Systems

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**M.Sc (Home Science)  
Food and Nutrition  
SEMESTER - 1  
PAPER-IV  
RESEARCH METHODS AND STATISTICS**

~~2018-19~~ 2021-22

M.M. 100

**Objectives**

- To understand the significance of statistics and research methodology in Home Science research.
- To understand state the types tools, methods of research and develop the ability to construct data gathering instrument appropriate to the research design.
- To understand and apply the appropriate statistical technique for the measurement and design.

**CONTENTS:**

**UNIT-I**

- Research: Meaning, objectives and significance of research.
- Science, scientific methods, scientific approach.
- Role of statistics and research in Home Science discipline.
- Types of Research: Historical, descriptive, experimental, case study, social research, observation.

**UNIT-II**

- Definition and identification of a research problem:
  - Selection, justification & limitation of research problem.
  - Hypothesis - meaning nature, characteristics, types & functions of hypothesis.
  - Variables: Meaning, nature, type & selection of variables.

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**UNIT-III**

**Sampling methods**

- Population and sample
- Probability & semi probability sampling - simple random, systematic random sampling, two stages and multi stage sampling, cluster sampling.
- Non-Probability sampling: purposive, quota and volunteer sampling
- Merit & Demerits sampling.

**UNIT-IV**

**Research Design**

- Meaning, features and concept & purpose of research design.

**Quantitative research Method**

- Definition Theory design types reliability & validity of:
  - Case study
  - Interview
  - Observation

**UNIT-V**

**Quantitative research method**

- Definition theory design types reliability & validity of
  - Socio metric scale
  - Questionnaire
  - Schedule
- Writing a research report

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