



## **DIPLOMA IN HUMAN NUTRITION**

TWO YEAR DIPLOMA

**.DIPLOMA COURSE IN HUMAN NUTRITION**

**Ist YEAR**

## **SCHEME FOR FIRST YEAR**

		<b>Internal Assessment</b>		<b>University Examination</b>		
<b>Code</b>	<b>Title of Papers</b>	<b>Theory</b>	<b>Practical</b>	<b>Theory</b>	<b>Practical</b>	<b>Total</b>
<b>HN-101T</b>	<b>Anatomy and Physiology</b>	<b>25</b>	<b>25</b>	<b>75</b>	<b>25</b>	<b>150</b>
<b>HN-102T</b>	<b>Microbiology &amp; Hygiene</b>	<b>25</b>	<b>25</b>	<b>75</b>	<b>25</b>	<b>150</b>
<b>HN-103T</b>	<b>Basic Nutrition</b>	<b>25</b>	<b>25</b>	<b>75</b>	<b>25</b>	<b>150</b>
<b>HN- 104T</b>	<b>Nutritional Biochemistry</b>	<b>25</b>	<b>25</b>	<b>75</b>	<b>25</b>	<b>150</b>
<b>TOTAL</b>						<b>600</b>

### **Note**

Passing marks in all subject candidate must obtain 50% in aggregate with minimum of 50% in Theory, Including viva and minimum 50% in practical.



## PAPER- I

### HUMAN PHYSIOLOGY AND ANATOMY THEORY

#### Subject code-HN101

- 1] **CELL AND TISSUE:** Structure and functioning of the cell, epithelial, connective, muscular and nervous tissues.
- 2] **BLOOD:** Composition- functions, coagulation, thrombosis, blood volume, blood groups and blood transfusion, Anaemia, Leukaemia, Haemolysis.
3. **SKELETON SYSTEM :** Bones joint bone deformities (Brief study).
- 4] **CARDOVASCULAR SYSTEM:** Anatomy of heart and blood vessels, heart rate, cardiac cycle, Cardiac output, blood pressure, hypertension, radial pulse, ECG and its significance, varicose veins, Arteriosclerosis, Angina pectoris.
- 5] **LYMPHATIC SYSTEM:** Lymph gland and its functions Spleen- structure and function
- 6] **RESPIRATORY SYSTEM:** Structure of respiratory system, Mechanism of respiration, chemical respiration, tissue respiration, regulation of respiration. Common Diseases – Tuberculosis, Asthma, Pleurisy, Cough, hiccups.
- [7] **DIGESTIVE SYSTEM:** Organs of digestion, their functions, Digestive juices, Digestion and adsorption of carbohydrates, protein and fats.
- [8] **EXCRETORY SYSTEM:** Structure and functions of kidneys, Nephron, Formation of urine. Normal and abnormal constituents of urine. Significance of urine examination.
- [9] **SKIN:** Structure and function.
- [10] **ENDOCRINE GLAND:** Endocrine glands – their structure and functions, disorders.
- [11] **REPRODUCTIVE SYSTEM:** Anatomy of the male and female reproductive organs. Physiology of menstruation.
- [12] **NERVOUS SYSTEM:** Central nervous system and its functions. Peripheral nervous system and its function.



[13] **SPECIAL SENSES:** Structure and functions of eye, ear, nose, tongue, and skin.

## **PAPER-II**

### **MICROBIOLOGY AND HYGIENE**

#### **Subject code-HN 102**

[1] Introduction of Microbiology and its relevance to everyday life, General characteristics of bacteria, fungi, virus, protozoa and algae.

[2] Growth of microorganisms: Growth curve, effect of environmental factors in growth of micro-organisms-pH, water activity, oxygen availability, temperature and others.

[3] Microbiology of different foods- Spoilage, contamination- sources, types, effect on the following.

- \* Cereal and cereal products.
- \* Sugar and its products.
- \* Vegetables and fruits.
- \* Meat and meat products.
- \* Fish, eggs, and poultry.
- \* Milk and milk products.
- \* Canned foods.

[4] **Environmental Microbiology-**

- \* Water and water borne diseases
- \* Air and air borne diseases
- \* Soil and soil borne diseases
- \* Sewage and diseases.



[5] Beneficial effect of microorganisms.

[6] Personal Hygiene- Hygiene of external body organs.

- \* Body structure

- \* Clothing and Bedding.

- \* Common infectious diseases.

[7] Control of infestations

- \* Rodent control- Rats, Mice-rodent, proofing, destruction.

- \* Vector control – Use of pesticides.

[8] Food sanitation- Control and inspection. Planning and implementations of training programme for health personnel.

[9] Sanitation- Kitchen design equipment and systems.

- \* Structure and layout of food.

- \* Premises- maintaining clean environment.

- \* Selecting and installing equipment, cleaning equipment.

[10] Waste product handling- Planning for waste disposal solid wastes and liquid wastes.

[11] Food Preservation- Methods

[12] Food Adulteration- in brief.

[13] Food Laws and Food standards.

## **HUMAN PHYSIOLOGY ANATOMY AND MICROBIOLOGY**

### **PRACTICAL**

[1] Microscope and its use.

[2] Microscopic examination of prepared slides-

a) Epithelial tissue b) Connective tissue



c) Muscle tissues d) Nerve cell e) Bacteria

f) Fungi g) Viruses

[3] **BLOOD**: Microscopic examination of prepared slides-

a) Fresh mount of blood.

b) Stained blood smear.

[4] Testing of blood groups using typed serum.

[5] Estimation of erythrocyte sedimentation rate [ESR].

[6] Hemoglobin estimation using haemoglobinometer.

[7] R.B.C. count.

[8] W.B.C. count

[9] Estimation of bleeding time, Clotting time.

[10] Recording blood pressure-using sphygmomanometer.

[11] Recording of pulse rate.

[12] Measurement of body temperature, mouth, armpit and rectum. Preparation of temperature chart.

[13] Study of Historical slides of different organs.

[14] Identification of bones of a skeleton.

[15] Studying different parts of human organs by using charts and models.



## **PAPER-III**

### **BASIC NUTRITION**

#### **Subject code-HN103**

[1] Definition of food, Nutrition, Malnutrition and Health, Functions of food.

[2] Nutrients- Macro and Micronutrients.

\* Classification- functions, RDA, Deficiency and excess. – Macronutrients- Protein, Carbohydrates, fats and water – Micronutrients – Vitamins and Minerals.

\* Water soluble vitamins – B complex and Vitamin C

\* Fat soluble vitamins Vitamin A, D, E, K.

\* Minerals – Calcium, phosphorous, iron, magnesium, zinc, fluorine, iodine, selenium, copper, manganese.

[3] Composition, structure and nutritional contribution of the following

\* Cereals

\* Pulses

\* Fruits

\* Vegetables

\* Milk and milk products



- \* Nuts and oil seeds
- \* Meat, fish and poultry.
- \* Eggs.
- \* Tea, coffee, cocoa, chocolate
- \* Condiments and spices.

[4] Cooking Methods: Various methods of cooking and their effect on nutritive value, nutrients conservation during cooking.

- \* Improving nutritional quality of foods.
- \* Germination. Fermentation
- \* Supplementation
- \* Fortification and enrichment.

[5] Meal Planning: meaning importance objectives of meal planning. – Planning meals for

- \* Infant
- \* Preschool and school going child.
- \* Adolescent
- \* Pregnancy
- \* Lactation
- \* Overweight
- \* Under weight.

## **BASIC NUTRITION**

### **PRACTICALS**

[1] Identification of food according to food groups and nutritive value.

[2] Weights and measures



# SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

NH-12, BEHIND NISSAN MOTORS, HOSHANGABAD ROAD, MISROD BHOPAL (M.P.)  
(Statutory University established under M.P. Act No. 17 of 2007 & Covered u/s 2 (f) of UGC Act)  
Website: [www.srku.edu.in](http://www.srku.edu.in), E-Mail: [info@srku.edu.in](mailto:info@srku.edu.in)/[srkubhopal@gmail.com](mailto:srkubhopal@gmail.com)

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- [3] Standard household measures and edible sizes of fruits and vegetables
- [4] Cooking of food using different cooking methods.
- [5] Germination , fermentation , sprouting.
- [6] Preparation of rice recipes (any two)
- [7] Making of curd and paneer.
- [8] Preparation of fresh vegetables salads and fruit punch.
- [9].Preparation of fresh vegetables salads and raitas
- [10]. Preparation of fruit salad and fruit punch.
- [11] Cakes and puddings.
- [12] Preparation of low cost recipes (any two).
- [13] Planning, preparation and calculation of diets for
  - (a) Pre school children
  - (b) School going children
  - (c) Adolescent and adult
  - (d) pregnancy
  - (e) Lactation
  - (f) Old age
  - (g) Over weight and under weight.





## PAPER – IV

### NUTRITIONAL BIOCHEMISTRY

#### **Subject code-HN104**

[1] **ENERGY:** Units of measuring energy, fuel value of food, and calculation of energy value of diets. Factors contributing to total energy expenditure, BMR and factors affecting it, SDA of food.

[2.] **CARBOHYDRATE:** Metabolism – glycolysis, glycogenolysis, gluconeogenesis, and citric acid cycle regulation of blood glucose levels.

[3.] **LIPID METABOLISM:** Oxidation of fatty acids, ketosis, and cholesterol metabolism lipoproteins in the blood, composition and their functions in brief.

[4] **PROTEIN:** Metabolism, transamination, decarboxylation, and entry of amino acids into TCA cycle, urea cycle.

[5] **ENZYMES:** Definition, classification, chemical nature, coenzymes, factors affecting role of enzymes action, enzymes inhibition.

[6] Structure of nitrogen bases, nucleosides, DNA and RNA (in brief). Mechanism of DNA replication and transcription (in brief).

[7] **HORMONES:** Hormones of pituitary, thyroid, parathyroid, Adrenals, Reproductive glands and pancreas.



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Website: www.srku.edu.in, E-Mail: info@srku.edu.in/srkubhopal@gmail.com

## 2-YEAR DIPLOMA COURSE IN HUMAN NUTRITION

### II<sup>nd</sup> YEAR

## SCHEME FOR SECOND YEAR

		Internal Assessment		University Examination		
Code	Title of Papers	Theory	Practical	Theory	Practical	Total
HN-201T	Therapeutic Nutrition	25	25	75	25	150
HN202T	Community Nutrition	25	25	75	25	150
HN-203T	Dietetics & Counseling	25	25	75	25	150
	Training Project Report					150
<b>TOTAL</b>						<b>600</b>

### Note

Pass Mark: In the All subject Candidate must Obtain 50% in aggregate with minimum of 50% in Theory, Including orals and minimum 50% in practical.



## THERAPEUTIC NUTRITION

### Subject code-HN201

#### [1] Therapeutic Nutrition- Meaning

- \* Psychological, sociology, cultural, and economical factors in feedings patients. \* Hospital basic diet.
- \* Feeding long term and chronically ill patients, Tube feedings.
- \* Therapeutically adaptation of normal diet, light, soft, and liquid diets.

#### [2] Diet in fevers and infections

- \* Fevers – Definition, metabolism and nutritional requirements
- \* Diet in typhoid, tuberculosis, rheumatic fever and poliomyelitis.

#### [3] Diet in gastro- intestinal Disturbances.

- \* Constipation – Types, causes, treatment (dietary and other)
- \* Diarrhoea – Types, causes and dietary treatment.
- \* Peptic Ulcer – Etiology, symptoms, dietary principles, complication, special diets.

#### [4] Liver Diseases: Functions of liver, Role of nutrition for proper functioning of liver.

- \* Jaundice – Types, symptoms, dietary principles and diet plan.
- \* Hepatitis - Etiology, Dietary treatment.
- \* Cirrhosis – Symptoms, etiology, types, dietary treatment.

#### [5] Diet in Cardiovascular diseases: \* Hypertension – Etiology, types, Dietary treatment. \* Atherosclerosis – atherogenesis, factors influencing plasma lipid level, symptoms, dietary treatment.

- \* Anaemia – Types, etiology and dietary treatment.



## [6] Diet in kidney Diseases

- \* Functions of kidney diseases
- \* Acute glomerulonephritis – symptoms, dietary principles and meal plan.
- \* Chronic glomerulonephritis – symptoms, dietary principles and meal plan.
- \* Uraemia – Symptoms and dietary treatment.
- \* Urinary calculi. [7] Diabetes mellitus – Etiology, symptoms, metabolism and treatment.

## [8] Diet in cancer.



## PAPER – II

### COMMUNITY NUTRITION

#### Subject code-HN202

[1] Nutrition and Health in national development Malnutrition- meaning, factors contributing to malnutrition.

[2] Nutritional Disorders: Epidemiology, clinical features, prevention and dietary treatment for:

- \* Protein energy malnutrition

- \* Nutritional Anaemias

- \* Vitamin A deficiency

- \* rickets

- \* Scurvy

- \* Beri-beri

- \* Riboflavin deficiency

[3] Methods of assessing nutritional status

- \* Samplings techniques

- \* Identification of risk groups.

- \* Direct assessment – Diet surveys, anthropometrics, clinical and biochemical estimation.

- \* Indirect assessment – Food balance sheet, ecological parameters and vital statistics.

[4] Improvement of nutrition of a community.



- \* Modern methods of improvement of nutritional quality of food. Food fortification, enrichment, nutrient supplementation.
- \* Nutrition education themes and messages in nutrition and health education.
- \* Nutrition Rehabilitation programmes. Antenatal and postnatal care.

[5] Nutrition and Infection relationship Immunisation and its importance food born infection and intoxication disease, foods involved, methods of prevention, infestation of food borne diseases outbreak, prevention, signs and control of infection.

[6] National and International agencies in uplifting the nutritional status. WHO, UNICEF, CARE, ICMR, NIN, ICAR, CSIR, CFTRI. Various nutrition related welfare programmes. ICDC, SCP, MDM and others. Community nutrition programmes planning-Identification of problem, analysis of causes, resources, constraints, selection of intervention, setting a strategy, implementation and evaluation of the programme.

## **THERAPEUTIC NUTRITION & COMMUNITY PRACTICAL**

[1] Planning preparation and calculation of diets with modified

- a. Consistency
- b. Fibre and residue
- c. Diet for Diarrhoea and constipation (d) Diet for peptic ulcer.
- d. Diet for liver diseases.

[2] Planning, preparation and calculation of diets in fevers and infections.

[3] Planning preparation and calculation of diets for insulin dependents diabetes mellitus, planning snacks, desserts and beverages for diabetes.

[4] Planning, preparation and calculation of diet in cardio vascular diseases.

[5] Planning, preparation and calculation of diet in

- a. Kidney Failure
- b. Kidney transplant
- c. Renal complication
- d. Kidney stones.

[6] Planning, preparation and calculation of diet in

- a. cancer



- b. Trauma (Buras)
- c. Surgery

[7] Hospital Visits to observe nutritional deficiency.

[8] Observe the working of nutrition and health oriented programmes.

[9] Assessment of nutritional status of risk groups.

## **PAPER- III**

### **DIETETICS AND COUSSELLING.**

**Subject code-HN203**

#### **THEORY.**

[1] Practical consideration in giving dietary advice and counseling.

\* Factors affecting and individuals food choice

\* Communication of dietary advice.

\* Consideration of behaviour modification

\* Motivation

[2] Counselling and educating patients

\* Introduction to nutrition Counselling.

\* Determining the role of nutrition counselling.

\* Responsibilities of the nutrition counsellor.

\* Practitioner v/s diet managed care.

\* Conceptualizing entrepreneur skills and behaviour.

\* Communication and negotiation skills.

[3] Teaching aids used by dietitians charts, leaflets, posters etc.

[4] Preparation of teaching material for patients suffering from



\* Digestive disorders.

\* Diabetes.

\* Hypertension.

\* Hepatitis and cirrhosis.

[5] Computer application.

\* Use of computer by dietitians.

\* Dietary computations.

\* Dietetic management.

\* Education / Training.

\* Information storage.

\* Administration.

\* Research

\* Lines – with other systems.

[6] **Computer application**

\* Execution of software package

\* Straight line, frequency table, bar diagram and pie chart.

\* Preparation of dietary charts for patients

\* Statistical computation and regression test.

**DIETETICS AND COUNSELLING**

**PRACTICALS**

[1] Project planning for any one disease.

[2] Computer application for different diseases.





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[3] Submitting computed data.

[4] Preparation of teaching aids in the field of nutrition.

[5] Preparation of case history of a patient and feeding of information in the hard disc.