Dr. Bhimrao Ambedkar University, Agra

A State University of Uttar Pradesh (Paliwal Park, Agra -282004)

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A Documentary Support

for

Matric No. – 1.3.1

Institution integrates cross-cutting issues relevant to **Professional Ethics, Gender, Human Values, Environment & Sustainability and other value framework enshrined in Sustainable Development goals and National Education Policy – 2020** into the Curriculum

under the

Criteria – I

(Curriculum Design and Development)

Key Indicator - 1.3

in

Matric No. – 1.3.1

POST GRADUATE DIPLOMA IN NUTRITION & DIETETICS

2023

PROFESSIONAL ETHICS	ENVIRONMENT & SUSTAINABILITY	NATIONAL EDUCATION POLICY – 2020
HUMAN VALUES	GENDER	

Registrar
Dr. B.R.A. University, Agra

Signature Not Verified
RAJEEV KUMAR
Digitally Signed By Registrar

COURSES:

I SEMESTER

Paper No.	Subject	Credits	External (Theory)	Internal (Practical)	TOTAL
I	Nutritional Biochemistry-I	5	60	40	100
II	Food and Meal Management	5	60	40	100
III	Food Service Management	5	60	40	100
IV	Food Microbiology &Food Safety	5	60	40	100
	Total		240	160	400

II SEMESTER

Paper No.	Subject	Credits	External (Theory)	Internal (Practical)	TOTAL
V	Public Health Nutrition	5	60	40	100
VI	Advanced Physiology	5	60	40	100
VII	Clinical Nutrition	5	60	40	100
VIII	Internship and Report Presentation	5	-	100	100
	Total		180	220	400

Employability Course, Skill Development Course

Paper I - NUTRITIONAL BIOCHEMISTRY

Credits: 5

External (Theory): 60

Internal (Practical): 40

Course Outcomes

This course will enable the students:

- To augment the biochemistry knowledge acquired and understand the significance of Biochemistry in Home Science research.
- To understand the mechanisms adopted by the human body for regulation of metabolic Pathways
- To become proficient for specialization in nutrition. Understand integration of cellular level metabolic events to nutritional disorders and imbalances.

UNIT I:

- Definition, objectives, scope and importance of biochemistry and its relation to nutrition

Carbohydrates-

- Definition, classification, and properties of Carbohydrates.
- Overview of Glycolysis, kreb's cycle, and its significance as amphibolic pathway, cori cycle and blood sugar regulation.

Water, -electrolyte and acid –base balance

UNIT II:

- Definition, classification of lipids
- Beta oxidation theory with energetic
- Ketosis.
- Biosynthesis of fatty acids

UNIT III:

Definition, classification Structure and properties of proteins.

- Essential and non essential amino acids.
- Urea cycle and its regulation.
- Transamination and deamination of amino acids
- Lipoproteins- types, composition, role and significance in And its relationship with lipid transport.

UNIT IV:

Enzymes-

- Definition, types and classification of enzymes
- Coenzymes, specificity of enzymes, isozymes, enzyme kinetics including factors affecting velocity of enzymes catalysed reaction. Enzyme Inhibition

Nucleic Acids –

- Classification, composition, and function of nucleic acids
- Structure and properties of nucleosides, nucleotides
- Genetic code.

Practical: - 1 Interactive periods /week.

1. Qualitative test for reducing and non reducing sugars, fat and proteins
2. Separation of water and non water soluble protein from soybean and Bengal gram flour.
3. Estimation of cholesterol.
4. Quantitative estimation of sugars.
5. Estimation of soluble protein by Biuret method.
6. Simple test of sterol.

References-

1. Text book of Biochemistry by West and Todd.
2. Introduction to Modern Biochemistry by Karlson.
3. Principles of Biochemistry by White Handler and Smith.
4. Essentials of food and Nutrition Vol.-I and II by M. Swaminathan.
5. Biochemistry by S.K. Dasgupta. Vol. I, II, III.
6. Essentials of Biochemistry by Dr. M.C. Pant.
7. Biochemistry by Virendra Kumar Shukla.
8. A Text Book of Biochemistry by S.P. Singh.
9. Principles of Biochemistry by Leneinger, D.L. Nelson, M.M. Cox.

Employability Course, Skill Development Course

Paper II - Food and Meal Management

Credits: 5

External (Theory): 60

Internal (Practical): 40

Course Outcomes

This course will enable the students:

- To understand the nutritive value of various food stuffs
- To familiar with the various cooking methods and its effect on nutritive value of food
- To learn about the meal management
- To acquire knowledge about the meal planning for different age group

Unit-1:

- Food Groups - Five Basic Food groups, Seven Basic Food groups, Three Basic food groups as per ICMR. Basic food groups – Their Nutritive Value.
- Milk and Milk Products
- Fish, Meat, Egg.
- Cereals.
- Oils, Butter, Sugar, Jaggery.
- Pulses.
- Vegetables and Leafy Vegetables.
- Fruits
- Roots and Tubers.

Unit-2

- Cooking, Objectives of Cooking, Methods of Cooking, Nutritional aspects of Cooking, Importance of Microwave Cooking and Solar Cooking. Effects of Cooking on Food.

Unit-3

- Meal Management –Principles and Objectives, Concept of Balanced diet and it's components.

Unit-4

- Meal Planning -Principles, Objectives, Preparation of Menu, Planning of meal for Special Conditions
    a. Infancy,
    b. Childhood,
    c. Adolescents

d. Pregnancy
e. Lactation
f. Old age

- Diet Planning as per income and activity, Factors affecting menu planning, Preparation of Menu for

a. High income,
b. Middle income
c. Low income
d. Sedentary
e. Moderate
f. Heavy

Practicals

1. Food preparation, understanding the principles involved , nutritional quality and portion size
   a. Cereals
   b. Pluses
   c. Vegetables
   d. Milk and milk products
   e. Meat, fish and poultry preparations
   f. Egg preparations
   g. Snacks: pakoras, cutlets, samosa, upma, poha, sandwiches

2. Identification of nutrient rich sources of foods, their seasonal availability and price, study of nutrition labeling on selected foods.

3. Use of food exchange list

4. Planning, preparation and evaluation of adequate diets using food exchange list to suit different socioeconomic groups for:

a. Young adult
b. Pregnant and lactating women
c. Preschool child
d. School age child and adolescents
e. Elderly

References:

- Bamji MS, Krishnaswany K, Brahma GNV(2009). Textbook of Human Nutrition, 3rdEdition.Oxford and IBH Publishing Co. Pvt.Ltd.
- Srilakshmi (2010). Food Science, 5th Edition. New Age International Ltd.
- Raina U, Kashyap S, NarulaV ,Thomas S, Survira, Vir S, Chopra S (2010). Basic food preparation :A complete Manual, forth edition, Orient Black Swan ltd.
- Bamji MS, Krishnaswany K, Brahma GNV(2009). Textbook of Human Nutrition, 3rd Edition.

- Khanna K., Gupta S, Passi SJ, Seth R, Mahna R and Puri S (1997). Textbook of Nutrition & Dietetics. Phoenix Publishing House, New Delhi
- Stacy Nix (2009). William's Basic Nutrition and Diet Therapy, 13th Edition. Elsevier Mosby.

Employability Course, Skill Development Course, Entrepreneurship Course

Paper III- Food Service Management

Credits: 5

External (Theory): 60

Internal (Practical): 40

Course Outcomes

This course will enable the students:

- To develop a knowledge about the food service industry and various food service systems
- To introduce the students about the management functions, principles, theories and tools
- To impart the knowledge about the food production components
- To understand about the personnel management

UNIT I: INTRODUCTION TO FOOD SERVICE

- Factors contributing to the growth of food service industry
- Kinds of food service systems- Conventional, commissary, ready prepared, assembly/serve

UNIT II: ORGANIZATION & MANAGEMENT

• Management Theories: Classical, Scientific, Behavioural, Systems approach, Contingency approach, MBO, JIT, TQM

• Functions of management /manager, Principles of management

• Definition of Organization and steps in organizing Tools of management

• Tangible Tools: Organization chart, Job description, Job specification, Job analysis: Path way chart, Process chart, Work schedule, Production schedule, Staff and service analysis, Budget , Intangible tools: Communication, Leadership, Decision making

UNIT III: FOOD PRODUCTION

• Menu planning: Importance of menu, Factors affecting menu planning, Menu construction, Types of menu, Menu card, Qualifications of a menu planner

• Food Purchase: Purchasing methods – Market, Buyer, Vendor, Methods of Purchase: Formal and Informal, Purchasing procedure

• Storage: Types of storage, Store room requirement, Appropriate temperature for storage of different foods, Storeroom Records

• Quantity Food production: Production planning and control, Importance of planning, Production forecast, Estimating quantities to buy Quantity preparation techniques, Production schedule Product evaluation , Standardization of recipes, Recipe adjustments and portion control

• Food delivery and service: Centralized and decentralized, factors affecting selection, Styles of service: self, table, tray equipment for delivery and service

UNIT IV: PERSONNEL MANAGEMENT

- Functions of a personnel manager,
- Factors to consider while planning the kind and number of personnel: Menu, type of operations, Type of service, Job description and job specification

Manpower placement:

- Recruitment: Process and Sources-Internal and External
- Selection: Process interview, Tests
- Orientation: Importance, Content of programme, Developing an Orientation programme
- Training: Importance; Types - OJT, Group; continuous training, training for development , Developing a training programme
- Contract negotiation with employee : appointment letter, establishment of wages, components of wages , rules and regulations, duties, and service and benefits , contact with vendors
- Performance appraisal: Importance, Methods, Limitations
- Leadership: Importance; Styles, traits and skills
- Motivation: Role; Motivation theories and their application-Content theories: Maslow, Herzberg, McClelland; Process theories: Vroom, Equity; Reinforcement theory; Motivational plan and incentives

Practical:

1. Market survey for food items, both raw and processed
2. Equipment for production and service To compare cost
3. Field visit to two food service institutions
4. Planning menus within specified budget for any 3 of the following:

- Nursery school
- College hostel
- College canteen
- Hospital cafeterias

5. Standardization of a recipe

References:

- West B Bessie & Wood Levelle (1988) Food Service in Institutions 6th Edition Revised ByHargar FV, Shuggart SG, &Palgne Palacio June, Macmillian Publishing Company New York.
- SethiMohini (2005) Institution Food Management New Age International Publishers
- Koontz Harold &Weihrich Heinz (2006) Essentials of Management 7th edition Tata Mc Graw Hill Book Company .
- Terrell E M (1971) Professional Food Preparation, Wiley publishers (New York)
- Tripathi P C (2000) Personnel management 15th ed Sultan Chand, New Delhi
- Dessler Gary (2007). Human Resource Mangement 11th edition. Prentice H all, New Jersey.

Employability Course

PAPER IV- FOOD MICROBIOLOGY & FOOD SAFETY

Credits: 5

External (Theory): 60

Internal (Practical): 40

Course Outcomes

This course will enable the students:

- To understand the basis of microbial growth in various foodstuffs and its beneficial and harmful effects.
- To learn the ways and means to prevent microbial contamination during and after food processing to contain spoilage and poisoning.
- To understand the role of microorganisms in food product development.

UNIT I- INTRODUCTION TO MICROBIOLGY

- Definition, scope of Food Microbiology
- An Introduction to microbial world: Bacteria, Fungi , Yeast, Viruses.
- Bacterial groups based on their morphology: Gram positive , gram negative, motile/ non-motile bacteria, sporulating/ non sporulating bacteria.
- Bacterial groups based on their physiological growth factors: Temperature, pH, water activity, availability of oxygen. Intrinsic and extrinsic parameters that affect microbial growth and their relevance to food spoilage and preservation.
- Fungi and Yeast : General features and their importance in food microbiology
- Viruses and Bacteriophages: Definition, their general characteristics and multiplication

Unit II-FOOD SPOILAGE AND DESTRUCTION OF MICROBES

- Food Spoilage :Definition, microorganisms involved in spoilage of various foods: Milk, bread, canned food, vegetables and fruits, fruit juices, meat, eggs and fish.
- Physical and chemical means used in destruction of microbes: Definition of sterilisation and disinfection. Role of heat, filtration and radiation in sterilization, use of chemical agents- alchohol halogens and detergents.

Unit III- CONTAMINATION- INTOXICATION & INFECTION

- Sources of food contamination, food poisoning Symptoms &control .
- Food Borne Intoxication: Botulism and Staphylococcal intoxication
- Food borne infections- Salmonellosis, Clostridium perfrigens, bacillus cereus gastroenteritis

Unit IV: MICRORGANISMS IN FOOD

- Microorganisms in food enzyme and technology:
- Food Fermentation

- Enzymes and food production
- Microorganisms as food
- Probiotics and Single cell proteins
- HACCP system and food safety used in controlling microbiological hazards

PRACTICALS

1. Identification of microbes
2. Preparation of chart and models (same as theory)
3. Identification of slides of microbes.
4. Sterilization
5. Techniques of culturing from liquid and solid media
6. Staining of bacteria: Gram staining and spore staining
7. Determination of plate count
8. Bacteriological analysis of water and milk

References:

1. Text Book of Zoology P.S Dhami, Pardeep Publication.
2. Food Microbiology Frazier, willian C and West off Dannis C, Tata McGraw Will Publish Company Ltd.
3. Pelczar, M.L. and Reid, R.D. Microbiology. Mc Graw Hill Book Company, New York.
4. Jay, J.M: Food Microbiology; 6th Edition, Aspen publishers, Inc.,Maryland.
5. Adams, M.R. and Moss M.G: Food Microbiology, 1ST Edition, New age International (P) Ltd.

Employability Course

PAPER V- PUBLIC HEALTH NUTRITION

Credits: 5

External (Theory): 60

Internal (Practical): 40

Course Outcomes

This course will enable the students:

- To understand the concept of public health nutrition.
- To be familiar with national health care delivery system
- To understand the concept of food and nutrition security
- To gain knowledge regarding national/ public sector policies and programs for improving food and nutrition security.
- To plan, implement and evaluate behavior change communication for promotion of nutrition and health among the vulnerable groups.

Unit I – PUBLIC HEALTH NUTRITION & HEALTH CARE SYSTEM

1. Aim, scope and content of public health nutrition
2. Current concerns in public health nutrition: An overview
3. Role of Public health nutritionists in National Development

- - Health- definition, dimensions, determinants, indicators
- - Community health care

4. National Health care delivery system

UNIT- II- PUBLIC HEALTH ASPECT OF UNDER NUTRITION

1. Aetiology, public health implications, prevention and community based management of PEM, Severe acute malnutrition
2. Micronutrient deficiencies of public health significance

UNIT-III-FOOD AND NUTRITION SECURITY

1. Concepts and definitions of food and nutrition security at National, regional , household and individual levels.

2. Public sector programmes for improving food and nutrition security
3. National Plan of Action on Nutrition

UNIT IV- BEHAVIOUR CHANGE COMMUNICATION FOR NUTRITION AND HEALTH PROMOTION

1. Planning of communication strategies for behaviour change programme.

- Stakeholders in nutrition promotion.
- Developing nutrition education plan
- Identifying communication strategies and approaches for health promotion (e.g social marketing)

- Designing nutrition and health messages, selecting communication channels, developing and field testing of communication materials

2. Ethics in Nutrition and Health Communication

PRACTICAL

1. Planning and preparation of diet/dishes for PEM, VAD and IDA.

2.Field Visit to ongoing national nutrition programmes

3.Assessment of Nutritional problem in an identified community and their determinants in different population groups through analysis of secondary data (such as NSSO, NFHS data etc)

4. Planning of a communication strategy for a nutrition education programme in the community; field testing of messages, materials and methods

References:

- Achaya,K.T. (Ed) (1984). Interface between Agriculture, Nutrition and Food Science. The United National University.
- Beaton, G.H and Bengoa, J.M (Eds) (1996) . Nutrition in Preventive Medicine, WHO.
- Gibney M.J., Margetts,B.M., Kearney, J.M. Arab, I., (Eds)(2004). Public health Nutrition, NS Blackwell publishing.
- National consensus workshop on Management of SAM children through Medical Nutrition Therapy (2009)- Compendium of scientific publications Volume I & ii. Jointly organised by AIIMS, SitaramBhartia Institute of Science and Research, IAP (subspeciality chapter on Nutrition, New Delhi. Sponsored by DBT.
- Park, K. (2009). Parks Textbook of Preventive and Social Medicine, 20th Edition, Jabalpur. M/S Banarsidas
- Gopalan,C and Kaur, S. (Eds) (1993). Towards better Nutrition , problems and policies. Nutrition Foundation of india.
- National Nutrition Policy, GOI, 1993.
- National Plan of Action on Nutrition, GOI, 1995.
- Public Health Communication: Evidence for Behaviour change by Robert C.Hornik (2002) by Lawrence Erlbaum Associates, Inc.
- Communication and Health : Systems and Applications. Edited by Eileen Berlin Ray and Lewis Donohew(1990) by Lawrence Erlbaum Associates, Inc.
- Designing health messages: Approaches for communication Theory and Public Health Practice ;Editors : Edward Maibach and Roxanne Louiselle Parrott (1995) by Sage Publications, Inc.

Employability Course

PAPER VI- ADVANCED PHYSIOLOGY

Credits: 5

External (Theory): 60

Internal (Practical): 40

Course Outcomes

This course will enable the students:

- To understand the functions of physiological systems including the lymphatic system, circulatory system, respiratory and digestive system, excretory and endocrine system ,reproductive and nervous system.
- To perform, analyze and report on different experiments (slides of different human organs)and observations in physiology
- To recognize and identify principal tissue structures.

Unit I- INTRODUCTION TO LYMPHATIC & CIRCULATORY SYSTEM

1. Lymphatic system and its and functions.
2. Circulatory System: blood – composition, blood cells - development and function of blood cells, blood clotting, blood grouping and haemoglobin
3. Heart and its anatomy. Circulation of blood, cardiac cycle, blood pressure and factors affecting blood pressure.

UNIT-II RESPIRATORY AND DIGESTIVE SYSTEM

1. Respiratory system: anatomy, physiology and mechanism of respiration, regulation of respiration.
2. Digestive system: anatomy of gastrointestinal tract and accessory organs. Digestion and absorption of food.

UNIT-III EXCRETORY AND ENDOCRINE SYSTEM

1. Excretory system: anatomy and functions of kidney, formation, composition and excretion of urine.
2. Endocrine glands, mode of action of hormones

UNIT- IV REPRODUCTIVE AND NERVOUS SYSTEM

1. Reproductive system: structure and functions of male and female reproductive organs.
2. Nervous system: anatomy and functions.

PRACTICALS

1.Microscopic examination of prepared slides of different human organs

2. Estimation of haemoglobin

3.Identification of blood groups

4.Preparation of blood smear.

5.Measurement of blood pressure.

6.Estimation of blood glucose

7.Preparation of TEC and TLC

8.Preparation of blood Haem-crystals

9.Demonstration and study of models of human body system.

Reference Books:

1. Best CH & Taylor NB. 1989. The Human Body. ASI Publ. House. (Source: National Book Depot, Bombay).
2. Chatterjee CC. 1992. Human Physiology. Vols. I, II. Medical Allied Agency.
3. Guyton AC. 1991. Text Book of Medical Physiology. WB Saunders.
4. Mukherjee KL. 1994. Medical Laboratory Technology. Vol I. Tata McGraw Hill.
5. Wilson KJW & Ross JS.1987. Ross and Wilson Anatomy and Physiology in Health and Illness. 6th Ed. Churchill Livingstone.

Employability Course, Skill Development Course, Entrepreneurship Course

PAPER VII- CLINICAL NUTRITION

Credits: 5

External (Theory): 60

Internal (Practical): 40

Course Outcomes

This course will enable the students:

- To learn about the nutrition care process and principles of dietary counselling
- To understand causative factors and metabolic changes in various diseases/ disorders.
- To understand the symptoms, diagnosis, complication and treatment in diseases
- To gain knowledge of medical nutrition therapy in various diseased / disorders

Unit I- NUTRITIONAL ASSESSMENT & CARE OF PATIENTS

1. Nutrition care process
   - Nutritional screening and assessment of patients- outpatient &hospitalised
   - Nutritional interpretation of routine medical and laboratory data
   - Nutrition care plan and implementation
   - Monitoring & follow up
2. Diet counselling
3. Diet, Nutrition and drug interaction
4. Nutrition support : Enteral & Parenteral Nutrition

Unit-II WEIGHT MANAGEMENT, DIABETES & HEART DISEASE

Pathophysiology, metabolic & clinical aberrations, diagnosis , complications, treatment, MNT, dietary counselling and recent advances in –

1. Weight imbalance disorders- Overweight and Underweight
2. Diabetes Mellitus – Type 1, Type 2 & Gestational Diabetes
3. Cardiovascular disease- Hypertension, hyperlipidaemia, metabolic syndrome, myocardial infarction, congestive heart failure, coronary bypass surgery.

UNIT-III GASTROINTESTINAL TRACT, LIVER & KIDNEY DISORDERS

Pathophysiology, metabolic & clinical aberrations, diagnosis, complications, treatment, MNT, Dietary counselling and recent advances in:

1. Gastrointestinal tract disorders – GERD, Peptic ulcer, diarrhoea, lactose intolerance, celiac disease, diverticular disease, Crohn's disease and ulcerative colitis.
2. Liver, Gallbladder & Pancreatic disorders-
   Cirrhosis, Encephalopathy, liver transplant, cholecystitis, cholecystectomy, Pancreatitis.

3. Kidney Disorders –Nephrotic syndrome, glomerulonephritis, acute renal failure, chronic kidney disease, dialysis, transplant, renal stones.

UNIT-IV METABOLIC STRESS AND CANCER

Metabolic & Clinical aberrations, diagnosis, complications, treatment, MNT and dietary counselling in :

1. Metabolic stress –Surgery, Burns, sepsis and trauma
2. Cancer-Role of diet in aetiology and management , effect of cancer therapy on MNT

PRACTICALS

1. Assessment of patient needs- Nutritional assessment & screening
2. Market survey of commercial nutritional supplements

- Collection of information on commercial food formula available in the market
- Intravenous nutrition supplement – TPN, Cost , Composition, dosage , indications.

3. Planning & preparation of diets using exchange lists for

- Overweight & underweight
- Diabetes mellitus
- Peptic ulcer
- Diarrhoea
- Ulcerative colitis
- Cirrhosis
- Hypertension
- Hyperlipidaemia
- Glomerulonephritis
- Acute & chronic renal failure
- Dialysis
- Burns

References:

1. Lee RD & Neiman DC (2009). Nutritional Assessment. 5th Edition. Brown & Benchmark.
2. Mahan , L.K. and Escott Stump. S(2008). Krause's Food & Nutrition Therapy.12th Edition. Saunders- Elsevier.
3. Shils, M.E.., Shike ,M, Ross, A.C., Caballero B and Cousins RJ (2005). Modern Nutrition in Health & Disease. 10th .Lipincott, William and Wilkins.
4. Gibney MJ, Elia M, Ljungquist&Dowsett J. (2005).Clinical Nutrition. The Nutrition society textbook series. Blackwell publishing company.
5. Marian M. Russel M, Shikora SA. (2008). Clinical Nutrition for surgical patients. Jones and Bartlett publishers.

World Cancer Research fund & American Institute for Cancer Research (2007). Food, Nutrition, Physical activity and the prevention of cancer – A global perspective. Washington E.D.WCRF

Employability Course, Skill Development Course
Entrepreneurship Course

PAPER VIII- INTERNSHIP AND REPORT PRESENTATION

Credits: 5

External (Theory): 0

Internal (Practical): 100

Course Outcomes:

This course will enable the students:

- To develop competency and skills in planning preparation and evaluation of various therapeutic diets
- To understand the application and integration of principles of nutrition in medical nutrition therapy of multiple disorders in clinical setting

Duration : 3 Months

Training : Hospital Setting

Norms :

3 months internship in a hospital setting of Minimum 200 bedded NABH accredited hospital with a Dietetic department.

Evaluation:

1. The students will have to prepare a give a case presentation and submit report after completion of their internship.
2. A presentation has to be made in seminar on their work experience.