VIDYASAGAR UNIVERSITY

Midnapore, West Bengal

PROPOSED CURRICULUM&SYLLABUS (DRAFT) OF

BACHELOR OF SCIENCE (HONOURS)

MAJOR IN NUTRITION

4-YEAR UNDERGRADUATE PROGRAMME

(w.e.f. Academic Year 2023-2024)

Based on

Curriculum & Credit Framework for Undergraduate Programmes

(CCFUP), 2023& NEP, 2020

VIDYASAGAR UNIVERSITY
BACHELOR OF SCIENCE (HONOURS) MAJOR IN NUTRITION
(under CCFUP, 2023)

Level	YR.	SEM	Course Type	Course Code	Course Title	Credit	L-T-P	Marks		
								CA	ESE	TOTAL
B.Sc. (Hons.)	3rd	V	SEMESTER-V							
			Major-8	NUTHMJ08	T: Fundamentals of Diet Therapy; P: Practical	4	3-0-1	15	60	75
			Major-9	NUTHMJ09	T: Clinical Diet therapy-1; P: Practical	4	3-0-1	15	60	75
			Major-10	NUTHMJ10	T: Food Microbiology; P: Practical	4	3-0-1	15	60	75
			Major Elective-01	NUTHDSE1	T: Nutrition and Immunity; P: Practical	4	3-1-0	15	60	75
			Minor-5 (Disc.-I)	NUTMIN05	T: Nutrition in Special Physiological Phases *(To be taken by the other Discipline)*	4	3-0-1	15	60	75
					Semester-V Total	20				375

MJ = Major, MI = Minor Course, DSE = Discipline Specific Elective Course, CA= Continuous Assessment, ESE= End Semester Examination, T = Theory, P= Practical, L-T-P = Lecture-Tutorial-Practical

SEMESTER-V

MAJOR (MJ)

Major 08: Fundamentals of Diet Therapy
Credit: 4
Full Marks: 75

Learning outcomes:

At the end of the course the student will be able to:

1. Understand the various therapeutic diets and role in prevention of diseases.
2. Know about dietary management for texture & consistency Based Diets
3. Learn about Core Components of the Therapeutic Food Plan
4. Knowledge regarding Personalised Nutrition.

MJ-8T: Fundamentals of Diet Therapy (Theory) **Credits 03**

Course Content:

1. Basic concepts of Diet Therapy

- Historical outline of Diet Therapy-Monastic & The Medieval Diet.
- Definition and objectives of therapeutic nutrition.
- Principles of therapeutic diet.
- Principles of modifying diets based on energy, macronutrients, texture, flavour, genetic predispositions, metabolic profile, gut microbiota, medical history & comorbidities, lifestyle factors (activity level, stress, sleep, etc.).

2.Texture & Consistency Based Diets

- Clear liquid diet for digestive rest—broths, gelatin, clear juice.
- Full liquid diet- smooth purees, milk, yogurt.
- Soft/blenderized diet: for chewing/swallowing challenges—foods pureed, cooked soft with mild seasoning.
- Bland diet: avoids spicy, caffeine, alcohol; mild, soothing for the GI tract.

3.Feeding Methods & Care Planning

- Enteral nutrition: tube feeding types, indications, complications.
- Parenteral nutrition: PPN vs. TPN, monitoring.
- Pre and post-operative diets.
- Diet for specific situation- acid ash diet, alkaline ash diet, ornish diet, DASH diet.

4.Core Components of the Therapeutic Food Plan

- Macronutrients balanced carbohydrates, healthy fats, lean proteins quinoa, olive oil, lentils, fatty fish.
- Micronutrients address deficiencies based on individual needs Spinach (folate), dairy (calcium), seeds (magnesium).
- Anti-inflammatory foods reduce oxidative stress & chronic inflammation turmeric, ginger, berries.
- Gut-health support restore microbiome balance yogurt, kefir, fermented foods, prebiotic fibers.
- Hydration support detox and cellular function herbal teas, infused water, coconut water

MJ-8P: Fundamentals of Diet Therapy (Practical) **Credits 01**

1. Planning and preparation of clear fluid diets.
2. Planning and preparation of full fluid diets.
3. Planning and preparation of soft diets.
4. Planning and preparation of therapeutic diets specially emphasis on gut health support with intervention of anti-inflammatory nutrition.

Major 09: Clinical Diet therapy-1
Credit: 4
Full Marks: 75

Learning outcomes:

At the end of the course the student will be able to:

1. 1.To know regarding dietary management of diabetic patient.
2. To learn regarding dietary management of heart disease patient.
3. To educate regarding dietary management of kidney disease patient.

MJ-9T: Clinical Diet therapy-1 (Theory) **Credits 03**

Course Content:

1. **Diabetes Mellitus**:

- Types with specific causes, symptoms, diagnosis, Management of diabetes by insulin therapy, oral hypoglycemic agents (OHA).
- Glucose monitoring at home.
- Dietary care and nutritional therapy, meal plan for a diabetic patient.
- Alternatives therapeutic management to combat hyperglycemia.

2. **Cardiovascular diseases**:

- Etiology and risk factors of various types of heart diseases.
- Hypertension-dietary management.
- Dietary management against progression of atherosclerosis.

3. **Hyerlipidemias:**

- Primary and secondary hyperlipidemia-causes, risk factors and linked with heart diseases and dietary management.
- National Cholesterol Education Programme (NCEP) guidelines.

4. **Renal Diseases**:

- Causes and dietary management of acute renal disease.
- Causes and dietary management of chronic renal disease.
- Uremia-cause, risk factors and dietary management.
- Causes and dietary management of nephrolithiasis.

MJ9P: Clinical Diet therapy-1 (Practical) **Credits 01**

1. Planning and preparation of diets for diabetes mellitus.
2. Planning and preparation of diet for atherosclerosis.
3. Planning and preparation of diets for hypertension.
4. Planning and preparation of diets for nephritis and nephrotic syndrome.
5. Planning and preparation of diets for Chronic Kidney disease.

Major 10: Food Microbiology
Credit: 4
Full Marks: 75

Learning outcomes:

At the end of the course the student will be able to:

1. 1.To know regarding bacteria, virus, protozoa, fungi etc.
2. To learn regarding bacterial growth and nutritional requirement.
3. To educate regarding fermented products and probiotics.

MJ-10T: Food Microbiology **Credits 03**

Course contents:

1.Basics of Microbiology:

- General characteristics of bacteria, fungi, virus, protozoa and algae.
- Bacterial structure- Cell walls of Gram positive and Gram negative, Bacteria capsule, Bacterial spore.
- Basic concept of viroids and prions.

2. Nutrition and culture of Bacteria:

- Bacterial growth-Extrinsic and intrinsic factors affecting growth.
- Bacterial growth curve.
- Types of starters culture.

3. Fermented Foods:

- Bacterial cultures.
- Yeast cultures.
- Mold cultures.
- Beneficial effect of microorganisms-concept of probiotics and related factors.
- Dietary different fermented products, importance of fermented foods.
- Alcoholic beverages and traditional foods.

4. Food borne diseases

- Bacterial agents (e.g., Salmonella enterica, Clostridium perfringens, Escherichia coli O157, Listeria monocytogenes).
- Viral agents (e.g., Norovirus, Hepatitis A virus).
- Parasites (e.g., Giardia lamblia, Taenia solium)
- Toxin-mediated illnesses: food intoxication (e.g., Clostridium botulinum toxin, mycotoxins)

MJ10P: Food Microbiology (Practical) **Credits 01**

1. Study of equipments in a food microbiology lab.
2. General procedures for aseptic work.
3. Staining of bacteria (gram staining).
4. Preparation of nutrient broth and media with agar.
5. Bacteriological examination of water, milk, dried fish and fish meal and canned foods.
6. Common preparation of starter culture for fermented food preparation.

MAJOR ELECTIVE (DSE)

Major Elective – 01: Nutrition and Immunity
Credit: 4
Full Marks: 75

Learning Outcome:

At the end of the course the student will be able to:

1. 1.To know the basics of immune system.
2. To learn how amino acid, fatty acid and carbohydrates control immune function.
3. To educate regarding probiotics and immune health.

Major (Elect.) MJE -1T: Nutrition and Immunity **Credits 03**

Course contents:

1. Overview of Immune System:

- Types of immunity-innate immunity, acquired immunity, active and passive immunity.
- Basic outline of antigen-antibody interaction.
- Basic idea about immuno-competent cells- Neutrophil, B-lymphocytes, T-lymphocytes (helper, cytotoxic and suppressor), monocytes and macrophages.
- Types and functions of immunoglobulins.
- Properties of immunogen, antigens and haptens. Human leukocyte antigens.

2. Macronutrients and immune functions:

- Role of various amino acids (glutamine, arginine etc) on immune functions.
- Role of glutathione on immune function.
- Polyunsaturated fatty acids - anti and pro inflammatory effects.
- Dietary fibres modulate the immune system.

3. Vitamins and minerals and immune functions:

- Effect of vitamin D, A and C on immune cell activation.
- Role of vitamin B1, B2, B3 and B12 on anti and pro inflammatory responses.

4. Immunomodulator properties of functional foods:

- Probiotics and Gut–Immune Axis Modulation.

- Role of Polyphenols and Flavonoids on immune health.
- Food-Derived Bioactive Peptides and Immunity.

Major (Elect.) MJE -1P: Nutrition and Immunity (**Practical**) **Credits 01**

1. Test for agglutination reaction.
2. Single Radial Immunodiffusion (SRID) test
3. Poster presentation on immunonutrition.
4. Preparation of immuno-nutrient rich functional foods.

MINOR (MI)

Minor-5: Nutrition in Special Physiological Phases
Credit: 4
Full Marks: 75

Learning outcomes-

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

1. To know regarding nutritional requirements and dietary management during pregnancy.
2. To know about the physiology of lactation, nutritional requirements and dietary management during lactation.
3. To learn about nutritional requirement of toddlers / preschool / school going children / adolescent / adults.

MI – 5T: Nutrition in Special Physiological Phases **Credits 04**

Course Contents-

1. Nutrition during Pregnancy:

- Importance of adequate weight gain during pregnancy, antenatal care and its schedule.
- Dietary management for a pregnant mother.
- Importance of iron, folic acid and calcium during pregnancy.
- Common problems of pregnancy and their managements- morning sickness, anaemia, constipation, pregnancy induced hypertension, gestational diabetes.

2. Nutrition during Lactation:

- Nutritional requirements during lactation.
- Dietary management, food supplements during lactation.
- Increase the production of breast milk-various factors.
- Care and preparation of nipples during breast feeding.

3. Nutrition during infancy to adult:

- Breast feeding - colostrums, its composition and importance in feeding. Initiation of breast feeding and duration of breast-feeding, advantages of exclusive breast-feeding, nutritional and other advantages of breast-feeding.
- Introduction of complementary foods, initiation of management of weaning.
- Nutrition requirement of toddlers / preschool / school going children / adolescent / adults.

MI-5P: Nutrition in different phases of Human life Cycle (Practical) **Credits 01**

1. Planning and preparation of balanced diet for a pregnant woman
2. Planning and preparation of balanced diet for a lactating women
3. Planning and preparation of balanced diet for a pre-school child
4. Planning and preparation of balanced diet for school going child.
5. Planning and preparation of balanced diet for adolescents