FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with "A" Grade by NAAC (3rd Cycle)

74th Rank in India Ranking 2020 (NIRF) by MHRD

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT : THE RESEARCH CENTRE OF HOME SCIENCE

NAME OF THE PROGRAMME : M.Sc. HUMAN NUTRITION & NUTRACEUTICALS

PROGRAMME CODE : PSNN

ACADEMIC YEAR : 2020 - 2021

PG – PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1: Our post graduates will exhibit professional competence in diet planning, nutrient analysis of foods and diet counseling.

PEO 2: Their social responsibility is highlighted through their community nutrition programme that imparts nutrition education to various sections of the community.

PEO 3: They are committed researchers in contributing innovative solutions to the contemporary needs of the society.

PG – PROGRAMME OUTCOMES

PO1: Scientific knowledge in the thrust areas of Foods, Nutrition and Nutraceuticals.

PO2: Acquisition of skills in the qualitative and quantitative analysis of blood and urine and nutrient analysis of various foods.

PO3: Professional competence in planning normal and therapeutic diets and

counseling. **PO4:** Social responsibility by participating in community health programs.

PO5: Enterprising by developing innovative value added food products.

PROGRAMME SPECIFIC OUTCOMES

M.SC Human Nutrition and Nutraceuticals

PSO1: Advanced scientific knowledge in food, nutrition and nutraceuticals PSO2:

Professional competence in planning therapeutic diets and counselling PSO3: Social

responsibilities by participating in community health programmes PSO4: Enterprising – by

developing innovative value added food products

PSO5: Environmental concerns – by understanding the role of microbes in human health and diseases

PSO6: Acquisition of skills in analysing food components and blood constituents

PSO7: Desire for knowing more about nutraceuticals from familiar and unfamiliar foods

PSO8: Creative thinking in choosing the appropriate research design

FATIMA COLLEGE (AUTONOMOUS) MADURAI –18.

M.SC. HUMAN NUTRITION & NUTRACEUTICALS

Major, Practical Papers Offered for the students 2020-2021

COURSE CODE	COURSE TITLE	HRS / WK	CREDIT	CIA Mks	ESE Mks	TOT. MKs
SEMESTER - I						
19PG1N1	Advanced Human Nutrition	6	4	40	60	100
19PG1N2	Advanced Dietetics	6	4	40	60	100
19PG1N3	Applied Physiology	6	4	40	60	100
19PG1N4	Advanced Dietetics Lab	4	2	40	60	100
19PG1N5	Clinical Laboratory Techniques Lab	4	2	40	60	100
19PGNEDC1	EDC-Nutrition & Dietetics	3	3	40	60	100
	Library	1	-	-	-	-
Total		**30**	**19**			

SEMESTER - II						
19PG2N6	Clinical Nutrition & Diet Therapy	6	4	40	60	100
19PG2N7	Functional Foods & Nutraceuticals	6	4	40	60	100
19PG2N8	Research Methodology	6	4	40	60	100
19PG2N9	Clinical Nutrition & Diet Therapy Lab	4	2	40	60	100

19PG2N10	Functional Foods & Nutraceuticals Lab	4	2	40	60	100
19PGNEDC2	EDC-Nutrition & Dietetics	3	3	40	60	100
Library	1		-	-	-	-	-	-
Total	**30**	**19**						

SEMESTER - III						
19PG3SIN1	Summer Internship	-	3	50	50	100
19PG3N11	Functional Foods & Nutraceuticals in Preventive Dietetics Community Nutrition	6	5	40	60	100
19PG3N12	Analytical Instrumentation	6	5	40	60	100
19PG3N13	Food Product Development and Evaluation/ Institutional Management	6	5	40	60	100
19PG3NE1/ 19PG3NE2	Community Nutrition Lab echniques for	4	4	40	60	100
19PG3N14	Experimental Nutrition- I Lab	4	2	40	60	100
19PG3N15		4	2	40	60	100
Total		**30**	**26**			

SEMESTER - IV

19PG4N16	Food Microbiology	6	5	40	60	100

19PG4N17	Nutritional Biochemistry	6	5	40	60	100
19PG4N18	Advanced Food Science and Processing Techniques	6	5	40	60	100
19PG4NE3/ 19PG4NE4	Food Safety and Quality Control/ Nutrition in Critical Care and Disasters	4	4	40	60	100
19PG4N19	Food Microbiology Lab	4	2	40	60	100
19PG4N20	Nutrient Analysis Lab	4	2	40	60	100
19PG4N21	Project*& Viva Voce		3	50	50	100
Total		**30**	**26**			
	Total	**120**	**90**			

ADD ON CREDITS

5

Soft Skills 3 Computer Application 4
Comprehension & Viva 2
Reading Culture 1

10

100% EMPLOYABILITY

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

I SEMESTER

ADVANCED HUMAN NUTRITION-19PG1N1

(For those who joined in 2019 onwards)

HOURS/WEEK:6 CREDITS:4

COURSE DESCRIPTION

The course provides the knowledge on classification, functions, metabolism and deficiency of macro and micro nutrients and its interrelationship.

COURSE OBJECTIVES

- Gain in depth knowledge in the study of major and minornutrients.
- Understand the recent trends in the study ofnutrients
- Develop competence for undertaking nutritional investigations.

COURSE OUTCOMES (CO)

The students will be able to

1. Recall the functions of nutrients in human body.
2. Explain the digestion, absorption, sources & requirements of different nutrients
3. Compare the energy value of foods by using differentcalorimetry
4. Build the knowledge of nutrient and druginterrelationship
5. Summarize the importance of fluid and electrolyte balance in humanbody

UNITI: MACRO NUTRIENTS ANDWATER [18HRS]

Carbohydrate - Definition, classification, functions, sources, requirements, digestion and absorption, Dietary Fibre - Definition, classification, functions, sources,requirements

Protein - Definition, classification, functions, sources, requirements, digestion and absorption, Evaluation of protein quality- protein efficiency ratio, digestibility coefficient, biological value, net protein utilization, net protein ratio, chemical scores and PDCAAS

Fat - Definition, classification, functions, sources, requirements, digestion and absorption, Essential fatty acids – functions and effects of deficiencies

Water- Definition, distribution, functions, sources, water balance, fluid and electrolyte balance Water Deprivation, dehydration, rehydration.

UNITII: ENERGY [18HRS]

Energy – Definition, Units of energy, Determination of energy value of foods – Direct – Bomb Calorimetry, Indirect Calorimetry – Benedicts Oxy calorimetry, Determination of energy requirements – BMR - Definition and factors influencing BMR, Measutrement of Basal metabolism, Direct Calorimetry – Atwatar Rose Respiratory Calorimeter, Indirect Calorimetry – Benedict Roth Apparatus, Determination of BMR using production equations (ICMR), Physiological fuel value, gross energy value, Respiratory Quotient, Thermal effect of foods (SDA), Energy requirements during work, Reference man, reference women, RDA for energy, food sources.

UNITIII: MINERALS [18HRS]

Calcium, Phosphorus, Magnesium, Sodium, Potassium, Iron, Iodine, Fluorine, Zinc, Selenium and

Vanadium – Introduction, functions, sources, requirements, digestion, absorption, storage, excretion, deficiency andtoxicity.

UNITIV: VITAMINS [18HRS]

Fat soluble and water soluble vitamins (Thiamine, riboflavin, niacin, vitamin B_{12}, folic acid, piridoxin, pantothenic acid, biotin and ascorbic acid - nomenclature, functions, sources, requirements, digestion, absorption, storage, excretion, deficiency and toxicity.

UNITV:INTERRELATIONSHIPANDINTERDEPENDENCE [18 HRS] BETWEEN NUTRIENTS AND DRUG INTERACTION

Nutrient and nutrient interaction, Nutrient and drug interaction

REFERENCE BOOKS:

1. Berdanier, C.D.(1988). *Advanced Nutrition- Micronutrients*, Marcel Dekker, inc., NewYork,
2. Brown,M.L.(1990). *Present knowledge in Nutrition,* International Life Science Institute, Nutrition Foundation, Washington, VI,Edition.
3. Gruff, J.L., Gropper, S.S, & Hunt, S.M (1995).*Advanced Nutrition and Humanmetabolism,* West Publishing Company, Minneapolis.
4. Helen, A. Guthrie. (1989). *Introductory Nutrition,* VII edition, Mosby College Publishing Col, Toranto.
5. Mahtab S. Bamji, Palhad Rao R, & Vinodhini Reddy, (1998). *Text book of Human Nutrition*, Oxford and IBH publishing co., Pvt.Ltd., NewDelhi.
6. Sith K.L & Dekker M. (1990) .*Trace Minerals in Foods*, Inc., NewYork.

JOURNALS:

1. British journal of nutrition, Cambridge University Press, London.
2. Nutrition news, Nutrition Institute of Nutrition, Hyderabad.
3. Nutrition reviews, the Nutrient Foundation, Inc., NewYork.
4. Nutrition and food science- incorporating home economics and technology, Pvt. Ltd.,England.
5. The journal of nutrition, Cambridge University Press,London.
6. World review of Nutrition and Dietetics- allvolumes.

WEB REFERENCES:

1. www.livestrong.com
2. www.healthguidance.org
3. www.whfoods.com
4. www.everydayhealth.com
5. www.healthboards.com 8

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.Sc HUMAN NUTRITION AND NUTRACEUTICALS

I SEMESTER

ADVANCED DIETETICS -19PG1N2

(For those who joined in 2019 onwards)

HOURS /WEEK: 6 CREDITS: 4 COURSE DESCRIPTION

The course explains the medical nutrition therapy for normal life cycle, common diseases, and special conditions like sports, space, deep sea and air travel.

COURSE OBJECTIVES

- To identify and describe the nutritional needs through lifecycle.
- To identify and describe various diseaseconditions.
- To gain knowledge on appropriate nutritionalmanagement.
- To develop the attitude and capacity for taking up dietetics as aprofession

COURSE OUTCOMES (CO)

The students will be able to

1. Describe nutritional care process
2. Recognize the nutritional needs of different stages of life cycle
3. Explain medical nutritional management.
4. Plan therapeutic interventions for traumatic conditions.
5. Categorize meal planning for sports, sea and air travel.

UNIT I : NUTRITIONAL CARE, NUTRITION DURING PREGNANCY, LACTATION, INFANCY [18 HRS]

Nutritional Care Process - Definition & Model

Balanced diet, food guide pyramid, meal planning and factors influencing meal

planning RDA- Meaning and importance

Pregnancy – importance, Physiological and biochemical changes, Physiological adjustment that affect energy and nutrient demands, complications.

Lactation – Mechanism, Colostrum, transition milk, mature milk, comparison of cow‟s and human milk, nutritive value of human milk, nutrient demands.

Infancy – Importance, nutritional requirements, breast feeding – advantageous, bottle feeding merits and demerits, feeding problems, weaning – definition, need, process, problems, supplementary foods – types.

UNIT II: NUTRITION DURING PRESCHOOL, SCHOOL GOING, ADOLESCENCE, ADULTHOOD, GERIATRICS [18 HRS]

Preschool Children - nutritional requirements, dietary guidelines & healthy food habits PEM – causes, signs, symptoms, biochemical and metabolic changes, treatment.

School going Children – nutritional requirements, importance of packed lunch, feeding problems-obesity, underweight, constipation, dental caries.

Adolescence - nutritional requirements, nutritional problems – obesity, under nutrition,

anemia, anorexia, premenstrual syndrome, pre-marital health status.

Adulthood - nutritional requirements according to activity and income levels.

Geriatrics – physical, physiological and psychological changes, nutritional requirements, nutrition related problems –osteoporosis, constipation, degenerative diseases.

UNIT III: THERAPEUTIC DIET [18 HRS]

Therapeutic diet – Definition, Purpose, Adaptations of normal diet to therapeutic diet, factors to be considered in diet prescription

Hospital diets – normal, clear fluid, full fluid and soft diet

Mode of feeding – enteral, parenteral feeding, TPN, Pre operative and post operative

diets Dietitians- definition, classification, responsibilities & code of ethics

UNIT IV: DIET IN BURNS, FEBRILE CONDITIONS AND WEIGHT MANAGEMENT [18 HRS]

Diet in burns – classification of burns, dietary management

Diet during fever and infections: typhoid, tuberculosis, malaria, – causes, symptoms, dietary treatment.

Diet in weight management – Obesity: classification, etiology, metabolic aberrations, clinical manifestations and dietary management Underweight: classification, etiology, clinical manifestations and dietary management

UNIT V: SPORTS, SPACE AND SEA &AIR TRAVEL NUTRITION [18 HRS]

Sports Nutrition

Definition, components of fitness, energy system – aerobic & anaerobic, nutritional demands of sports and dietary recommendations – objectives, nutritional requirements, dietary guidelines carbohydrate loading, pre and post game meals, sports anaemia, water and electrolyte balance, losses and their replenishments during exercise and sports events, dehydration and its effects

Space Nutrition

Definition, physiological changes & changes in body composition, classification of space foods, nutritional recommendations

Sea and Air Travel Nutrition: Physiological changes in human body during sea and air

travel; Health and nutritional problems encountered during sea and air travel; Nutrient requirements and dietary management during sea and air travel.

REFERENCE BOOKS:

1. Antia F.P. (1989).Clinical Dietetics and Nutrition, Oxford University Press,Mumbai

2. Carolynne E. Townsead, Ruth a. Ruth.(2000).*Nutrition and Diet therapy*, (7th ed).Delmar publishers,

3. Cornnie H. Robinson & Emena S. Weighly.(1989).*Basic Nutrition and Diet Therapy*, (6th ed), Macmillan Publishing Company, NewYork,

4. Davidson, S.S. Passmore, P. & Brack, J.F. (1993).Human Nutrition and Dietetics, (9^{th} ed), F&S, Lingstone Ltd., Edinburgh and London,

5. Garrow.J.S. & James W.P.T. (1993) *Human Nutrition and Dietetics,* Chwchill Lurystone, (9^{th} ed),

6. KathleenMahan.L. Sylvia Escott-Stump, Janice L Raymond & Krause (2011) .*Food & Nutrition Therapy,* (13^{th} ed), ElsevierPublications.

7. Robinson CH.(1994) . *Normal & Therapeutic Nutrition* XVIII Edition, Macmillan Publishers Company, NewYork,

8. Srilakshmi.B (1995). *Dietetics,* New Age International Private Ltd., NewDelhi, 9. Sue

Rodwell Williams. (2001). *Basic Nutrition and Diet therapy,* Mosbypublications

JOURNALS :

1. Food and Nutrition Bulletin United Nations University Press,Japan.

2. Journal of American Dietetic Association, The American Dietetic Association, Mount Marris, Illinois, 61054,USA.

3. Nutrition Abstracts and Reviews, CBB International,UK.

4. Nutrition Reviews, Nutrition Foundation, Washington,DC.

5. The American Journal of Clinical Nutrition, Waverfy Press,USA.

6. The Indian Journal of Nutrition and Dietetics, Sri Avinashilingam University,Coimbatore. 7.

The Indian Journal of Medical Research, The Indian Council of Medical Research, NewDelhi.

WEB REFERENCE:

1. www.faseb.org/asns
2. www.nutritionfoundation in org
3. www.lifelines.com/ntnlnk.html
4. www.diabetes.org
5. www.americanheart.org
6. www.cancer.org
7. www.pugmarks.cons/aims
8. www.eatright.org/
9. www.sea&airtravelnutrition.org

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.Sc HUMAN NUTRITION AND NUTRACEUTICALS

I SEMESTER

APPLIED PHYSIOLOGY -19PG1N3

(For those who joined in 2019 onwards)

HOURS /WEEK:6 CREDITS: 4

COURSE DESCRIPTION

The course provides a detailed insight on the anatomy and functions of the various systems of the human body.

COURSE OBJECTIVES

- Organs of the body and theirfunctions
- Different systems of the body, their functions with special reference tothe control and feedback mechanisms
- Physiological changes at different stages oflife.

COURSE OUTCOMES (CO)

The students will be able to

1. Identify and recall the aspects of human physiology.
2. Illustrate the anatomy of the various organ systems of the body and
3. Categorize the functions of all the systems.
4. Describe the interrelationship of nutrition and physiology.
5. Compare the alterations in organ systems during disease conditions.

UNIT I : BLOOD AND ENDOCRINE SYSTEM [18 HRS] Blood

Composition and functions of blood and Plasma proteins,RBC – Structure and functions, Bone marrow – functions, Erythropoiesis, Haemoglobin, Life span ,fate, Anaemia, haemolysis, polycythemia, ESR, WBC – Classification and functions, Coagulation, Bleeding time, clotting time.Blood Groups.Blood indices,Use of blood for investigation and diagnosis of specific disorders.

Endocrine system

Structure, functions,role of hormones,regulation of hormonal secretion and disorders of pituitary gland, thryroid gland, parathyroid gland, pancreas and adrenal glands. Emphasis on physiology of Diabetes and stress hormones.

UNIT II : CIRCULATORY SYSTEM [18 HRS]

Anatomical considerations of heart, valves of heart and its action, layers of heart, blood vessel – arteries, arterioles, capillaries, veins, vasovasorum.Blood pressure – factors and regulatio

Cardiac centre – heart rate – regulation, cardiac output, cardiac impulse, junctional tissues, cardiac cycle, heart sounds, ECG, coronary circulation, pulmonary circulation, cerebral circulation, hepatic circulation, renal circulation, cutaneous circulation and skeletal muscle circulation.

UNIT III : DIGESTIVE AND EXCRETORY SYSTEM [18 HRS] Digestive system

Review of anatomy and functions- secretary, digestive and absorptive functions of the digestive tract – Buccal cavity, stomach, pancreas, liver, small intestine and large intestine. Role of enzymes and hormones in digestion and absorption of carbohydrate, protein and fat. Dysfunction of liver,pancreas and gall bladder.

Excretory system

Anatomy and functions of kidney and nephrons, juxta glomerular apparatus. Formation of urine, micturition. Role of kidney in maintaining pH of blood. Water, electrolyte and acid base balance, diuretics.

UNIT IV : MUSCULO - SKELETAL AND RESPIRATORY SYSTEM [18 HRS] Musculo - Skeletal system

Structure and function of Bone tissue – osteocytes, osteoblasts, osteoclasts, structure of osseous tissue, section of femur bone. Types of muscles – structure and functions.

Respiratory system

Review of structure and functions of the respiratory tract, lung unit.Mechanism of respiration, transport of oxygen and carbon dioxide. Regulation of respiration, lung volumes, pulmonary function tests, Cardio – respiratory response to exercise and physiological effects of training.

UNIT V : NERVOUS SYSTEM [18HRS]

Review of structure and function of nervous system –central or somatic nervous system -neuron – types, structure, properties, myelin sheath, nerve endings, synapse, neuro transmitters, reflex arc, receptors, brain –cerebrum-cerebral cortex-cerebral lobes-structure and functions, cerebellum, medulla oblongata, - thalamus, hypothalamus. The role of Hypothalamus in various bodyfunctions – obesity, sleep,memory.

Autonomic nervous system – sympathetic and para sympathetic – actions, functions of

ANS. Blood Brain Barrier, CSF

References:

1. Best and Taylor, The Living Body, Chapman and Hall ltd.,London.
2. Chatterji (1999).*Human Physiology*, RoyPublications
3. Gitanjali Chatterjee (1999) *Handbook of Food and Nutrition*, RajatPublications
5. Kamala Krishnaswami (2000) *Nutrition Research-Current Scenerio and futuretrends,* Oxford and IBH Publishing Co.Pvt.ltd.,
6. Lraine M.Summerfield (2000).*Nutrition ,exercise and behaviour an integrated approach to Weight management* ,Thomson learning,
7. Mahtab S. Bamji, Pralhad & Rao Vinodhini Reddy.(1996) *Textbook of HumanNutrition,* Oxford, IBH publishing Co. pvt ltd.,
8. Margaret McWilliams (1994).*Experimental Food laboratory Manual*,SurjeetPublications,
9. Mickael J.Gibney,Ian A.Macdonald & Helen M.Roche (2004),*Nutrition andmetabolism* Blackwell Publications,.
10. Mike Epsy (2001) *Nutrition Eating for good health*,SurbhiPublications,Jaipur,.

11. Sembulingam & Prema Sembulingam (2006), *Essentials of Medical Physiology*, Yaypee Brothers, Medical Publishers (p) Ltd, New Delhi.

12. Vijay Kamshik (2000).*Food science and nutrition,* Mangal Deep Publications.Jaipur

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

I SEMESTER

ADVANCED DIETETICS LAB - 19PG1N4

(For those who joined in 2019 onwards)

HOURS /WEEK:4 CREDITS: 2 COURSE DESCRIPTION

The practical course offers hands-on experience in the planning, preparation and calculation of nutrients for the menu planned for various stages of normal life cycle, deficiency disorders, hospital diets, sports and space nutrition.

. **COURSEOBJECTIVES**

- To develop skills in planning and preparing diets for various stages of normal lifecycle.
- To get expertise in planning and preparing diets for various deficiencydisorders.
- To plan diets for weight management, burns and febrileconditions.

COURSE OUTCOMES (CO)

The students will be able to

1. Plan and prepare menu for normal lifecycle.
2. Choose appropriate supplementary foods forinfants.
3. Solve problems of nutritional deficiency disorders with modified diets.4. Differentiate the various hospitaldiets.
5. Construct diets for sports, burns and weightmanagement.

UNITI [12HRS] Planning and preparation of normal diets- diets during pregnancy, lactation, preschool, school going, adolescence and old age.

UNITII [12HRS] Preparation of supplementary foods for infants and nutritional deficiency disorders.

UNITIII [12HRS] Classification of routine hospital diets – clear fluid, full fluid &soft diet and diet for febrile conditions- acute and chronic.

UNITIV [12HRS] Diet plan for burns and weight management- obesity & underweight.

UNITV [12HRS] Planning of meals for sports anaemia,pre & post game meals and space.

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.SC. HUMAN NUTRITION AND NUTRACEUTICALS

I SEMESTER

CLINICAL LABORATORY TECHNIQUES – LAB -19PG1N5

(For those who joined in 2019 onwards)

HOURS /WEEK:4 CREDITS: 2 COURSE DESCRIPTION

The course provides hands on training on the estimation of the qualitative and quantitative analysis of blood and urine constituents.

COURSE OBJECTIVES

- To understand the techniques of qualitative and quantitative analysis of blood and urineconstituents
- To familiarise with the functioning of the equipments used in clinicallab
- To interpret the biochemical parameters for the diagnosis ofdiseases.

. COURSE OUTCOMES(CO)

The students will be able to

1. Identify organic, inorganic and abnormal constituents of urine.2. Explain the quantitative analysis ofurine.
3. Describe the hematologicalexamination.
4. Organize the examination of blood glucose and lipid profile.5. Recognize the serumconstituents.

UNIT-I QUALITATIVE ANALYSIS OF URINE [12HRS]

A. INORGANIC CONSTITUENTS
- Calcium
- Phosphate

B. ORGANICCONSTITUENT
- Creatinine
- Urea
- UricAcid

C. ABNORMALCONSTITUENT

a. Physical Characteristics
- Colour
- SpecificGravity
- PH

b. Chemical Constituents
- Protein

- Glucose
- BileSalts
- BilePigments
- KetoneBodies

UNIT-II QUANTITATIVE ANALYSIS OF URINE [12HRS]

A. Urea

B. Creatinine

C. Calcium

UNIT-III HAEMATOLOGICAL EXAMINATION [12HRS]

A. Haemoglobin

B. Packed Cell Volume

UNIT-IV EXAMINATION OF BLOOD [12HRS]

A. Glucose

B. LipidProfile

- Cholesterol
- TG
- LDL
- HDL
- VLDL

UNIT-V EXAMINATION OF SERUM [12HRS]

A. UricAcid

B. Bilurubin

C. Calcium

D. Total Protein/ Albumin/ Globulin/ AGRatio

REFERENCE BOOKS:

1. J.Jayaraman,1996. Laboratory Manual in Biochemistry. New Age International Ltd. New Delhi.
2. Oser, B.L.Harke‟s Physiological Chemistry XIV Edition, Tata Mc-Graw Hill, Publishing Company Ltd., Bombay,1954.
3. Raghuramulu, N.Nair, K.M.Kalyanasundaram, S.A.Manual of laboratory techniques, National Institute of Nutrition, ICMR, Silver Prints, Hyderabad,1983.
4. S.Sadasivam. and A. Manickam, 1991. Biochemical Methods. New Age International Pvt. Ltd., NewDelhi.

5. Varley, H.Gowenlak, A.H and Hell, M.Practical Clinical Biochemistry, William Itinmaon Medical Books, London,1980.

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.SC. HUMAN NUTRITION AND NUTRACEUTICALS

I SEMESTER

EDC – NUTRITION AND DIETETICS -
19PGNEDC1/19PGNEDC2

(For those who joined in 2019 onwards)

HOURS /WEEK: 3HOURS CREDITS: 5 COURSE DESCRIPTION

This course offers the scientific understanding of how nutrition can impact the health of individuals and the role of diet in treatment of diseases.

COURSE OBJECTIVES

- To understand the basics ofnutrition.
- To learn the menu planning methods for familymembers.
- To learn the clinical aspects of disease conditions and manage the same through the diet therapy.

COURSE OUTCOMES (CO)

The students will be able to

1. Define the different terms in nutrition andfood.
2. Classify the food andnutrients
3. Describe the functions of macro and micronutrients.
4. Choose the food sources of micro andmacronutrients
5. Illustrate food pyramid and explain the foodgroups.

UNIT-I INTRODUCTION TO NUTRITION [18HRS]

Nutrition – definition, nutritional status, nutrients and their function, relationship of food and health – Characteristics of good nutrition – balanced diet – BMI, IBW, Dietary guidelines-basic food groups, foodpyramid

UNIT-II MACRO NUTRIENTS [18HRS] Classification, functions, sources, deficiency of

carbohydrates, protein, lipids.

UNIT-III MICRO NUTRIENTS [18HRS]

Functions, sources, deficiency disorders of

Vitamins – Fat soluble vitamins A, D, E, K; Water Soluble vitamins – B1, B2, Niacin, B6, B12, Folic acid.

Minerals – Ca, P. Zn, Fe, I, Fl.

UNIT-IV NUTRITION FOR DEVELOPMENTAL MILESTONES [18HRS]

Menu planning, Principles of planning meals,

Nutritional importance of pregnancy, changes incurred and complications

Nutritional importance of lactation

Nutrition during infancy – growth and development, advantages of breast feeding and bottle feeding, formulation criteria for bottle milk. supplementary foods.

Nutritional importance for adolescence.

UNIT-V PRINCIPLE OF DIET THERAPY [18HRS]

Definition of Diet therapy, Foods to be included and avoided – obesity and underweight, diabetes mellitus, typhoid, peptic ulcer, anaemia, CVD.

REFERENCE BOOKS

1. B. Srilakshmi, “Dietetics”, New Age International Publishers,2012
2. Antia F.P., Chemical Nutrition Dietetics, Oxford University Press1989.
3. Dr. M. Swaminathan, Advanced text book on Food and Nutrition, Vol I and Vol II, The Bangalore Printing and Publishing Co., Ltd.,1988.

100% EMPLOYABILITY

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

II SEMESTER

CLINICAL NUTRITION AND DIET THERAPY-19PG2N6

(For those who joined in 2019 onwards)

HOURS /WEEK:6 CREDITS: 4 COURSE DESCRIPTION

The course provides a comprehensive knowledge required for the prevention and treatment of various diseases

COURSE OBJECTIVES

- To identify and describe various diseaseconditions.
- To gain knowledge on appropriate nutritionalmanagement.
- To develop the attitude and capacity for taking up dietetics as aprofession.

COURSE OUTCOMES (CO)

The students will be able to

1. Identify the characteristics of various diseaseconditions.
2. Describe the medical nutritional management of different disease.3. Plan diets for degenerativediseases.
4. Categorize the foods used in the treatment ofdiseases.
5. Summarize the treatment strategies for food allergy and foodintolerance.

UNIT-I DIET IN ENDOCRINE DISORDERS [18HRS]

Diabetes Mellitus - Etiology, classification, signs and symptoms, treatment, changes in metabolism during diabetes, nutritional management, food exchange systems, diabetes education and preventionprogram.

Hypo and Hyperthryroidism - Etiology, signs and symptoms and medical nutritional

therapy. Gout- Etiology, signs and symptoms and medical nutritional therapy.

UNIT-II DIET AND CARDIOVASCULAR DISEASE [18HRS]

Atherosclerosis - Risk factors, causes, signs and symptoms, medical nutritional therapy, Hypertension – Etiology, types, dietary treatment, education and prevention.

UNIT-III DIET AND RENAL DISEASES [18HRS]

Etiology, signs and symptoms, medical nutritional therapy of Glomerulonephritis, Nephrotic syndrome, Renal failure and Kidney stones.

UNIT-IV DIET AND GASTRO INTESTINAL PROBLEMS [18HRS]

a. Upper gastro intestinal tract – Etiology, signs and symptoms, medical nutritional therapy of Hiatal hernia and Peptic ulcer.

b. Lower gastro-intestinal tract- Etiology, signs and symptoms, medical nutritional

of Celiac sprue, Diverticular disease, Constipation and Diarrhea.

c. Liver diseases- Etiology, signs and symptoms, medical nutritional therapy of Hepatitis, Cirrhosis and Hepatic coma

d. Gall bladder disease – Etiology, signs and symptoms, medical nutritional therapy of Cholecystitis and Cholelithiasis.

e. Pancreatic disease - Etiology, signs and symptoms, medical nutritional therapy of Pancreatitis

UNIT-V NUTRITIONAL SUPPORT IN CANCER, AIDS AND FOOD [18HRS] ALLERGIES

Cancer - Nature and causes of cancer, relation of cancer and foods, effects of cancer, Nutritional therapy and support for cancer treatment,precaution.

AIDS – Definition, Progression and symptoms, malnutrition and AIDS, medical nutrition therapy and practical suggestions for symptommanagement.

Food allergies and intolerances – Definition, Types of reactions, Types of allergens, diagnosis, treatment.

REFERENCE BOOKS :

Antia F.P., (1989) *Clinical Dietetics and Nutrition*, Oxford University Press, Mumbai.
Carolynne E. Townsead, Ruth a. Ruth, Nutrition and Diet thrapy, Delmar publishers, 7th Edition, 2000.

1. Cornnie H. Robinson and Emena S. Weighly, (1989). *Basic Nutrition and DietTherapy*, 3nd .Ed, Macmillan Publishing Company, New York.
2. Davidson, S.S. Passmore, P. Brack, J.F. (1993). *Human Nutrition and Dietetics*, 9th Ed, F&S, Lingstone Ltd., Edinburgh and London,
3. Garrow.J.S, W.P.T. James, 9th Ed 1993, *Human Nutrition and Dietetics*, ChurchillLivingstone.
4. Kathleen Mahan.L , 13th Ed, (2011), Sylvia Escott-Stump, Janice L Raymond *Krause's Food & Nutrition Therapy*, ElsevierPublications,.
5. Robinson CH (1994), *Normal and Therapeutic Nutrition*, 18th Ed, Macmillan Publishers Company,NewYork,.
6. Srilakshmi.B, *Dietetics*, 1995, New Age International Private Ltd., NewDelhi. 7. Sue Rodwell Williams, 2001, *Basic Nutrition and Diet therapy*, Mosbypublications.

JOURNALS :

1. Food and Nutrition Bulletin, United Nations University Press,Japan.
2. Journal of American Dietetic Association, The American Dietetic Association, Mount Marris, Illinois, 61054,USA.
3. Nutrition Abstracts and Reviews, CBB International, UK
4. Nutrition Reviews, Nutrition Foundation, Washington,DC.
5. The American Journal of Clinical Nutrition, Waverfy Press,USA.
6. The Indian Journal of Medical Research, The Indian Council of Medical Research, NewDelhi.
7. The Indian Journal of Nutrition and Dietetics, Sri Avinashilingam DeemedUniversity, Coimbatore.

WEB REFERENCES:

1. www.americanheart.org
2. www.cancer.org

3. www.diabetes.org
4. www.eatright.org/
5. www.pugmarks.cons/aims

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

II SEMESTER

FUNCTIONAL FOODS AND NUTRACEUTICALS - 19PG2N7

(For those who joined in 2019 onwards)

HOURS/WEEK:6 CREDITS :4 COURSE DESCRIPTION

The course contents are an eye opener to students on the terminologies, importance, therapeutic applications of Nutraceuticals from sources through plant, animal and microbes.

COURSE OBJECTIVES

- To enable students understand the relation between FunctionalFoods, Nutraceuticals to Food and Drugs
- To introduce them to various functional food groups andproducts
- To enable students understand the regulatory aspects of Functional Foodsandnutracueticals.

COURSE OUTCOMES(CO)

1. Define and understand the concepts of functional foods.2. Categorize the bioactive components of functionalfoods.
3. Distinguish the role of prebiotics, probiotics & synbiotics as functional ingredients.4. Explain the efficacy of herbs and flowers as functional foods.
5. Build knowledge on the role of Nutraceuticals in treating diseases.

UNIT-I INTRODUCTION TO FUNCTIONAL FOODS AND [18HRS] NUTRACEUTICALS

Functional foods and Nutraceuticals – Definition and history.

Teleology – definition, primary and secondary metabolites.

Organisational Models for Nutraceuticals - a) Food Sources b) Mechanism of Action: c) Chemical Nature

Consumer Marketing - Factors for marketing functional foods and nutraceuticls. **UNIT-II**

FUNCTIONAL COMPONENTS FROM PLANT SOURCES [18HRS]

(i) Nutrient Molecules: a) Phospholipids b) Vitamin K c) Carbohydrate Derivatives Dietary fiber - Types and sources, Physical and Physiological properties d) Minerals – Zinc, Selenium.

(ii) Non Nutrient Molecules: a) Phenolic compounds – Phytoestrogens (Isoflavones, Lignans) Flavonoids – Quercetin, kempferol, Flavones – limonene, Flavols – Catechin, Phenolicacid – Ellagic acid, Caffeic acid b) Phytosterols and phyto stenols c) Saponins d) Tannins e) Carotenoids - Lycopene, Beta-carotene, Lutein andzeaxanthin

(iii) Hypocholesterolemic and antidiabeticcomponents

UNIT-III FUNCTIONAL COMPONENTS FROM ANIMAL [18HRS] SOURCES

(i) Major and minor components in cow‟s Milk and Human Milk

Proteins – lactalbumin, lactoglobulin, lactoferrin, immunoglobulins,

Derived peptides – casein phospho peptides, glycomacropeptides,

Lactose. Fat. Mineral – zinc, selenium, Calcium

(ii) Dietary lipids - Conjugated Linolenic Acid, linoleic acid, oleic acid,GLA

(iii) Omega 3 and Omega 6 FattyAcids

(iv) StructuredLipids

UNIT-IV MICROBES AS FUNCTIONAL FOODS [18HRS]

General Functions of Intestinal Microflora Prebiotics - Definition, role of prebiotic as functional ingredient, examples. Probiotics - Definition, role of prebiotic as functional ingredient, examples. Symbiotics - Definition, functions, examples.

UNIT-V HERBS AND FLOWERS AS FUNCTIONAL FOODS [18HRS]

Action of Herbs and Efficacy on:

a. NervousSystem
Ginseng,St.John‟swort,Ginkgobiloba,BacopaMonnieri&Centalla asiatica

b. Heart and Circulatory System-Hawthornplant

c. Immune System-Echinacea

d. Digestive System-Ginger valerian root fennel

e. Respiratory System-Licorice root, kavakava

f. Urinary System-Cranberry, Sawpalmetto

g. Musculoskeletal System-Feverfew

2. Flowers

Medicinal values, nutritional importance, culinary uses, effect of cooking of

Edible flowers – Drumstick, Neem, Agathi, Plantain

Ornamental edible flowers – Hibiscus, lotus, rose

REFERENCEBOOKS:

1. Chatwick. R. (2003), Functional FoodsSpringer.

2. David H Watson (2001), Performance Functional Foods, Culinary and Hospitality Industry Publications.

3. Israel Goldberg (2001), Functional Foods Designer Foods PharmaFood,Nutraceuticals ,Culinary and Hospitality Industry Publications.

4. Mary K Schmidl and Theodore P.Labuza, (2000), Essentials of Functional Foods, Culinary and Hospitality Industry PublicationsServices.

5. Mazza G. (1998), Functonal Foods Biochemical Processing Aspects, Culinary and Hospitality IndustryPublications.

6. Robert E C Wildman (2001), Handbook of Nutraceuticals and Functional Foods ,Culinaryand Hospitality IndustryPublications.

WEB REFERENCES

1. http://www.wisegeek.com/what-are-the-health-benefits-of-hibiscus-tea.htm
2. http://www.livestrong.com/article/119463-health-benefits-hibiscus-tea/
3. http://www.oohoi.com/natural%20remedy/everyday_food/benefits-lotus.htm

4. http://www.diethealthclub.com/health-food/rose-health-benefits.html
5. http://www.homeremediesweb.com/ginseng-health-benefits.php

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

II SEMESTER

RESEARCH METHODOLOGY – 19PG2N8
(For those who joined in 2019 onwards)

HOURS /WEEK: 6 CREDITS:5 COURSE DESCRIPTION

The course provides a detailed insight on the types of research, methods of collecting data, sampling techniques, framing hypothesis and ultimately preparing the research report

COURSE OBJECTIVES

- To impart the necessary knowledge to frame an experimental design to carry out systematic researchwork
- To help the students to do the projectsystematically.

COURSE OUTCOMES (CO)

The students will be able to

1. Classify the types of research based on intent andmethods
2. Restate in own words the significance and formulation ofresearch
3. Categorize methods of datacollection
4. Distinguish the samplingtechniques
5. Summarize the steps in formulation of hypothesis and tabulation
6. Explain the layout of a thesis, report writing andplagiarism

UNIT-I RESEARCH COMPONENTS AND TYPES [18HRS]

Meaning of research – objectives of Research – Motivation in Research – Types of Research – Research approaches – Significance of Research and Scientific Method. Qualities of Good Research – Problems Encountered by Researchers in India. Identifying a Research, Necessary condition for Formulation of the research Problem – Criteria for Good ResearchProject.

UNIT-II METHODS OF DATA COLLECTION [18HRS]

Primary data: Observation, Experimentation,Simulation,Interviewing, Questionnaire, Projectivetechnique.

Secondary data: Published and Unpublished sources

UNIT-III SAMPLING TECHNIQUES [18HRS]

Characteristics of good sample, advantages and disadvantages of sample.

Sampling techniques – Probability or random sampling, Non Probability or Non random sampling, Sampling and non sampling errors.

UNIT-IV FORMULATION OF HYPOTHESIS [18HRS]

Hypothesis – Definition, Role and Types , criteria for useful hypothesis — its formulation. Tabulation – editing – coding – analysis and interpretation of data. Procedure for testing hypothesis.

UNIT-V THESIS AND REPORT WRITING [18HRS]

Components or layout of a Thesis – Introduction, Review of Literature, Methodology, Results and discussion, Summary and conclusion, Bibliography, Footnotes and Appendix

Significance of report writing – Types of report, oral presentation, Mechanics of writing and Precautions of writing research report, scientific writing.

Plagiarism - Meaning and significance.

REFERENCE BOOKS :

1. Donald.H.Mc. Burney (2003). *Research Methods*, Thomson – Wordsworth, 5th Edition, 2. Ghosh B.N., (1987). *Scientific method & Social Research:*, Sterling Publishers Pvt. Ltd., NewDelhi, 4th Edition.
3. Goode & Hatt, (1983). *Methods and Social Research*, McGraw Hill International Book Company, 23rdPrinting.
4. Gopal Lal Jain, (1998), *Research Methodology – Methods tools and Techniques*, Mangal Deep Publications, Jaipur.
5. Gupta S.P. (2001). *Statistics*, S. Chand & Company LTD, NewDelhi.
6. Kothari C.R., (2004). *Research Methodology*, New Age International Publishers, New Delhi, 3rd reprint Edition.
7. Krishnaswamy O.R. & Ranganathan M., (2006). *Methodology of Research in Social Sciences*, Himalaya Publishing House, NewDelhi.
8. Pillai & Bagavathi R.S.N. (1983). *Statistics*, S.Chand & Company LTD, New Delhi,.
9. Sadhu & Singh, (2001) *Research Methodology in Social Sciences*, Himalaya Publishing House, Mumbai, 2nd Edition.
10. Santhosh Gupta, (2001). *Research Methodology and Statistical Techniques*, Deep and Deep publications, NewDelhi.
11. Sonachalam K.S., (1988). *Research Methodology of Social Science*, Emerald Publishers, Madras.
12. Yogesh Kumar Singh & Ruchikanath, (2005). *Research Methodology*, A.P.H. Publishing Corporation, NewDelhi.

WEB REFERENCE:

1. http://www.biomedcentral.com
2. http://www.tandfonline.com 29

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

II SEMESTER

CLINICAL NUTRITION AND DIET THERAPY –LAB -19PG2N9
(For those who joined in 2019 onwards)

HOURS /WEEK:4 CREDITS: 2 COURSE DESCRIPTION

The course provides skill in assessment, estimation of nutritional requirement, planning and evaluation of menus for various diseases.

COURSE OBJECTIVES

- To estimate the nutritional requirements for therapeuticconditions
- To plan diets for diseaseconditions
- To develop skills in dietcounselling

COURSE OUTCOMES (CO)

The students will be able to

1. Recall the dietary principles for normalcondition.
2. Categorize the different hospitaldiets.
3. Describe diets for weightmanagement
4. Summarize the preparation aspects of degenerativediseases

2. Visit to kidney diagnosticscentre.

UNIT-I Planning and preparation of normal diets – diet during pregnancy, lactation, adolescence, adults.

UNIT-II Preparation of Hospital diets – tube feeding blends, diet for febrile conditions, diet for burn patients

UNIT-III Preparation of diets for obesity and underweight Diet planning and preparation for

UNIT-IV - DiabetesMellitus
- Cardio Vasculardisorders
- Renaldisorders
- Gastro intestinal disorders, liver and gall bladderdiseases

UNIT-V - Cancer
- AIDS

Related Experience:

1. Visit to dietary kitchen ofhospital

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

I M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

II SEMESTER

FUNCTIONAL FOODS AND NUTRACEUTICALS – LAB-19PG2N10
(For those who joined in 2019 onwards)

HOURS /WEEK: 4 CREDITS:4 COURSE DESCRIPTION

The practical course provides hands –on training in the use of hi-tech precision equipments to identify and analyze the specific nutraceuticals present in the respective functional food.

COURSE OBJECTIVES

- To make the students aware of the principle of analysis, extraction and identification of nutraceuticals.
- To determine qualitatively and quantitatively the presence of certain bioactive components in particular foods.
- To understand the calculation of the quantity of nutraceuticals present in the foods.

COURSE OUTCOMES (CO)

The students will be able to

1. Identify the various nutraceutical components present in functional foods.
2. Choose the appropriate methods to analyze the specific nutraceutical component.
3. Construct the experimental research with the knowledge of the analytical methods.
4. Draw conclusions on the therapeutic availability of nutraceuticals.

Estimation of the following Nutraceutical Components:

- **Lycopene – Tomato, papaya, watermelon**
- **Curcumin – turmeric, ginger avocados**
- **Phenols – Soybeans, oats, almonds**
- **Tannins – Grapes, pomegranates, chocolates**
- **Lignin – Wheat, pistachios**
- **Capsaicin – Pepper, chillies, Bacosides**

REFERENCES:

1. Berwal. J.S,.Grewal R.B,.Kapoor C.M &.Garg M.R (2004). *Practical Methods in Food Analysis*. Agrotech Publishing Academy,Udaipur.
2. Geetha Swaminathan & MaryGeorge, (2002). *Laboratory Chemical Methods in Food Analysis*. Margham Publications, Chennai.

3. Jayaraman J. (1996), *Laboratory Manual in Biochemistry*. New Age International Ltd.

New Delhi.

4. Ranganna S. **(**1986), *Hand Book of Analysis and Quality Control for fruit and Vegetable Products*. Tata Mc Graw –Hill Publishing Company Limited, NewDelhi.

5. Sadasivam S. & Manickam A.**(**1991), *Biochemical Methods*. New Age International Pvt. Ltd., NewDelhi.

6. Yeshajahu Pomeranz & Clifton E. Meloan,(2004), *Food Analysis –Theory and Practice*. CBS Publishers and Distributors, NewDelhi.

100% EMPLOYABILITY

I M.SC. HUMAN NUTRITION AND NUTRACEUTICALS

CREDITS: 3

II SEMESTER

SUMMER INTERNSHIP - 19PG3S1N1

COURSE DESCRIPTION

This course provides on the job training in the multi speciality hospitals by which various skills pertaining to dietary management and diet counselling are imbibed by the students, making them skilled dieticians.

COURSE OBJECTIVES

- To enable students have an idea of the functioning of the dietetic department in the hospital.
- To plan and prepare diets for various diseaseconditions.
- To go on rounds to visit patients share their nutritional knowledge through diet counselling.
- To develop a rapport with the dieticians and patients to provide jobsatisfaction.

COURSE OUTCOMES (CO)

The students will be able to

1. Recall the principles of therapeutic diets in relation to the hospitaldiets.
2. Categorize the pathophysiology ofdiseases
3. Recognize the quantity food preparation of therapeuticdiets.
4. Plan menus for therapeuticconditions.
5. Describe the various disease conditions in terms of causes, signs and dietetic treatment.
6. Describe the organization management of dietarydepartment.

PATTERN OF EVALUATION

30 days–Hospital - External - 50 marks, Internal – 50 marks Total - 100marks

The students are evaluated on the basis of regular attendance, case study, report andpresentation.

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

III SEMESTER

FUNCTIONAL FOODS & NUTRACEUTICALS IN PREVENTIVE DIETETICS - 19PG3N11 (For those who joined in 2019 onwards)

Hours /week:6 Credits:4 COURSE DESCRIPTION

The course elicits the role of various bioactive components in the prevention and treatment of therapeutic conditions.

COURSE OBJECTIVES

- To have a clear understanding of the anatomy and functions of organsystems.
- To impart knowledge on the role of functional foods in the treatment andprevention of diseases pertaining the various organsystems.
- To plan for a functional food incorporated food to reduce the prevalence ofparticular diseasecondition.
- To help create a scientific data base for accurate healthclaims.

COURSE OUTCOMES (CO)

The students will be able to

1. Identify the role of functional foods and nutraceuticals in oral, gut and renal health

.2. Describe the importance of functional foods in weight management and CVD 3. Categorize the functional foods for bone health anddiabetes.

4. Summarize the effect of functional foods and Nutraceuticals in cancer and AIDS.5. Build knowledge on patho- physiology of nervousdisorders.

6. Choose the functional foods for the management of nervous and respiratorydisorders.

UNIT-I FFN IN ORAL / GUT & RENAL HEALTH [18HRS]

- Anatomy and functions of the organs of the digestive system - oral cavity, stomach, small intestine, large intestine, pancreas,Liver
- Anatomy of the urinary system – kidney, nephron, formation of urine,micturition •

Dietary strategies for oralhealth

- Functional Foods for promoting oral health –xylitol
- Relationship between dental caries and dietarycarbohydrates
- Colonic functional foods –Prebiotic, Probiotic andSymbiotic
- Metabolism of colonicfoods
- Host microbe interaction

- Improving the effectiveness of probiotics and prebiotics in optimizing guthealth. •

Dietary fiber and guthealth

- Role of functional foods in prevention and treatment of renal disorders – urinary infection, glomerulonephritis, nephrosis, acute renalfailure.

UNIT-II FFN FOR OBESITY AND CARDIOVASCULAR DISEASES [18HRS]

FFN in obesity

Role of hormones in obesity.

Role of functional foods in the management of obesity.

FFN in CVD

Structure and functions of the heart, cardiac impulse-Junctional tissues, cardiac cycle, Blood pressure- factors affecting blood pressure.

Role of Functional foods in the management of CVD

UNIT-III FFN FOR BONE HEALTH AND DIABETES MELLITUS [18HRS]

FFN in Bone Health

Bone growth and factors affecting bone mass

Role of functional foods in bone health - Osteoporosis.

FFN in Diabetes Mellitus

Role of Functional Foods and nutraceuticals in blood sugar support

UNIT-IV FFN IN CANCER & AIDS [18HRS]

- Types ofCancer
- Risk factors – Endogenous and exogenous risk factors
- Role of functional foods in the prevention of cancer – Symbiotics, Glucosinolates, Phytoesterogens, Dietary fiber and vitamins,Antioxidants.
- Role of functional foods in the prevention and treatment ofAIDS

UNIT-V FFN IN NERVOUS & RESPIRATORY SYSTEM [18HRS]

- Structure and functions of neuron, brain and spinalcord
- Anatomy of respiratory system – Lung unit, Transport of respiratory gases, mechanism of respiration, Lung volumes, regulation ofrespiration
- Brain mechanisms involved in mood
- Role of functional foods in Mood andmemory
- Alzheimers and Parkinsons diseases – Definition, causes, role of functionalfoods •

Role of functional foods in the prevention and treatment of respiratorydisorders.

REFERENCES

1. Best,C.H., and Taylor,R.B (1975), *The Physiological Basis for Medical Practice*; The William and Wilkinson Scientific Book Company,Kolkata.

2. Chatwick R et al. (2003), *Functional Foods*, Springer, Culinary and Hospitality Industry Publications Services.

3. David H Watson, (2001), *Performance Functional Foods*, Culinary and Hospitality Industry Publications.

4. Guyton, A.C, (2009), *Function of the Human body*, 4th Edition ,W.B.Sanders Company, Philadephia.

5. Hari Niwas Mishra et.al., *Functional Foods*, New India Publishing Agency, NewDelhi.

6. Israel Goldberg, (2001), *Functional Foods Designer Foods*, Pharma Food,Nutraceuticals Culinary and Hospitality IndustryPublications.

7. Mary K. Schimdl and Theodore P Labuza, (2000), *Essential of Functional Foods*, Culinary and Hospitality Industry PublicationsServices.

8. Mazza G. (1998), *Functional Foods Biochemical Processing Aspects*, Culinary and Hospitality IndustryPublications

9. Robert E C, (2001), Wildman *Handbook of Nutraceuticals and functional Foods*, Culinary and Hospitality IndustryPublications.

10. Subramanian S. and S.M.Kutty, (1971), Text Book of Physiology, Orient Longman.

WEBSITES

1. http://en.wikipedia.org/wiki/Bone

2. simple.wikipedia.org/wiki/Digestion -17k

3. www.cvphsysiology.com-Comprehensive explanation of basic cardiovascularconcepts

4. www.medicalnewstoday.com/articles/11949.php -59k

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

III SEMESTER

COMMUNITY NUTRITION – 19PG3N12
(For those who joined in 2019 onwards)

HOURS /WEEK: 6 CREDITS: 4 COURSE DESCRIPTION

The course imparts the knowledge on various national nutritional problems and its implications, nutrition awareness among various sections of the population.

COURSE OBJECTIVES

- To understand national nutritional problems and theirimplications.
- To become familiar with the national and international contributions towardsimprovement of nutrition inIndia.
- To impart skills in the planning and execution of nutrition awareness programmesamong various sections of thepopulation.

COURSE OUTCOMES (CO)

The students will be able to

1. Identify National Nutritionalproblems.
2. Recognize the relation of nutrition in national development.3. Explain the strategies to overcomemalnutrition.
4. Categorize nutrition intervention programmes andorganization.
5. Describe national nutrition policy and nutrition surveillancesystem.
6. Organize nutrition education programme and assessment of nutritional status of thecommunity.

UNIT-I NUTRITION AND NATIONAL DEVELOPMENT, [18HRS] NATIONAL NUTRITIONAL PROBLEMS

Relation of nutrition to national development in terms of socio-economic, industrial and agriculturaldevelopment.

National nutritional problems – prevalence, causes, consequences and prevention of PEM, vitamin A deficiency, anaemia, iodine deficiency, and fluorosis,

UNIT-II MALNUTRITION, STRATEGIES TO OVERCOME [18HRS] MALNUTRITION

Malnutrition - Definition, etiology and consequences

Strategies to overcome malnutrition : Food based strategies – Dietary diversification, Horticulture intervention, Food fortification, Nutrition & Health education, Nutrition based strategies –

Supplementation, Concepts of Selecting / implementing and intervention strategy.

UNIT-III NUTRITION INTERVENTION PROGRAMMES, [18HRS] NATIONAL, INTERNATIONAL

Genesis, objectives and operation of nutrition intervention programmes in India – School lunch programme, CMNMP, ICDS organized by government for vulnerable sections of the population.

National organizations – ICMR, CSWB, SSWB, NIN, NNMB, CFTRI, DFRL,

NIPCCD. International organization : FAO, WHO, UNICEF, KGNMT, CARE.

UNIT-IV NATIONAL NUTRITION POLICY, NUTRITIONAL [18HRS] SURVEILLANCE

National Nutrition policy – aim, nutrition policy instruments and its implementation

Nutrition Surveillance System- definition, objectives, uses, infrastructure, key indicators for successful nutrition surveillance programme.

UNIT-V NUTRITION EDUCATION, ASSESSMENT OF [18HRS] NUTRITIONAL STATUS OF COMMUNITY

Nutrition Education - Definition, importance, Process of nutrition education and communication – components of communication process, phases of nutrition education – conceptualization, formulation, implementation and evaluation, Methods of Nutrition education – face to face, mass media, traditional media, and criteria for selecting methods.

Assessment of nutritional status – Direct and indirect methods of assessment.

REFERENCE BOOKS :

1. Davidson, S.S. Passmore, P. Brack, J.F. (1993) .*Human Nutrition and Dietetics, 9th Edition*, F&S, Lingstone Ltd., Edinburgh andLondon.
2. Gupta J.P. & Indra Murali (1989) *National Review of Immunisation Programme in India*, National Institute of Health and Family Welfare, New Delhi.
3. Jose M. Conon (1988). *Food Toxicology – Part A Principles and Concepts*, Marceldebber, Inc., NewYork.
4. King F.S. & Burgess, A. (1992).*Nutrition for Developing Countries, 2nd edition*, Oxford, Oxford University Press,London.
5. Rajammal P. Devadas (1980) *Nutrition and Nutritional Development*, Saradalaya Press, Coimbatore, Tamil Nadu.
6. Sach Dev. H.P.S. & Choudhury, P. (1994).*Nutrition in Children – Developing Country Concerns*, Cambridge Press, NewDelhi.
7. Shanthi Ghosh, (1992) .*The Feeding and care of Infants and Young Children*, Voluntary Health Association of India, New Delhi.
8. Shanthi Ghossh (1997) *Nutrition and Child Care, A Practical Guide*, Jay Pee Brothers, Medical Publishers (P) Ltd., NewDelhi.
9. UNICEF (1990). *Children and Women in India*, Situation Analysis, NewDelhi.

JOURNALS :

1. Annual Reports of ICMR, ICAR and DS.
2. Journals of Nutrition Education, Published by Society for Nutrition Education Berkely,U.K.
3. Nutrition Trends in India, NIN, Hyderabad.
4. Proceedings of the Nutrition Society of India, NIN, ICMR, NewDelhi.

5. Reports of the National Nutrition Monitoring Bureau, ICMR, NewDelhi.

6. Social Welfare, Central Social Welfare Board, NewDelhi.

7. The Indian Journal of Nutrition and Dietetics, Avinashilingam Deemed University,Coimbatore.

WEB REFERENCES:

1. www.ajph.org
2. www.journals.cambridge.org/phn
3. www.nutrition.org

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II - M.SC. HUMAN NUTRITION AND NUTRACEUTICALS

III SEMESTER

ANAYTICAL INSTRUMENTATION - 19PG3N13 (For those who joined in 2019 onwards)

HOURS /WEEK:6 CREDITS: 5 COURSE DESCRIPTION

The course offers the understanding of the principles, instrumentation and analytical techniques of food

COURSE OBJECTIVES

- To understand the principle and instrumentation of analytical instrumentationtechniques.
- To gain knowledge on applications of different analyticalinstruments.

COURSE OUTCOMES (CO)

The students will be able to

1.Explain the principles of analytical instrumentation techniques.2.Choose the relevant analytical techniques for food.
3. List the applications of different analyticalinstruments.
4. Categorize the different types of isotopes and itsapplication.
5. Describe the principles and application of microbialassays.

UNIT-I CHROMATOGRAPHY [18HRS]

Meaning – Types of Chromatography – principles, components and applications of i. Paper Chromatography – Ascending and descending – One and twodimensional ii. Thin LayerChromatography
iii. GasChromatography
iv. Ionexchange
v. Gelfiltration
vi. High Performance LiquidChromatography

UNIT-II ELECTROPHORESIS [18HRS]

Meaning –Types –Paper, Starch, Gel, Agar-gel, Poly Acrylamide gel, Moving boundary Electrophoresis, Immuno electrophoresis – Principle – components – Applications.

UNIT-III COLORIMETRY, FLUORIMETRY AND CENTRIFUGATION [18HRS]

Photoelectric Colorimeters, Fluorimeters –Principle -Applications.

Centrifugation:

Types of Centrifuge – Ordinary and Ultracentrifuge - Principle and applications.**Microbiological Assays**

Types of Assays -Principle - Requirements for the conduct of Microbiological assays – Applications.

UNIT-IV SPECTROSCOPY [18HRS]

SPECTROSCOPY:

Spectrophotometry – Spectrophotometers – Atomic Absorption Spectrophotometers –Principle – Applications.

NMR and NIR:

Nuclear Magnetic Resonance- Application and principle

Near Infra Red -Principle and Application

UNIT-V ISOTOPES [18HRS]

Types – Stable and Radioactive, Units of radio-activity – Uses in biological investigations - Geiger Muller Counter and Scintillation Counter –Effects of ionizing radiation-hazards and prevention - Applications.

pH and Buffer:

pH meter –measurement of pH, Buffer – Definition – Types – Buffer system with special reference to living body.

REFERENCES:

1. Ewing. W.W. (1970). *Instrumental Methods of Chemical Analysis.* McGraw Hill Book Company, NewDelhi.
2. Mahinder Singh, (2003). *Analytical Chemistry – Instrumental Techniques.* Dominant Publishers and Distributors, NewDelhi.
3. Nikelal, (1973). *Experimental methods in Biophysical Chemistry*. John WileyPublishers.
4. Yadav M.S (2001). *Instrumental Methods of Chemical Analysis*. Campus Books Internationals, NewDelhi.

WEB REFERENCES

1. www.rpi.edu
2. www.rajaha.com
3. www.chemistry.adelaide.edu
4. www.docstoc.com

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

III SEMESTER

FOOD PRODUCT DEVELOPMENT AND SENSORY EVALUATION -19PG3NE1

(For those who joined in 2019 onwards)

HOURS/WEEK:4 CREDITS: 4 COURSE DESCRIPTION

This course gives in-depth knowledge on the development, evaluation & marketing of food products.

COURSE OBJECTIVES

- To understand the consumer needs and demands in thesociety.
- To develop innovative food products based on the consumerneeds.
- To gain knowledge on the marketing and evaluation of foodproducts

COURSE OUTCOMES (CO)

The students will be able to

1. Identify the food needs and consumer demands in thesociety
2. Explain the classification, characteristics and future trends in food product development
3. Choose the different sensory tests employed for foodevaluation
4. Build knowledge on the marketing and evaluation of food products
5. Categorize the food products according to the productcost

UNIT-IFOOD NEEDS AND CONSUMER PREFERENCE [12HRS] Food needs and population, Hierarchy of food needs- Instrumental food, Novel food, Good- tasting food, Reliable, Ongoing access to food, Acceptable food and Enough food, Factors impacting food choices – Physiological, Psychological, Economical and Social. Consumer Preference – Definition, Meeting consumer demands.

UNIT-II PROCESS OF FOOD PRODUCT DEVELOPMENT [12HRS] Definition and Need for Product development, Classification and Characteristics of food product, Phases in food product development, Factors influencing product development, Consumer acceptance of new food products, Future trends in food product development

UNIT-III SENSORY EVALUATION OF FOOD PRODUCT [12HRS] 43

Definition, Sensory characteristics of food, Requisites for conducting sensory tests – trained panel members, testing laboratory, preparation of samples, techniques of smelling and tasting, testing time, design of experiment. Types of tests: Difference tests –Paired comparison test, Duo-trio test, Triangle test. Rating tests – Ranking test, Single sample test, Two sample difference test, Multiple sample difference test, Hedonic rating test, Numeric scoring test, composite scoring test, Sensitivity tests –

Sensitivity threshold test, dilution test. Descriptive tests – Descriptive flavour profile method.

UNIT-IV MARKETING OF FOOD PRODUCT [12HRS] Food Marketing, Historical phases of food marketing, Components of food marketing, Requisites of selling a product; Trends in Food Market; Marketing methods, Advantages and disadvantages of marketing methods; Market testing – Where, When, How, What to market; Evaluating the results; Failures in the Market places – Causes of failure – external and internalreasons.

UNIT-VECONOMIC EVALUATION OF FOOD PRODUCT [12HRS] Costing / Pricing-Steps for determining product price; Calculation of selling price; Product cost Variable and Fixed cost; Categories of Product Cost- Material, Labor, Overhead cost, Breakeven point. Product launch- Meaning, Benefits, Steps to launch a new product. Commercialization of product-Meaning, Key aspects, Commercialization process, Action plan. **REFERENCES:**

1. Fuller,G. W. (1994) *New Food Product Development from Concept to MarketPlace'* CRC Press, BocaRaton,USA
2. GouldWA(1991)„Research and Development GuidelinesfortheFoodIndustry"CTI Pub,Baltimore.
3. Lyon, D H (1992) *'Guidelines for Sensory Analysis in Food Product Development and Quality Control'* Chapman and Hall,London.
4. Robinson J, Roberts H, Barnard E, and Shepard T (2001) *'Design and Make It Food Technology'* Nelson Thomes Ltd,UK.
5. Srilakshmi, B. (2008), *Food science,* New age international publishers, NewDelhi.

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II -M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS IV SEMESTER

ELECTIVE – INSTITUTIONAL MANAGEMENT - 19PG3NE2 (For those who joined in 2019 onwards)

HOURS /WEEK: 4 CREDITS: 4 COURSE DESCRIPTION

The course will describe the concepts of organization and management approaches of food service establishment.

COURSE OBJECTIVES

• To develop a knowledge base in key areas of institutional foodadministration. • To provide practical field level experience in institutional foodadministration. • To impart necessary expertise to function as a food servicemanager.

COURSE OUTCOMES (CO)

The students will be able to

1. Recognize the key areas of food administration.2. Identify the characteristics of food service units3. Describe the management process
4. Illustrate the organizational chart of food service establishment5. Explain the aspects of financial management
6. Plan the maintenance of hygiene and sanitation in food service establishment7. Classify the different laws governing food service establishment.

UNIT–I [12 HRS] INTRODUCTION TO FOOD SERVICE SYSTEM

Evolution of food service systems; Characteristics of the various types of food service units **UNIT–II [12 HRS] APPROACHES TO MANAGEMENT**

Theories, aspects, types of management, management tools

UNIT–III [12 HRS] PERSONNEL MANAGEMENT

Selection, training, supervision, leadership, induction

UNIT–IV [12 HRS] FINANCIAL MANAGEMENT

Selection, cost accounting, inventory maintenance, food cost analysis

UNIT–V [12 HRS] LABOUR LAWS AND LEGISLATIONS

Labour laws and legislation; Measure for utilization and conservation of

time 45

REFERENCES:

1. Knosotz, H.O Donnel C (1968) *Principles of Management*, McGraw Hill BookCompany.
2. Kotas Richard & Jayawardardene.C (1994): *Profitable food and Beverage Management*, Hodder & SloughtonPublication.

3. Sethi Mohini (2000), *Catering Management An integrated Approach*, 2nd Ed Wiley Publication.

4. West, B Bessie & Wood, Levelle (1986) *Food Service in Institutions* 6th Ed, Macmillian Publication Company, New York.

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

III SEMESTER

COMMUNITY NUTRITION LAB - 19PG3N14
(For those who joined in 2019 onwards)

HOURS /WEEK: 4 CREDITS: 2 COURSE DESCRIPTION

The practical course provides hands -on training on assessing the nutritional status, preparation of supplementary foods and imparting nutritional education for the vulnerable groups in the community.

COURSE OBJECTIVES

- To impart skills in the planning and execution of nutrition awareness programmesamong various sections of thepopulation.
- To develop skill in the assessment of nutritionalstatus

COURSE OUTCOMES (CO)

The students will be able to

1. Identify the nutritional status of various age groups.2. Classify and construct audio visual aids.
3. Organize nutrition awareness programmes forcommunity.
4. Categorize and plan supplementary foods for the vulnerable groups in thecommunity.

UNIT 1 – Assessment of nutritional status of various age group- pregnant woman, lactating mother, pre school children, school going children and elderlypeople. **[12HRS]**

UNIT 2 – Preparation of audio- visual aids- charts, posters, pamphlets, folders,campaign, exhibition, demonstrationandvideos. **[12HRS]**

UNIT 3- Imparting nutrition education atcommunitylevel. **[12 HRS]** **UNIT 4-**

Formulation ofsupplementaryfoods. **[12 HRS]**

UNIT 5 – Maintenance oflogbook. **[12HRS]**

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS)
MADURAI – 18.

II M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

III SEMESTER
TECHNIQUES FOR EXPERIMENTAL NUTRITION LAB
19PG3N15 (For those who joined in 2019 onwards)

HOURS / WEEK:4 HOURS CREDITS: 2 COURSE DESCRIPTION

The practical course provides hands –on training in the use of hi-tech precision equipments to identify and analyze the various nutrients present in the food.

COURSE OBJECTIVES

- To understand the techniques involved in analyzing the nutrients present infoods.
- To familiarize in handling analyticalinstruments

COURSE OUTCOMES (CO)

The students will be able to

1. Recall the principles of analytical technique
2. Identify the amount of ascorbic acid infoods.
3. Explain the procedure for the estimation ofβ-carotene
4. Compare the amount of free fatty acid and peroxide values in fats andoil
Choose the method of analyzing amount of antioxidant present infoods

ANALYSIS FOR:

- β-Carotene inFruits
- β-Carotene inVegetables
- Ascorbic acid inFruits
- Ascorbic acid inVegetables
- Estimation ofCarbohydrate
- Peroxidevalue
- Saponification value infats
- Saponification value inoils
- Free fattyacids
- Antioxidant inFruits
- Antioxidant in Vegetables

REFERENCES:

1.Berwal. J.S,.Grewal R.B,.Kapoor C.M &.Garg M.R (2004).*Practical Methods in Food Analysis*. Agrotech Publishing Academy,Udaipur.

2. Geetha Swaminathan & Mary George, (2002). *Laboratory Chemical Methods in Food Analysis*. Margham Publications, Chennai.

3. Jayaraman J. (1996), *Laboratory Manual in Biochemistry*. New Age International Ltd. New Delhi.

4. Ranganna S. **(**1986), *Hand Book of Analysis and Quality Control for fruits and Vegetable Products*. Tata Mc Graw –Hill Publishing

Company Limited, NewDelhi.

5. Sadasivam S. Manickam A. **(**1991), *Biochemical Methods*. New Age International Pvt. Ltd., NewDelhi.

6. Yeshajahu Pomeranz & Clifton E. Meloan,(2004), *Food Analysis –Theory and Practice*. CBS Publishers and Distributors, NewDelhi.

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.SC HUMAN NUTRITION AND NUTRACEUTICAS

IV SEMESTER

FOOD MICROBIOLOGY - 19PG4N16
(For those who joined in 2019 onwards)

HOURS/WEEK:6HOURS CREDITS: 5 COURSE DESCRIPTION

The course outlines the role of micro-organism in food spoilage, preservation and processing.

COURSE OBJECTIVES

- To gain knowledge of role of micro-organisms in humans andenvironment
- To understand the importance of micro-organisms in food spoilage and to learn advanced,techniques used in foodpreservation.
- To understand the latest procedures adopted in various food operations to prevent food-borne disorders and legal aspects involved in theseareas.

COURSE OUTCOMES (CO)

The students will be able to

1. Recall the basic concepts of food microbiology.
2. Describe the principle of foodpreservation.
3. Distinguish the contamination and spoilage offoods.
4. Choose the appropriate method of foodpreservation.
5. Explain the food and water bornediseases.
6. Identify and enumerate the microbes infood.

UNIT-I FOOD AND MICROORGANISMS [18HRS]

Food Microbiology – Definition, Basic concept, History of Food Microbiology

Food as substrate for microorganisms – Hydrogen ion concentration, Water activity, Oxidation-Reduction potential, Nutrient content.

Microorganisms important in Food – Industrial importance of Mold, Yeast and Bacteria.

UNIT-II CONTROL AND DESTRUCTION OF [18HRS] MICROORGANISMS IN FOOD

General Principles of Food Preservation

Methods of Food Preservation- Asepsis, Removal of microorganisms, Maintenance of anaerobic conditions, Use of high temperature, Use of low temperature, Use of chemicals, Drying, Use of Radiation, Non thermal methods – Ohmic heating, High Pressure Processing, Cold Plasma Processing, Pulsed electric field.

UNIT-III CONTAMINATION AND SPOILAGE OF DIFFERENT [18HRS] KINDS OF FOODS

Contamination and Spoilage - Cereals, Vegetables, Fruits, Meat, Fish, Egg, Poultry, Milk and its products, Canned foods.

UNIT-IV FOOD IN RELATION TO DISEASE [18HRS]

Classification of Food borne diseases,

Food infection – Definition, Classification, Types – Salmonellosis, Clostridium Perfringes Gastroenteritis, Bacillus cereus Gastroenteritis, E.coli infection, Shigellosis

Food Intoxication – Bacterial food intoxication – Botulism, Staphyloccocal gastroenteritis, Mycotoxins – Definition, Types – Ochratoxin, Aflatoxin, Patulin.

Identification and Enumeration of Microbes in food – Preparation and Distribution of Culture Media, Inoculation of Culture media, Examination of Organisms, Plating techniques.

UNIT-V WATER MICROBIOLOGY [18HRS]

Microbial analysis of water- Sanitary tests for coliforms, MPN of coliforms Water borne

diseases – Definition – common microorganism involved in water borne diseases.

Typhoid - Causes- incubation period – clinical symptoms – mode of transmission – prevention andcontrol.

Diarrhoea- Causes- incubation period – clinical symptoms – mode of transmission prevention andcontrol.

Cholera – Causes- incubation period – clinical symptoms – mode of transmission prevention andcontrol.

PRACTICALS:

1. Enumeration of microbial load (bacteria, fungi and yeast) in portablewater.
2. Enumeration of microbial load (bacteria, fungi and yeast) in differentfoods.

REFERENCES:

1. Adams M.R.and M.O.Moss (2005), *Food Microbiology*, New Age International (P) Ltd., Publishers, NewDelhi.
2. FrazierW.C, (2000), *Food Microbiology*, New Age International (P) Ltd., Publishers, New Delhi.
3. George J.Banwart (2004), *Basic Food Microbiology*, S.K.Jain for CBS Publishers and Distributors, NewDelhi.
4. James.M.Jay, (1996), *Modern Food Microbiology*, S.K.Jain for CBS Publishers and Distributors ,4596/1A,11 Darya Ganj,New Delhi- 110 002,.
5. Pelczar.J, Jr.E.C.S.Chan, Noel R.Kieg, (1993), 5th edition *Microbiology*, Tata McGraw Hill Publishing Co., NewDelhi,.
6. Rao A.S., (1998), *Introduction to Microbiology*, Asoke K, Ghosh, Pentice-Hall of India Pvt., New Delhi-110001,
7. Sharma.P.D, (1996), *Microbiology*, Rakesh Kumar Rastogi for rastogi Publications "Gangotri" Shivaji road, Meerut,.

Web reference

1. www.aces.uiuc.edu
2. www.bcit.ca.com
3. www.springer.com

4. www.woodheadpublishing.com
5.

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

100% EMPLOYABILITY

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

IV SEMESTER

NUTRITIONAL BIOCHEMISTRY -

19PG4N17

(For those who joined in 2019 onwards)

HOURS/WEEK: 6 CREDITS: 5 COURSE DESCRIPTION

The course provides understanding on the structure, metabolism and energetic of macro and micro nutrients and the integration of metabolic systems.

COURSE OBJECTIVES

- To understand the application of biochemistry in the field of foods andnutrition.
- To understand the mechanisms adopted by the human body for regulation of metabolicpathways.
- To understand integration of cellular level metabolic events to nutritional disorders andimbalances.

COURSE OUTCOMES (CO)

The students will be able to

1. Identify the structure ofbiomolecules.
2. Explain cellularrespiration.
3. Construct the metabolic pathways ofbiomolecules
4. Categorize the inborn errors of metabolism of biomolecules5. Compute the energetic of metabolism ofbiomolecules.

UNIT-I CARBOHYDRATE [18HRS]

Structure, Metabolism –Definition, Types of metabolism, Carbohydrate metabolism – Glycogenesis, Glycogenolysis, Glycolysis, Fate of pyruvic acid, Citric Acid cycle, Energetics of glucose metabolism, Hexose Monophosphate Shunt, Gluconeogenesis, Cori Cycle,Uronic Acid pathway.

Inborn errors of carbohydrates metabolism- galactosaemia, fructose intolerance, lactose intolerance

UNIT-II PROTEIN [18HRS]

Structure, Mechanism of protein synthesis, Metabolism - Oxidative and non-oxidative Deamination, Transamination, Decarboxylation, Transmethylation, Krebs Urea Cycle, Linkage of Krebs Urea Cycle and Krebs Citric Acid Cycle, Catabolism of Ketogenic amino acids, Catobolism

of Glycogenic amino acids, Catabolism of amino acids that are both Ketogenic and Glycogenic, Biosynthesis of amino acids, Energetics of amino acids.

Inborn errors of amino acid metabolism – albinism, phenylketonuria (PKU), maple syrup urine disease (MSUD)

UNIT-III LIPID [18HRS]

Structure, Metabolism of fat – β-Oxidation Cycle, Energetics of fatty acid oxidation, Ketosis, Ketogenesis, Ketolysis, Biosynthesis of fatty acids.

Inborn errors of fat metabolism - Gaucher's disease, Tay-sachs disease, Niemann-Pick disease. **T-IV NUCLEIC ACIDS [18HRS]**

Nucleic acid - Definition and types.

DNA – Structure, Replication, Enzymes involved in replications.

RNA- types and comparison of DNA and RNA.

Metabolism of Nucleic acids - Synthesis and breakdown of purine and pyrimidine.

UNIT-V CELL RESPIRATION AND BIOLOGICAL OXIDATION [18HRS]

Site of biological oxidation, pathway of biological oxidation, electron transport system, bioenergetics system.

REFERENCE BOOKS:

1. Abraham Cantrarow and Bernard Schepartz, (1967). *Biochemistry.* W.B.Saunders Company, London.
2. AlbertL.Lehninger,(1984). *Principles of Biochemistry*. CBS Publishers and Distributors, Delhi.
3. Ambika Shanmugam, (1983). *Fundamentals of Biochemistry for Medical Students*. Published by the author,Madras.
4. Jain.J.L., (1988). *Fundametals of Biochemistry*. S.Chand and company (Pvt.) Ltd., NewDelhi.
5. Joseph S. Fruton and Sofia Simmonds, (1960). *Biochemistry*. Asia Publishing House, New Delhi.
6. Singh.S.P, (1998). *A Text Book of Biochemistry*. CBS Publishers and Distributors, NewDelhi.

WEB REFERENCES:

1. http://news.bbc.co.uk
2. http://www.kcl.ac.uk/
3. http://www.nature.com
4. www.acs.org

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.Sc HUMAN NUTRITION AND NUTRACEUTICALS

II SEMESTER

ADVANCED FOOD SCIENCE AND PROCESSING TECHNIQUES –19PG4N18
(For those who joined in 2019 onwards)

HOURS /WEEK: 6 CREDITS: 4

COURSE DESCRIPTION

The course offers the understanding of processing techniques involved to transform raw ingredients into processed food products for human consumption.

COURSE OBJECTIVES

- To understand the science behind processing of foods and its impact on physicochemical properties of foods
- To provide in-depth knowledge on production of processed foodproducts.

COURSE OUTCOMES (CO)

The students will be able to

- Illustrate the structure and milling ofcereals.
- Explain the processing methods of pulses andoilseeds.
- Choose the methods of harvesting & storage of vegetables andfruits.
- Classify the processing & preservation methods of fleshfoods
- Identify the processing & preparation of milk & eggproducts.

UNIT-I CEREAL PROCESSING [18HRS]

Structure, Processing of Rice and Wheat- Parboiling and Milling,Physico-chemical changes during parboiling. Corn-dry and wet milling, Oats-Milling, Ragi and Samai - Milling.

Processing of Cereal products- Puffed rice, Flaked rice, Quick cooking rice, Rice flour. Wheat products - Vermicelli, Semolina, Extruded products. By- products – Rice bran, Rice bran oil and Husk.

UNIT-II PULSE PROCESSING & OIL SEED PROCESSING [18HRS]

Pulse Processing: Structure, Processing of pulses- Decortication, Milling, Germination, Fermentation, Parching, Puffing, Extrusion. Antinutritional factors, Methods to eliminate toxic constituents. Pulse products- dhal, Instant legume powders, Legume protein concentrates. Effect of processing on the physiochemical properties of pulses.

Oil Seed Processing: Structure, Processing of edible oil, Hydrogenated fat and Margarine, Effect of processing on the physiochemical properties of oil seeds. By- products- Oilseed cake, Rancidity Types and preventionmethods

UNIT-III VEGETABLE PROCESSING & FRUIT PROCESSING [18HRS]

Vegetable Processing: Classification of vegetables, General structure of edible portion of vegetables and fruits, Harvesting and storage, Post harvest practices, Vegetable products Dehydrated vegetables,

Canned vegetables, frozen vegetables, Paste, Powder, Pickled vegetables Sauerkraut, Gherkins.

Fruit Processing: Classification, Maturity concepts, Ripening- Definition, Chemicals for ripening, Changes occurred during ripening and senescence, Harvesting and processing, Storage. Fruit products- dried fruits, Canned fruits, Powders, Fruit juice concentrates.

UNIT-IV MILK AND EGG PROCESSING [18HRS]

Milk Processing: Milk processing steps, Properties of milk, Effect of heat on milk.

Milk products: Definition, Manufacturing process -Milk powder, Ice cream, Butter, Cheese Yoghurt and Sweetened condensed milk.

Egg processing: Structure, Egg storage, Egg quality- Evaluation, deterioration during storage, Egg product- Egg powder.

UNIT-V MEAT PROCESSING [18HRS]

Meat- Structure, Classes, Post-mortem changes, Ageing, Tenderizing, Curing, Cuts and grades and changes during cooking.

Fish- Classification, Selection criteria, - Processing of Smoked fish and canned

fish Poultry- Classification, Processing of poultry and storage. Products- Ham,

Sausages, Bacon.

REFERENCE BOOKS:

1. Avantina Sharma, (2006)), *Textbook of Food Science and Technology***,** International book distributing company,Lucknow.
2. Potter, N.N. (1978**),** *Food Science*. AVI Publishing company, INC, Westport,Connecticut.
3. Shakuntala Manay. **N.,** *Foods, Facts and Principles*, New Age International Publishers, New Delhi, IIedition.
4. Sivasankar.B, (2002), *Food Processing and Preservation*, PHI Learning Private Limited, New Delhi.
5. Subbulakshmi.G and Udipi.A.S, (2006), *Food Processing and Preservation*, New Age International Publisher,NewDelhi.
6. Vijaya Khader, (2001), *Textbook of Food Science and Technology*, Indian Council of Agricultural Research, NewDelhi.

JOURNALS:

1. Journal of Food Science and Technology. AFST, CFTRI, Mysore.
2. Journal of FoodScience. The Institute of Food Technologies, Illinois, USA.

WEB REFERENCE:

1. www.fao.org
2. www.icar.org.in

3. www.healthfinder.gov

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

IV SEMESTER

FOOD SAFETY AND QUALITY CONTROL - 19PG4NE3
(For those who joined in 2019 onwards)

HOURS /WEEK: 4 CREDITS:4 COURSE DESCRIPTION

The course provides an outline on the standards, tools and techniques to ensure safety and integrity of foods in food preparation and processing.

COURSE OBJECTIVES

- To develop approaches to identify food safety hazards in foodprocessing
- To apply preventive measures and control methods to minimize microbiologicalhazards and maintain quality offoods.
- To identify the wide variety of parameters affecting foodquality.
- To develop quality controlstrategies

COURSE OUTCOMES(CO)

The students will be able to

1. Define the concept of food safety and food laws.2. Explain the toxicants in animal and plant foods.3. Classify the foodadditives.
4. Plan the various quality assurance system in food industries.
5. Categorize the packaging materials and properties
6. Recognize and understand nutrition labeling/ claims.

UNIT-I BASIC CONCEPTS OF FOOD SAFETY AND FOOD LAWS [12HRS]

Food and its safety concerns, Importance of safe food, Factors affecting food safety, Threats to safety of food supply, Principles of food quality.

Food Laws: PFA, Essential Commodity Act, Standards of Weights and measures Act, Export Act.

Voluntary Laws: BIS, AGMARK, Consumer Protection Act, FSSA

International Laws: Codex Alimentarius. Code India, ISO, FAO, WHO.

UNIT-II NATURAL TOXINS IN FOOD [12HRS]

Toxicants in animal foods – Shellfish

Toxicants inplant foods - Favism, Gossypol, Toxic amino acids, Toxic alkaloids, Cyanogens, Lima beans, Mushroompoisoning.

Antinutritional factors – Protease inhibitors, Trypsin inhibitors, Haemagglutanins, Phytates, Tannins, Oxalates, Goitrogens

Environmental Toxins - Mercury; Polybrominated biphenyl (PBB); Polychlorinated biphenyl (PCB); Lead; Cadmium; Pesticide residues; Contaminants from plastics

UNIT-III FOOD ADDITIVES [12HRS]

Definition, Importance of use in foods, Classification, Types - Preservatives, antioxidants, artificial colours, Flavour enhancers, bleaching agents, nutrient additives, Thickening and stabilizing agents, anticaking, antifoaming, sequestrants sweetening agents, GRAS - Generally Recommended As Safe(GRAS).

UNIT-IV QUALITY ASSURANCE IN FOOD [12HRS]

HACCP – Definition, principles, Guidelines for application of HACCP

principles. ISO 22000, Halal

UNIT-V FOOD PACKAGING [12HRS]

Definition, Functions of Packaging, Classification of Packaging materials, Packaging methods, Moisture Sorption Properties of foods and selection of packaging materials,

Interaction between packaging and foods.

Nutrition labeling and nutrition claims.

REFERENCES:

1. J udith E. Brown, (2002), 3rd Ed, Nutrition Now, Wadsworth, London.
2. P omeranz Y and Meloan CE (1996), *Food Analysis : Theory and Practice*, CBS Publishers and Distributors, New Delhi.
3. S hirley J. Van Grade, Margy Woodburn. (1999), "*Food Preservation and Safety Principles* & *Practice"*; Surabhi Publications.
4. S ubbulakshmi.G; Shobha.A.Udipi, (2001), "*Food Processing and Preservation*", New Age International Publishers.

WEB REFERENCE:

1. www.fao.org
2. www.healthfinder.gov
3. www.icar.org.in

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18

II M.Sc. HUMAN NUTRITION AND NUTRACEUTICALS

III SEMESTER

NUTRITION IN CRITICAL CARE AND DISASTERS - 19PG4NE4

(For those who joined in 2019 onwards)

HOURS/WEEK:4 CREDITS: 4 COURSE DESCRIPTION

The course offers a comprehensive knowledge on the assessment and management of nutritional support system for critically ill.

COURSE OBJECTIVES

- To understand the physiology, metabolism and special nutritional requirements of the critically ill.
- To be familiar with special nutritional support techniques and feeding formulations to meet their nutritional requirements.

COURSE OUTCOMES (CO)

The students will be able to

1. Identify nutritional screening and nutritional statusassessment.
2. Recognize nutritional support system for criticallyill.
3. Summarize the role of immune enhancers, suppressants and special diets in criticalcare
4. Classify rehabilitationdiets
5. Describe the patho-physiology in criticalillnesses
6. Solve the diet related ethical issues in terminallyill.

UNIT-I [12HRS]

Nutritional screening and nutritional status assessment of the critically ill. Nutritional support system and other life saving measures for the critically ill.

UNIT-II [12HRS]

Role of immuno enhancers, conditionally essential nutrients, immuno suppressants and special diets in critical care

UNIT-III [12HRS]

Patho physiological, clinical and metabolic aspects, understanding the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like stress, trauma, sepsis, burns, CV complications and surgery, dialysis, transplant, multiple

failure

UNIT-IV [12HRS]

Patho physiological, clinical and metabolic aspects, understanding the special nutritional requirements, nutritional goals and monitoring the therapy in critical

illnesses like GI tract surgery, hepatic transplants

UNIT-V [12HRS]

Complications of nutritional support system including refeeding syndrome
Diet related ethical issues in the terminally illEFERENCES:

1. Mahan,LK. And Escott – Stump.S. (2000), *Krause's food Nutrition and Diet Therapy*, 10th Ed.W.S.Saunders Ltd.
2. Shields, R. (1992), *Bailliere's Clinical Gastroentrology*, Baillere Tindall London.

3 Shikora, S.A. and Blackburn. G.L. (1999). Nutritional Support – Theoryand Therapeutics, Chapman and Hall, ITP (International Thompson Publishing).

EVALUATION COMPONENTS

T1	T2	TA	C1	C2	TOTAL
15	15	15	5	5	25

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.SC HUMAN NUTRITION AND NUTRACEUTICAS

IV SEMESTER

FOOD MICROBIOLOGY LAB - 19PG4N19
(For those who joined in 2019 onwards)

HOURS/WEEK:4HOURS CREDITS: 5 COURSE DESCRIPTION

The course gives the clear idea of assessing the microbes present in foods causing spoilage

COURSE OBJECTIVES

- To enable the students to identify the microbes causing spoilage infoods
- To determine the shelf life of the foods by assessing the microbialcount
- To provide insight on the effect of packaging on the microbial load infoods

COURSE OUTCOMES (CO)

The students will be able to

Describe the working principle of compoundmicroscope.

Compare the culturingtechniques

Choose the appropriate method of media prepartation.

4. Identify and enumerate the microbes infood.

Safety concerns of laboratory, Basics and Use of equipments **UNIT-I**

UNIT-II - Sterilization techniques

UNIT-III- Culture media preparation

UNIT – IV - Methods of culturing microorganisms

UNIT-V - Quantification of microbes

100% SKILL DEVELOPMENT

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

II M.SC. HUMAN NUTRITION AND NUTRACEUTICALS

IV SEMESTER

NUTRIENT ANALYSIS LAB -19PG4N20
(For those who joined in 2019onwards)

HOURS / WEEK:4 HOURS CREDITS: 2 COURSE DESCRIPTION

The practical course provides hands –on training in the use of hi-tech precision equipments to identify and analyze the various nutrients present in the food.

COURSE OBJECTIVES

- To enable the students to get practical experience in thelaboratory
- To develop the skill to undertake research work and carryout experiments innutritionindividually

COURSE OUTCOMES (CO)

The students will be able to

1. Identify the calorific value offoods.
2. Explain the protein estimation procedure.3. Choose the analytical methods ofminerals.
4. Build knowledge on the estimation of moisture content in foods.5. Compare the amount of crude fibre present in foods.

ANALYSIS FOR:

- Calories
- Moisture
- Protein
- Estimation of Fat in Nuts
- Estimation of Fat in oilseeds
- Crude Fibre inFruits
- Crude Fibre inVegetables
- Ash
- Calcium inmillets
- Calcium in Green leafyvegetables
- Phosphorous
- Iron

REFERENCES:

1. Geetha Sminathan and Mary George, (2002). *Laboratory Chemical Methods in Food Analysis*. Margham Publications, Chennai.

2. Jayaraman.J, (1996). *Laboratory Manual in Biochemistry*. New Age International Ltd. New Delhi.

3. Sadasivam.S.. and Manickam.A**, (**1991). *Biochemical Methods*. New Age International Pvt. Ltd., NewDelhi.

4. Ranganna.S.,**(**1986**),** *Hand Book of Analysis and Quality Control for fruit and Vegetable Products*. Tata Mc Graw –Hill Publishing Company Limited, NewDelhi.

5. Yeshajahu Pomeranz and CliftonE.Meloan,(2004). CBS PublishersandDistributors, NewDelhi.

FATIMA COLLEGE (AUTONOMOUS) MADURAI – 18.

M.Sc HUMAN NUTRITION AND NUTRACEUTICAS

SEMESTER IV

THESIS AND VIVA VOCE-19PG4N21

No of hours –30hours/week Sub. Code:PG3N18 No of credit-12 Max marks :200

OBJECTIVES

1. Dissertation topics chosen on socially relevant feasibletopics
2. Formulation and standardization of foodproducts
3. Packaging of developed products in various packingmaterials.
4. Supplementation of prepared nutrient dense food products to vulnerable section of thepopulation
5. Projects taken up at industry or researchinstitutes.
6. External Viva Voce enables the students to defend theirwork

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