MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI
PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc . Dietetics and Food Management
(Choice Based Credit System)
(with effect from the academic year 2017- 2018 onwards)

Sem. **(1)**	**Sub. No. (2)**	**Subject Status** **(3)**	**Subject Title** **(4)**	**Contact Hrs./ Week (5)**	**Credits** **(6)**
I	1	Core - 1	Laboratory Techniques in Nutrition Research– I	6	4
	2	Core - 2	Clinical Dietetics - I	6	4
	3	Core - 3	Food Microbiology and Safety	5	4
	4	Core - 4	Advanced Food Science and Chemistry	5	4
	5	Core - 5 Practical - 1	Laboratory Techniques in Nutrition Research– I	4	2
	6	Core - 6 Practical – 2	Clinical Dietetics - I	4	2
II	7	Core - 7	Laboratory Techniques in Nutrition Research– II	5	4
	8	Core - 8	Clinical Dietetics - II	5	4
	9	Core - 9	Functional Foods and Nutraceuticals	4	4
	10	Core - 10	Computer Applications in Food Service Management	4	4
	11	Core - 11	Field Work	4+	3
	12	Core - 12 Practical - 3	Laboratory Techniques in Nutrition Research	4	2
	13	Core - 13 Practical - 4	Clinical Dietetics	4	2

Sem. (1)	Sub. No. (2)	Subject Status (3)	Subject Title (4)	Contact Hrs./ Week (5)	Credits (6)
III	14	Core - 14	Nutritional Biochemistry	6	4
	15	Core - 15	Food Processing And Preservation	6	4
	16	Core - 16	Advanced Baking	5	4
	17	Core - 17	Research Methodology	5	4
	18	Core - 18 Practical - 5	Food Processing and Preservation	4	2
	19	Core - 19 Practical - 6	Advanced Baking	4	2
IV	20	Core - 20	Human Factors & Ergonomics	4	4
	21	Core - 21	Food Quality Control	4	4
	22	Core - 22	Nutrition For Fitness	4	4
	23	Core - 23 Practical - 7	Food Processing and Preservation	4	2
	24	Core - 24 Practical - 8	Advanced Baking	4	2
	25	Elective - 1	Elective / Field Work / Study Tour	3+	3
	26	Core - 25	Project	7+	8

+ Extra hours for the Project

For the Project, **f**lexible credits are b/w 5 – 8 &Hours per week are b/w 10 - 16.

Total number of credits **≥ 90** :90

Total number of Core Courses : 25 (15 T + 8 P + 1 Prj. + 1 FW.)

Total number of Elective Courses / F.W. / S.T.: 1

Total hours : 134

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester I / Ppr.no.1 / Core - 1

LABORATORY TECHNIQUES IN NUTRITION RESEARCH-I

Objectives:

1. Recognize the various equipment and apparatus available in biochemistry laboratory
2. Describe the working of each of these instruments / apparatuses and practice the general and safety measures recommended for working in a laboratory
3. Provide an explanation of the components of qualitative and quantitative analysis of food samples

Unit I

Introduction to Laboratory Equipment and Basic Laboratory Operations

a. Identification and use of common laboratory glassware and equipment
b. Techniques of simple laboratory operation, Laboratory reagents, Use and care of common laboratory instruments, Basic needs of a clinical laboratory.

Unit II

General Comments on Specimen Collection

General consideration, Blood, Urine, Sputum, Throat swab, stool, Cerebrospinal fluid, miscellaneous specimens

Unit III

Specimen Collection and Laboratory Preparation in Hematology

Specimen collection for hematological studies, cleaning of laboratory glassware in hematology

Unit IV

Collection and processing of Blood for Transfusion

Preparation for blood collection, Transportation of blood after collection, storage of blood, preparation and use of blood components

Unit V

Urine and Semen Analysis

a) Urine Analysis: Indication, Composition and methods of collection of urine, Routine Urine Examination- Physical, chemical, microscopic examination, evaluation of Renal function tests.
b) Semen Analysis: Clinical significance, Specimen collection, Laboratory investigation, examination of semen.

REFERENCE:

1.A manual of laboratory techniques
2.Cantrow A and Trumper, Clinical Bio-Chemistry, M.W.B. Saunders co – 1975
3.Swaminathan, M. Bio-Chemistry for medical teachers
4.Harold valley, Clinical, Bio-Chemistry (1986)
5.Saunder's C Clinical Bio-Chemistry

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester I / Ppr.no.2 / Core - 2

CLINICAL DIETETICS – I

Objectives:

- To understand the etiology, physiological and metabolic anomalies of acute and chronic disorders / diseases
- To understand the effect of various disorders / diseases on nutritional status, nutritional and dietary requirements
- To be able to recommend and provide appropriate nutrition care for prevention and treatment of various disorders / diseases
- To remain updated on recent advances in Medical Nutrition Therapy (MNT) for various diseases
- To identify the factors related to various diseases & account for their effect on the underlying disease process involved.
- To understand the possible nutrition factors in different diseases.
- To study the current knowledge of the diseases to a reasonable plan for nutritional care in its prevention and treatment.

Unit I

Nutritional Management for Infections, Fevers, HIV/AIDS and Burns

a) Nutritional management for infections and fevers – a) meaning, etiology, nutrition and infection –metabolic changes during infection

b) Febrile conditions- classification, etiology, symptoms, dietary management, treatment- fever, typhoid, tuberculosis, malaria

c) HIV/AIDS

d) Nutritional management for burns – classification, complication, dietary management, mode of feeding, support, non-dietary treatment for burns

Unit II

Nutritional Care in Weight Management and Gastrointestinal tract diseases and disorders

a) Obesity and underweight- Types, predisposing factors, diagnosis, Nutritional care in weight management, treatment and prevention

b) Gastro-intestinal tract disorders and diseases: types, etiology, clinical symptoms, Dietary Management, treatment – Dyspepsia, Diarrhoea, Dysentry, Constipation, Hiatal Hernia, Diverticular disease, Peptic ulcer, Gastritis, GERD, Inflammatory bowel syndrome, Short bowel syndrome, Ulcerative colitis

Unit III

Diet for Liver, Gall bladder and Pancreatic diseases and Diabetes:

Liver, Gall bladder and Pancreatic disorders: classification, etiology, Dietary Management, clinical symptoms, treatment -Hepatitis, cirrhosis, hepatic encephalopathy, Cholelithiasis, Cholecystisis Pancreatitis.

b) Diabetes: classification, etiology, factors affecting blood glucose, metabolic aberrations, Hormonal controls & functions of the disorders, symptoms, complications, diagnosis, Nutritional therapy, insulin therapy, prevention.

Unit IV

Nutritional management of coronary heart and renal diseases

a) Cardiovascular diseases: types, risk factors, causes, relation to lipid metabolism, hormonal mechanisms, symptoms, complications, dietary management, treatment and prevention – Hypertension, Atherosclerosis Myocardial Infarction, Congestive Heart failure, Coronary Bypass Surgery.

b) Renal problems: classification, etiology, clinical and metabolic manifestations, clinical symptoms, commonly available commercial formulas for renal patients, dietary Management, treatment - renal calculi, glomerulonephritis, Renal failure, ESRD

Unit V Diet for Cancer and disabling disease:

a) Nutrition & Cancer: Causes, epidemiological factors, treatment, therapeutic problems & Goals, Problems related to cancer treatment, nutritional therapy.

b) Nutrition support in disabling disease: Pre-disposing factors, nutritional therapy-Gout

REFERENCE:

1.Sri lakshmi (2003) Dietetics, Wiley Eastern publishers.
2.Corrine Robinson (1990) Normal and Therapeutic Nutrition, Oxford and IBH publishers.
3.Swaminathan. M. (2000) Principles of Nutrition and Dietetics, Bappco publishers, Bangalore.
4.Gopalan et al., (2001) Nutritive value of Indian Foods, NIN publication, Hyderabad.
5.Bhavana sabarwal (1999) principles and practices of Dietetics, Ajay verma common wealth publishers, New Delhi.
6.Davidson Passmore (1989) Human Nutrition and Dietetics, London Churchill and Livingston publishers.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester I / Ppr.no.3 / Core - 3

FOOD MICROBIOLOGY AND SAFETY

OBJECTIVE:

This course will enable the student to:

1. Gain deeper knowledge of role of microorganisms in humans and environment.
2. Understand the importance of microorganisms in food spoilage and to learn advanced, techniques used in food preservation.
3. Understand the latest procedures adopted in various food operations to prevent food-borne, disorders and legal aspects involved in these areas.

Unit I

Introduction to Food Microbiology

a) Food Microbiology – Basic Concept and History of food Microbiology
b) Role of Microbiology in Biotechnology

Role of Microorganisms in Fermented Foods

Unit II

Factors Affecting Food Safety

1.Physical Hazards
2.Biological Hazards
3.Chemical Hazards

a) Microorganisms in Foods

i. Bacteria
ii. Fungi
iii. Yeasts
iv. Moulds
v. Viruses
vi. Parasites

b) Recent Concerns of Food Safety

i. Prions
ii. Concern of Genetically Modified Foods
iii. Concern of Dioxin- Contaminated Foods

Unit III

Microbiology of Air, Water soil and food

a) Microbiology of Air, Water and soil
b) Sources of food contamination
c) Factors Affecting the growth of Microorganisms – Nutrition, Oxygen, Temperature, Moisture Requirement – The concept of Water Activity, Osmotic Pressure, Hydrogen Ion Concentration- pH and light
d) Control and Destruction of Microorganisms

Unit IV

Factors Responsible for food Spoilage

a) Chemical Changes due to Spoilage -

i. cereals and cereal products
ii. Fruits and Vegetables
iii. Soft Drinks, Fruits Juices, Fruit Preserves and Miscellaneous Products
iv. Milk and Milk Products
v. Meat, Poultry and Poultry Products, Fish and Other Sea Foods.

Unit V

Food Borne infections and Diseases

a) Food Borne Diseases – types, Definition – intoxication infection, Food Borne Intoxications – Staphylococcal Poisoning, Bacillus Cereus Poisoning and Botulism

b) Food Borne Infections – Salmonellosis, Shigellosis (Bacillary dysentry), Vibrio Parahaemolyticus Gastroenteritis, Enteropathogenic *E.coli* Diarrhoea, Hepatitis A and Shellfish Poisoning.

c) Food Borne Diseases Due to Naturally occurring Toxicants – Lathyrism, Veno-occlusive Disease (VOD), Epidemic Dropsy

REFERENCE:

1.Atlas, M.Ronald (1995) Principles of Microbiology, 1st Edition, Mosby-Year Book, inco, Missouri, U.S.A.
2.Frazier, W.C. (1998) Food Microbiology, Mc Graw Hill Inc, 4th Edition.
3.Roday. S. (1999) Food Hygiene and Sanitation, 1st Edition, Tata Mc Graw Hill, New Delhi.
4.Joshua A.K.2000 Microbiology. Popular Book Depot, Madras.
5.Adams & Moss 2000, Food Microbiology, Panima Publishing corporation, New Delhi.
6.Anandhanarayan. R & C.K.J. Panicker, 2003, Textbook of Microbiology, Orient longman publications, Chennai.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester I / Ppr.no.4 / Core - 4

ADVANCED FOOD SCIENCE AND CHEMISTRY

Unit I

Introduction to Food Science and simple sugars

a) Carbohydrates in the diet- classification, chemistry, Functionality and their Role in Food Industry

b) Food Polysaccharides and their Applications: Characteristics and Functional Properties of Native and Modified Starches, Food Hydrocolloids –Non Starch Polysaccharides, Algal Polysaccharides, Seed Gums, Exudate Gums, and Microbial Polysaccharides

Unit II

Lipids

a) Introduction, Classification and Composition
b) Functional Properties of Food Lipids
c) Deep Fat Frying, Deteriorative Changes in Fats and Oils
d) Antioxidants – Preventing the Deteriorative changes in Fats and oils

Unit III

Protein

a) Introduction and sources
b) Classification, composition and Biological Functions
c) Functional Properties of Protein
d) Protein Concentrates, Isolates and Hydrolysate and their applications

Unit IV

Vitamins and Minerals

a) Vitamin A, B, C, D, E, K- classification, importance, occurrence, determination, application

b) Minerals -classification, nutritional and functional role, bioavailability, Estimation of minerals in foods, effect of processing on mineral content of foods

Unit V

Enzymes and Pigments

- **a.** Enzymes - Introduction, classification, role of enzymes and coenzymes in metabolism, isozymes, enzymes in clinical diagnosis
- b. Biotechnological application – enzyme utilization in food industry, applications in food industry
- **c.** Pigments- natural colours used in foods, novel sources of natural colourants, stability of natural colourants, stabilized forms of natural colorants

REFERENCE:

1.Belitz.W. grosch. 1986. Food Chemistry. Springer Verley Belin Heidelberg, New York.
2.David. S. Robinson, 1987. Food biochemistry and Nutritive Value. Longman Group, U.K.
3.Leslie Hart.F and Harry Johnstone Fisher, 1971. Modern Food Analysis. Spinger – Verlag, New York.
4.Dauthy, M.E. 1995. Fruit and Vegetable processes. FAO Agricultural Services Bulletin 119. Rome.
5.Sadasivam.S.A, Manickam, 1996. Biochemical methods for agricultural sciences. New Age International Publishers.
6.Potter H.N: Food Science, the AV Publishing Co., Inc., Wet poet, Connectcut 1968.
7.Destrosier N.W. The technology of food preservation. The AV Publishing Co., inc West post, Connectcut 1973.
8.Meyer L.H: Food Chemistry, Von Nostrand

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester I / Ppr.no.5 / Practical -1

LABORATORY TECHNIQUES IN NUTRITION RESEARCH-I

1. Demonstration of Qualitative analysis of urine
2. Determination of iron and Haemoglobin in blood
3. Estimation of urea in blood
4. Estimation of glucose in blood
5. Estimation of cholesterol in blood.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester I / Ppr.no.6 / Practical -2

CLINICAL DIETETICS - I

I. Visit to hospital to observe tube feeding

II. Meal Planning and preparation of diet for

i. Post-operative patient
ii. Typhoid, tuberculosis and HIV/AIDS
iii. Obesity, Underweight
iv. Ulcer
v. Typhoid And Tuberculosis
vi. Cirrhosis, Hepatitis
vii. Diabetes
viii. Hypertension, Atherosclerosis, MI, Coronary Bypass Surgery
ix. Renal failure, glomerular nephritis
x. Cancer and Gout

LABORATORY TECHNIQUES IN NUTRITION RESEARCH –II

Objectives:

1.Develop the basic skills of volumetric analytic method
2.Provide an explanation of the components of qualitative analysis of blood and urine and semen samples.

Unit I

Analysis of food

b.Calories, Fibber.
c.Moisture, Ash.
d. Fat

Unit II

Analysis of food

a.Nitrogen by microkjeldahl method
b.Iron, Calcium
c.Carotene, Vitamin C.

Unit III

Chromatography and Radiochemical Methods

a) Chromatographic Separations: Liquid, GC and TLC. Super critical fluid extraction chromatography.
b) Radiochemical Methods: Use of radio isotopes

Unit IV

Routine Biochemical Tests - I

a.Glucose, Protein
b.Albumin, Urea

Unit V

Routine Biochemical Tests – II

a.Creatinine, Uric Acid
b.Bilirubin, Triglycerides, Cholesterol

Reference:

1.A manual of laboratory techniques
2.Cantrow A and Trumper, Clinical Bio-Chemistry, M.W.B. Saunders co – 1975
3.Swaminathan, M. Bio-Chemistry for medical teachers
4.Harold valley, Clinical, Bio-Chemistry (1986)
5.Saunder's C Clinical Bio-Chemistry

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester II / Ppr.no.8 / Core -8

CLINICAL DIETETICS – II

Objectives:

1.To study different tests for various diseases
2.To know the biochemical composition of blood and different parts of the body

Unit I

Changes in Carbohydrate metabolism:

a) Level of blood glucose in normal and abnormal conditions – maintenance of blood glucose level
b) Inborn errors of carbohydrate metabolism
c) ketosis, pentosuria, galactosuria, glucosuria
d) Glycogen storage diseases
e) Glucose tolerance test, galactose tolerance test

Unit II

Changes in Lipids during disorders:

a) Types and level of lipids in blood lipid transport
b) Plasma lipoprotein metabolism, plasma lipoprotein and atherosclerosis
c) Primary disorders of lipoproteins hyper and hypocholesteremia
d) Inborn errors of fat metabolism

Unit III

Changes in protein during disorders:

Plasma – functions and inborn errors of amino acid metabolism – phenylketonuria, albinism, alkaptonuria and maple syrup urine disease.

Unit IV

Tests for liver and gastric function

a) Bile Salt – functions, formation of bile acids and bile salts, bile pigments from haemoglobin
b) Test for liver function tests based on excretory, metabolism, capacity for intoxication and enzymes, vitamin and mineral metabolism
c) Test for gastric function : collection and examination of stomach contents determination of free acidity, fractional test meal – normal and abnormal curves, examination of duodenal contents
d) Test for malabsorption examination of faeces- determination of fat content of faeces, fat balance study
e) Xylose absorption and excretion test and vitamin A absorption test.

Unit V

Tests for renal function

Urine examination – their significance in health and disease: tests for kidney function – urea clearance, insulin clearance, creatinine clearance, concentration test, dye test.

Reference

1.Cantrow A and Trumper, Clinical Bio-Chemistry, M.W.B. Saunders co – 1975
2.Swaminathan, M. Bio-Chemistry for medical teachers
3.Harold valley, Clinical, Bio-Chemistry (1986)
4.Saunder's C Clinical Bio-Chemistry
5.Bhavana sabarwal (1999) principles and practices of Dietetics, Ajay verma common wealth publishers, New Delhi.
6.Davidson Passmore (1989) Human Nutrition and Dietetics, London Churchill and Livingston publishers.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester II / Ppr.no.9 / Core -9

FUNCTIONAL FOODS AND NUTRACEUTICALS

Objectives

1. Gain knowledge about functional foods and nutraceuticals

2. Have thorough understanding about the health effects

3. Be familiar with applications in industry.

Unit I

Introduction

a) Functional foods and nutraceuticals- Introduction, definition, importance
b) Health attributes of functional foods – Introduction, Health living Index provides information on healthy diet

Unit II

FFN and probiotic

a) Prebiotic and Probiotic immune system, sources of micro algal health supplements.

b) Colonic Functional Foods : Introduction, Metabolism, Probiotics, Symbiotic, Health aspects of functional colonic foods, Host – microbe interaction, treatment of GI tract disorders

Unit III

Phytochemicals

a) Introduction –Terpenoids, Polyphenolics, Anthocyanins, Isoflavones, Silymarin, Tangeretin, Saponins
b) Other dominant phytochemicals

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester II / Ppr.no.9 / Core -9

Unit IV

Other Nutraceuticals

a) Source, natural constituents of animal and vegetable lipids, functions of PUFAs
b) Functional foods in the control of aging, mood and performance

Unit V

Nutraceuticals in medical foods

a) Anti – Tumor properties: Nature of tumour growth, mode of carcinogenesis, Diet and gene interactions, Mechanisms of action, Nutrients & their role of functional foods

Reference:

1.Mary K. Schimsl and Theodre P. Labuza; Essentials of functional foods 2000, Culinary and Hospitality industry Publication Services

2.C. Remacle and B. Reusens, Functional Foods, Aging and Degenerative Diseases, Culinary & Hospitality Publications Services.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester II / Ppr.no.10 / Core -10

COMPUTER APPLICATIONS IN FOOD SERVICE MANAGEMENT COMPUTER APPLICATIONS IN FOOD SERVICE MANAGEMENT

Unit I

Introduction

a) Introduction to computer, characteristics of computer, Types of computer :Analog, Digital, Hybrid, Optical. Classification of Digital Computer – Micro, Mini, Mainframe, Super Computer.
b) History of Computer : Dark age, Modern age. Generation of Computer
c) Anatomy of Digital Computer : Functions and components of computer, Memory, How CPU and Memory works
d) Input devices, Output Devices, Storage Devices

Unit II

Software and Data processing

a) Software : Types of Software
b) Data Processing : What is data ?. What is information?. Qualities of information, Data Processing, its types and stages.
c) Data Storage and Retrieval

Unit III

MSDOS, MS Word, MS Excel, MS Power Point

MS-DOS :- dir, copy, rename, delete files - make and remove directory MS-WINDOWS 95-Explore-File-New folder-Edit-Cut-Copy-Paste-View by name, by type.

MS-WORD :- MS-WORD-Menu bar-file-new-open-close-save-print-print view-page set up-margin settings

EDIT :cut, copy, paste, select all-find, find and replace, Go to page.

VIEW :tool bar, standard formatting-drawing-tables and borders.

INSERT: page number-Date & Time-picture-text box-object

FORMAT: font-paragraph-bullets and numbering-boarders and shading-tabs

TABLE :Insert table-cells and rows dele-merge-split-sort-formula-sum above, window left and right.

MS EXCEL :- Edit Menu, View Menu, Format Menu, Tools Menu.

MS POWER POINT – Slides – format – transition background-slide show.

Unit IV

Multimedia

a. Multimedia Introduction: Multimedia- meaning. HardwareComponents ofMultimedia system, Multimedia Elements; Text and Graphics.

b.Multimedia Elements: Sound, Animation and View, issues and trends in Multimedia. International Media; e-mail, Internet, Teleconferencing, videoconferencing.

Unit V

Application of computer in different fields

a) Bookkeeping (Room inspection check list, Housekeepers report, Floor register, Debit note book, Job order book, guests special request register, room receipt)

b) Planning of different styles of flower arrangement.

c) Special decorations (floor, wall) in various institutions

REFERENCE:

1.Rajaraman.1984. Principles of Computer Programming. Prentice Hall of India, New Delhi.
2.Sankaranarayanan, M. Computer programming. Fortran 77 MS-OFFICE 97-MS WORD-MS-EXCEL and MS POWER POINT Manual Published by Microsoft coy, USA.
3.PC Software for Windows Made Simple – R. X. Taxali – Tata McGraw Hill
4.PC Software for Office Automation – Karthikeyan& Dr. C. Muthu – Sultan Chand.
5.Office 2000 complete reference – Stephen L. Nelson – BPB
6.Quick course in Microsoft office – Joyce Cox, Pully Urban – Galgotia Publications.
7.Mastering Office 2000 – Gini Courter, Annette Marquis – BPB.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester II / Ppr.no.11 / Field Work -1

Field work- (Internship Training in hospital -one month)

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester II / Ppr.no.12 / Practical - 3

LABORATORY TECHNIQUES IN NUTRITION RESEARCH

1. Demonstration of Qualitative analysis of urine
2. Determination of iron and Haemoglobin in blood
3. Estimation of urea in blood
4. Estimation of glucose in blood
5. Estimation of cholesterol in blood.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester II / Ppr.no.13 / Practical -4

CLINICAL DIETETICS

I. Visit to hospital to observe tube feeding

II. Meal Planning and preparation of diet for

xi. Post-operative patient
xii. Typhoid, tuberculosis and HIV/AIDS
xiii. Obesity, Underweight
xiv. Ulcer
xv. Typhoid And Tuberculosis
xvi. Cirrhosis, Hepatitis
xvii. Diabetes
xviii. Hypertension, Atherosclerosis, MI, Coronary Bypass Surgery
xix. Renal failure, glomerular nephritis
xx. Cancer and Gout

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester III / Ppr.no.14 / Core -14

NUTRITIONAL BIOCHEMISTRY

Objectives

1.Augment the biochemistry knowledge acquired at the undergraduate level

2.Understand the mechanisms adopted by the human body for regulation of metabolic pathways

3.Get an insight into interrelationships between various metabolic pathways

4.Become proficient for specialization in nutrition

5.Understand integration of cellular level metabolic events to nutritional disorders and imbalances.

Unit I Carbohydrates

a) Structure and its properties-Monosaccharide- glucose, fructose, galactose

b) Disaccharides- Maltose, Lactose, sucrose. Polysaccharides- Starch and glycogen.

c) Carbohydrate metabolism- Glycolysis, Gluconeogenesis, Glycogenesis, TCA cycle.

Unit II

Protein

a) Structure and properties. Deamination, transamination, decarboxylation, urea cycle.

b) Nutritional classification protein, determination of nutritive value of proteins- PER, Digestibility coefficient, BV, NPR, NPU, Chemical score, nitrogen balance, supplementation of protein.

c) Fluid, electrolyte and acid base balance.

Unit III

Lipids

Lipid- properties of lipid. Iodine, saponification and peroxide value.

a) Lipid metabolism- β oxidation of fatty acids.

Unit IV

Vitamins & Minerals

a) **Vitamins:** Structure, biochemical properties, functions and sources.

b) **Minerals:** Structure, biochemical properties, functions and sources.

Unit V

Enzymes & Co-enzymes

a) Enzymes- Definition, classification of enzymes and factors influencing enzyme action.

b) Co-enzyme- Definition and its types.

c) Structure and function of DNA- transcription and replication.

d) Structure and function of RNA- types- mRNA, rRNA and tRNA.

Reference

1.Arumugam, (1994). Elements of Biochemistry. Saras publication.

2.Ambika Shanmugam, (1998). Fundamentals of Biochemistry. Karthik Offset Printers.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester III / Ppr.no.15 / Core -15

FOOD PROCESSING AND PRESERVATION

Objectives

1. To understand the principle of food preservation.

2. To develop skills for setting small scale industry.

Unit I

a) Processing of cereals and pulses - Milling of wheat, rice and processing of corn and barley

b) Processing of Fruits and Vegetables - Harvesting, Bio-Chemical changes during ripening, handling and storage.

c) Processing of nuts and oil seeds

d) Processing of spices and tea, coffee and cocoa.

Unit II

a. Milk and Milk products - processing methods and product preparations.
b. Processing of meat, poultry, seafood and egg.

Unit III

a) Aims and principles of Food preservation, traditional methods of food preservation.

b) Heat processing of food – dehydration, pasteurization, smoking, microwave heating and canning - methods and its applications.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester III / Ppr.no.15 / Core -15

Unit IV

a) Cold processing – chilling, freezing, freeze drying - methods and its applications.

b) Chemical methods of food preservation- Preservatives, anti-oxidants, sequesterents and stabilizers

Unit V

a) Use of radiation technology.

b) Food concentrates - use of acid, sugar and salt - methods and its applications.

Reference

1.Dexrosier, N.W. 1987. The technology of food preservation, CBS Publisher and Distributors, New Delhi.

2.Lal and Siddappa. 1986. Fruit and Vegetable preservation ICMR.

3.Luh and Woodroof 1975. Commercial Vegetable Processing. The AVI Publishing Company, INC, Westport.

4.Ranganna, S. 1986. Handbook of Analysis and quality control for fruit and vegetable processing, 2nd Edn., Tata McGraw-Hill Publisher company Ltd., New Delhi.

5.Arhold Spicer. 174. Advances in pre concentration and dehydration of Foods. Applied Science Publishers Pvt.Ltd.

6.Charm, S.E. 1971. Fundamentals of Food Engineering. The AVI Publishing Co., Connecticut.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester III / Ppr.no.16 / Core -16

ADVANCED BAKING

Objectives:

This course will enable the students to-

1. Understand basic concepts of baking
2. Acquaint with the role of various major and minor ingredients in bakery products
3. Familiarize with baking process and operations.
4. Learn the quality parameters of bakery products.

Unit I

Bakery organization and Equipment

Bakery Organization- Structure, Duties and Responsibilities. Layout for Small Bakery and Bread Making Unit.

Equipments-Small Equipments and Large Equipment- Weighing machine, flour sifter, spiral dough mixer, vertical mixer, dough divider, bun divider and rounder, dough sheeter, deck oven, convection oven, rotary rack oven

Unit II

Bakery Ingredients and their role

Wheat: hard wheat and soft wheat, composition or constituents of flour, types of flour, characteristics of good quality flour, functions of flour.

Sugar: types and functions of sugar in bakery products.

Egg: Composition and functions of egg.

Emulsifier: Glycerol Monostearate and lecithin.

Unit III

Yeast, fats & oils, leavening agents & salt

Yeast: types and composition of yeast, characteristics of yeast, role of yeast during fermentation and function of yeast.

Fats and Oils: types of fats- milk and animal fats and vegetable fat and functions of fat in bakery products.

Leavening agents: methods and functions of leavening- mechanical, chemical, biological / natural and vapour pressure.

Salt: functions.

Unit IV

Bread and Cake Making Process -Yeast made products:

a. Bread: Ingredients and their function. Methods- straight dough method, salt delayed method, no dough time method, sponge and dough method and ferment and dough method. Processing, characteristics of bread- internal and external characteristics. Bread faults and their causes- external and internal bread faults.
b. Cake: Ingredients and their functions. Method- sugar batter method, flour batter method, blending method, boiled method, sugar water method, all in process method, foaming method. Characteristics of cake- internal and external characteristics. Cake faults and their causes- external and internal cake faults.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester III / Ppr.no.16 / Core -16

Unit V

Icings, Cookies and Pastries.

a. Icings: Butter cream, royal icings, almond paste, fondant icing, gum paste, American frosting, water icings/ glace icings.
b. Cookies: Difference between biscuits and cookies, method for mixing cookies, types of cookies, faults and their causes.
c. Pastries: types of pastry- short crust, puff, flaky, philoor filo, chox and Danish pastry

Reference

1.Kent.N.L. (1975): Technology of cereals – with special reference to wheat, pergamon Press, New York, USA.

2.France.W.J: The student Technology of Bread making and flour confectionery, Routledge and Kegan Paul Ltd., London, UK.

3.Sultan.W.J. (1976): Practical baking manual – for students and instructors, AVI Publishing Co.INC, West Port, Connecticut.

4.Matz S.A. (1989): Bakery Technology, packaging, nutrition, product development and quality assurance, Elsevier Science Publisher Ltd., New York, USA.

5.Malik. R.K. and Dhingra.K.C. (1981): Technology of Bakery Industries. Small Industry Research Institute, New Delhi, India.

6.Pomeraz, Y. (1988): Wheat Chemistry and Technology, Vol. 1 and II American Assn. of Cereal Chemists, 3rd Ed. St. Paul Minnesota, USA.

7.Matz. S.A. (1989); Technology for the Materials of Baking, Elsevier Science Publishers. Baking, England.

8.Yogambal and Ashok kumar, (2009). Theory of Bakery and Confectionary, PHT learning Private Limited, New Delhi.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester III / Ppr.no.17 / Core -17

RESEARCH METHODOLOGY

Objectives

1. Understand the methodology of research and techniques

2. Develop skills in conducting research from planning a study to report Writing

3. Apply statistical procedure to analyse numerical data draw inferences

Unit I

Methods of Research

a) Definition of research, characteristics of research, criteria of good research

b) Merits and demerits of scientific research

c) Different types of research and characteristics:

i. Historical research, Ex-post facto research, laboratory experiments, Field experiments, survey research, evaluative research, Case study research, operational research, participatory research

ii. Steps in conducting research

iii. Hypothesis: Definition, purpose, types

iv. Reporting: Methods of reporting, Technical reports

v. Research Abstract: Definition, guidelines for writing abstract

vi. Thesis: Definition, parts, steps in writing thesis

Unit II

Sampling Design

a) Census and sample survey- Steps in sampling design, Sample size and its determination

b) Types of sampling: Random Sampling, Simple random sampling, Stratified random sampling, Systematic sampling, Cluster sampling

c) Non random sampling methods:

i. Judgement sampling

ii. Convenience sampling, quota sampling

iii. Benefits of sampling

iv. Sampling errors

v. Non sampling errors

Unit III

Methods of Data Collection and Classification

a) Methods of collecting primary data: Questionnaire, Interview, Schedule, Observation, Inventories, Checklists

b) Scaling techniques

c) Drafting of questionnaire, training of interviewers

d) Criteria for evaluation of instruments – reliability and validity

e) Sources of secondary data, precautions in the use of secondary data

f) Classification of data: types of classification

g) Formation of discrete and continuous probability distributions

h) Tabulation of data: parts of a table, general rules of tabulation, types of tables

i) Diagrammatic representation of data

j) Graphic representation of data

Unit IV

Statistical Methods

a) Measures of central tendency: mean, median and mode, their relative advantages and disadvantages

b) Measures of dispersion: Mean deviation, standard deviation, Coefficient of variation, percentile

c) Types of correlation, coefficient of correlation and its interpretation-Rank correlation, Regression equations and predictions, Analysis of variance, Contingency tables, Chi-square test, 't' test: student's 't' test, paired 't' test, unpaired 't' test, 'F' test

Unit V

Sampling Statistics and Introduction to Statistical Package for Social Sciences (SPSS)

a) Statistical inference and central limit theorem

b) Null hypothesis and tests of significance

c) The chi-square

d) Testing difference between mean, proportions, standard deviations and correlations.

e) Introduction to Statistical Package for Social Sciences (SPSS)

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester III / Ppr.no.18 / Practical - 5

FOOD PROCESSING AND PRESERVATION

1. Refrigeration and Freezing of fruits and vegetables.
2. Refrigeration and Freezing of meat and fish.
3. Sun and Oven drying of Fruits and Vegetables.
4. Preparation of Jam, Jelly, Syrup and Squash.
5. Preparation of pickles.
6. Visit to Canning and Bottling unit.
7. Visit to fish processing unit.
8. Visit to a food packaging unit.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester III / Ppr.no.19 / Practical - 6

ADVANCED BAKING

1. Preparation and cost analysis of

- Cookies
- Biscuits
- Cakes
- Bread rolls
- Danish pastry
- Madeline
- Nankhatai
- Melting moments
- Puffs
- Bread and Rusk

2. Determination of gluten content

3. Physical characteristics of bakery products

4. Fifteen days training in baking.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester IV / Ppr.no.20 / Core - 20

HUMAN FACTORS AND ERGONOMICS

UNIT- I

Introduction to Ergonomics

a) Definition, History and evolution.

b) Scope of Ergonomics in home and other occupations

c) Nature of work in household and other occupations

d) Human Body and Work: Physiology of Neuro-muscular function in relation to occupational ergonomics; Physiological factors in muscle work; Physical work capacity; Energy requirement for muscular work; Energy expenditure for different activities; Endurance and muscular strength.

UNIT- II

Job Analysis

a) Significance of job analysis for occupational ergonomics, Fundamental elements of job analysis.

b) Anthropometry in relation to occupational ergonomics

c) Postures-Definition and Scope

UNIT- III

Application of Ergonomic Principles in:

a) Tool Evaluation and Design**;** Work Station Evaluation and Design; Maintenance of Postures

b) Identifying types of postures assumed during work, analysis and interpretation

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester IV / Ppr.no.20 / Core - 20

UNIT- IV

Use of instruments employed in ergonomic research.

a) Physiological tools for testing and monitoring -Blood pressure, Heart rate at rest, work and recovery period

b) Exercise ergometry- Cycle ergometer, treadmill

UNIT- V

Cardio-Respiratory Fitness

a) Anthropometric measurements and Physical Fitness Index

b) Body composition - body fat % , Body surface area, lean body mass by skinfold method and Somatotyping.

c) Maximum aerobic capacity using modified Harvard test (Queens college test)

d) Determination of workload using heart rate and oxygen consumption- Treadmill, step stool

i. Heart rate and oxygen consumption.
ii. Pulse rate
iii. Time and motion study.
iv. Physiological cost.
v. Energy cost.
vi. Cardiac cost
vii. Assessment of Physical work capacity (PWC)

References

(1) Astrand P .O. and Radahl K. : Textbook of Work Physiology , McGraw Hill, New York.

(2) Davies D.R. and Shakleton V .J. : Physiology of work, Motunen& Co. Ltd.

(3) OborneDavid : Ergonomics at work, John Wiley and sons, New York.

(4) Dul Jan and Weed mesterBernard : Ergonomics for Beginners, Tylorand Francis, London.

(5) Wilson J.R. and Corlett N. : Evaluation of Human Work. A PracticalErgonomics Methodology. Tylor and Francis, London.

(6) PheasanStephan : Body space, Anthropometry , Ergonomics and theDesigns at work, Taylor& Francis, London.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester IV / Ppr.no.21 / Core - 21

FOOD QUALITY CONTROL

Objectives

This course aims to :

1.Provide adequate theoretical background and understanding about sensory evaluation of food.

2.Enable students to use various sensory methods for evaluation variety of foods.

3.Enable students to analyse and interpret sensory evaluation data.

Unit I

a. General principles of quality control – quality attributes - size, shape, colour, consistency, viscosity, texture, taste and flavour.

b. Methods of evaluation of food quality – sensory, objective technique, micro biological methods of quality evaluation.

c. General testing conditions – quantitative difference tests – designing of questionnaire (or) evaluation of score card.

Unit II

a. Food contaminants: Naturally occurring toxicants, anti-nutritional factors in foods.

b. Environmental containments: Biological contaminants, Pesticide residues, veterinary drug residues and heavy metals.

Unit III

a. Direct Additive: Preservatives, Nitrate, Nitrite, and N-nitroso compounds.

b. Indirect Additives, Anti-microbial and veterinary drugs, pesticides, poly halogenated aromatic hydrocarbons, polycyclic aromatic hydrocarbons.

c. Other organic residues, packing materials, heavy metals, Radio nuclides in foods.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester IV / Ppr.no.21 / Core - 21

Unit IV

a. Common adulterants – tests to detect adulterants.

b. Government and trade standards for quality – food laws and regulations – PFA, FPO and APEDA- BIS standards – Agmark standard – International Standards for export.

c. HACCP – Food safety system.

Unit V

Laws and regulations for setting up a processing unit.

Reference

1. . Giridarilal Sidappa, G.S., and Tandon, G.L. (1979) Preservation of fruits and vegetables, ICAR, New Delhi.

3. FPO (1955), Quality Control.

4. Horace, D.Graham, 1980, the safety of foods, 2nd End, AVI publishing Co.Inc, Westport.

5. Julie Miller Jones, 1992, Food Safety, Eagan Press, USA.

6. Lewis M.J. 1987, Physical properties of food and processing system, Ellis Harwood Ltd., England.

7. Picgott, J.R, 1984, Sensory Analysis of Foods, Elsevier Applied Science Publisher, New York.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester IV / Ppr.no.22 / Core - 22

NUTRITION FOR FITNESS

Unit I

Yoga- Meaning, Aims and objectives, significance.

Unit II

a) Systems of Yoga - Eight limbs of yoga.

b) Asanas - Classification, difference between physical exercise and yogic exercise

c) Guidelines for practicing Asanas.

Unit III

Meditation - Meaning, types, role

Unit IV

Facial and body - fruit and vegetables, Electrical treatment

Machinery and technology - figure analysis - recommended treatment eg: muscle toning, fat elimination, relaxation and detoxification.

Unit V

a. Exercise and Weight control - fundamentals of aerobics

b. Nutrition guidance on balanced eating and nutritional advice to clients for obesity, skin nourishment, hair treatment.

References

1. B.K.S. Iyengar, Light on yoga, London University, in paperback, 1989.

2. Yogeshwar, Text Book of Yoga, Madras Yoga Centre.

3. K. Chandrasekaran, “Sound health through Yoga” PremKalyan Publication, Sedapatti, 1999.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester IV / Ppr.no.23 / Practical - 7

FOOD PROCESSING AND PRESERVATION

1. Refrigeration and Freezing of fruits and vegetables.
2. Refrigeration and Freezing of meat and fish.
3. Sun and Oven drying of Fruits and Vegetables.
4. Preparation of Jam, Jelly, Syrup and Squash.
5. Preparation of pickles.
6. Visit to Canning and Bottling unit.
7. Visit to fish processing unit.
8. Visit to a food packaging unit.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester IV / Ppr.no.24 / Practical -8

ADVANCED BAKING

1. Preparation and cost analysis of

- Cookies
- Biscuits
- Cakes
- Bread rolls
- Danish pastry
- Madeline
- Nankhatai
- Melting moments
- Puffs
- Bread and Rusk

2. Determination of gluten content

3. Physical characteristics of bakery products

4. Fifteen days training in baking.

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester IV / Ppr.no.25 / Elective – 1 / Field Work

Field work/ study tour- report

MSU/ 2017-18/ PG -Colleges / M.Sc. (Dietetics and Food Management) / Semester IV / Ppr.no.26 / Project

Individual /group Project