

Manonmaniam Sundaranar University, Tirunelveli

UG COURSES –AFFILIATED COLLEGES

B.Sc. Food Science & Nutrition

(Choice Based Credit System)

(For those who joined the course from the academic year 2016-2017 onwards)

(45th SCAA meeting held on 09.02.2017)

Sem	Pt I/ II/ III/ IV	Sub No.	Subject status	Subject Title	Hrs/ week	Cre dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext.	Tot.	Ext	Tot.
V	I	33	Core - 7	Clinical Biochemistry	4	4	25	75	100	30	40
	II	34	Core - 8	Food Packaging	4	4	25	75	100	30	40
	III	35	Elective – 1 (Select any one)	A) Food Microbiology B) Hygiene and Sanitation	5	5	25	75	100	30	40
		36	Elective – 2 (Select any one)	A) Food Service Management B) Principles of Interior Decoration -I	5	5	25	75	100	30	40
		37	Practical - 5	Nutrition Through Lifecycle	3	-	50	50	100	20	40
		38	Practical - 6	Dietetics	3	-	50	50	100	20	40
		39	Practical - 7	Food Chemistry	2	-	50	50	100	20	40
	IV	40	Skill Based subject (Common)	Personality Development/ Effective Communication/ Youth Leadership	4	4	25	75	100	30	40
				Subtotal	30	24					

Sem	Pt I/ II/ III/ IV	Sub No.	Subject status	Subject Title	Hrs/ week	Cre dits	Marks				
							Maximum			Passing minimum	
							Int.	Ext	Tot.	Ext.	Tot.
VI	I	41	Core - 9	Nutrition Through Lifecycle	6	4	25	75	100	30	40
	II	42	Core - 10	Dietetics	6	4	25	75	100	30	40
	III	43	Core - 11	Food Chemistry	5	4	25	75	100	30	40
		44	Elective – 3 (Select any one)	A) Textiles and Clothing B) Principles of Interior Decoration –II	5	5	25	75	100	30	40
	IV	45	Practical – 5	Nutrition Through Lifecycle	3	4	50	50	100	20	40
		46	Practical – 6	Dietetics	3	4	50	50	100	20	40
		47	Practical - 7	Food Chemistry	2	4	50	50	100	20	40
				Subtotal	30	29					

CLINICAL BIOCHEMISTRY

Objectives:

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

Unit I

Blood Sugar

Level of blood glucose in normal and abnormal conditions, Ketosis, Diabetic coma.

Unit II

Inborn Errors of carbohydrate metabolism

Pentosuria, Galactosemia, Glucosuria, Glycogen storage diseases, Glucose tolerance test

Unit III

Blood Lipids

Types and level of lipids in blood disorder of lipoproteins – Hyper and Hypo

Cholesterol, Atherosclerosis, Inborn errors of fat metabolism

Unit IV

Plasma Protein:

- a. Plasma – Types, Functions
- b. Inborn errors of amino acid metabolism – phenylketonuria, Albinism, Alkaptonuria and maple syrup urine disease

Unit V

Gastric disorders

- a. Bile Salt – Functions, formation of bile acids and bile salts, bile pigments from haemoglobin.
- b. Test for kidney function-clearance tests, dye and concentration tests.

References :

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.

FOOD PACKAGING

Objectives :

This course is designed to enable students to:

- Gain knowledge about various packaging materials and importance of packaging.
- Be familiar with testing and evaluation of packing media.
- Be familiar with packaging laws and regulations.
- Be able to select appropriate packaging material for a variety of foodstuffs vis-à-vis the need for preventing environment degradation.

Unit I

Packaging

Concepts, Definition, Significance, Classification.

Application in packaging

Unit II

Packaging Media

Primary Packaging Media – Properties and applications.

Paper boards, metals, plastics, wood & plywood, glass, flexible, tin, aluminium can, foil.

Labels, caps & closures & wads, adhesives, inks & lacquers, cushioning materials, reinforcements

Unit III

Testing, evaluation and transport packages

Testing & evaluation of packing media

Retail packs (including shelf life evaluation) and transport packages

Unit IV

Packaging systems and methods

Packaging systems and methods for food products – vacuum packaging, gas packaging, Aerosol packaging, Shrink packaging, Aseptic packaging, retort packaging, Bag-in Box, MAP, BOPP.

Unit V

Storage, handling and distribution of packages

- a) Storage, handling and distribution of packages (foods) – Effect of improper packaging – Preventive techniques.
- b) Branding and labelling.
- c) Packaging laws and regulations.

References :

1. Sachrow & Griffin, Food Packing – AVI Publications.
2. Hotchikess Food & Packaging Interaction – American Chemical Society.
3. Darry, R. & T, Blackie: Principles & Applications of MAP – Academic & Professions.
4. Bhatia S.C. Canning & Preservations of Fruits & Vegetables – New Delhi, India.
5. Robertson G.L. Food Packaging – New York, Marcell Dekker, INC.
6. Bureau of G & Multon J.K. Food Packaging Technology (Vol.1 & 2) – VCH, Publishers, INC, New York.

**MSU/2016-17/UG colleges/Part I (B.Sc. Food Science & Nutrition)
Semester V/ Ppr.no.35/Elective –I (A)**

FOOD MICROBIOLOGY

Objectives :

- To instruct students who are having their first experience with microbiology on the nature of micro organism
- To outline the source of contamination and their aspects of foods
- To understand the principles of food preservation
- To gain knowledge of the methods to prevent contamination

Unit I

General characteristics:

General characteristics of main group of microorganisms – Bacteria, fungi, yeast.

Unit II

Microorganisms of soil, water, sewage & atmosphere:

Soil – Nitrogen cycle, Carbon cycle, Sulphur cycle & Phosphorus cycle

Water – methods of water purification, types of microorganisms

Sewage – Sewage treatment methods, types of microorganisms

Air – microbial pollution, control measures

Unit III

Contamination of Cereals and cereals products:

Contamination and prevention of spoilage of cereals and cereals products

Contamination and prevention of spoilage of vegetables and fruits

Unit IV

Contamination of milk, fish, meats:

Contamination and prevention of spoilage of milk and milk product

Contamination and prevention of spoilage of meats, fish and other sea foods

Unit V

Contamination of egg and poultry:

Contamination and prevention of spoilage of eggs

Contamination and prevention of spoilage of poultry

References:

- Joshua. A.K. Microbiology, India printing works
- Martein Probisher, Fundamentals of micro-biology
- Goss, R.C., Experimental Microbiology. Guide laboratory, Kalyani publishers
- Frazier, W.C. Food Microbiology, Tata Mc. Graw Hill Book Company, Bombay, 1988
- Adams, M.R and Moss M.O. Food Microbiology Royal Society of Chemistry, Cambridge, 1995
- Banwart, G.T, Baric Food Microbiology CSS Publishers, New Delhi. 1987

**MSU/2016-17/UG colleges/Part I (B.Sc. Food Science & Nutrition)
Semester V/ Ppr.no.35/Elective –I (B)**

HYGIENE AND SANITATION

Objectives :

This course will enable the students to –

- a. Understand the principles and application of hygiene and sanitation in Food Processing.
- b. Develop good habits of personal and environmental hygiene.
- c. Learn safe handling of food and ensure complete safety of raw and processed foods.

Unit I

Hygiene

- a. Definition of hygiene – its application to everyday life.
- b. Personal hygiene.

Unit II

Safe handling of food:

Personal hygiene including uniform, medical check-up, good food handling habits and training. Control and eradication of flies, cockroaches, rodents and other pests.

Unit III

Disinfections :

Definition of disinfectant, sanitizer, antiseptic and germicide. Common disinfectants. Use in case of working surfaces, kitchen equipment, dish washing, hand washing etc.

Sterilization of kitchen and service equipment. Sanitizing of watering equipment

Unit IV

Care of premises and equipment

- a. Impervious washable floors, walls, table tops, floor etc.
- b. Good ventilation and lighting.
- c. Care of dark corner, crevices and cracks.
- d. Garbage disposal – collection, storage and proper disposal from the premises.

Unit V

Food Adulteration and laws

- a. Food adulteration and public health hazards. Prevailing food standards in India –
P.F.A., F.P.O., Agmark and B.I.S.
- b. Legal administration and quality control – laws relating to food hygiene.

References :

1. Hobbs, B.C. and Gilbert, R.J. (1970): Food Poisoning and Food Hygiene, Edward Arnold, London.
2. Rack, B.G: Hygiene in food manufacturing and Handling, Food trade press, London.
3. Longree, K. Blaker, G.G. (1971): Sanitary techniques in food service, John Wiley, New York.
4. Longree. K. (1967): Quantity food sanitation, 2nd Ed. Inter Science Publishers.
5. John Wiley & Sons, New York.

**MSU/2016-17/UG colleges/Part I (B.Sc. Food Science & Nutrition)
Semester V/ Ppr.no.36(A)/Elective –II (A)**

FOOD SERVICE MANAGEMENT

Objectives :

To enable students to

- Gain knowledge about various types of food service
- Understand the principles and functions of management
- Understand personnel management, financial management and legal aspects of catering
- Realize the importance of sanitation and hygiene in food service institution

Unit I

Management and Organization:

- a. Lay out for kitchen – location, layout – work centres, lighting ,ventilation, storage areas
- b. Storage spaces – location, types of storage, layout
- c. Service areas – location – planning service areas, layout

Unit II

Management and equipment:

- a. Tools of management – organizational chart – Job description, Job specification, job analysis work and time schedule – production and service analysis, budget.
- b. Equipments – classification, selection, care, maintenance.

Unit III

Personnel Management

- a. Recruitment – sources, selection, steps in selection ,
- b. Methods of induction – formal, informal training, supervision.

Unit IV

Food Service Management:

- a. Procedure for purchasing and receiving and storage
- b. Types of menu-principles involved in menu planning, techniques in writing menu card
- c. Standardization of recipes
- d. Portion control and utilization of left overs
- e. Styles of service – waiter service, self-service, vending, mobile catering

Unit V

Financial Management:

- a. Food cost control – factors responsible for losses – methods of controlling food cost
- b. Book keeping – advantages of double entry system, book of accounts, purchase book, sales book, purchase return book, sales return book, journal and balance sheet.

References:

1. Mohini sethi and Surjeet malhan, 1993, catering management and Integrated Approach wiley Eastern Ltd., New Delhi.
2. West, B.B Wood, L. Harger, V.F and Shugart G. (1993) Food science in institutions, Johon Wiley and sons, New York.
3. The theory of catering, Kinton and Ceasarani 91996) ELBS.
4. Malhotra – Food Service Management – Anmol publishers, New Delhi.
5. Vera claussen Crusius (1984), Quantity Food Management – Principles and Applications, surjeet publications.

**MSU/2016-17/UG colleges/Part I (B.Sc. Food Science & Nutrition)
Semester V/ Ppr.no.36 (B)/Elective –II (B)**

PRINCIPLES OF INTERIOR DECORATION - I

Objectives :

1. To learn the basic principles of art.
2. To develop the skill of applying the principles of art in decorating the house.

UNIT - I

Family Housing :

Need and importance of Housing.

Factors influencing selection of site.

Factors to be considered for good housing, Ventilation.

UNIT- II

Elements Of Design :

Design – Definition – Kinds of design. Elements of design line – Direction – Shape, Size, Texture and colour

UNIT- III

Principles Of Design :

Harmony, Balance, Rhythm, Proportion, Emphasis.

UNIT- IV

Use Of Colour In Interior :

Classifications of colours – primary, binary, intermediate, tertiary and quaternary. Qualities of colour, Hue value, intensity, Prang colour system, colour and emotion, use of colour in interior decoration.

UNIT - V

Furniture selection :

Care and selection of furniture in dining room, office, bed room, living room.

References:

1. Nickel, P. and Dorsey, J.M. – Management in Family living, John Wiley and sons, Inc, New York (1986).
2. Varghese and Oglae, Home management, Wiley Easter Ltd., New Delhi (1994).
3. Butt, H.H., Home Furnishings, John Wiley and sons, New York, 1971.

**MSU/2016-17/UG colleges/Part I (B.Sc. Food Science & Nutrition)
Semester VI/ Ppr.no.41/Core 9**

NUTRITION THROUGH LIFE CYCLE

Objectives:

- a. To help students to understand the basis of meal planning.
- b. To obtain knowledge on various nutritional deficiency disorders.
- c. To understand the nutritional needs of members at different age levels.

Unit I

Requirements for infancy and preschool age:

- a) Infancy – Growth and development, nutritional requirements, breast feeding, weaning practices, diet supplements
- b) Preschool age – nutritional requirements, factors affecting nutritional status, problem related to nutrition

Unit II

Balanced diets for school going children and adolescence:

- a) Balanced diet – meaning, basic principles meal planning
- b) Planning meals for different socio economic conditions – low income, middle income & high income groups
- c) School age – nutritional requirements, food requirements, packed lunches, school lunch programmes
- d) Adolescence – Nutritional requirements, food habits, fast food, nutritional problems

Unit III

Balanced diets for adults, pregnant women, lactating mother

- a. Adult – nutritional requirements, food requirements, principles involved in planning of meals.
- b. Pregnant woman – Physical changes, nutritional requirements, food requirements, problems related to nutrition, during pregnancy complications & dietary problems
- c. Lactating mothers – nutritional requirements, food management
- d. Geriatric Nutrition – Process of aging, physiological and biochemical changes, considerations in feeding elderly

Unit IV

Modification of Diet

- a. Definition, importance, modification of normal diet – clear fluid, full fluid & soft diet.
- b. Tube feeding, parenteral feeding.
- c. Pre and post-operative diets

Unit V

Diet for Deficiency conditions:

- a. Nutritional deficiency diseases – PEM, Vitamin A and Anemia
- b. Lactose intolerance, phenyl ketonuria, alkaptonuria, galactossemia and sickle cell anaemia

Reference:

1. Sri Lakshmi (2004) Dietetics, Wiley Eastern publishers.
2. Corrine Robinson (1990) Normal and Therapeutic Nutrition, Oxford and IBH publishers.
3. Swaminathan. M. (2003) Principles of Nutrition and Dietetics, Bappco publishers, Bangalore.
4. Gopalan Etal., (1996) Nutritive value of Indian food, 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/2016-17/UG colleges/Part II (B.Sc. Food Science & Nutrition) /
Semester VI/ Ppr.no.42/Core 10**

DIETETICS

Objectives :

1. To gain insight into the national nutritional problems and their implications
2. To obtain knowledge about the methods of assessment of nutritional status
3. Develop skills in organizing and evaluating nutrition projects in the community

Unit I

Diseases of GIT

- a. Diet in diseases of the digestive tract – peptic ulcer, diarrhoea and constipation.
- b. Diet in diseases of the liver and biliary tract – hepatitis, cirrhosis, gall bladder diseases.

Unit II

Febrile and Diabetes Mellitus

- a. Diet in Febrile conditions, causes, types, metabolic changes, diet modification in Influenza, Malaria, typhoid, tuberculosis
- b. Diet in Diabetes Mellitus – etiology, changes in metabolism, clinical symptoms, methods of treatment- diet, drug, complications and Food Exchange list

Unit III

Cardiac disorders and allergy

- a. Diet in Cardiac disorders: Atherosclerosis and hypertension, signs and symptoms, complications, diet modification
- b. Diet in food allergy- definition, classification, tests for allergy, diet modification

Unit IV

Kidney diseases and burns

- a. Diet in Kidney disease: acute, chronic – glomerulonephritis, nephrosis, renal failure, uremia, urinary calculi, etiology, symptoms, diet modification.
- b. Diet in burns -degrees of burns and diet management

Unit V

Obesity, Underweight and Cancer

- a. Diet in obesity & underweight – causes, methods of diagnosis, dietary modifications
- b. Diet in Cancer – types, clinical symptoms, and dietary management

References:

1. Sri Lakshmi (2004) Dietetics, Wiley Eastern publishers.
2. Corrine Robinson (1990) Normal and Therapeutic Nutrition, Oxford and IBH publishers.
3. Swaminathan. M. (2003) Principles of Nutrition and Dietetics, Bappco publishers, Bangalore.
4. Gopalan Etal., (1996) Nutritive value of Indian food, 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.

FOOD CHEMISTRY

Objectives :

1. Understand the meaning and chemical preparation of carbohydrates in foods
2. Explain the role of lipids and protein in foods
3. Acquire knowledge on the chemical changes occurring in foods

Unit I

Carbohydrates in Food:

- a) Introduction to food chemistry
- b) Monosaccharides- structure, properties & derivatives
- c) Oligosaccharides- structure, properties & derivatives

Unit II

Carbohydrates in Food:

- a) Functions of sugars in foods
- b) Polysaccharides and their role in foods

Unit III

Lipids in food

- a) Classification and composition
- b) Characteristics of fat
- c) Functional properties

Unit IV

Functional role of proteins

- a) Denaturation of proteins,
- b) Foam formation of proteins
- c) Functional role in foods

Unit V

Functional role of vitamins and minerals

Vitamins and minerals – Functional role in foods and its bioavailability

References:

1. Seema Yadav, 1997, Food Chemistry, Anmol Publications Pvt. Ltd, New Delhi
2. Meyer. L.H, Food Chemistry
3. Srilakshmi. B, 2002, Food Science, New Age International (P) Ltd, New Delhi
4. Shankuntala Manay, 2001, Food Principles, New Age International (P) Ltd, New Delhi

MSU/2016-17/UG colleges/Part III (B.Sc. Food Science & Nutrition) Semester VI/ Ppr.no.44(A)/ Elective –III (A)

TEXTILES AND CLOTHING

Objectives:

1. To understand the characteristics & properties of textile fibres
2. To acquire thorough knowledge on fabric & yarn
3. To understand the construction of yarn and fabric.

Unit I

a. Fibres:

Definition, classification, general characteristics of cellulose, protein, thermoplastic and mineral fibres.

b. Major textile fibres:

Manufacturing process, properties, use and care of textile fibres (eg) cotton, silk, rayon.

c. Minor textile fibres Study of minor fibres- jute, hemp, Coir.

Unit II

a. Yarn construction:

Definition, twist, types and counts.

b. Fabric construction

Weaving-definition, Types of weaves-basic weaves – plain, twill, satin and decorative weaves (Jacquard weave).

Unit III

Fabric finishes

Definition: Boiling, scouring, sizing, carbonizing, bleaching, shearing, singeing, calendaring, tendering, weighting, mercerizing.

Unit IV

Dyeing, Printing and Embroidery

- a. Dyeing – initial dyeing – stock, yarn, piece, cross dyeing tie and dye, batik methods.
- b. Printing – types block, stencil and screen.
- c. Parts and function of sewing machines, use and care.
 - Tools for clothing construction.
 - Basic hand stitches.

Temporary – basting-even, uneven, diagonal.

Permanent – hemming, back stitch, whipping, overcasting, run stitch.

- d. Embroidery – stem, chain, cross, bullion, lazy – Daisy, fly, wheel, couching, blanket.

Unit V

Seams, Neck Line, Plackets, Gathers, Fasteners, Bias.

- a. Seams – definition, types.
- b. Bias – uses, types.
- c. Neck line – facing, binding, collar, Peter Pan collar.
- d. Fasteners – Types, uses & disadvantages.
- e. Plackets – uses, types.
- f. Garment Constructions
- g. Drafting – panty, A – line frock, six gore skirt, blouse.

References

1. Fundamentals of textiles and their use. (Orient Longman Ltd.,)
2. Textiles fibres and their use – X.P. Hoss.
3. Household Textiles and laundry work Danlkar.
4. Mary Mathew.
5. Clothing for modern – Macmillan & co.
6. Pattern drafting and making up – Bela Kapoor.

MSU/2016-17/UG colleges/Part III (B.Sc. Food Science & Nutrition) Semester VI/ Ppr.no.44(B)/ Elective -III (A)

PRINCIPLES OF INTERIOR DECORATION- II

Objectives :

1. To learn the basic principles of art.
2. To develop the skill of applying the principles of art in decorating the house.

UNIT—I

Furnishings – selection, use and care. Draperies and curtains, floor coverings. Hanging Pictures. Table settings.

UNIT- II

Flower Arrangement :

Requirement of flower arrangement. Treatment of flower styles in flower arrangement (traditional oriental and modern), Types of flower arrangement. Steps in making flower arrangement

UNIT- III

Household Equipment and Cleaning:

Study about various house hold equipment. Need for house hold cleaning. Reagents, Equipment, Methods of cleaning. Principles followed in cleaning. Furniture cleaning and polishing, care doing cleaning.

UNIT- IV

Household Pests :

Common house hold pests mode of infection, methods of eradication, pest control common natural and artificial Pesticides.

UNIT - V

Illumination: Importance of lighting, lighting design for interior space

REFERENCES :

1. Nickel, P. and Dorsey, J.M. -(1986). Management in Family living, Tohn Wiley and Sons, Inc., New York
2. Varghese and Oglae, Home management, Wiley Easter Ltd., New Delhi (1994).
3. Butt, H.H., Home Furnishings, John Wiley and Sons, New York, 1971.

**MSU/2016-17/UG colleges/Part III (B.Sc. Food Science & Nutrition)
Semester VI/Ppr.no.45/ Major Practical - 5**

NUTRITION THROUGH LIFE CYCLE – I

- a) Basic principles of menu planning
- b) Nutrition during pregnancy and lactation
- c) Nutrition during infancy and lactation
- d) Nutrition during preschoolers
- e) Nutrition during school children & adolescence
- f) Nutrition during old age

**MSU/2016-17/UG colleges/Part III (B.Sc. Food Science & Nutrition)
Semester VI/Ppr.no.46/ Major Practical - 6**

DIETETICS

Menu Planning for

- a) Underweight and Obesity
- b) Diabetics
- c) Peptic Ulcer
- d) Cardiovascular disease
- e) Renal Disorders
- f) Fever

**MSU/2016-17/UG colleges/Part III (B.Sc. Food Science & Nutrition)
Semester VI/ Ppr.no.47/Major Practical - 7**

FOOD CHEMISTRY

- a. Determination of gluten content
- b. Preparation of colloid, gel, foam, emulsion
- c. Determination of acidity in flour
- d. Determination of acid value and free fatty acids
- e. Determination of peroxide value in fat and oil
- f. Purity in fat and oil
- g. Evaluation of milk samples