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 2016- 2017 onwards)
(45th SCAA meeting held on 09.02.2017)

Sem.	Sub. No.	Sub. status	Sub Title	Hrs/ Week	Credits	Marks				
						Maximum			Passing Minimum	
						Int.	Ext.	Tot.	Ext	Tot.
III	13	Core-7	Nutritional Biochemistry	6	5	25	75	100	38	50
	14	Core-8	Food Processing and Preservation	6	5	25	75	100	38	50
	15	Core-9	Advanced Baking	6	5	25	75	100	38	50
	16	Core-10	Research Methodology	6	5	25	75	100	38	50
	17	Practical III	Food Processing and Preservation	3	-	-	-	-	-	-
	18	Practical IV	Advanced Baking	3	-	--	-	-	-	-
IV	19	Core 11	Human Factors and Ergonomics	6	4	25	75	100	38	50
	20	Core 12	Food Quality Control	6	4	25	75	100	38	50
	21	Core 13	Nutrition for Fitness	6	4	25	75	100	38	50
	22	Practical III	Food Processing and Preservation	3	4	50	50	100	25	50
	23	Practical IV	Advanced Baking	3	4	50	50	100	25	50
	24	Project	Project	3	5	50	50	100	25	50

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

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

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

a) Co-enzyme- Definition and its types.
b) Structure and function of DNA- transcription and replication.
c) 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.

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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

Milk and Milk products - processing methods and product preparations.

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.

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.

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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 Equipments

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:

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.

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.

Unit V

Icings, Cookies and Pastries.

Icings: Butter cream, royal icings, almond paste, fondant icing, gum paste, American frosting, water icings/ glace icings.

Cookies: Difference between biscuits and cookies, method for mixing cookies, types of cookies, faults and their causes.

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.

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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)

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FOOD PROCESSING AND PRESERVATION PRACTICAL

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.

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ADVANCED BAKING PRACTICAL

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.

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

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

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 , McGrawHill, 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.

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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.

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.

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.

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1. Refrigeration and Freezing of fruits and vegetables.
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    - 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.

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Project