

**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI**

PG - COURSES – AFFILIATED COLLEGES

Course Structure for M.Sc. Nutrition and
Dietetics with Hospitality 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/ Wee k	Cre dits	Marks				
						Maximum			Passing Minimum	
						Int.	Ext.	Tot.	Ext	Tot
III	13	Core-7	Food Microbiology & Sanitation	6	5	25	75	100	38	50
	14	Core-8	Food Quality Control\Biochemical Changes in Diseases	6	5	25	75	100	38	50
	15	Core-9	Principles of Business Organization and Accounting	6	5	25	75	100	38	50
	16	Core -10	Research Methodology	6	5	25	75	100	38	50
	17	Practical II	Food Microbiology & Sanitation	3	2	50	50	100	25	50
	18	Practical V	Biochemical Changes In Diseases	3	2	50	50	100	25	50
IV	19	Core 11	Food Processing And Preservation	6	4	25	75	100	38	50
	20	Core 12	Nutrition For Fitness	6	4	25	75	100	38	50
	21	Core 13	Human Factors & Ergonomics	6	4	25	75	100	38	50
	22	Practical I	Food Processing And Preservation	3	4	50	50	100	25	50
	23	Practical II	Internship Training	3	4	50	50	100	25	50
	24	Project		3	5	50	50	100	25	50

FOOD MICROBIOLOGY AND SANITATION

Objectives

1. Understand the common organisms associated with food borne illness.
2. Gain knowledge on the necessity for cleanliness in preparation and service of foods.

UNIT -I

Sterilization

- a. Physical agents – Lights, Desiccation, Electricity and Heat.
- b. Chemical agents- removal of microorganisms and filtration
- c. Water-Sources of bacteriology of water supplies, Bacteriological examination, Purification.

UNIT - II

Microbiology of Fruits and Vegetables :

External contamination preservation and spoilage of fruits, contamination and control of microorganism in vegetables.

UNIT - III

Microbiology of Milk and Milk Products:

- a. Kinds of microorganism in milk
- b. Sources of contamination pathogens in milk
- c. Control of Microorganism
- d. Quality and methods of study

Microbiology of dairy products-fermented milk, butter and cheese

UNIT -IV

Microbiology of Cereal and Cereal Products

- a. Organism associated with grains
- b. Classification and control of molds in bread

UNIT -V

Microbiology of Flesh Foods

Microbiology of poultry, fish and meat products

Reference

1. Frazier, W.C. and Westhof, D.C., Food Microbiology, Tata MC Graw Hill Publishing Company Limited, 1993.
2. Johns, N Managing Food Hygiene, Mc Millan press Ltd., 1995.
3. Longree, K., Quantity Food sanitation, Inter Science Publishers, New York, 1955.
4. Joshua, A., Microbiology, Popular book depot publishers, New York, 1995.
5. Adams, M.R., Moss, M.O., Food Microbiology, New Age International (P) Limited Publishers, 1996.
6. Rodey, S., Hygiene and Sanitation in food Industry, Tata McGraw Hill Publishing Company Limited, New Delhi, 1999.
7. Kumar, H.D, Kumar, S., Modern concepts of Microbiology, Vikas publishing House Pvt. Limited, 1999.

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FOOD QUALITY CONTROL

Objectives

This course aims to :

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

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

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 flavor.

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

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

UNIT –II

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

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

UNIT-III

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

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

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.

HACCP – Food safety system.

UNIT-V

Laws and regulations for setting up of a processing unit

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Reference :

1. GiridarilalSidappa, G.S., and Tandon, G.L. (1979) Preservation of fruits and vegetables, ICAR, New Delhi.
2. FPO (1955), Quality Control.
3. Horace, D.Graham, 1980, the safety of foods, 2nd End, AVI publishing Co.Inc, Westport.
4. Julie Miller Jones, 1992, Food Safety, Eagan Press, USA.
5. Lewis M.J. 1987, Physical properties of food and processing system, Ellis Harwood Ltd., England.
6. Picgott, J.R, 1984, Sensory Analysis of Foods, Elsevier Applied Science Publisher, New York.

BIOCHEMICAL CHANGES IN DISEASES

Objectives :

- Understand the biochemical physiological impairments in diseases.
- Develop skills to analysis selected constituents in blood and urine during diseases.

UNIT: I

Biophysics

Principles involved in estimating calorimetry, chromatography, flame photometry, ion selective electrodes, radioimmunoassay, ELISA test.

UNIT: II

Disorders of Carbohydrate Metabolism

- a) Disorders associated with hyperglycemia, hypoglycemia.
- b) Urine glucose concentration, glucose in cerebrospinal fluid, ketone bodies in urine, identification of reducing sugars in urine- principles.
- c) Biochemical changes in diabetes mellitus and obesity.
- d) Inborn errors of carbohydrate metabolism

UNIT: III

Disorders of Lipid Metabolism

- a) Serum total cholesterol, triglyceride and lipoproteins, phospholipids, glycolipids
- b) Plasma lipids in various diseases - Atherosclerosis, hypertension, hypolipidemia, ketosis.
- c) Factors associated with development of heart diseases.
- d) Plasma lipoprotein levels in various diseases.
- e) Biochemical changes in atherosclerosis & fatty liver.
- f) Inborn errors of fat metabolism.

UNIT: IV

Disorders of Protein Metabolism

- a) Clinical significance of protein concentration in blood
- b) Cerebrospinal fluid and other body fluids- urine, lymph, synovial fluid, pleural fluid, transudate and exudates.
- c) Nitrogen metabolism with recommended readings to urea, uric acid, creatinine, creatine.
- d) Inborn errors of protein metabolism.

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UNIT: V

Haematology and Body Electrolytes

- a) Hematology- Physical and biochemical changes in AIDS, cancer and different types of anaemia and haemophilia.
- b) Body Electrolytes -Law of electron neutrality, maintenance of pH, buffer system in the body, regulation of acid base balance, role of sodium, potassium & chlorine.

RECOMMENDED READINGS:

1. Gowen lock, AH, varleys practical Biochemistry, CBC publishers, New Delhi, 1980.
2. Williams, DI and Vincent, R, Bio Chemistry in Clinical Practice 1990.
3. Zubey, Biochemistry, III Edition MC Brown communication, 1993.
4. Mukergee, K.L, Medical Laboratory technology, Tata MaGraw Hill Publishing Company, Co-Ltd, New Delhi.
5. Chatergee, M.N and Shinde R, Texrbook of Medical Biochemistry, Jay Pee Brothers Medical Publishing Pvt Ltd, New Delhi.
6. Lehinger A L, Nelson DC and Cox MM, Principles of biochemistry, CBS Publishers and distributors, Jain Bhavan, BhalaNatu Nagar.
7. Oser. B.I. Hawkes, Physiological Chemistry, XIV Tata Mac Graw Hill Publishing corporation Limited.
8. Jayaram, J. Laboratory manual in Bio Chemistry, New age international Ltd. Publishers, NewDelhi.

INDIVIDUAL EXPERIMENTS

I ANALYSIS THE BLOOD

Glucose

Hemoglobin

Total Cholesterol

Lipoprotein factors

Serum A/C ratio and total protein

Serum phospholipids

\ Serum Vitamin - A

Serum alkaline phosphatase

Serum Glutamate Oxaloacetate transaminase

Serum glutamate pyruvate

Serum Bilirubin

II. ANALYSIS OF URINE

Creatinine

Urea

Total nitrogen - albumin

\ Calcium

Phosphorus

Vitamin C

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PRINCIPLES OF BUSINESS ORGANIZATION AND ACCOUNTING

Objectives

1. Understand the legal formalities of starting various types of business organization.
2. Gain knowledge on the various sources of finance.

UNIT- I

Scope of Business:

- a. Objects of modern business Essential of a successful business
- b. Forms of Business Organization
- c. Type of companies - Sole proprietorship, partnership, Joint Stock Company.

Important documents of companies, State enterprises

UNIT- II

Sources of Finance and Principles of Accounting

- d. Important Finance - sources of company finance, source of long term and short term finance.
- e. Kinds of shares, Debentures - Ploughing back of profits.
- f. Role of banks and other financial institutions
- g. Journal and ledger
- h. Trial balance, preparation of cash book, subsidiary books.

UNIT –III

Marketing, Sales Promotion and Cost Control

- i. Channels of Distribution
- j. Importance of middlemen in trade, Wholesale and retail trade with reference
- k. Salesmanship and advertisement

Methods of controlling cost, Types of Cost, Cost Sheet

UNIT- IV

Small Scale Industry:

- a. Need for Management problems of small
- b. Government policy towards small business
- c. Development schemes
- d. Registration of Industrial estates - Objectives – Advantages

UNIT - V

Preparation of Final Accounts:

- e. Preparation of Trading A/C, Profit and Loss Account, Balance Sheet - Simple adjustments.

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Reference:

1. N. Mani, P.L. and Nagarajan, K.L.I., Principles of Accounting, Himalaya Publications, New Delhi 2003.
2. Reddy, T.S., Murthy. A, Financial Accounting, Margham Publications, Chennai, 2003.
3. Jain, S.P., and Narang, M., Financial Accounting Kalyani Publishers, Ludhina, 2003.
4. Jain, S.P., and Narang, K,I., Cost Accounting Kalyani Publishers, Ludhina, 2003.
5. Reddy, P.N., Gulshan, Principles of Business Organisation and Management, Eurasia Publishing House, New Delhi, 2003.
6. Bhusan, Y.K, Fundamentals of Business Organisation and Management, Sultan Chand and Sons, New Delhi, 2003.

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

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- 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

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- 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)

FOOD MICROBIOLOGY AND SANITATION

1. Visit to water plant to observe methods of purification.
2. Microbial examination of fruits – surface washing.
3. Determination of quality of milk.
4. Identify types of microorganisms in cereal and cereal products.
5. Microbial examination of fleshy foods surface washing.
6. Visit to water plant to observe methods of sewage treatment

BIOCHEMICAL CHANGES IN DISEASES

INDIVIDUAL EXPERIMENTS

ANALYSIS THE BLOOD

Glucose

Hemoglobin

Total Cholesterol

Lipoprotein factors

Serum A/C ratio and total protein

Serum phospholipids

Serum Vitamin - A

Serum alkaline phosphatase

Serum Glutamate Oxaloacetate transaminase

Serum glutamate pyruvate

Serum Bilirubin

II. ANALYSIS OF URINE

Creatinine

Urea

Total nitrogen - albumin

Calcium

Phosphorus

Vitamin C

III DEMONSTRATION EXPERIMENTS

Analysis of food for

Dietary fibre

Sodium

Potassium

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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-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.

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. Desrosier, 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.

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4. Ranganna, S. 1986. Handbook of Analysis and quality control for fruit and vegetable processing, 2ndEdn., 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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NUTRITION FOR FITNESS

UNIT- I

Yoga- Meaning, Aims and objectives, significance, Systems of Yoga - Eight limbs of yoga.

UNIT-II

Asanas

a) Classification, difference between physical exercise and yogic exercise.

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

Exercise and Weight Control

a) 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 paper back, 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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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

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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)OsborneDavid : Ergonomics at work, John Wiley and sons, New York.
- (4)Dul Jan and Weed mesterBernard : Ergonomics for Beginners, Tylor and Francis, London.
- (5)Wilson J.R. and Corlett N. : Evaluation of Human Work. A Practical Ergonomics Methodology . Tylor and Francis, London.
- (6)PheasanStephan : Body space, Anthropometry , Ergonomics and the Designs at work, T ylor& Francis, London.

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Practical - (Food Processing & Preservation)

1. Visit to wheat and rice milling plants.
2. Visit to Aavin and other private milk plants.

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Internship Training

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Project