

**K. J. SOMAIYA COLLEGE OF SCIENCE AND COMMERCE ,
AUTONOMOUS**

**DIPLOMA/ CERTIFICATE COURSE IN NUTRITION,
DIETETICS AND FOOD SERVICE MANAGEMENT**

**Department of Biochemistry
2019-2020**

Course Details

- ❖ **Course type** : Certificate / Diploma
- ❖ **Course Title** : Diploma/ Certificate course in nutrition, dietetics and food service management
- ❖ **Preamble** : Food is an indispensable part of our life and safety of food is the grave concern for us. nutrition, dietetics and food service management, Food Quality and Safety has been an area of priority for consumers, retailers, manufacturers and regulators.

The Diploma is intended for graduates in Science/ Agriculture/ Food Science or Allied Disciplines contemplating a career in nutrition, dietetics and food service management. It is also intended for Professionals in food domain for strengthening their proficiency in design and implementations of quality management systems. The programme shall also open new vista for entrepreneurs who intend to diversify in nutrition, dietetics and food service management aspect.

This programme is designed to develop a practical “hands on training” in nutrition, dietetics and food service management. The programme incorporates the specialized knowledge and skills required to implement the fundamental principles of ‘Quality Assurance.’ Schedules will be provided with knowledge required to either enter into or progress within the food industry. This programme is equally beneficial to those who wants complement their pre-existing skills and knowledge by upgrading.

This Diploma programme aims to improve the overall health of people through nutrition. The mission is to provide students with a broad educational background in the science of food and nutrition and food service management. The field of nutrition & dietetics is a multi dimensional field with practical application in our day-to-day lives. With its dynamic and interesting curriculum, this course aims at producing versatile candidates in the field of nutrition and dietetics.

❖ **Objectives of course** :

1. To train the students to be competent working professionals in the food industry, in the production of quality food by imparting better nutritional, sanitation & hygiene concepts.
2. To encourage students to the entrepreneurs and develop the capacity for setting up small scale enterprises with respect to food within the country.
3. To organize functions for creating awareness about the importance of safe processed nutritious food.
4. To provide diagnostic analysis of food products.

❖ **Learning Outcomes** :

1. Versatile candidates in the field of nutrition and dietetics.
2. Competent working professionals in the food industry

❖ **Prerequisites / Eligibility Criteria** : 10+2 with Science stream and pursuing graduation in field of science /hotel management.

❖ **Intake Capacity** : 20

❖ **Duration** : 1 year Diploma course /6 months Certificate course

❖ **Course Coordinator** : Mrs. Saeema Khan

❖ **Career opportunities:**

Nutritionists & dieticians could find employment in Food Service and Processing Industry, Hospitals, health clubs, hotels, Catering departments of star hotels, research labs of food manufacturers, health departments of government etc.

- Have wider scope in Government sponsored Nutrition programmes and projects in improving health and nutrition both at the National and International level.
- As research assistants /associates in institutes undertaking research programmes in Dietetics, Food Science, Nutrition and health.
- They can work as teaching faculty in higher education and also in Higher Secondary schools offering Home Science at plus two levels.
- There is a great demand in the global nutrition & food industry for highly knowledgeable and competent food scientists.
- Have limitless entrepreneurial opportunities in Quantity Food Production.
- As Nutrition and Food experts in hotels and other catering industries.

❖ Syllabus

Semester I (Certificate Course)

Course Code	Topic Headings	Credits
19S1DFSM1	Basics of Human Nutrition	4
19S1DFSM2	Lifespan Nutrition	4
19S1DFSM3	Dietetics	4
19DFSM1P	Practicals	8

Semester II (Diploma Course)

Course Code	Topic Headings	Credits
19S2DFSM1	Food Microbiology and Food Preservation	4
19S2DFSM2	Food Quality Control	4
19S2DFSM3	Food Service Management	4
19DFSM2P	Practicals	8

Course Code	UNIT	TOPIC HEADINGS	Credits
19S1DFSM1	I	Carbohydrates	4
	II	Lipids & Fats	
	III	Proteins & Amino acids	
	IV	Minerals and Vitamins	
19S1DFSM2	I	Nutrition for Infants	4
	II	Nutrition for children	
	III	Nutrition for Adults	
	IV	Nutrition in old age	
19S1DFSM3	I	Energy & Recommended Dietary Allowances (RDA)	4
	II	Nutrition in Pregnancy and Lactation	
	III	Nutrition for therapeutic Condition	
	IV	Meal Planning and Scientific Principles Underlying Food Preparation	
19S2DFSM1	I	Introduction to food microbiology	4
	II	Food poisoning and food borne diseases	
	III	Hygiene and sanitation in preparation and serving area	
	IV	Food preservation	
19S2DFSM2	I	Food adulteration, QC, GMP	4
	II	Quality improvement techniques	
	III	Food safety	
	IV	Quantity food preparation and service	
19S2DFSM3	I	Introduction to Food Service Management	4
	II	Theories of management and approaches	
	III	Principles and procedures of management	
	IV	Personnel and Financial Management	
19DFSM1P		Practicals (Semester I)	8
19DFSM2P		Practicals (Semester II)	4
		Project work/Field work/ training	4

Paper I

Title :- Basics of Human Nutrition

Credits :- 4 credits

Sr. no.	1. Title	No. of lectures
1	Carbohydrates Occurrence and classification of food carbohydrates Properties of food carbohydrates Changes in food carbohydrates during processing Importance of glucose, fructose, starch, glycogen, pectin, gums in food evaluation Dietary fibre, crude fibre and application of food carbohydrates	15
2	Lipids & Fats Introduction and definition of lipids and their classification Various types of lipids – Simple, conjugated, phospholipids and their occurrence in foods Fatty acid composition and physical and chemical characteristics of various fats and oils Iodine value, saponification value, acid value, Reichert-Meissel value Storage changes in fats and oils, antioxidation, effect of various metals, Refining of fats and oils; Hydrogenation of vegetable oils.	15
3	Proteins & Amino acids Chemistry and classification of amino acids and proteins, Physico-Chemical properties of protein and their structure, Nature of food proteins – Plant, animal and other relative merits	15
4	Minerals and Vitamins Minerals (Ca, P, Fe, I, Na, K, Zn, Cu, Ni, Pb) Various metallic elements occurring in foods; Level of occurrence Sources, Functions, Deficiency & toxicity, Unit of measurement, RDA Vitamins Classification (Fat Soluble and Water Soluble) Sources, Functions, Deficiency & toxicity, Unit of measurement, RDA	15

Paper II

Title :- Lifespan Nutrition

Credits :- 4 credits

Sr. no.	Title	No. of lectures
1	Nutrition for Infants Nutritional status of the infants- growth of infants, growth monitoring, nutritional requirements, basis and recommended dietary allowances for the infants, breast- feeding Vs. formula feeding, weaning foods suitable for infants, feeding the premature infants.	15
2	Nutrition for Children Physical growth, nutritional status of school age children, food habits and nutritional requirements, basis and recommended dietary allowances. Packed lunch.	15
3	Nutrition for Adults Physical, physiological and psychological changes in adolescents, nutritional needs, requirements and RDA of adolescents, food habits and promotion of desirable eating habits in adolescents, changes needed to prevent malnutrition in adolescents, habits and disorders affecting food intake.	15
4	Nutrition in Old Age Physiological and psychological changes during old age, nutritional requirements, factors affecting food intake, common nutritional problems in old age.	15

Paper III

Title :- Dietetics

Credits :- 4 credits

Sr. no.	Title	No. of lectures
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1	<p>Energy and Recommended Dietary allowances (RDA)</p> <p>Energy Introduction, Calorific value of foods, determination of calorific value, BMR,SDA, sources, deficiency, PEM, Requirements, RDA, Unit of measurement</p> <p>Recommended Dietary allowances (RDA) Definition, factors affecting RDA, Methods used to calculate RDA, Practical application of RDA, Reference man and woman.</p>	15
2	<p>Nutrition in pregnancy and Lactation</p> <p>Nutrition in Pregnancy Nutritional status and general health, physiological adaptations in pregnancy, effect of nutritional status on pregnancy the nature of weight gain, storage of nutrients in normal pregnancy, RDA and basis for requirements during pregnancy. Diet during pregnancy, complications of pregnancy with dietary implications.</p> <p>Nutrition in Lactation Physiological adjustments during lactation, hormonal controls & reflex action, lactation in relation to growth and health of infants, problems of breast feeding, nutritional components of colostrum and mature milk, special foods during lactation, nutritional requirements and its basis during lactation, diet during lactation.</p>	15
3	<p>Nutrition for therapeutic condition:</p> <p>Nutrition for Hypertension, CVD, Diabetes mellitus, anemia, Renal disorders, CRF, ARF, Jaundice, gastritis, peptic ulcer, flatulence, malabsorption syndrome, inflammatory bowel syndrome, hepatitis, cirrhosis of liver, cholecystitis, cholelithiasis and pancreatitis</p> <p>Nutrition for health & weight management, Exercise and Sport performance bone health.</p>	15
4	<p>Meal planning and Scientific Principles Underlying Food Preparation</p> <p>Meal planning: Factors to be considered when planning the regular balanced diet: adequacy, balance caloric control, moderation, variety and aesthetics, Meals for persons at all stages of the life cycle, Modification of the regular diet to suit therapeutic and other needs</p>	15

	<p>Scientific Principles Underlying Food Preparation</p> <p>Effect of heat on various foods: meats; vegetables; fruits; poultry; eggs.</p> <p>Heat transfer methods and application - dry, moist and combination.</p> <p>Principles involved in different methods of cooking.</p> <p>Effects of heat on nutrients found in foods.</p> <p>Food preparation methods to retain nutritive properties, colour and flavour.</p>	
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Semester II

Paper I

Title :- Food microbiology & Food preservation

Credits :- 4 credits

Sr. no.	Title	No. of lectures
1	<p>Introduction to microbiology</p> <p>Characteristics and morphology of bacteria, fungi, virus, algae and protozoa</p> <p>Introduction to microscope, culture Medias, types and Culture techniques, Microbial Growth curve, Factors affecting microbial growth</p> <p>The role and significance of microorganisms in nature and in foods – Primary sources of microorganisms in foods, Intrinsic and Extrinsic parameters of foods that affect microbial growth, The incidence and types of microorganisms in foods.</p>	15
2	<p>Food poisoning and Food borne diseases</p> <p>Definition, Classification (Food infections and intoxication)</p> <p>Food hazard- definition, types</p> <p>Food poisoning- types, prevention and control</p> <p>Diseases- neurolathyrism, Botulism, aflatoxin, ergotism, staphylococcal intoxication, salmonellosis etc</p>	15
3	<p>Hygiene and sanitation in preparation and serving area – Personal hygiene, types, sources of contamination, prevention, safety measures, methods of controlling infestation, methods of dish washing</p>	15

4	<p>Food preservation</p> <p>Introduction, Importance, principle and Types</p> <p>High and low temperatures preservation</p> <p>Pasteurization, Sterilization, Canning , Freezing, Refrigeration</p> <p>Moisture removal preservation technique</p> <p>Concentration, Drying, Dehydration, Freeze Drying, Dehydro freezing</p> <p>Fermentation, irradiation, combination and pickling techniques</p> <p>Types of Fermentation, Fermented Foods, Properties of irradiation, Microwave heating</p>	15
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Paper II

Title :- Food Quality Control

Credits :- 4 credits

Sr. no.	Title	No. of lectures
1	<p>Food Adulteration, QC, GMP</p> <p>General principles of Quality Control and Good Manufacturing Practices in food industry.</p> <p>Determination of shelf – life of food products, transport of perishable food items.</p> <p>Food Adulteration- Definition, Classification, Health hazards caused by various adulterants, Critical levels of metals in various foods</p>	15
2	<p>Quality improvement techniques</p> <p>Quality Improvement Plans(QIP), Quality Control Circles(QCC), Total quality management (TQM)</p>	15
3	<p>Food safety</p> <p>Laws and regulations, regulatory agencies ISI ,Agmark Role of, WHO, FAO, UNICEF, ICAR, NIN, ICMR, Food Nutrition Board, CFTRI, NSI, IDA, ICDS and FDA in food industry</p>	15
4	<p>Quantity food preparation and service - Definition. Principles of quantity food purchase- selection, buying and accounting of different foods.Inventory management- assessing requirements, receiving of stock, release of stocks,</p>	15

Record maintenance. Factors in menu planning for large groups, systems for maintaining quality in food preparation and service Kitchen control and maintenance of Kitchen records. Tools of management – Definition, classification:- tangible tools, intangible tools, Organization chart, structure, function, work improvement techniques	
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Paper III

Title :- Food Service Management

Credits :- 4 credits

Sr. no.	Title	No. of lectures
1	Introduction to Food Service Management: Definition of food service industry, principles of food service industry, objectives, types of food service industry Hospitals, school meals, hostels, Industrial canteens, commercial hotel, canteens Institutions catering to different types of handicapped personnel.	15
2	Theories of management and approaches -Classical or traditional theory, Neoclassical approach, Quantitative approach, MBO approach, System approach, Behavioral and Human relations, Contingency approach, JIT approach, Total quality management approach, Management science or operation research Developing objectives and goals -Definition, importance, types of goals, Policies, procedures, rules.	15
3	Principles and procedures of management -Definition of management, organization & interaction at work •principles of management, functions of management , Managerial roles & responsibilities, the manager& leadership quality.	15
4	Personnel and Financial management – Personnel Management Definition, scope, concept of personnel management, approaches of	15

personnel management, personnel policies, staff employment, training, placement, promotion, personnel records, work appraisals.	
Financial management -Definition, scope of financial management, financial accounting, management accounting, budgeting, costing, cost control, accounting.	

PRACTICALS

Semester I (Credits: 8)

1. Planning and preparation of meals for Adult women/Adult men/Pregnant women/Lactating women/Infancy/Preschooler/School going child(Male and Female)/Adolescent/Elderly(Male and Female)
2. Standardization of recipe: Using ingredients from different food groups, plan and prepare the recipe for different therapeutic conditions
3. Determination of the ideal frying temperature for different fats and learn the house hold tests for oil readiness for frying.
4. Determination of effect of added substances, surface area and temperature on oil absorption.
5. Preparation of Jams/Jellies/Squashes/Syrups/Sauces/Chutneys/Pickles(short term/Long term)/dehydrated products/ instant foods and masalas
6. Estimation of fat by Soxhlet extraction method.
7. Estimation Iodine value of fats and oils
8. Estimation of Saponification value
9. Estimation of Peroxide value
10. Free fatty acids in fats and oils
11. Determination of protein in foods (Folin/Ciocalteau method / Biuret test)
12. Determination of total and acid insoluble ash
13. Spectrophotometric determination of reducing and total sugars
14. Estimation of crude fibre in foods (gravimetric)
15. Determination of vitamin C (volumetric)
16. Quantitative analysis of proteins & carbohydrates.
17. Determination of moisture by air oven method and vacuum
18. Planning and preparation of diets for various disorders/sports persons
19. Fitness assessment- height, weight and body composition, Body fat determinations by different methods.
20. Proximate analysis: estimation of moisture, crude protein, crude fat, ash
21. Mineral analysis: Estimation calcium, phosphorous, iron from food samples

Semester II Practicals :-(Credits: 4)

1. Detection of adulteration in various foods
2. Study of compound microscope
3. Introduction to aseptic handling in the laboratory, Explanation of the principles of food preservation and sources of contamination
4. Working and handling of common microbiological laboratory equipment and materials
5. Gram staining
6. Capsule staining and other Food microbiology practicals
7. Isolation, Enumeration and Characteristics of microorganisms
8. Sensory evaluation techniques and their applications
9. Visit to canning and cold storage plants and various food industries for developing an awareness of commercial techniques of food preservation and packaging.
10. Detection and Determination of Coliforms, Faecal coliforms and *E. coli* in Foods and Beverages
11. Detection and Confirmation of *Salmonella* species in Foods
12. Detection, Determination and Confirmation of *Staphylococcus aureus* in Foods
13. Estimation of Yeasts and Moulds in Foods
14. Bacteriological Examination of water for water Coliforms

Project work/Field work/ training (4 Credits)

❖ **Evaluation Pattern :**

Distribution of Marks and Credits

Course	Semester	Marks			Credits		
		Theory	Practical	Total	Theory	Practical	Total
Certificate/ Diploma	I	3 Papers X 100 = 300 Marks	1 Practical =200 Marks	500	12	8	20
	II	3 Papers X 100 = 300 Marks	Research project = 200 Marks	500	12	8	20
TOTAL				1000			40

Theory :- 100 marks

(60 marks theory paper at semester end and 40 marks for Internal evaluation)

Certificate course:- Completion of only Semester I will be mandatory

Diploma course:- Completion of both Semester I & II will be mandatory

❖ **Reference Books:**

1. Clinical dietetics & nutrition – F.P. Anita
2. Food science chemistry & experimental foods – Dr. M. Swaminathan
3. Normal and therapeutic nutrition – H. Robinson
4. Food and nutrition – Dr. M. Swaminathan
5. Nutritive value of Indian Foods – G. Gopalan
6. A textbook of bio-chemistry- A.V.S.S Rama Rao
7. Text book of Biochemistry & Human Biology – G.P .Talwar
8. Principles of Food science by Borgstrom and Macmillon
9. Food science by Potter & Hotchkiss.
10. Fundamentals of food & nutrition, Mudambi & Raj Gopal IV Edition 2001
11. Nutritional Biochemistry & Metabolism – Linten.
12. Human Nutrition & Dietics- Davidson & Passmore (ELBS)
13. Text book of Biochemistry & Human Biology – G.P .Talwar
14. Text book of Human Nutrition – M.S.Banerji, N.Pralhad Rao & V.Reddy.
15. A text Book of Medical Biochemistry- M.N Chatterje and R. Shindea, Jaypeepub.
16. Harpers Illustrated Biochemistry- R.K murray, D.kGarnnes. And V.V Rodwell,
17. Dietetics – B Srilakshmi
18. A First Course in Food Analysis - Sathe, A.Y

19. Catering Management :An Integrated Approach - Sethi, Mohini
20. Fasting and Feasting – Then and Now - Sethi, Mohini
21. Institutional Food Management - Sethi, Mohini
22. Hand book of analysis & quality control by fruits & vegetables by Rangana S
23. Life span nutrition- Conception through life- S.R Rolfes, LK De Bruyne and E.N Whitney.
24. Understanding normal and Clinical nutrition, Whitney, Cataldo of holfes Sixth edition
25. Nutritional Biochemistry- Tom Brody.
26. Normal and Therapeutic nutrition CH Robinson and MR Lawler.
27. Principles of Nutrition - M. Swaminathan.
28. Nutrition in Health & Diseases - Cooper.
29. Modern Nutrition in Health and Diseases - M.E. Skilis and V.R. Young
30. *Nutrition Science-B Srilakshmi*
31. Industrial Microbiology – AH Patel, McMillan India Ltd, 1st Edition
32. Food Microbiology – Frazier & Westhoff, Tata McGraw Hill Publishers, New Delhi
33. Microbiology – Anna .K Joshna
34. Food and nutrition – Dr. M. Swaminathan
35. Food Microbiology. 2nd Edition By Adams
36. Modern Microbiology, James M.Jay
37. Fundamental Food Microbiology ,Bibek Ray. CRC press
38. GMP for pharmaceuticals, A plan for TQC – SH Wiling & JR Stoker
39. Total Quality Assurance for the Food Industries – WA Gould & RW Gould.
40. Current Good Manufacturing Practices for Food Plan Sanitation – WA Gould,