



**SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE**

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)  
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution &  
Accredited by NAAC with "A" Grade)

Madagadipet, Puducherry - 605 107



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## **SCHOOL OF ARTS AND SCIENCE**

### **Department of Food Science**

#### **B.Sc. Nutrition and Dietetics**

#### **SEMESTER III AND IV SYLLABUS**

*Department of Food Science(B.Sc.Nutrition and Dietetics)*

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**SEMESTER – III**

S. No	Course Code	Course Title	Category	Periods			Credits	Max.Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20NDT307	Nutrition Through Life Cycle	DSC	4	0	0	4	25	75	100
2	A20NDT308	Food Microbiology	DSC	4	0	0	4	25	75	100
3	A20NDE301	Food Safety and Sanitation	DSE	3	0	0	3	25	75	100
4	A20CPD301	Computer Basics	IDC	3	1	0	4	25	75	100
5	A20XXO3XX	Open Elective–I	OE	2	0	0	2	25	75	100
Practical										
6	A20NDL309	Nutrition Through Life Cycle Practical - I	DSC	0	0	4	2	50	50	100
7	A20NDL310	Food Microbiology Practical	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20NDS303	Functional Foods	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20NDC303	Certification Course III	EEC	2	0	2	0	100	0	100
							23	425	475	900

**SEMESTER– IV**

S. No	Course Code	Course Title	Category	Periods			Credits	Max.Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	A20NDT411	Nutritional Biochemistry	DSC	4	0	0	4	25	75	100
2	A20NDT412	Bakery and Confectionery	DSC	4	0	0	4	25	75	100
3	A20NDE402	Nutritional Assessment and Surveillance	DSE	3	0	0	3	25	75	100
4	A20NDD406	Food Standards and Quality Control	IDC	3	1	0	4	25	75	100
5	A20XXO4XX	Open Elective	OE	2	0	0	2	25	75	100
Practical										
6	A20NDL413	Nutritional Biochemistry Practical	DSC	0	0	4	2	50	50	100
7	A20NDL414	Bakery and Confectionery Practical	DSC	0	0	4	2	50	50	100
Skill Enhancement Course										
8	A20NDS404	Interior Decoration in Food Service Units	SEC	0	0	4	2	100	0	100
Employment Enhancement Course										
9	A20NDC404	Certification Course IV	EEC	2	0	2	0	100	0	100
							23	425	475	900

Department of Food Science(B.Sc.Nutrition and Dietetics)




## SEMESTER III

### NUTRITION THROUGH LIFE CYCLE

**A20NDT307****L T P C Hrs****4 0 0 4 60****Objectives:**

To enable the students to

1. Understand the importance of nutrition and health.
2. Obtain knowledge on the nutritional needs pertaining to pregnancy and lactation.
3. Acquire the nutritional needs for infants and childhood stage.
4. Plan a diet for school children and adolescents.
5. Plan a diet for adult and oldage group.

**Course Outcomes**

After the completion of the course, the students will be able to

- CO1 - Understand the concept of balanced diet  
 CO2 - Enable the students to know nutritional requirements for pregnancy and lactation  
 CO3 - Know the in depth knowledge requirements and complications of infants  
 CO4 – Obtain the basic requirements and problems of adolescents  
 CO5 – Get acquainted about the dietary modifications of adult and elderly people.

**UNIT I****(12 hrs)**

Balanced Diet - Basics guidelines for planning Balanced Diet, Calculation of balanced diet for different categories of people.

Meal Planning – Principles & Factors to be considered in meal planning.

Steps in Menu Planning

**UNIT II****(12 hrs)**

Nutrition during pregnancy – Physiological changes, Nutritional requirements, Dietary modifications and complications.

Nutrition for lactating women – Physiological changes, Nutritional and food requirements, hormonal control, Indian Nursing mothers

**UNIT III****(12 hrs)**

Nutrition in infancy – Growth and development during Infancy, Nutritional requirements, Breast Feeding, Artificial Feeding, Preterm baby, Weaning and supplementary foods, feeding problems.

Nutrition in preschool age – Growth and development, Nutritional requirements, factors affecting nutritional status, food requirement, low cost supplementary foods, nutrition related problems in childhood.




#### UNIT IV

(12 hrs)

Nutrition in the school age children – Nutritional and food requirement, Feeding problems, Packed lunch

Nutrition in adolescence -Nutritional requirements, Food Habits, Nutritional problems.

#### UNIT V

(12 hrs)

Nutrition in adulthood – Nutritional requirements of an adult man and women, health related issues, planning diet to suit different income levels.

Nutrition in elderly – Process of ageing, Nutritional requirement, Modification of diet in old age, Drug - Food and Nutrient reaction.

#### Text books:

1. Mahtab, S, Bamji, Kamala Krishnasamy, G.N.V. Brahmam, *Text Book of Human Nutrition*, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2012.
2. Srilakshmi, B., *Dietetics*, New Age International (P) Ltd., New Delhi, 2013.
3. Swaminathan, M., *Advanced Textbook on Food and Nutrition*, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore, 2012.

#### Reference books:

1. *Dietary Guidelines for Indians*, ICMR, National Institute of Nutrition, Hyderabad, 2013.
2. Gopalan, C. Rama Sastri B.V. and Balasubramanian, *Nutritive Value of Indian Foods*, NIN, ICMR, Hyderabad, 2014.
3. Krause, M.V. and Hunscher, M.A., *Food, Nutrition and Diet Therapy*, 14th Edition, W.B. Saunders

#### Web References :

- <https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=315&printable=1>  
<https://mynutrition.wsu.edu/nutrition-basics>  
<https://www.getsmarter.com/blog/market-trends/what-are-macronutrients-and-micronutrients/>



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**A20NDT308****FOOD MICROBIOLOGY****L T P C Hrs****4 0 0 4 60****Objectives:**

To enable the students to

1. Know about the different types of microbes and its significance
2. Acquire the knowledge of food spoilage of perishable foods
3. Acquire the knowledge of food spoilage of non perishable foods
4. Understand the knowledge of food related microbial diseases
5. Know the beneficial effects of microorganisms

**Course Outcomes**

After the completion of the course, the students will be able to

CO1 - Understand the different microorganisms and their importance

CO2 - Enable the students to know different types microbial spoilage of perishable foods

CO3 - Enable the students to know different types microbial spoilage of perishable foods

CO4 – know the indepth knowledge of food related microbial diseases

CO5 – Get acquainted with the beneficial effects of microorganisms

**UNIT I Introduction****(15 hrs)**

Classification &amp; Morphology of Micro- organisms -Bacteria, Virus, Yeasts, Moulds, Algae, Protozoa

Factors influencing growth of Microorganism - Oxygen – Water Availability, Nutrition, Temperature, H<sup>+</sup> ion Concentration, Light and Osmotic pressure.

Economic Importance of Bacteria, Yeast, Moulds

**UNIT II Microbiology of Perishable Foods****(10 hrs)**

Outline of Contamination- Spoilage and Preservation of Vegetables and Fruits, Milk and Milk Products and Canned Foods, Meat and Meat Products, Egg and Poultry

**UNIT III Microbiology of Non-Perishable Foods****(10 hrs)**

Outline of Contamination- Spoilage and Preservation of Cereal and Cereal Products and Sugar and Sugar Products

**UNIT IV Food Related Microbial Diseases****(15 hrs)**

Causative agents, Incubation period, Symptoms, Prevention and Treatment. Bacterial diseases, Viral diseases and Fungal Diseases

**UNIT V Beneficial effects of Microorganism****(10 hrs)**

Fermented Foods – Curd, Cheese, Sauerkraut, Meat, Soy Based Foods, Alcoholic Beverages and Vinegar, Microbial Biomass

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### Text Books

1. Salle, A.J.: Fundamental Principles of Bacteriology – Read Books, 2007
2. Dubey, R.C & Maheshwari.D.K.; A Textbook of Micro – biology, S. Chand Publishing; IV Edition 2013
3. Pelczar J. Michael: Micro-biology Concepts and Applications, McGraw –Hill,1993
4. Ananthanarayan.R & Paniker C.K.J.: Textbook of Microbiology, Universities Press; Tenth edition 2017
5. Ray. B, Bhunia. A, Fundamental Food Microbiology, CRC Press,V Edition, 2013.

### References

6. Willey J, Sherwood. L, Woolverton J.C, Prescott's Microbiology, McGraw-Hill Education, IX Edition, 2013
7. Joshua A.K.: Micro-biology - India Printing works, Madras - 1971
8. Carpenter: Micro-biology - W.B. Saunders Co., London, 1968
9. Frazier. W.C.: Food Micro-biology - McGraw Hill Book and Co; New York, 1967



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**A20NDE301****FOOD SAFETY AND SANITATION****L T P C Hrs****3 0 0 3 45****Objectives:**

To enable the students to

1. Understand the causes and prevention of food spoilage
2. Understand the principles of cleaning and sanitation
3. Identify the knowledge of safety programmes
4. Acquire the knowledge of employee safety and personal hygiene
5. Determine the food safety standard operating procedures.

**Course Outcomes**

After the completion of the course, the students will be able to

CO1 - Analyse the microbial spoilage of food

CO2 - Enable the students to know the importance of cleaning and sanitation

CO3 - Know the in depth knowledge regarding safety programmes adhering

CO4 – Get acquainted with employee safety

CO5 – Get acquainted about the food safety standard operating procedures.

**UNIT-I: Food Contamination and Spoilage****(9 hrs)**

Micro organism causing Food Borne Infection and Illness

Spoilage – Classification, Type and Spoilage Indicators in Different categories of Food

**UNIT II: Cleaning and Sanitation****(9 hrs)**

Principles of Cleaning and Sanitation,

Mechanical and Manual Dishwashing - Kitchen utensils, Glassware and silverware

**UNIT III: Safety in Food Facilities****(9 hrs)**

Potential Hazards in Food Production

Safety Programmes – Three E's – Engineering, Education and Enforcement,

Worker Safety – Types of Injury, OSHA

Pest Control - Signs of Infestation and Integrated Pest Management (IPM)

**UNIT IV: Employee Safety and Personal Hygiene****(9 hrs)**

Accident &amp; Safety in Food Establishments-Types of Injuries, Self Inspection,

Safety Checks, Management during Emergency

Necessity for Personal Hygiene, Health of Staff, Personal Appearance,

Sanitary Practices.

**UNIT V: Food Safety****(9 hrs)**

Standard Operating Procedures

HACCP, ISO series, Food Safety Regulations and Standards.




**Text Books:**

1. Sunetra Roday, "Food Hygiene and Sanitation with case studies", Second Edition, Tata McGraw Hill Education Private Limited, New Delhi, 2011.
2. Norman G. Marriott, Robert B. Gravani, "Principles of Food Sanitation", Food Science Text Series, 2010.
3. Barbara Almanza and Richard Ghiselli, "Food Safety researching the Hazard in Hazardous Foods", Apple Academic Press, 2014.

**References:**

1. McSwane, D., Rue, N., Linton, R., "Essentials of Food Safety and Sanitation", (3rd ed.). Prentice Hall, Upper Saddle River, New Jersey, 2003.
2. Longree, K., and G. Armbruster, "Quality Food Sanitation", Wiley Inter Science, New York, 1996.
3. Bennett, G. W., J. W. Owens, and R. M. Corrigan, 5th edition, "Truman's Scientific Guide to Pest Control Operations", 1997.
4. Jay, James J, "Modern Food Microbiology", 6th edition, Aspen Publishers, Gaithersburg, MD.



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**A20CPD301****COMPUTER BASICS****L T P C Hrs****2 0 2 4 60****Objectives:**

To enable the students to

1. Understand the basics of computer
2. Obtain knowledge on the nutritional needs pertaining to pregnancy and lactation.
3. Acquire the nutritional needs for infants and childhood stage.
4. Plan a diet for school children and adolescents.
5. Plan a diet for adult and oldage group.

**Course Outcomes**

After the completion of the course, the students will be able to

CO1 - Understand the concept of balanced diet

CO2 - Enable the students to know nutritional requirements for pregnancy and lactation

CO3 - Know the in depth knowledge requirements and complications of infants

CO4 – Obtain the basic requirements and problems of adolescents

CO5 – Get acquainted about the dietary modifications of adult and elderly people.

**UNIT I: INTRODUCTION TO COMPUTERS****(10 hrs)**

History of computers ,Components of computer – Input & Output device,  
Hardware – Software, Hard copy & Soft copy. Starting up and shutting down  
Secondary storage devices.

**UNIT II: MS WORD****(15 hrs)**

Introduction - Exploring the desktop ,Running multiple programs, Accessories  
Control Panel, Managing documents and folders ,Starting MS-Word  
Creating and formatting a document, Changing fonts and point size  
Table creation and operation , Auto correct, auto text, spell check, thesaurus  
Word art, inserting objects, Page set up, page preview, Printing a document.

**UNIT III: MS EXCEL****(15 hrs)**

Starting excel, Work sheet, cell, inserting data into rows or columns ,Alignment,  
text wrapping, Sorting data, auto sum, Generating graphs, Integrating charts with WORD  
Page Set up, Print preview, printing worksheets.

**UNIT IV: MS – POWERPOINT****(10 hrs)**

Starting MS – PowerPoint

Auto Wizard, creating a presentation using auto content wizard

Blank presentation, creating and saving a presentation, Adding a slide to a presentation, Slide sorter, slide show, editing slides, Use of clip art, word art gallery

Adding transitions and animation effects, setting timings for slide show

Printing presentation documents

## UNIT V: INTERNET

(10 hrs)

Genesis and Use of Internet, Types of Connection, Software & Hardware requirements  
Search engines, - Internet Explorer, Google Chrome, Opera, Firefox, Subject  
Gateways, Setting up email account & using it.  
Social Media – Facebook, Twitter, Linked In

### Text Books

1. Subramanian, S, Introduction to Computers, S. Chand Publishers, 1999
2. Norton P: Introduction to computer, Tata Mc GrawHillPublishing Co Ltd., New Delhi, 2017
3. Nagpal, D. P, Mastering Microsoft Office 2000, Wheeler Publishing, New Delhi, 2000

### References:

1. . Saxena. S, MS Office 2000 for Everyone, Vikas Publishing House; First Edition 2000
2. Ahilya. R, Computer, Lucent Publications; VIII Edition, 2016



**NUTRITION THROUGH LIFE CYCLE PRACTICAL****A20NDL309****L T P C Hrs****0 0 4 2 30****Objectives:**

To enable the students to

1. Obtain knowledge on the nutritional needs pertaining to pregnancy and lactation.
2. Acquire the nutritional needs for infants and childhood stage.
3. Plan a diet for school children and adolescents.
4. Plan a diet for adult and oldage group
5. Create nutritional awareness of the selected rural community

**Course Outcomes**

After the completion of the course, the students will be able to

- CO1 - Enable the students to know nutritional requirements for pregnancy and lactation  
 CO2 - Know the in depth knowledge requirements and complications of infants  
 CO3 – Obtain the basic requirements and problems of adolescents  
 CO4 – Get acquainted about the dietary modifications of adult and elderly people  
 CO5 - Understand the positive and importance of creating awareness programme

1. Plan, nutritive value calculation and preparation of meals for
  - a) Pregnancy
  - b) Lactation
2. Planning, nutritive value calculation and preparation of meals for
  - a) Infancy- weaning foods, low cost supplementary foods
  - b) Pre-school age
  - c) School age
3. Planning, nutritive value calculation and preparation of meals for
  - a) Adolescence .
  - b) Adult
4. Case-study- Elderly – dietary recall and food habits
5. Dissemination of nutrition knowledge for the rural community.




**FOOD MICROBIOLOGY PRACTICAL****A20NDL310**

L	T	P	C	Hrs
0	0	4	2	30

**Objectives:**

To enable the students to

1. Know about the different types of microbes and its significance
2. Acquire the knowledge of food spoilage of perishable foods
3. Acquire the knowledge of food spoilage of non perishable foods
4. Understand the knowledge of food related microbial diseases
5. Know the beneficial effects of microorganisms

**Course Outcomes**

After the completion of the course, the students will be able to

- CO1 - Understand the different microorganisms and their importance  
 CO2 - Enable the students to know different types microbial spoilage of perishable foods  
 CO3 - Enable the students to know different types microbial spoilage of perishable foods  
 CO4 – know the indepth knowledge of food related microbial diseases  
 CO5 – Get acquainted with the beneficial effects of microorganisms

1. Demonstration of different parts of microscope and accessories – their use and care.
2. Identification of microorganisms – Slides
3. Examination of microorganisms through Hanging Drop
4. Examination of microorganisms by Simple and Differential Staining Method
5. Microbiological evaluation of milk and milk products.
6. Isolation of spoilage organisms from different food commodities




**A20NDS303****FUNCTIONAL FOODS****L T P C Hrs****0 0 4 2 30****Objectives:**

To enable the students to

1. Understand the concept of functional foods, Bioactive carbohydrates
2. Know about the importance of bioactive lipids
3. Identify the knowledge of bioactive polyphenols and carotenoids
4. Acquire the knowledge of specific functional foods
5. Determine the role of milk and milk products.

**Course Outcomes**

After the completion of the course, the students will be able to

- CO1 - Analyse the health benefits associated with bioactive carbohydrates  
 CO2 - Enable the students to know the health benefits associated with bioactive lipids  
 CO3 - Know the in depth knowledge bioactive polyphenols and carotenoid  
 CO4 – Get acquainted with the knowledge of specific functional foods  
 CO5 – Understand the benefits of probiotics.

**Unit I Bioactive Carbohydrates****(6 hrs)**

Introduction, Trehalose, Polysaccharides, Soluble fibres, Insoluble fibres, Resistant Starches, Prebiotics.

**Unit II Bioactive Lipids****(6 hrs)**

Introduction, Butyric acid, Medium chain fatty acids, Long chain fatty acids.

**Unit III Bioactive Polyphenols and Carotenoids****(6 hrs)**

Specific Polyphenolic products  
 Carotenoids - Lycopene

**Unit IV Specific Functional Foods****(6 hrs)**

Introduction about specific functional foods with examples, Soybean

**Unit V Milk and its Products****(6 hrs)**

Milk and Milk Products - Whey Protein, Lactoferrin, Probiotics.

**Text Books:**

1. Swaminathan, M., *Advanced Textbook on Food and Nutrition*, Vol. 1, Second Edition, Bangalore Printing and Publishing Co. Ltd., Bangalore, 2012.
2. *Dietary Guidelines for Indians*, ICMR, National Institute of Nutrition, Hyderabad, 2013.
3. Gopalan, C. Rama Sastri B.V. and Balasubramanian, *Nutritive Value of Indian Foods*, NIN, ICMR, Hyderabad, 2014.

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**SEMESTER IV****A20NDT411****NUTRITIONAL BIOCHEMISTRY**

L	T	P	C	Hrs
4	0	0	4	60

**Objectives:**

To enable the students to

1. Develop an understanding of the principles of nutritional biochemistry
2. Obtain an insight into the biochemistry of metabolism of protein
3. Obtain an insight into the biochemistry of metabolism of fat
4. Obtain an insight into the biochemistry of metabolism of vitamin
5. Obtain an insight into the biochemistry of metabolism of mineral

**Course Outcomes**

After the completion of the course, the students will be able to

- CO1 - Acquainted with the concept of nutritional biochemistry  
 CO2 - Understand the indepth knowledge of metabolism of protein  
 CO3 - Understand the indepth knowledge of metabolism of fat  
 CO4 - Understand the indepth knowledge of metabolism of vitamin  
 CO5 - Understand the indepth knowledge of metabolism of mineral

**UNIT I: Introduction to Biochemistry****(15 hrs)**

Definition, objectives, scope and inter relationship between biochemical and other biological sciences.

**Carbohydrate Metabolism** - Physical & Chemical properties, Glycolysis, TCA cycle, Hexose Monophosphate pathway, Glycogenolysis, Glycogenesis, Gluconeogenesis, Uronic acid pathway, Cori cycle, Factors regulating blood sugar.

**UNIT II: Protein Metabolism****(10 hrs)**

Proteins - Physical & Chemical properties, Transamination, Oxidative Deamination, Decarboxylation, Urea cycle.  
 Plasma Proteins-Nature, properties and functions.

**UNIT III: Fat Metabolism****(10 hrs)**

Lipids- , Physical & Chemical properties  
 Cellular Metabolism of Lipids-  $\beta$ - oxidation of fatty acids, ketogenesis, synthesis of triglycerides, synthesis of phospholipids, metabolism of cholesterol.

**UNIT IV: Vitamin Metabolism****(15 hrs)**

Biochemical functions and metabolism of Fat soluble vitamins – A, D, E & K  
 Water soluble vitamins – B complex vitamins & C

**UNIT V: Mineral Metabolism****(10 hrs)**

Biochemical functions and metabolism of Macro Minerals: Sodium, Potassium, Calcium, Phosphorus.  
 Micro Minerals: Iron, Zinc, Iodine




**Text Books:**

1. Rao A.V.S.S., "Textbook of Biochemistry, " UBS Publishers, 2008
2. Murray. R.V., Granner.P. A. Mayes. V, Rodwell. W, 21st Edition, "Harper's Biochemistry", McGraw – Hill Education, XXX Edition, 2015.
3. Lehninger. A.L., "Human Biochemistry", W. H Freeman & Co., VI Edition, 2012.

**References:**

1. Satyanarayana.U, and Chakrapani.U, "Biochemistry", Fifth Edition, Elsevier-Saunders, Mosby, Churchill, 2017.
2. Conn, E.E., Stumpf, P.K. Bruening, G. and Doi, R.H., 5th Edition, "Outlines of Biochemistry", John Wiley and Sons, 2001.
3. Vasudevan.DM., Sreekumari, and Kannan Vaidyanathan.S., " Textbook of Biochemistry for Medical Students", Eighth Edition, Jaypee Brothers Medical Publishers, 2013.



**A20NDT412****BAKERY AND CONFECTIONERY****L T P C Hrs****4 0 0 4 60****Objectives:**

To enable the students to

1. Know about the concept of Bakery
2. Determine the ingredients used for bakery
3. Identify the factors for setting up a bakery unit
4. Know about the preparation and decoration of baked foods
5. Know the concept of confectionery

**Course Outcomes**

After the completion of the course, the students will be able to

CO1 - Understand the importance bakery and confectionery

CO2 - Understand the principles, role of various food components involved in baking and confectionery.

CO3 - Develop skills and responsibility for setting up bakery and confectionery units

CO4 – know the indepth knowledge of preparing and decorating baked foods

CO5 – Get acquainted with the concept of confectionery

**Unit I Introduction to Bakery****(10 hrs)**

Baking industry in India. Enrichment of Flour and Bread.

Methods of making batters and doughs. Principles of Baking, Classification of Baked Foods.

**Unit II Baking Ingredients****(10 hrs)**

Role of Ingredients – Flour, Water, Yeast, Sugar, Shortening, Milk, Egg, Butter, Salt, Chemical Leavening Agents, Spices, Flavorings, Fruits and Nuts, Food Colors, Setting Materials, Cocoa and Chocolate, recipe balance, storage of baked products, selection of packaging materials.

**Unit III Factors for Setting up a Bakery Unit****(15 hrs)**

Factors to be considered for Setting up a Bakery Unit. Types of ovens – construction and working of conventional and modern ovens.

Equipments required to start a small bakery unit – classification of major & minor equipments , Maintenance of major and minor equipment and tools.

**Unit IV Preparation and Decoration of Baked Foods****(15 hrs)**

Bread Making – Steps and Methods, Role of Ingredients, Variety Breads, Qualities of a Good Loaf,

Cake Making – Functions of Ingredients,

Cake Mixing Methods, Types of Cakes, Cake Judging, Cake Faults and remedies

Cookie Making and Pastry Making, Types and techniques of Icing, Frosting and fillings.






## Unit V Confectionery

(10 hrs)

Processing of Raw Materials-Cocoa and Chocolate. Making of Toffee, Chocolates, Fruit Drops, Hard Boiled Candies (clear, hard, pulled, grained, filled), Soft candies (basic fondant, modified fondant like toffee, fudge, 30 marshmallows, gums, jellies, chocolates) Special Confectionery Foods, role of major components, factors affecting quality of the product.

### Related Experience

Visit to Bakery units and Bakery outlets.

### Text Books:

1. Dubey, S.C. (2002), *Basic Baking* IV Edition, The Society of Indian Bakers, New Delhi.
2. *Bakers Handbook on Practical Baking* (1998) Compiled and Published US Wheat Associates, New Delhi.
3. NIR Board, *The Complete Technology Book on Bakery Products*, National Institute of Industrial Research, New Delhi

### Reference :

1. *Fellows, J.P. (1998), Food Processing Technology – Principles and Practice*, Ellis Horwood Limited, London.
2. *Avantina Sharma, (2006), Text Book of Food Science and Technology*, International Book Distributing Co., Chaman Studio Building, Charbagh, Lucknow, UP.

## NUTRITIONAL ASSESSMENT AND SURVEILLANCE

A20NDE402

L	T	P	C	Hrs
3	0	0	3	45

**Objectives:**

To enable the students to

1. Determine the dimensions of health and disease
2. Identify the methods of Nutritional Assessment
3. Acquire the knowledge of assessing nutritional status through indirect methods
4. Understand the concept of nutrition education
5. Identify the nutritional programmes combating malnutrition.

**Course Outcomes**

After the completion of the course, the students will be able to

- CO1 - Understand the dimensions of health and disease  
 CO2 - know the indepth knowledge of the methods adopted  
 CO3 - View the indirect methods of assesing the nutritional status  
 CO4 - Get an idea of creating nutrition educations for the benefit of people  
 CO5 - Get acquainted with the indepth knowledge of nutritional programmes.

**UNIT I: Dimensions of Health and Disease****(9 hrs)****Health** - Definition of Health, Dimensions of Health.

Health Indicators, Mortality Indicators – Crude Death rate, Life Expectancy, Infant Mortality Rate, Child Mortality Rate, Maternal Mortality Rate.

Morbidity Indicators – Incidence, Prevalence

Disability Indicators – Sullivan Index, Disability Adjusted Life Year (DALY),

**Disease** - Concept of Disease, Iceberg Phenomenon**UNIT II: Direct Methods of Nutritional Assessment****(9 hrs)**

Anthropometry, Biochemical Assessment, Biophysical or Radiological Examination

Clinical Examination, Functional Assessment, Rapid Assessment Procedure (RAP)

**UNIT III: Indirect Methods of Nutritional Assessment****(9 hrs)**

Dietary Assessment - Need and Importance, Methods of Dietary Survey

**UNIT IV: Nutrition Education****(9 hrs)**

Definition, Methods, Computers in Nutrition Education

**UNIT V: Nutritional Policies, Programmes and Agencies in Combating Malnutrition****(9 hrs)**

National Health Policy, National Nutritional Policy

**National Nutritional Programmes** - Nutritional Anaemia Control Programme

Vitamin A Prophylaxis Programme, National Iodine Deficiency Disorder Control

Programme (NIDDCP), Integrated Child Development Service (ICDS) and School

Mid-day Meal Programme, PoshanAbiyan

**National Agencies** -ICMR, NIN, CFTRI, NNMB, NNB

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## **International Agencies – WHO, UNICEF, FAO**

### **Text Books:**

1. Park, Textbook of Preventive and Social Medicine, BanarsidasBhanot Publishers, Jabalpur 2015
2. Srilakshmi, B.Nutrition Science, New Age International Publishers, New Delhi, VI Edition, 2018
3. Jelliffe, D.B. Assessment of the Nutritional Status of the community, World Health Organization, 1966

### **References:**

1. Sahn, B.R. Lockwood, R.Scrimshaw, N.S. Methods for the evaluation of the impact of Food and Nutrition Programmes, (Food and Nutrition Bulletin No.8) United Nations University, 1984.
2. Gopalan, C, Nutrition and Health care- Problems and Policies, Nutrition Foundation of India, Special Publication Series, 1983.
3. Beghin, J, Cap, M., Dujardan, B.A Guide to Nutritional assessment, WHO, 1988
4. Mason, J.B., Habicht, J.P., Tabatabai, H., Valverdre, V: Nutritional Surveillance, WHO, 1984.



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**Food Cost and Quality Control****A20NDD405**

L	T	P	C	Hrs
4	0	0	4	60

**Objectives:**

To enable the students to

1. Determine the concept of Food cost
2. Understand the importance of food cost control
3. Identify the principles of quality control
4. Know the controlling measures of quality of food
5. Determine the quality evaluation of food

**Course Outcomes**

After the completion of the course, the students will be able to

- CO1 - Get an idea about the food cost  
 CO2 - Acquire the importance of food cost control  
 CO3 - Understand the principles of quality control  
 CO4 - Understand the quality control measures  
 CO5 - Get acquainted with quality evaluation of food.

**Unit - I Introduction to Food Cost****(10 Hrs)**

Food Cost - Purchasing , Receiving and Storage of food

Introduction to food cost, Components of costs, Behaviour of cost, Concept of contribution and Breakeven.

**Unit - II Food Cost Control****(15 Hrs)**

Food Cost control, Factors responsible for losses, Methods of controlling food cost.

Pricing - Methods of pricing, Factors affecting pricing, Subsidy pricing.

**Unit III Principles of Quality control - An Introduction****(15 Hrs)**

Food Quality, Quality features of foods, quality checking of raw material & processed foods, quality deterioration, simple techniques of quality checking of raw food materials, advantages of quality control, stages of quality control .

**Unit - IV Quality control Measures****(10 Hrs)**

a) **Food specifications:-** Food specifications for various food products – starchy foods, milk and milk products, fruit products, beverages, spices and condiments, oils and fats; objectives and advantages.

b) **Food Additives & their specifications:-** Classification of food additives, usages and optimal level recommended for usage as specification – Food colors, leavening agents, preservatives.




## Unit - V Quality evaluation of food

(10 Hrs)

- a) **Subjective evaluation:** Sensory characters of food, types of sensory tests, Role and purpose and defects in sensory evaluation – panel member, essential qualities of a panel member, procedure of sensory evaluation, popular centers for sensory evaluation in India and their role.
- b) **Objective evaluation:** objectives, requirements, different tests, and instruments used for objective evaluation, advantages and limitations, popular centre in India.

### Text Books:

1. Siddappa, G. S., Girdhari Lal and Tandon, G.L. 1998. Preservation of Fruits and Vegetables. ICAR, New Delhi
2. Sivasankar, B. 2002. Food Processing and Preservation. PHI Learning Pvt. Ltd. Delhi
3. Srilakshmi. 2010. Food Science. New age International 978-81-224- 2724-0.
4. Srivastava, R. P. & Sanjeev Kumar. 2002. Fruits and vegetable Preservation – Principles and Practice. International Book Distributing Co., Lucknow.

### References:

1. Swaminathan, M. 1988. Hand book of Food Science & Experimental Foods. Bappco publishers, Bangalore
2. U.D. Chavan and J.V. Patil. 2013. Industrial Processing of fruits and vegetables. Astral International Pvt Ltd. New Delhi.
3. Vijay, K. 2001. Text Book of Food Sciences and Technology. I.CAR, New Delhi



T. J. J.

## NUTRITIONAL BIOCHEMISTRY PRACTICAL

A20NDL413

L	T	P	C	Hrs
0	0	4	2	30

### Objectives:

To enable the students to

1. Develop an understanding of the principles of nutritional biochemistry
2. Obtain an insight into the biochemistry of metabolism of nutrients

1. Quantitative Analysis of Reducing sugar-Benedict's method.
2. Estimation of Free Fatty acids.
3. Estimation of Calcium in Milk Powder through EDTA Complexometry.
4. Estimation of Iron from processed Ragi flour.
5. Estimation of Phosphorus from processed Ragi flour.
6. Preparation of Starch from Potatoes.

### Text Books:

1. Rao A.V.S.S., "Textbook of Biochemistry, " UBS Publishers, 2008
2. Murray. R.V., Granner.P. A. Mayes. V, Rodwell. W, 21st Edition, "Harper's Biochemistry", McGraw – Hill Education, XXX Edition, 2015.
3. Lehninger. A.L., "Human Biochemistry", W. H Freeman & Co., VI Edition, 2012.



## BAKERY AND CONFECTIONERY PRACTICAL

A20NDL414

L	T	P	C	Hrs
0	0	4	2	30

### Objectives:

To enable the students to

1. Develop an understanding of the preparation of cakes.
2. Develop skills and responsibility for setting up bakery and confectionery units.

1. Demonstration of oven and its parts
2. Introduction about Oven equipments
3. Preparation of different types of cakes
4. Preparation of biscuits and cookies
5. Visit to bakery units and outlets.

### Text Books:

1. Neelam Khetarpaul, Raj Bala Grewal and Sudesh Jood, Bakery science and cereal technology, Daya publishing house. 2013.
2. John Kingslee, A professional text to Bakery and Confectionary, New Age International (P) Limited. 2014.
3. The complete technology book on bakery products, second edition, National Institute of Industrial Research, Delhi. 2009.



**INTERIOR DECORATION IN FOOD SERVICE UNITS****A20NDS404**

L	T	P	C	Hrs
0	0	4	2	30

**Objectives:**

To enable the students to

1. Understand the important of Interior Decoration in daily life.

☐

2. Develop the skills in selection and use of appropriate materials for various decorations.

**UNIT I: Aesthetics and Design Basics****(6 hrs)**☐

Aesthetics and Good Taste

Interior decoration- Definition and Importance

Design- Definition and Types

**UNIT II: Elements and Principles of Design****(6 hrs)**

Elements of Art – Line, Direction, Shape, Colour, Texture and Value

Principles of design - Harmony, Balance, Proportion, Rhythm and Emphasis

**UNIT III: Interior Decor****(6 hrs)**☐

Colour - Definition, Classification, Prang Colour Chart, Colour Harmonies and Use of Colour in Different Rooms.

Lighting - Definitions, Types, Lighting Fixtures and Requirements of Lighting in Different Areas of food service units.

**UNIT IV: Interior Furnishing****(6 hrs)****Hard Furnishing** Furniture - Types, Materials and Requirement and arrangement of Furniture in Different areas of food service units**Soft Furnishing** Window Treatment: Curtains and Draperies – functions, selection and types.

Floors and Floor coverings : Importance, Features, Functions, Types- Carpets and Rugs

**UNIT V: Interior Decoration****(6 hrs)**☐

Flower arrangement: Definition, Design rules, Guidelines, Styles - Traditional and Modern, Materials required in Flower Arrangement, Common flowers and Foliage used in formal Flower arrangements.

☐**RELATED EXPERIENCE:**☐

Visit to Hotels

☐

Visit to Architectural Houses






**Text Books:**

1. Vargese M.A., Ogale N., N.Srinivasan.K Home Management, Wiley Eastern Limited Delhi.1985.
2. Raghu Balan.G and Smritee Ragubalan, Hotel Housekeeping Operation and Management, Oxford University University press New Delhi 2007
3. Joan C. Branson., Margaret Lennox, Hotel, Hostel and Hospital HouseKeeping. ELST 1990
4. Parimalam.A, Andal.A, Premalatha.M.R, Text Book of Interior Decoration, Satish Serial Publishing House, New Delhi,2008.
5. Premavathy Seetharaman and Parveen Pannu., Interior Design and Decoration, CBS Publisher and Distributor Pvt.Ltd, New Delhi 2005.



T. J.