

**ST. JOSEPH'S COLLEGE FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF HOME SCIENCE**

M.SC FOOD & NUTRITION



2022-2023

ABOUT THE DEPARTMENT

The department of Home Science was started in the College in the year 1958. Since the adoption of Autonomy by the College, the Department has been offering the three-year B.Sc. program with three core areas, namely, Foods and Nutrition, Human Development and Resource Management. The department strives to impart training and education to young girls with a perspective view of transforming them into change agents, exercising their influence at the micro level in order to bring about a sustainable change in society with reference to effective management of households, families and resources.

St. Joseph's College for Women has launched the Master's Programme in Home Science in 2014 offering two specializations, namely

- Foods & Nutrition, and
- Interior Design & Resource Management

The Master's Programme is affiliated to Andhra University.

VISION AND MISSION

VISION OF THE DEPARTMENT

To transform young women into change agents in the society by equipping them to attain better quality of life in all areas.

MISSION OF THE DEPARTMENT

The department of Home Science envisages educating and fostering enthusiasm to gain knowledge and skills in Home Science towards effective management of life, career and family.

M.Sc. Home Science (Interior Design & Resource Management)

The eligibility criteria to pursue the two year M.Sc. programme is

- Any student who has completed her Bachelors Programme in Sciences as per UGC Norms in a recognized HEI.

PROGRAM OUTCOMES

On completion of the Program of M.Sc. with **FOOD & NUTRITION** it is expected that the students would

1. To summarize the significance of statistics and apply the appropriate statistical technique for the measurement of scale and design in home science research.
2. To acquire knowledge about computer fundamentals and apply the skills learned to situations in home science.
3. To understand the integrated function of all organs and its structure and function in all conditions.
4. To familiarize the recent advances in nutrition and translate the knowledge in practical guidelines for dietary need of human nutrition at different stages of life.
5. To identify the new communication technologies for various presentations.
6. To explain the principles of nutritional epidemiology and its importance in community public health.
7. To understand the composition of various food stuffs and apply theoretical knowledge in various food preparations.
8. To get deeper knowledge of microorganisms and its role in food spoilage and to learn advance techniques in food preservation and food operations.
9. To provide adequate theoretical understanding about sensory evaluation and to analyse and interpret sensory evaluation data.
10. To get insight into the mechanisms adopted by the human body and its integration of cellular level, metabolic events and to get proficiency in understanding various metabolic pathways.
11. To get acquainted with growth, development and physiological changes of various stages of development during life cycles.
12. To infer biochemical and physiological impairments in disease and to obtain knowledge of dietary factors and dietary management of various disease and to take dietetics as a profession.

M.Sc Home Science (Foods & Nutrition)**List of Papers**

Sem	Paper Title
I	Research Methodology & Statistics
	Research Methodology & Statistics Practical
	Computer applications
	Computer applications Practical
	Human Physiology
	Human Nutrition
II	Communication Technology
	Communication Technology Practical
	Community and Public Nutrition
	Community and Public Nutrition Practical
	Food Chemistry
	Food Chemistry Practical
	Food Microbiology
	Food Microbiology Practical
III	Institutional Food Management
	Institutional Food Management Practical
	Nutritional Biochemistry
	Nutritional Biochemistry Practical
	Food Analysis
	Food Analysis Practical
	Dietetics
	Dietetics Practical
IV	Current Trends in Foods & Nutrition (Seminar)

	Internship
	Dissertation

RESEARCH METHODOLOGY AND STATISTICS

Code : **Fn 1.1**
Credits : **4**
Periods / Week : **6**
Marks : **(80+20=100)**

OBJECTIVES: To enable the studentsto -

- Understand the significance of statistics and research methodology in Home Science research.
- Identify the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design.
- Apply the appropriate statistical technique for the measurement of scale and design.

COURSE OUTCOME:

- Application statistics in the field of home science research.
- Learn to identify problems and compare variables
- Able enough to develop research design.
- Acquiring skills on data collection and interpretation
- Gaining knowledge on basic concepts of theories of probability

CONTENTS:

Unit 1:

Science, scientific methods, scientific approach.Role of statistics and research in Home Science.

Research process, Objectives of research: Explanation, control and prediction.

Unit-2

Types of Research: Historical, Survey, experimental, case study, social research, participative research.Definition and Identification of a Research Problem - Selection of research problem - formulation of hypothesis, basic assumptions, limitations and delimitations of the problem.

Unit-3

Research variables- meaning and their significance in research, types of variables, selection and measurement of variables. Sampling- Population and sample - Probability sampling: systematic random sampling, two stages and multistage sampling, cluster sampling. Non – Probability sampling: purposive, quota and volunteer sampling/snowball sampling

Unit-4

Basic principles and Purpose of research design - Fundamental, applied and action exploratory and descriptive experimental, survey and case study, Longitudinal and cross sectional.

Qualitative Research Methods: Definition and types of qualitative research -Methods and techniques of data collection - Observation, questionnaire, interview, scaling methods, case study, home visits, reliability and validity of measuring instruments

Unit-5

Classification & tabulation of data - Measures of central tendency Measures of variation - Testing of Hypothesis - Parametric & Non-parametric tests, chi-square test, correlation ANOVA.

References

1. Bandarkar, P.L. and Wilkinson T.S. (2000): Methodology and Techniques of social Research, Himalaya Publishing House, Mumbai.
2. Bhatnagar, G.L. (1990): Research Methods and Measurements in Behavioural and Social Sciences, Agri. Cole Publishing academy, New Delhi.
3. Dooley, D. (1995): Strategies for Interpreting Qualitative Data; Sage Publications, California.
4. Gay, L.R. (1981): Educational Research, proper Solutions: Avoiding Errors in Quantitative Research. II Edn. Sage Publications: Beverly Hills, California.
5. Long; J.S. (Ed) (1988): Common Problems Proper Solutions: Avoiding Errors in Quantitative Research, Beverly Hills, Sage Publications, California.
6. Mukherjee, R. (1989): The Quality of Life: Valuation in Social Research, Sage Publications, New Delhi.
7. Stranss, A. and Corbin, J. (1990); Basis of Qualitative Research: Grounded Theory Procedures and Techniques, Sage Publications, California.

RESEARCH METHODOLOGY AND STATISTICS PRACTICAL

Code : Fn 1.15
Credits : 2
Periods / Week : 4
Marks : (30+20=50)

Content:

Objectives: To enable the students to -

- Identify the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design.
- Apply the appropriate statistical technique for the measurement of scale and design.

Course outcome:

- Applying theory practically on computers.
- Able to create and design web page.
- Applying all the skills in context to home science.

PRACTICAL

1. Gathering Primary Data on a related topic from a selected sample and writing a report of the study in the format of a Project Report. 20M
2. Gathering Secondary Data on a related topic from a standard source and writing a report of the study in the format of a Project Report. 20M
3. Data presentation as graphs and diagrams and tables. 10M

References:

1. Bandarkar, P.L. and Wilkinson T.S. (2000): Methodology and Techniques of social Research, Himalaya Publishing House, Mumbai.
2. Bhatnagar, G.L. (1990): Research Methods and Measurements in Behavioural and Social Sciences, Agri. Cole Publishing academy, New Delhi.
3. Dooley, D. (1995): Strategies for Interpreting Qualitative Data; Sage Publications, California.
4. Gay, L.R. (1981): Educational Research, proper Solutions: Avoiding Errors in Quantitative Research. II Edn. Sage Publications: Beverly Hills, California.
5. Long; J.S. (Ed) (1988): Common Problems Proper Solutions: Avoiding Errors in Quantitative Research, Beverly Hills, Sage Publications, California.
6. Mukherjee, R. (1989): The Quality of Life: Valuation in Social Research, Sage Publications, New Delhi.
7. Stranss, A. and Corbin, J. (1990); Basis of Qualitative Research: Grounded Theory Procedures and Techniques, Sage Publications, California.

COMPUTER APPLICATIONS

Code : Fn 1.2

Credits : 4

Periods/Week: 6

Marks : (80+20=100)

Objectives: To enable the students to –

- Acquire knowledge about computer fundamentals.
- Learn and use the applications of MS office
- Apply the skills learnt to situations in Home Science.

Course outcome:

- Acquire knowledge to prepare invitation and brochure in MS word
- Applications of formulas and simple statistical applications for research papers
- Creating a PowerPoint presentation using different templates and using clipart
- Applying skills in Photoshop for editing and using various layers
- Understanding the concept of HTML and creating a web page.

Content:

Unit-1

Review Windows:

Desktop settings and creating shortcuts. Start menu, how to launch programs using start menu. Recycle bin, task bar, Windows accessories M.S. WORD 2003: Creating, saving and closing a document. Opening an existing document. Page set up. Spell check. Tables. Selecting in tables. Modifying table structure. Edition text. Text formatting Headers and footers. Bullets and numbering. Borders and shading. Auto correct Auto text. Creating styles. Columns. Printing in 2003.

MS EXCEL:

Starting. Parts of Excel Screen. Quitting Excel. Selecting a cell. Entering data in a cell, Editing, clearing and formatting data in a cell. Inserting and deleting rows and columns, charts, Formulae and simple statistical applications.

Unit-2

MS POWERPOINT:

Starting & Quitting PowerPoint. Creating of Presentation. Use of design templates, slide show. Inserting clip art. Application of special effects setting up a slide show.

Uni-3

Page Maker

PageMaker Basics, working with a publication, The Drawing tools, the text tools, Importing Graphics, Transformations, Utilities, working with large amounts of text, The story editor.

CorelDraw:

CorelDraw Concepts, Exploring the work area, drawing & shaping, working with text, using writing tools blending, exporting, distorting, importing, exporting & ole.

Unit-4

ILLUSTRATOR

Using the Illustrator tools, using selection tools, Gradients, Brushes. Applying transformations over objects, using layers, applying filters.

Photoshop

Tools – Painting, Editing, Selection, Filters, Layers, Working with type – paths

Unit-5

HTML

Understanding HTML, creating a web page, publishing HTML, Pages, Text alignment & lists, text formatting & font control, Creating HTML forms, creating web page graphics, putting graphics on a web page, custom background & color.

References:

1. Peter Norton, Introduction to Computers, Sixth edition, Tata McGraw Hill (2007)
2. Fundamentals of Computers, IV Edn V Rajaraman Prentice – Hall of Indias Limited, New Delhi.()
3. Computer fundamentals by A Lexix Leon and Mathews Leon, Leon – Tech World , New York 1999
4. Ron Mansfield, Workin in Microsoft Office Tata McGraw Hill (2008)
5. Adobe Pagemaker (Training Guide) – By Shashank Jain and satish Jain, BPB Publications, 2001
6. CorelDraw 9 (Training Guide) – By Manohar Lotia& Shailesh Tank, BPB Publications, 2001
7. Adobe Illustrator in 24 hours Mordy Golding (Tech Media)
8. Photoshop 7.0 in easy steps – Robert Shuffle Botham, Dream Tech, 2003

COMPUTER APPLICATIONS PRACTICAL

Code : Fn 1.25

Credits : 2

Periods/Week: 4

Marks : (30+20=50)

Content:

Objectives:

- To learn to techniques of designing
- Acquire skills in presentations using PowerPoints and Photoshop
- To acquire knowledge on tools

Course outcome:

- Using illustrator various transformations of objectives and filters are been applied
- Design an ID card using Photoshop
- Gain knowledge on analysis of data for research papers

-Application of each of the following units in Home Science related areas

1. Creating a Word document on Home Science topic, Ms Excel 2003
2. MsPowerPoint
3. Page Maker, CorelDraw
4. Illustrator, photoshop
5. HTML - Creating a web page

References:

9. Peter Norton, Introduction to Computers, Sixth edition, Tata McGraw Hill (2007)
10. Fundamentals of Computers, IV Edn V Rajaraman Prentice – Hall of Indias Limited, New Delhi.()
11. Computer fundamentals by A Lexix Leon and Mathews Leon, Leon – Tech World , New York 1999
12. Ron Mansfield, Workin in Microsoft Office Tata McGraw Hill (2008)
13. Adobe Pagemaker (Training Guide) – By Shashank Jain and satish Jain, BPB Publications, 2001
14. CorelDraw 9 (Training Guide) – By Manohar Lotia& Shailesh Tank, BPB Publications, 2001
15. Adobe Illustrator in 24 hours Mordy Golding (Tech Media)
16. Photoshop 7.0 in easy steps – Robert Shuffle Botham, Dream Tech, 2003

HUMAN PHYSIOLOGY

Code	: Fn 1.3
Credit	: 4
Periods / Week	: 6
Marks	: (80+20) = 100

Objectives: This course will enable students to :

- Advance their understanding of some of the relevant issues and topics of human physiology.
- Understand the integrated function of all systems and the grounding of nutritional science in Physiology
- Understand alterations of structure and function in various organs and systems in disease conditions.

Course outcome:

- Learn about human organ systems in details.
- Able to distinguish different blood groups with compatibilities.
- Acquiring knowledge about breakdown of food inside human body.
- Understanding physical milestone like puberty and menstruation.

Content:

Unit-1

Nervous system

Review of structure and function of neuron, conduction of nerve impulse, synapses, role of neurotransmitters. Organization of central nervous system, structure and function of Brain and spinal cord, Afferent and efferent nerves, Blood Brain Barrier, Hypothalamus and its role in various body functions-obesity, sleep, memory.

Endocrine system

Endocrine glands – mechanism of hormones, regulation of hormonal secretion. Disorders of endocrine glands. Emphasis on physiology of diabetes and stress hormones

Unit-2

Digestive system

Review of structure and function, Digestive and Absorptive functions, mechanism and functions of secretory juices, Structure and physiological functions of liver, pancreas and gall bladder and their dysfunctions. Motility and hormones of Gastrointestinal tract.

Unit-3

The excretory system

Renal physiology, Structure and function of nephron. Mechanism of Urine formation.

Glomerular Filtration Rate and its regulation, Maintenance of acid base balance, Water and electrolyte balance.

Respiratory system

Structure and physiology of respiratory system. Role of lungs in the exchange of gases.

Transport of oxygen and CO₂. Role of hemoglobin and buffer systems. Control of respiration

Unit-4

Cardiovascular system

Structure and function of heart and blood vessels. Types of circulation, Cardiac muscle,

Regulation of cardiac cycle and cardiac output. Blood pressure and its mechanism and its factors affecting. Effect of exercise on cardiovascular system. Pathophysiology of hypertension, ECG,

Blood

Composition of blood and its functions, Plasma protein and its functions, blood clotting mechanism, Blood groups and histocompatibility, Erythropoiesis. Cell mediated and humoral immunity.

Unit-5

The Musculo – skeletal system

Structure and function of bone, cartilage and connective tissue. Disorders of the skeletal system.

Types of muscles, structure and function.

Reproduction

Structural and physiological functions of female reproductive system, Menstrual cycle, spermatogenesis, physiological changes in pregnancy and lactation, Role of hormones.

References:

1. Ganong, W.F. (1985) : Review of Medical Physiology, XII Edn, Lange Medical Publication.
2. Moran Campbell E.J., Dickinson, C.J., Slater, J.D., Edwards, C.R.W. and Sikora, K. (1984): Clinical Physiology, V Edn, ELBS, Blackwell Scientific Publications.
3. Guyton, A.C (1985): Function of the Human Body, IV Edn, W.B. Sanders Company, Philadelphia.
4. Guyton, A.C. and Hall, J.B. (1996): Text Book of Medical Physiology, IX Edn, W.B. Sanders Company, Prism Books (Pvt.) Ltd., Bangalore.
5. Wilson, K.J. W. and Waugh, A. (1996): Ross and Wilson Anatomy and Physiology in Health and illness, VIII Edn, Churchill Livingstone.
6. McArdle, W.D. Katch, F.I. and Katch, V.L. (1996): Exercise Physiology. Energy, Nutrition and Human Performance, IV Edn, Williams and Wilkins, Baltimore.
7. Jain, A.K.: Textbook of Physiology. Vol. I and II. Avichal Publishing Co., New Delhi.

HUMAN NUTRITION

Code : Fn 1.4
Credits : 4
Periods/Week: 6
Marks : 80+20 =100

Objectives: This course is designed to:

- Provide in – depth knowledge of the physiological and metabolic role of macro and micro nutrients and their importance in human nutrition.
- Familiarize with the recent advances in nutrition and apply this knowledge in planning for public health programme.
- Enable the students to translate the knowledge into practical guidelines for dietary needs of human nutrition at different stages of life.

Course outcome:

- Knowledge on standardization of weights.
- Learning about deficiency symptoms of nutritionally deficient diseases.
- Understanding reference between different nutrients.
- Able to calculate energies required for various health conditions.
- Skilled to give diet counseling in various diseases condition.

Content:

Unit-1

Energy: Energy Balance. Factors affecting energy requirement- BMR, TEE, PAR. Methods to estimate energy expenditure. Energy requirements and recommendation for different age groups. Energy imbalance: undernutrition and obesity.

Unit-2

Carbohydrates: Physiological functions. Types of carbohydrates in Indian diets and their contribution to energy intake

Dietary fiber – Components, Sources Role of dietary fiber in human nutrition. Resistant starch and fructooligosaccharides – Physiological effects.

Proteins: Classification, Physiological functions. Protein quality- Classification, Methods of evaluation. Protein and amino acid requirements. Protein deficiency - Kwashiorkor and Marasmus – clinical features and biochemical changes

Unit-3

Lipids: Physiological functions. Nutritional significance of fatty acids-SFA, MUFA, PUFA, Role of n3 and n6 fatty acids. Role of lipoprotein and cholesterol, triglycerides in health and disease. Requirements of total fats and fatty acids requirements. Deficiency of Essential fatty acids

Body Composition: Methods used for measurement of body components. Body fat, Fat Free Mass (FFM), Factors affecting body composition.

Unit-4

Recent advances in minerals: Macro minerals – Calcium, Phosphorous, Magnesium, Sodium, Potassium Chloride, Sulphur

Micro minerals - Iron, Copper, Zinc, Manganese, Iodine, Fluoride

For each mineral the following should be discussed:

- Physiological functions
- Food sources
- Bioavailability (wherever applicable) factors affecting bioavailability.
- Interaction with other nutrients.
- Requirements, deficiency.

Recent advances in vitamins: Fat soluble vitamins – Vitamin A, Vitamin D, Vitamin E, Vitamin K. Water soluble vitamins – Thiamine, Riboflavin, Nicotinic acid, Pyridoxine folic acid, B₁₂, pantothenic acid, biotin, choline, inositol, vitamin C

For each nutrient following should to discussed:

- Physiological functions
- Food sources
- Bioavailability (wherever applicable) factors affecting bioavailability.
- Interaction with other nutrients.
- Requirements, deficiency.

Unit-5

Nutritive and non-nutritive foods: Functional foods, classification: prebiotics and probiotics – Dietary and their mode of action and effect. Polyphenols – definition, bioavailability, health benefits. Health benefits of other dietary factors and anti-nutritional effects, amylase, protease inhibitors, leptins, phytates.

Water: Distribution and functions. Water balance and its regulation – Role of hormones and electrolytes. Requirements for water. Disturbances in fluid balance – Dehydration, oedema and water toxicity

References:

1. Mahan L.K. and Ecott – Stump, S. (2000): Krause's Food, Nutrition and Diet Therapy
2. Shils, M.B Olson, J.A. Shike, N and Ross, A.C. (Ed). (1999): Modern Nutrition in Health and Disease, 9th Edition, San Williams and Wilkins
3. WHO Technical Report Series
4. Indian Council of Medical Research, Recommended Dietary intake for Indians – Latest Recommendations
5. Sarren S. Gropper, Jack. L. Smith, James, L. Gruff. Advanced Nutrition and Human Metabolism. IV Edn
6. Williams Basic Nutrition and Diet Therapy. Staci Nix. XII Edn (2005)

Journals:

1. Nutrition Reviews
2. Internal Journals of Vitamin and Nutrition Research

COMMUNICATION TECHNOLOGY

Code :Fn 2.1
Credits : 4
Periods/week : 6
Marks : (80+20=100)

Objectives – To enable the students to

- Understand the vital aspects of communication, various Audio and visual media and their use.
- Identify the new communication technologies and their use.
- Impart skills in preparation and use of communication technologies for various presentations.

Course outcome:

- Aware of concept and function of communication.
- Able to apply principles of visual design.
- Acquired knowledge on animation\graphics using 3D studio.
- Understand use of international media.
- Knowing basics of multimedia and its uses.

Contents:

Unit-1

Communication Systems: Types of Communication systems – concept, functions and significance. Elements, characteristics and scope of mass communications.

Unit-II

Communication Types: Mass communication – models and theories; role of gatekeepers and opinion leaders. Visual communication – elements of visual design – colour, line, form, texture and space. Principles of visual design – rhythm, harmony, proportion, balance and emphasis.

Unit-III

Media Systems: Trends and Techniques: Concept, scope and relevance of media in society. Functions reach and influence of media. Media scene in India, issues in reaching out to target groups. Contemporary issues in media – women and media, human rights and media, consumerism and media. Historical background: nature, characteristics, advantages and limitations and future prospects of media.

Unit-IV

Media types: Traditional media: role on enhancing cultural heritage, co-existence with modern media systems and applicability in education and entertainment – puppetry, folk songs, folk theatre, fairs. Print media: books, newspapers, magazines leaflets and pamphlets. Electronic media – radio, television, video, computer-based technologies. Outdoor media; exhibition, fairs and kiosks. Media planning and scheduling, selection of media on the basis of suitability, reach, impact, frequency and cost. Introduction to ethics in mass media, freedom of speech, expression and social responsibility

Unit- V

Advertising: Definition, concept and role of advertising in modern making system and national economy. Inter-relation of advertising and mass media system. Types of advertisements- commercial, primary demand, selective demand, classified and display advertising, comparative and co-operative advertising. Techniques of preparation of effective advertisements for various media. Ethics in advertising.

References

1. Curran, J. et al (1997): Mass communication and Society, London.
2. Banerjee (Eds) (1985) Culture and Communication, Paroit Publishers, Delhi.
3. Ruloof, M.E. and Miller, G.R. (Eds) (1987): Interpersonal Process; New Directions in Communication Research, Sage, USA.
4. Chatterjee, P.C. (1988): Broadcasting in India, New Delhi, Sage Publication.
5. Berger, C.R. and Chafee, S. (Eds) (1987): Handbook of Communication Science, Sage Publications, New Delhi.
6. Brown, J., Lewis, R. and Harclerod, F. (1985): All Instruction: Technology Media and Methods, McGraw Hill; New Delhi.
7. Ellington, H. (1985): A Handbook of Educational Technology, Kogan Page, London.
8. Nair, R. (1993): Perspective in Development Communication, Sage Publications, New Delhi.

COMMUNICATION TECHNOLOGY PRACTICAL

Code : Fn 2.15

Credits : 2

Periods/Week: 4

Marks : (30+20=50)

Objectives – To enable the students to

- Understand the vital aspects of communication, various Audio and visual media and their use.
- Identify the new communication technologies and their use.

Course outcome:

- Able to design book cover with the help of computer.
- To evaluate outdoor and print media system.
- Able to design company logo

Content:

1. Designing a visual composition-book cover, or Folder with the help of computers.
2. Evaluation of advertising, a newspaper story, a radio programme and a television broadcast.
3. Planning, development and evaluation of Communication strategies and techniques for selected traditional, print electronic and outdoor media systems.
4. Preparing effective advertisements keeping in Consideration headlines, illustration, slogan, logo, seal of approval and colour effectiveness with the help of computer.
5. Individual Project on 3D Studio max. (animation).

References:

1. Curran,J.et al(1997): Mass communication and Society, London.
2. Banerjee(Eds) (1985) Culture and Communication, Paroit Publishers, Delhi.
3. Ruloof, M.E. and Miller, G.R.(Eds) (1987): Interpersonal Process; New Directions in Communication Research, Sage, USA.
4. Chatterjee, P.C.(1988): Broadcasting in India, New Delhi, Sage Publication.
5. Berger, C.R. and Chafee, S.(Eds)(1987): Handbook of Communication Science, Sage Publications, New Delhi.

6. Brown, J., Lewis, R. and Harclerod, F. (1985): All Instruction: Technology Media and Methods, McGraw Hill; New Delhi.
7. Ellington, H.(1985): A Handbook of Educational Technology, Kogan Page, London.
8. Nair, R. (1993): Perspective in Development Communication, Sage Publications, New Delhi.
9. Nair, K.S. and White, Shirley (1993): Perspective on development Communication, Sage Publications, New Delhi.
10. Narula, U.(1994): Development Communication, Haran & Publications.
11. Sandllio, K. Problems of Communication in Developing Countries - Vision Books.

Community and Public Nutrition

Code : Fn 2.2

Credits : 4

Period/week :

Marks : (80+20= 100)

Objectives: This course is designed to equip the student to

- Understand the principles of nutritional epidemiology and its importance in Community and Public Health.
- Be able to design and evaluate studies nutritional programmes.
- To understand the role of nutrition in different age groups.
- Gain knowledge on assessment methods

Course outcome:

- Relate food and nutrition to different age groups.
- To generate nutritional information
- To assess the nutritional status through methods of assessment

Content:

Unit-1

Assessment of nutritional status:

Direct Assessment-Anthropometric measurements, biophysical, biochemical, clinical, functional and dietary assessment.

Indirect assessment-Vital statistics, indicators of health and nutrition. mortality, morbidity indicators, demographic indicators – sex ratio, reproductive health index.

Unit-2

Maternal Nutrition:

Pregnancy- Physiological Changes during Pregnancy, Hormonal Profile in Pregnancy, Nutritional Needs during Pregnancy, Antenatal Care, Nutritional Assessment and Guidance in prenatal Common Concerns during Pregnancy, High Risk Pregnancies, Management of High-Risk Pregnancies

Lactation: Physiology of Lactation, Human Milk Composition and Infant Growth and Development, Malnutrition - Effects on Milk and Effects on Mothers Maternal Nutrition during Lactation, Nutrient Requirements during Lactation, Dietary Management, Other Concerns during Breastfeeding

Unit-3

Infants and Childhood:

Growth and Development, Physiological Changes, Growth Monitoring, Health Monitoring
Nutrient Needs and Recommended Dietary Allowances Diet and Feeding Patterns, feeding 0-6
Months Infant, feeding 6-12 Months Infant, Feeding Preschoolers. National Programmes
Targeting infants and Preschoolers Problems of Infants and Preschoolers Nutrition
School going: Food habits, nutritional requirements, Packed lunch, government feeding
programmes-Mid day meal

Unit-4

Adolescent, Adulthood, Geriatric Nutrition:

Adolescent-Hormonal influences, psychological and nutritional problems, eating disorders,
nutritional management and RDA

Adulthood Nutrition-Nutrition and work efficiency, nutritional requirement.

Geriatric Nutrition- Physiological changes, nutritional requirements and dietary modification,
common health issues.

Unit-5

Importance of nutrition education for improving the nutrition status of community.

Nutritional problems in India, Nutrition Intervention Schemes & Programmes operating in India,
National Nutrition Policy, Role of various National and International agencies in combating
Malnutrition

References:

1. Shills ME, Olson JA, Shike N, Ross AC (1999): Modern Nutrition in Health and Disease. 9th Ed. Williams and Wilkins
2. Mahan LK & Escott- Stump S (2000): Krause's Food, Nutrition and Diet therapy, 10th ed. WB Saunders Ltd.
3. Srilakshmi B (2012) Nutrition Science. 4th ed.
4. Srilakshmi B (2005) Dietetics, 5th ed. New age International (P) Ltd. Pbs.
5. Gopalan C (1996) Nutritive value of Indian foods. NIN. Hyderabad.
6. Bamji M, Prahlad Rao N, Reddy V (2000). Text book of Human Nutrition. Oxford and IbH publishing Co. Pvt. Ltd.
7. Guthrie H (1986) Introductory Nutrition. 6thEd.Mosby college Pbs.
8. Michele JS, Sadler J, strain J, Benjamin C (1999) Encyclopedia of Human Nutrition. Vol I to III. Academic Press.
9. Ganesh and Co., Williams S (1981) Nutrition and diet therapy. 4th Ed. Missouri. Masby co. Pbs.
10. Swaminathan M (1985) Essentials of Food and Nutrition. Vol I and II.
11. Gopalan C and Narasinga Rao B (1988) Dietary Allowances for Indians. NIN

12. Nutrition Research Reviews
13. American J Clinical Nutrition
14. British J of Nutrition

Community and Public Nutrition Practical

Code :Fn 2.25
Credits : 2
Periods/week : 4
Marks : (30+20=50)

Objectives:

- To Understand the concept of health and health indices popularly used
- To realize the health problem of the community and the scientific intervention
- To Know menu plans and its calculation

Course outcomes:

- Gain knowledge of meal planning
- Exhibit ability to plan diets for different age groups
- Be qualified to take up career as nutritionist in fitness centers/voluntary organizations

Content:

1. Planning, preparation & evaluation of diets for various age groups in life cycle keeping in mind various principles of menu planning (Infancy, preschool, school-going, adolescents, adulthood, pregnant and lactation)
2. Assessment of nutritional status of different age groups
3. Development of Audio-visual aids and Presentation to the target groups for Nutrition education
4. Conducting Dietary survey of different age groups using different methods

Reference

1. Shills ME, Olson JA, Shike N, Ross AC (1999): Modern Nutrition in Health and Disease. 9th Ed. Williams and Wilkins
2. Mahan LK & Escott- Stump S (2000): Krause's Food, Nutrition and Diet therapy, 10th ed. WB Saunders Ltd.
3. Srilakshmi B (2012) Nutrition Science. 4th ed.
4. Srilakshmi B (2005) Dietetics, 5th ed. New age International (P) Ltd. Pbs.
5. Gopalan C (1996) Nutritive value of Indian foods. NIN. Hyderabad.
6. Bamji M, Prahlad Rao N, Reddy V (2000). Text book of Human Nutrition. Oxford and IbH publishing Co. Pvt. Ltd.
7. Guthrie H (1986) Introductory Nutrition. 6thEd.Mosby college Pbs.
8. Michele JS, Sadler J, strain J, Benjamin C (1999) Encyclopedia of Human Nutrition. Vol I to III. Academic Press
9. * *

FOOD CHEMISTRY

Code : Fn 2.3
Credits : 4
Periods/ week : 6
Marks : (80+20 = 100)

Objectives: The Course is designed to:

- Provide an understanding of composition of various food stuffs
- Familiarize students with changes occurring in various foodstuffs as a result of processing and cooking
- Enable students to use the theoretical knowledge in various applications and food preparations

Course outcome:

- Acquiring knowledge on various methods of cooking.
- Understanding different food groups and their storage measures.
- Gaining knowledge about food preservation technique.
- Discovering the effects of food additives.
- Gaining knowledge about food adulteration and different acts and measures in India.

Content:

Unit-1

Water and Food dispersions: Sorption phenomena, types of water, solutions and colligative properties. Free and bound water, Water activity and Food spoilage. Freezing and Ice structure. Colloidal salts, stabilization of colloidal systems, Rheology of food dispersions. Gels: Structure, formation, stability, surfactants and emulsifiers. Foams: Structure, formation and stabilization.

Unit-2

Polysaccharides, Sugars and Sweeteners. Starch: Structure, gelatinization- Effects, Characteristics of various starches. Modified food starches. Non-starch Polysaccharides: Cellulose, hemicelluloses, pectin's, gums, animal polysaccharides. Sugars and Sweeteners: Sugars, syrups, sugar alcohols, potent sweeteners, sugar products, solubility and crystallization, hygroscopicity, colligative properties, textural contributions, fermentation, non-enzymatic browning.

Unit-3

Protein chemistry

Structure and composition of proteins, Physiochemical properties of protein, functional properties of protein. Protein:Concentrates,hydrolysates and textured vegetable proteins, milk substitutes. Structure and composition, physical and functional properties and effect of heat, alkali and acid on plant and animal proteins. Enzymes- Nomenclature, classification, enzymatic browning in fruits and vegetables, immobilized enzymes.

Unit-4

Lipid chemistry

Structure and composition of lipids, physical and chemical properties of lipids, deteriorative changes in fats and oil and their prevention- auto-oxidation, autolysis, thermal decomposition, antioxidants, adulteration of fats and oils

Unit-5

Chemistry of non-nutritive components

Polyphenols-definition, classification, bioavailability, health benefits. Phytoestrogen- dietary sources, chemical forms, physiological effects. Other Dietary Factors with Antinutritional Effects -Protease Inhibitors, Saponins, Amylase Inhibitors, Lectins or Haemagglutinins, Phylates. Health Benefits of other Dietary Factors with Antinutritional Effects

References:

1. Belitz, H.D. and Grosch, W. (1999) Food Chemistry, Springer – Verlag, Berlin Heidelberg
2. Damodaran, S. and Parot, A (editors). (1997) Food Proteins and their Application. Marcel Dekker Inc
3. Davis, M.B. Austin, J. and Partidge, D.A. (1991) Vitamin C: Its Chemistry and Biochemistry. The Royal Society of Chemistry T.G. House, Science Park, Cambridge CB 4 4 WF
4. Diehl. J.F. (1995) Safety Irradiated Food Marcel Dekker Inc, New York
5. Friberg, S.E. and Larsson, K.(editors) (1997) Food Emulsions. Marcel dekker, New York
6. Goldberg, I. (ed) (1994) Functional Foods Chapman and Hall, Inc
7. Gunasekaran, s.(ed) (2001) Nondestructive Food Evaluation Marcel Dekker Inc, New York
8. Tombs, M.P. (1991) Biotechnolgoy in the Food Industry PRehtics-Hall Inc, India
9. O'Brien, L.O., Nabors and Gelardi, R.C. (1991) Alternative Sweeteners. Marcel Dekkr, New York
10. Risch, S.J. and Hotchkiss, J.H. (ed) (1991) Food Packaging Interactions II. Acs Symposium Series 473, Amercan Chemical Society, Washington D.C.

11. Marwaha, S.S. and Arora, J.K. (2000) Food Processing : Biotechnological Applications Asiatech Publishers Inc, New Delhi
12. Mahindru, S.N. (2000) Food Safety – A Techno-legal Analysis. Tata McGraw Hill Publishing Co Ltd., New Delhi.
13. Mahindru, S.N.(2000) Food Additives-Cheracteristics – Detection and Estimation Tata McGraw Hill Publishing Co.Ltd.
14. Borwankar, R.P. and Shoemaker, C.E. (1992) Rheology of Foods. Elsevier Science Publishers Ltd., Englad
15. Charalambour, G. (1990) Flavours and Off-Flavours'89, Elsevier Science Pubishers Ltd., P.O. Box 211, 1000 AE Amsterdam, The Netherlands.
16. Salunke, D.K. and Kodam, S.S. (2001): Handbook of Vegetable Science and Technology, Marcel Dekker, Ince., 270, Madison Avenue, New York, NY, 10016.
17. FAO Food and Nutrition Paper: Manual of Food Quality Control - Parts 14/1 (1979) to 14/8 (1986), FAO of the united Nations Rome.

FOOD CHEMISTRY PRACTICAL

Code : Fn 2.35
Credits : 2
Periods/ week : 4
Marks : (30+20 = 50)

Objectives:

- To enable the students to develop skills to prepare recipes. acceptable with reference to appearance, palatability and nutritive value

Course outcome:

- Practically applying food preservation techniques.
- Identifying importance of microbes in food processing.
- Knowing sugar cookery- application in preparation of desserts and confectionaries.

Content:

1. Effect of solutes on boiling point and freezing point of water. Effect of types of water on characteristics of cooked vegetables, pulses and cereals. Factors affecting ice crystal formation. Quality characteristics of frozen desserts.
2. **Sugar and Jaggery Cookery:** stages of sugar cookery, caramelization, crystallization, factors affecting crystal formation.
Starches, vegetable Gums and cereals: Dextrinization, gelatinization, retrogradation, thickening power. Factors affecting gels. Gluten formation and factors affecting gluten formation
3. **Fat and Oils:** Flash point, melting point and smoking point. Determination of acid value of different oils.
4. **Milk and Milk Products:** Scalding, Denaturation. Effect of acid, salt, alkali, sugar, heat, enzymes, polyphenols on milk.
5. **Meat and Poultry:** Methods affecting tenderness of meat, effect of various methods of cooking and ingredients on colour, volume, texture, flavour, aroma and water holding capacity.
6. Estimation of Chlorophyll and polyphenols content in vegetables and fruits.

References:

1. O'Brien, L.O., Nabors and Gelardi, R.C. (1991) Alternative Sweeteners. Marcel Dekker, New York
2. Risch, S.J. and Hotchkiss, J.H. (ed) (1991) Food Packaging Interactions II. ACS Symposium Series 473, American Chemical Society, Washington D.C.
3. Marwaha, S.S. and Arora, J.K. (2000) Food Processing : Biotechnological Applications Asiatech Publishers Inc, New Delhi

4. Mahindru, S.N. (2000) Food Safety – A Techno-legal Analysis. Tata McGraw Hill Publishing Co Ltd., New Delhi.
5. Mahindru, S.N.(2000) Food Additives-Characteristics – Detection and Estimation Tata McGraw Hill Publishing Co.Ltd.
6. Borwankar, R.P. and Shoemaker, C.E. (1992) Rheology of Foods. Elsevier Science Publishers Ltd., Englad
7. Charalambour, G. (1990) Flavours and Off-Flavours'89, Elsevier Science Pubishers Ltd., P.O. Box 211, 1000 AE Amsterdam, The Netherlands.
8. Salunke, D.K. and Kodam, S.S. (2001): Handbook of Vegetable Science and Technology, Marcel Dekker, Ince., 270, Madison Avenue, New York, NY, 10016.
9. FAO Food and Nutrition Paper: Manual of Food Quality Control - Parts 14/1 (1979) to 14/8 (1986), FAO of the united Nations Rome.

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FOOD MICROBIOLOGY

Code	: Fn 2.4
Credits	: 4
Periods/ week	: 6
Marks	: (80+20=100)

Objectives: The Course will enable the student to:

- Gain deeper knowledge of role of micro-organisms in humans and environment.
- Understand the importance of micro-organisms in food spoilage and to learn advanced techniques used in food preservation.
- Understand the latest procedures adopted in various food operations to prevent food-borne. Disorders and legal aspects involved in these areas.

Course outcome:

- Understanding the concept of sterilization and disinfectant
- Knowing about the microbial analysis and assessment and comparing with indices
- Comprehending importance of microbes in food fermentation.
- Learning different staining techniques and isolation methods
- Knowing about factors effecting microorganisms' survival and practically applying it

Content:

Unit-1

Introduction to historical developments in food preservation, spoilage, infections and legislation. Micro-organisms and their general characteristics, morphology, cultural characteristics and biochemical activities of bacteria, molds, yeast and virus. Their primary sources in microorganisms in food. Intrinsic and Extrinsic parameters that affect microbial growth.

Unit-2

Sterilization and disinfectants-types and methods. Food Preservation: Physical methods – Drying, freeze drying, Cold storage, heat treatments, Irradiation, High pressure processing. Chemical preservatives and Natural antimicrobial compounds. Biologically based preservation systems and probiotic bacteria.

Unit-3

Methods of Isolation and detection of microorganisms or their products in food: Conventional methods. Rapid methods (Newer techniques). Immunological methods: Fluorescent antibody, Radio immunoassay, ELISA. Chemical methods: Thermostable nuclear, ATP measurement and PCR (Polymer's chain reactions).

Unit-4

Spoilage of different groups of foods: Cereal and cereal products, vegetables & fruits, meat & meat products, eggs and poultry, fish and other sea foods, milk and milk products, canned food. Food borne

diseases: Bacterial, and viral foods-borne disorders, Food-borne important animal parasites, Mycotoxins.

Unit-5

Indicators of food safety and quality: Microbiology criteria of foods and their significance.

The HACCP system and food safety used in controlling microbiological hazards. Role of microbes in fermented foods and genetically modified foods.

References:

1. Pelczar, M.I and Reid R.D. (1993) Microbiology MCGraw Hill Book Company, New yark, 5th Edition
2. Akas, M. Ronald (1995) Principles of Microbiology, I Edn, Mosby-year Book, Inc, Missouri, U.S.A.
3. Topley and Wistson's (1983) Principles of Bacteriology, Virology and Immunity, Edited by S.G. Wilson A. Mike and M.T. Parkar, Vol I: General Microbiology and Immunity, II: Systematic Bacteriology. VII Edn., Edward Arnold Publisher.
4. Block, J.G. (1999) Microbiology Principles and Explorations, IV Edn. John Wiley and Sone Ince.
5. Frazier, W.C. (1988) Food Microbiology, Mc Graw Hill Inc. IV Edn.
6. Jay, James, M. (2000) Modern Food Microbiology, VI Edn., Aspen publishers, Inc., Maryland.
7. Banwart, G. (1989) Basic Food Microbiology, II Edn.. CBS Publisher.
8. Garbutt, J. (1997) Essentials of Food Microbiology, I Edn., Arnold International Students Edition.
9. Doyle, P. Benehat, L.R. and Mantville, T.J. (1997): Food Microbiology, Fundamentals and Frontiers, ASM Press, WASHinton DC.
10. Adams, M.R. and M.G. Moss (1995): Food Microbiology, I Edn., New Age intenational (P) Ltd.
11. Bensaon, H.J. (1990) Microbiological applications, C. Brown Publishers U.S.A.
12. Roday, S. (1999) Food Hygiene and sanitation , I Edn.. Tata McGraw Hiolo new Delhi.
13. Venderzat, C. and D.F, SplittsToesser (1992): Compendium of methods for the Microbiological Examination of Foods III Edn.. American Public health Association, Washington D.C.

Journals

14. Journal of Fooed Science Published by the Institution of Food Technologists, Chicago Lu, U.S.A.
15. Journal of Food Science and Technology published by Association of Food Scientists and Technologists (India) CFTRI-MYSORE
16. Food Technolgoy published by the Institute of Food Technologists, Chicago, U.S.A.

FOOD MICROBIOLOGY PRACTICAL

Code : Fn 2.45
Credits : 2
Periods/ week : 4
Marks : (30+20=50)

Objectives

- To prevent food borne infections and food poisonings
- Understand various toxic factors in foods

Course outcome

- Display ability to explore beneficial and harmful activities of microorganism
- Demonstrate skill in the usage of equipment used for sterilization and disinfectants
- Exhibit skill in scheduling and types of immunity
- Acquire skills in studying microorganisms in sewage and water treatment

Content:

- 1. Preparation of common laboratory media and special media** for cultivation of bacteria, yeast & molds.
- 2. Staining of Bacteria:** Gram's staining, acid-fast, spore, capsule and flagellar staining , Motility of bacteria, staining of yeast and molds.
- 3. Cultivation and Identification of important molds and yeast.** (slides and mold culture)
Isolation of microorganisms: Different methods and maintenance of cultures of microorganisms
- 4. Study of Environment around us as sources of transmission of microorganisms in foods.**
Assessment of surface of food preparation units' swab and rinse techniques.
- 5. Bacteriological analysis of Foods:** Both processed and unprocessed like vegetables and fruits, cereals, spices and canned foods, using conventional methods, yeast and mold count in foods.
- 6. Bacteriological analysis of water and milk,** Total count, MPN Coli form (count) and MBRT, IMVIC etc., To perform various biochemical tests used in identification of commonly found bacteria in foods.
- 7. Demonstration of available rapid methods and diagnostic kits used in identification of microorganisms or their products.**
- 8. Visits to food processing units.**

References:

17. Pelczar, M.I and Reid R.D. (1993) Microbiology MCGraw Hill Book Company, New yark, 5th Edition

18. Akas, M. Ronald (1995) Principles of Microbiology, I Edn, Mosby-year Book, Inc, Missouri, U.S.A.
19. Topley and Wistson's (1983) Principles of Bacteriology, Virology and Immunity, Edited by S.G. Wilson A. Mike and M.T. Parkar, Vol I: General Microbiology and Immunity, II: Systematic Bacteriology. VII Edn., Edward Arnold Publisher.
20. Block, J.G. (1999) Microbiology Principles and Explorations, IV Edn. John Wiley and Sone Ince.
21. Frazier, W.C. (1988) Food Microbiology, Mc Graw Hill Inc. IV Edn.
22. Jay, James, M. (2000) Modern Food Microbiology, VI Edn., Aspen publishers, Inc., Maryland.
23. Banwart, G. (1989) Basic Food Microbiology, II Edn.. CBS Publisher.
24. Garbutt, J. (1997) Essentials of Food Microbiology, I Edn., Arnold International Students Edition.
25. Doyle, P. Benehat, L.R. and Mantville, T.J. (1997): Food Microbiology, Fundamentals and Frontiers, ASM Press, WASHinton DC.
26. Adams, M.R. and M.G. Moss (1995): Food Microbiology, I Edn., New Age intenational (P) Ltd.
27. Bensaon, H.J. (1990) Microbiological applications, C. Brown Publishers U.S.A.
28. Roday, S. (1999) Food Hygiene and sanitation , I Edn.. Tata McGraw Hiolo new Delhi.
29. Venderzat, C. and D.F, SplittsToesser (1992): Compendium of methods for the Microbiological Examination of Foods III Edn.. American Public health Association, Washington D.C.

Journals

30. Journal of Fooed Science Published by the Institution of Food Technologists, Chicago Lu, U.S.A.
31. Journal of Food Science and Technology published by Association of Food Scientists and Technologists (India) CFTRI-MYSORE
32. Food Technolgoy published by the Institute of Food Technologists, Chicago, U.S.A.

INSTITUTIONAL FOOD MANAGEMENT

Code	: Fn 3.1
Credits	: 4
Periods/ week	: 6
Marks	: (80+20=100)

Objectives: This course aims to:

To enable students to

- Gain knowledge in menu planning, large scale food production and service.
- Manage the mass production of cuisines and beverages.
- Know the different types of food service techniques.

Course Outcomes:

- Standardize production of recipes and evaluate and price menus.
- Understand the different purchasing methods, product specifications and standards.
- Plan, organize and implement large scale production and distribution of food.
- Manage food service and understand different food and beverage service techniques.

Unit I

Food service management- Origin- factors influencing growth of industries, Food services system: Types of food service system-Traditional, Convectional, Centralized and decentralized services, Commissary, Ready prepared, assembly services, Cryogenic chill system.

Unit II

Menu- Planning, Standardization and Production Menu – Definition, types of menus, objectives, functions, factors to be considered while planning menu, steps in menu planning, menu writing and menu display. Production Forecasting and Scheduling. Planning production for outdoor and function catering. Standardization of recipes and portion control.

Unit III

Table Service Styles: Types of Table service styles- Banquet services, Restaurant services, Buffet Services, self-service, tray service, trolley, waiter services, Travel services, Canteen services, portable services, vending and Kiosk. Food services in selected areas- schools, hospitals. Restaurant, industries, Hotels.

Unit-IV

Purchasing and Storage Techniques: Methods of purchasing, qualities of effective food buyer, Purchasing Procedure, The Factors That Determine Purchase of Foods, Guidelines for Purchasing, Food Storage Methods, Receiving Procedure, Organization of Storages, Store keeping
Food Production: Definition, Steps in food production, factors in preparation, Effective use of leftovers, Production control. Sanitation and Hygiene.

Unit V

Costing and Budgeting: Cost concepts, Cost control- Food cost, labor cost, overhead cost, hidden Cost, Concept of gross profit, profit, after wage profit, Concept of profit, gross profit, after wage profit, net profit.

Budgeting- Types of Budgets, steps in planning budget, Preparation of budget, Forecasting.

References

1. Gisslen, W., Professional Cooking, (2014), 8 th Edition, John Wiley and sons, Inc., (New York).
2. Lillicrap,G.Cousins,J. and Weekes.S., (2014), 9 th Edition, Food and Beverage Service, Hodder and Stoughton (Publishers) Ltd., England.
3. Bali, P.S., (2011), Quantity Food production Operations and Indian Cuisine, Oxford university press.
4. Sethi,M and Malhan,S,M, (2008), 3 rd Edition, Catering Management an Integrated approach", New age International Pvt Ltd.
5. Shock,PJ, Stefanelli,JM. And Cheryl, S., (2011), 3rd Edition, On Premise Catering, John Wiley and Sons Increase, New York. 8. Andrews,S., (2013), Food and Beverage Service, Training Manual, Tata McGraw, Hill Publishing Company Ltd, New Delhi.
6. Kotschevar, L.H. and Withrow, D., (2007), Fourth Edition, Management by Menu, John Wiley and Sons.
10. Barrows, W.C., Powers, T. and Reynolds, D. R., (2012), Study Guide to accompany Introduction to Management in the Hospitality Industry, John Wiley and Sons
7. June Payne-Palacio, and Monica Theis, (2016),Foodservice Management: Principles and Practices, 13th Edition, Harlow :Pearson.
8. Knight,J.B. and Kotschevar,L.H., (2017), 3 rd Edition, Quantity: Food Production, Planning and Management, John Wiley and Sons.

INSTITUTIONAL FOOD MANAGEMENT PRACTICAL

Code : Fn 3.15
Credits : 2
Periods/ week : 4
Marks : (30+20=50)

Objectives:

- Understanding the factors affecting the organization and administration of food service.
- Understanding type of Institution where the food service is housed.

Content

1. Menu planning as per different cuisine, as per different service styles
2. Standardization of recipes- standardization of 11, 10,50,100 servings
3. Preparation of large-scale meal (optional)
4. Visits to star hotels and food service units of industries- to observe kitchen layout, table setting
5. Market survey to know the availability of large-scale food preparation equipment/ tools

References

1. Mohini Sethi & Surjeet Malhan (1987) Catering Management. An Integrated Approach. Wiley Eastern Ltd. New Delhi.
2. Awatramani P (1980). Catering management for Indian Hotels. Bombay. Popular Book depot.
3. Bessie B and West Le Wood (1986) Food Service in Institutions (6th Ed.) Macmillan Publishing Co.
4. Buttle F (1992) Hotel and Food Services marketing- a managerial approach. London ELBS/Casell

NUTRITIONAL BIOCHEMISTRY

Code : Fn 3.2
Credits : 4
Periods/Week : 6
Marks : (80+20= 100)

Objectives: The course will enable the students to:

- Understand the mechanisms adopted by the human body for regulation of metabolic pathways
- Get an insight into interrelationships between various metabolic pathways
- Become proficient for specialization in nutrition
- Understand integration of cellular level metabolic events to nutritional disorders and imbalances.

Course outcome:

- Gaining depth knowledge on human metabolism.
- Understanding principles of bio-chemical methods.
- Learning the chemistry of nutrients.
- Relating bio-chemistry with nutrition for extensive application

Content:

Unit-1

Carbohydrates: a. Definition, classification, structural, physical and chemical properties of carbohydrates. Regulations, reactions, energy and pathway of glycolysis, TCA cycle, HMP shunt, gluconeogenesis, Glycogenesis, Glycogenolysis, Regulation of blood glucose level, alteration in carbohydrate metabolism.

Unit-2

Proteins – classification of protein and amino acids, structure of protein, Transamination, deamination and decarboxylation of amino acid, Urea cycle. Alteration in Protein metabolism.

Nucleotide metabolism: Purines synthesis-de novo synthesis, salvage pathway of proteins, degradation. Pyrimidines – Synthesis and breakdown.

Unit-3

Lipids-Classifications of lipids, Physical and chemical properties, Functions of lipids, Beta-oxidation, de novo synthesis of fatty acids, synthesis and breakdown of unsaturated fatty acids, cholesterol, phospholipids and triacylglycerol. Ketosis and its mechanism.

Unit-4

Hormone – Regulation of endocrine system. Mechanism of action of hormones. Biochemical role of hormones.

Enzymes- Classification, mechanism of enzyme action, factors affecting enzyme activity, role of enzymes and coenzymes in metabolisms, enzyme inhibition, enzymes in clinical diagnosis.

Unit-5

Vitamins and Mineral: Function and biosynthesis of Vitamin (A,D,E,C,B), and Minerals (Ca, P, Mg, Fe, Na, K)

Biological oxidation: Electron transport chain, oxidative phosphorylation, high energy phosphate bond.

References:

1. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2000): XXV Edn. Harpers Biochemistry. Macmillan Worth Publishers.
2. Nelson, D.L. and Cox, M.M. (2000): III Edn. Lehninger's Principles of Biochemistry, Macmillan Worth Publishers.
3. Devlin, T.M. (1997): IV Edn. Text book of Biochemistry with Clinical Correlations, Wiley Inc.
4. Stryer, L. (1998): IV Edn. Biochemistry, WH Freeman and Co.
5. Conn, E.E., Stumpf, P.K., Bruening, G. and Doi, R.H. (2001): Outlines of Biochemistry, V Edn. John Wiley and Sons.
6. Voet, D., Voet, J.G. and Pratt, C.W. (1999) Fundamental of Biochemistry.
7. Oser, B.L. (1965), Hawk's Physiological Chemistry, XIV Edn. Tata McGraw-Hill Publishing Co. Ltd.
8. Varley, H., Gowenlock, A.H. and Bell, M. (1980), Practical Clinical Biochemistry. V Edn., Heinemann Medical Books Ltd.
9. Tietz, N.W. (1976) Fundamentals of Clinical Chemistry, W.B. Saunders Co.

NUTRITIONAL BIOCHEMISTRY PRACTICAL

Code : Fn 3.25
Credits : 2
Periods/Week : 4
Marks : (30+20= 50)

Objectives: This course will enable the students to:

- Understand the principles of biochemical methods used for analysis of food and biological samples.
- Perform biochemical analysis with accuracy and reproducibility.

Course outcome

- Gain depth knowledge on human metabolism.
- Understand and experiment on the principles of bio-chemical methods.
- Be able to demonstrate through scientific experiments chemistry of nutrients.
- Be qualified to take up career relating bio-chemistry with nutrition for extensive application

1. **Calcium** : Estimation of calcium in foods and serum.
2. **Ascorbic acid**: Estimation of ascorbic acid in foods.
3. **Proteins** : a. Estimation of protein in food stuffs.
b. Estimation of albumin, globulin and albumin/globulin ratio in serum and urine.
c. Estimation of hemoglobin
4. **Glucose** : Estimation of glucose in blood and urine.
5. **Cholesterol** : Estimation of cholesterol in blood.
6. **Enzyme assay**: Estimation of activity of serum alkaline phosphatase and transaminase
7. **Urea and Creatinine**: Estimation of urea and creatinine in serum and urine.
8. **Study of pathological laboratories**:To obtain information about the methods used for blood/serum analysis

References:

10. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2000): XXV Edn. Harpers Biochemistry. Macmillan Worth Publishers.
11. Nelson, D.L. and Cox, M.M. (2000): III Edn. Lehninger's Principles of Biochemistry, Macmillan Worth Publishers.
12. Devlin, T.M. (1997): IV Edn. Text book of Biochemistry with Clinical Correlations, Wiley Inc.
13. Stryer, L. (1998): IV Edn. Biochemistry, WH Freeman and Co.
14. Conn, E.E., Stumpf, P.K., Bruening, G. and Doi, R.H. (2001): Outlines of Biochemistry, V Edn. John Wiley and Sons.
15. Voet, D., Voet, J.G. and Pratt, C.W. (1999) Fundamental of Biochemistry.
16. Oser, B.L. (1965), Hawk's Physiological Chemistry, XIV Edn. Tata McGraw-Hill Publishing Co. Ltd.
17. Varley, H., Gowenlock, A.H. and Bell, M. (1980), Practical Clinical Biochemistry. V Edn., Heinemann Medical Books Ltd.
18. Tietz, N.W. (1976) Fundamentals of Clinical Chemistry, W.B. Saunders Co.

19. Vogel, A.I. (1962) A Textbook of Quantitative Inorganic Analysis. III Edn., The English Language Book Society and Longman.
20. Raghuramulu, N., Madhavan Nair and K.Kalyanasundaram, S. (1983), A Manual of Laboratory Techniques. NIN. ICMR.
21. King, E.J. and Wootton, I.D.P. (1956) Micro-Analysis in Medical Biochemistry. III Edn. J and A Churchill Ltd.
22. Plummer, D.T. (1987) III Edn. An Introduction to Practical Biochemistry. McGraw-Hill Book Co.
23. Winton, A.L. and Winton, K.B. (1999), Techniques of Food Analysis. Allied Scientific Publishers: New Delhi.

Code : **Fn 3.3**
Credits : **4**
Periods/Week : **6**
Marks : **(80+20=100)**

Objectives

- To obtain knowledge and hands on experience in various aspects of food analysis.
- To gain knowledge about usage and working principles of instruments.
- To obtain knowledge on application of various instruments in analysis of food.

Course outcomes: -

- Acquiring skill and knowledge on different analysis procedures.
- Understanding standard operation procedure for various instruments.
- Learn the analytical techniques for quantitative and qualitative estimation of different food groups.

Content

Unit I

Methods in sampling of foods for analysis, Sample preparation, Determination of moisture and Ash content by different methods, Estimation of minerals by ashing. Determination of Dietary and crude fibre. Measuring acid content of food by titration.

Unit II

Need for food analysis, Different food analysis technique, Chromatography- Gas, Liquid, TLC, HPTLC. Spectroscopy- Techniques and Instruments- UV, AAS, NMR, analysis of food additives by spectrophotometry.

Unit III

Electrophoresis in food analysis, Determination of solids in juices and honey. Thermal methods of food analysis- Thermogravimetry, DTA, DSC. Hyphenated techniques- Gas chromatography- mass spectrometry (GC-MS), Liquid Chromatography- mass spectrophotometry (LC-MS).

Unit IV

General physical properties of food, Quantitative analysis of foods – protein by Direct method, Indirect method, Formal titration, Fat-Direct solvent extraction method, Solubilization extraction method, Volumetric method. Other estimations- iodine number, saponification, acid number. Determination of lipid constituents in food.

Unit V

Carbohydrates- qualitative and quantitative estimation of sugars, estimation of carbohydrates from starch, Analysis of fibres present in food – TDF, IDF, SDF. Vitamin estimation- vitamin A, Vitamin C, Thiamine, Riboflavin.

References

1. Seemayadav (1997) Food Chemistry S, Author publication of Anmol Pvt. Ltd., 437/4B Ansari Road, Daryaganj, New Delhi..
2. Sathe (1999) A First Course In food Analysis
3. David & Robinson, Food biochemistry & nutritional value.
4. Dennis D. Meller Awiley , Food chemistry, A Laboratory manual by– Inter
5. science publication John Wiley & Sons, INC.
6. Owen R. Fennema, Food chemistry 2nd edition Revised & Expanded.
7. Meloan , Food Analysis-Theory & PracticeSathe (1999) A First Course In food Analysis
8. Yeshajahu P, Clifton E & Meloan , Food Analysis-Theory & Practice

FOOD ANALYSIS PRACTICAL

Code : Fn 3.35
Credits : 2
Periods/Week : 4

Marks : (30+20=50)

PRACTICAL

1. Different methods of sampling of foods for food analysis.
2. Determination of moisture content in different foods
3. Estimation of Ash value in different foods and preparation of Ash solution
4. Estimation of different types of Fiber in foods
5. Estimation of Protein content in foods by Kjeldahl method
6. Estimation of Fat content in foods by Soxhlet method
7. Estimation of total sugars and reducing sugars
8. Estimation thiamine and riboflavin content of foods
9. Estimation of Vitamin C in foods
10. Determination Saponification value, Iodine value, Free fatty acid value and Peroxide value of fats and oils
11. Determination of Refractive Index of fats and oils
12. Determination of plant pigments using spectrophotometer.
13. In collaboration with local labs/organization/HEI (Higher educational Instituts

Reference

1. Seemayadav (1997) Food Chemistry S, Author publication of Anmol Pvt. Ltd., 437/4B Ansari Road, Daryaganj, New Delhi..
2. Sathe (1999) A First Course In food Analysis
3. David & Robinson, Food biochemistry & nutritional value.
4. Dennis D. Meller Awiley , Food chemistry, A Laboratory manual by– Inter
5. science publication John Wiley & Sons, INC.
6. Owen R. Fennema, Food chemistry 2nd edition Revised & Expanded.
7. Meloan , Food Analysis-Theory & PracticeSathe (1999) A First Course In food Analysis
8. Yeshajahu P, Clifton E & Meloan , Food Analysis-Theory & Practice

DIETETICS

Code : Fn 3.4

Credits : 4

Hours/Week: 6

Marks : (80+20 = 100)

Objectives: The Course will enable the students to:

- Understand the Biochemical and Physiological impairments in diseases
- Understand the role of Nutrition for good health
- Obtain knowledge of dietary factors and dietary management of various diseases
- Develop capacity and attitude for taking up dietetics as a profession

Course outcome:

- Skilled enough to plan and prepare therapeutic diets.
- Understanding metabolic changes in degenerated diseases.
- Learns about pre and post operative diets.
- Able to plan diets using food exchange list.
- Acquiring knowledge about diet counseling according to symptoms of disease.

Content:

Unit-1

Principles of clinical nutrition and nutritional assessment: Development of nutrition care plan, Role of clinical dietitian in the hospital, Nutrition counseling components – planning, implementation and evaluation

Cardiovascular diseases: The heart and the blood vessels – Reviews. Path physiology, etiology, symptoms, dietary factors and dietary Management of Dyslipidemia, Atherosclerosis, coronary heart disease, myocardial infarction, Hypertension, Congestive heart failure, Cardiac cachexia.

Unit-2

Diabetes mellitus-etiology, signs and symptoms, complications, types (IDDM, NIDDM), management and dietary modifications, laboratory tests, diagnosis, education. Glycemic index.

Renal diseases: Renal function tests. Laboratory tests, Diagnosis of renal disorders. Etiology, pathophysiology and medical nutrition therapy in Glomerulonephritis, Nephrosis. Artificial Kidney- Principles of dialysis, types of dialysis, Renal Calculi, End stage renal diseases.

Unit-3

Diseases of Liver, Gall Bladder and Pancreas: Etiology, pathophysiology, symptoms, function tests and medical nutrition therapy of Acute viral hepatitis, Chronic hepatitis, Alcoholic liver disease and Nonalcoholic fatty liver disease, Inherited disorders- Wilson's disease, hemochromatosis, Liver cirrhosis, Gall bladder: Cholecystitis, cholelithiasis and choledocholithiasis, Pancreas – pancreatitis

Unit-4

Etiology, Metabolic & Clinical aberrations, complications, prevention and nutrition management of Cancer, Neurological disorders- Alzheimer's disease & epilepsy

Gastrointestinal disorders- Etiology, Metabolic & Clinical aberrations, complications, prevention and nutrition management of Peptic ulcer, Esophagitis, Diverticular diseases, Gastritis, Dyspepsia, Irritable bowel syndrome.

Unit-5

Metabolic disorder - Etiology, patho-physiology, symptoms and medical nutrition management of Metabolic syndrome (Syndrome X), Gout, Inborn errors of metabolism- Lactose intolerance, Phenylketonuria (PKV), Maple syrup urine disease, Galactosemia

References:

- 1.Krause. M.V. And Mahan, L.K. Food, Nutrition And Diet Therapy, VI Edn: W.B. Saunders company, Philadelphia, 2004.
- 2.Sri Lakshmi. V. Dietetics New Age International Private Ltd., New Delhi, 2007
- 3.David A, Bender .Introduction to Nutrition and Metabolism, Fourth Edition,
- 4.Michael J. Gibney, Ian A. Macdonald and Helen M. Roche. Nutrition and Metabolism,
- 5.Shills, M.E., Olson, J.A., Shike, M, and Ross, A.C. (1999): Modern Nutrition in Health and Disease, IX Edn, Williams and Wilkins.
- 6.Williams, S.R.(1993): Nutrition and Diet Therapy, VII Edn Times Mirror/Mosby College Publishing.
- 7.Mahan ,LK and Escott- Stump, S .(2000) : Food Nutrition and Diet Therapy , X Edn ,W.B . Saunders Ltd.
- 8.Shils, M.E., Olson ,J.A., Shike,M. and Ross . A.C. (1999) : Modern Nutrition in Health and Disease, IX Edn, Williams and Wilkins.
- 9.Escott- stump, S. (1998) Nutrition and Diagnosis Related Care , IV Edn, Williams and Wikins.
10. Garrow , J.S., James .W.P. T.and Ralph , A (2000) : Human and Dietetics, X Edn, Churchill Livingstone.
11. Williams,S.R.(1993) : Nutrition and Diet therapy , VII Edn, Times Mirror/ Mosby College Publishing.

DIETETICS PRACTICAL

Code : Fn 3.45

Credits : 4

Hours/Week: 2

Marks : (30+20 = 80)

Objectives: To enable the students to

- Understand the role of food in treatment of diseases.
- Relate the planning of the diet and diet counseling to etiology and symptoms.

Course outcomes

- Demonstrate the ability to plan hospital diets for different health conditions
- Be familiar with all clinical condition that impact diet planning.
- Possess hands-on knowledge of physiology of diseases, to be considered in diet planning under different disease conditions
- Be qualified to take up career as a diet planner in a hospital

Content:

1. Assessment of nutritional status including Body Composition
2. Physiological parameters like heart rate and blood pressure
3. Assessment of coronary risk profile-RISKO factor
4. Planning diets and formulating dietary guidelines for:
 - Prevention of chronic degenerative disorders
 - Obesity management
 - Management of diabetes mellitus and CVD
5. Case studies
6. Nutritional Management in critical care.

References:

8. Krause. M.V. And Mahan, L.K. Food, Nutrition And Diet Therapy, VI Edn: W.B. Saunders company, Philadelphia, 2004.
9. Sri Lakshmi. V. Dietetics New Age International Private Ltd., New Delhi, 2007
10. David A, Bender .Introduction to Nutrition and Metabolism, Fourth Edition,
11. Michael J. Gibney, Ian A. Macdonald and Helen M. Roche. Nutrition and Metabolism,
12. Shills, M.E., Olson, J.A., Shike, M, and Ross, A.C. (1999): Modern Nutrition in Health and Disease, IX Edn, Williams and Wilkins.
13. Williams, S.R.(1993): Nutrition and Diet Therapy, VII Edn Times Mirror/Mosby College Publishing.
14. Mahan ,LK and Escott- Stump, S .(2000) : Food Nutrition and Diet Therapy , X Edn ,W.B . Saunders Ltd.
12. Shils, M.E., Olson ,J.A., Shike,M. and Ross . A.C. (1999) : Modern Nutrition in Health and Disease, IX Edn, Williams and Wilkins.
13. Escott- stump, S. (1998) Nutrition and Diagnosis Related Care , IV Edn, Williams and Wikins.
14. Garrow , J.S., James .W.P. T.and Ralph , A (2000) : Human and Dietetics, X Edn, Churchill Livingstone.
15. Williams,S.R.(1993) : Nutrition and Diet therapy , VII Edn, Times Mirror/ Mosby College Publishing.

16. Davis, J and Sherer ,K. (1994) : Applied Nutrition and Diet therapy for Nurses , II Edn, W.b. Saunders Co.
17. Walker , W.A. and Watkins ,J.B. (Ed) (1985) : Nutrition in Pediatrics , Boson , Little , Brown & Co
18. Guyton , A.C. (1990) : Boyd's Textbook of Pathology, IX Edn, Lea and Febiger, Philadelphia.
19. Fauci, S.A. et al (1998) : Harrison's principles of internal Medicine, XIV Edn,McGraw Hill Publishers: New York.

CURRENT TRENDS AND ISSUES IN FOODS & NUTRITION

Code : Fn 4.1

Credits : 4

Hours/Week: 6

Marks : (80+20 = 100)

Objectives : -

- To create awareness regarding current trends, issues and regarding current trends, issues and regarding current trends, issues and researches in various aspects of foods and nutrition.
- To debate on various emerging areas of studies and research needs for nutrition.

Contents: -

1. Magnitude and prevalence of Malnutrition
2. Nutrition impact on AIDs affected.
3. Emerging trends in Nutrition and Dietetics
4. Role of nutritionists in Public health nutrition.
5. New initiatives in nutrition research
6. Public health and Nutrition Programmes
7. Online Nutrition initiatives
8. Global Players in Nutrition.

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INTERNSHIP

Code	: Fn 4.25
Credits	: 4
Periods/ week	: 8
Marks	: (50+100=150)

The student will be required to undergo an internship/field placement for a total duration of 6 - 8 weeks in their chosen area of interest which will facilitate their pursuing a professional career in the same field. This program could be taken up either as a single block or in two different blocks. It is mandatory that the organization/institutions (public/private) participating in the field placement programme be of good professional standing. The list could include hospitals, state run/NGO administered public nutrition programmes, food industry etc. the students will be required to submit and present a report of the internship/ field placement project after its completion. It is also envisaged that the participating organization/institution will give their performance appraisal of the students work.

This programme is designed with the following objectives:

1. To enable the students to acquire an in-depth understanding of the practical aspects of knowledge and skills acquired during the course work in the relevant subject/Subjects.
2. To gain hands on experience for higher proficiency in their selected area of expertise.
3. To help the students to develop and have their analytical abilities for situation analysis and bringing about improvements.

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THESIS-MAJOR PROJECT

Code	: Fn 4.35
Credits	: 4
Periods/ week	: 8
Marks	: (50+100=150)

OBJECTIVES: The major project is intended to arouse a genuine interest in research and present the student with an opportunity to express her individual skill and ability

COURSE OUTCOMES: On successful completion of the course, the student shall exhibit the ability to

- It is expected to train the student in the process of methodical scientific research.
- To strengthen the scientific temper in the student.

The student shall undertake a research project from a relevant area in the field and collect data and present a project report as a thesis under the headings

- Introduction (stating objectives of study)
- Review of literature
- Research design
- Results and discussion
- Summary and conclusion

The major project shall be valued as under:

I Seminar – after objectives and area of study are finalized – 15m

II Seminar – after tool of study is finalised and pilot study is completed – 15m

III Seminar – after data collection – 15m

IV Seminar – after statistical analysis is completed – 15m

External Evaluation – 90m