SARDAR PATEL UNIVERSITY
VALLABH VIDYANAGAR

SYLLABUS EFFECTIVE FROM: 2018-19
Programme: M.Sc. (Home Science)
Subject: Foods and Nutrition
Semester: III

PH03CFDN21 RESEARCH METHODOLOGY AND SCIENTIFIC WRITING

(50MARKS -2HOURS, CREDITS-2)

Objectives:

- To understand significance of research in Home Science
- To understand sampling methods and techniques.
- To understand types of researches and develop the ability to construct data gathering tools appropriate to research design
- To gain knowledge regarding scientific writing in research report presentations.

Content:

Unit: 1

Basic concepts of research Introduction, meaning of research, objectives of research, characteristics of research, requirements for a scientific research, types of researches: Exploratory and Descriptive

Unit: 2

Research Problem Introduction, selecting the problem, defining the problem, sources of problem, criteria for selection of the problem, delimiting a problem, process of formation of a research problem

Unit: 3

Research design and Hypothesis Formulation
Meaning of research design, types of research designs (exploratory, descriptive, diagnostic, experimental)
What is Hypothesis, sources of hypothesis, forms of hypothesis

Unit: 4

Sampling methods and techniques
Meaning and definition of population and sampling, techniques of sampling (probability and non-probability)

Unit: 5

Data collection and Measurement

Types of data: Secondary and Primary
Methods of Primary data collection: observation, personal interview, questionnaire, schedule, case study, social survey, field study, field experiment
Scaling measurement: types of measurement scales (Nominal, ordinal, interval, ratio)

Unit: 6

Organization of data and presentation
Coding, tabulation and charts
Purpose of report, essentials of a good report, types of report presentations (written, oral, poster) format of a report

Course Learning Outcome:

- The students would become better researchers.
- They would know how to present their research report in a systematic manner
- The students would have also learned the details of a research proposal

Reference Books:

1. Taxman's Research Methodology by Sarangi Prasant, Taxman Publications (P) Ltd, New Delhi (2010)
2. Research Methodology Methods and Techniques by C.K.Kothari , Wiley Eastern Ltd., New Delhi (1990)
3. Research Methodology Concepts and Cases by Chawla. D and Sondhi. N, Vikas Publishing House, Noida
4. Research methodology- Methods and Techniques by C.R.Kothari, Wishwa Prakashan, New Delhi (1990) ISBN-81-7328-035
5. Doing your Master's Dissertation by Cris Hart, Vistaar Publications, New Delhi (2005)
    a. ISBN-81-7829-506-7
6. Your Research Project by Nicholas William, Vistaar Publications, New Delhi ISBN-81-7829-540-7
7. Research Methodology for Community Development by Uma Joshi, Authorspress, New Delhi ISBN-978-81-7273-457-2
8. Writing your Thesis by Paul Oliver, Sage Publication, India Pvt. Ltd., Delhi (2008) ISBN-978-81-7829-918-1
9. Research and Writing: Across the Disciplines by P. Ramdass and A. Wilson Aruni, MJP Publishers, Chennai ISBN-978-81-8094-068-2

PH03CFDN22 PRACTICAL –SCIENTIFIC WRITING

(25 MARKS - 2 HOURS, CREDITS -1)

1. Scientific writing as a means of communication (grammar, punctuation and conventions of scientific writing)
2. Sections of a report:
   -research paper
   -thesis/dissertation
   -poster

   Steps in writing a report
3. Tables: Drafting titles, subtitles, construction details
4. Graphs- types, title, elements (scales, title, scale captions and key)
5. Citing the references
6. Appendices- content, need, rules for presentation
7. Writing of proposal (for grants)

PH03CFDN23 MOLECULAR NUTRITION – I

(100 MARKS -4 HOURS, CREDITS-4)

Objective:

The course will enable the students to:

- Gain knowledge about the physiological and metabolic role of carbohydrates, proteins and fats in human body.
- Learn the requirements of carbohydrates, proteins and fats for various age groups and factors affecting it.
- Understand the molecular action of carbohydrates, proteins and fats in health and diseases.

Content:

Unit 1: Introduction to Molecular Nutrition

Introduction to Molecular Nutrition:Concept of molecular nutrition opposed to 'classic' concept of nutrition.Gene regulation and nutrient-gene interaction.Types of regulation by nutrient.Research methods in molecular nutrition.Application of genomic and post-genomic technologies.

Unit 2: Energy

Energetics of intermediate metabolism, measurement of energy intake and energy expenditure, Human energy requirement. Molecular action of hormones and biomolecules in energy regulation.

Unit 3: Carbohydrates

Functions, deficiency, RDA, Food sources, digestion, absorption and metabolism of carbohydrates. Role of carbohydrates in gene expression. Molecular action of carbohydrates in health and disease.

Unit 4: Proteins and aminoacids

Functions, deficiency, RDA, Food sources, digestion, absorption and metabolism of proteins. Role of proteins and amino acids in gene expression. Molecular action of proteinsand amino acids in health and disease.

Unit 5: Lipids

Functions, deficiency, RDA, Food sources, digestion, absorption and metabolism of lipids. Role of lipids in gene expression. Molecular action of lipidsin health and disease.

Course learning outcome:

The students will be able to-

- Discuss about the functions and deficiency of carbohydrates, proteins and lipids.
- Describe about the molecular action of carbohydrates, proteins and lipids'

- Describe about the role of carbohydrates, proteins and lipids in health and disease.

Reference Books:

1. Nutritional Genomics: Discovering the Path to Personalized Nutrition by Jim Kaput, Raymond L. Rodriguez, Willi Publications.
2. Nutritional Genomics: Regina Brigelius -Flohe and Hans- Geory Joost, Willi Publication.
3. Krause's Foods and Nutrition Therapy by L. Kathleen Mahan and Sylvia Escott Stump, Saunders Elseviers Publication.
4. Moder Nutrition in health and diseases, by Maurice E. Shills, Lippincott Williams and Wilkins Publication.

PH03CFDN24 PRACTICAL BASED ON PH03CFDN23

(50 MARKS - 4 HOURS, CREDITS -2)

Serum/ Plasma Analysis for the following Nutrients/ Compounds –

1) Total Antioxidant Capacity
2) Glutathione
3) Vitamin A, E and C
4) Lipid Peroxidation
5) AOPP

PH03CFDN25 MEDICAL NUTRITION THERAPY – I

(100 MARKS -4 HOURS, CREDITS-4)

Objective:

This course will enable the students to:

- Understand the etiology and metabolic variations in acute and chronic diseases such as obesity, diabetes mellitus, cardiovascular diseases and diseases of the adrenal cortex, thyroid gland and Para thyroid gland.
- Know the effect of the above diseases on the nutritional status and on nutritional and dietary requirements.
- Be able to recommend and provide appropriate nutritional care for the prevention and treatment of diseases such as obesity, diabetes mellitus, cardiovascular diseases and diseases of the adrenal cortex, thyroid gland and para thyroid gland.

Content:

Unit: 1 Nutritional care for Weight Management

- Regulation of energy intake and balance of body weight
- Control of appetite and food intake - Neural control, hormonal control, insulin, estrogen and other peptides and hormones.
- Identifying the obese
- Types of obesity, Health risks
- Causes, Psychology of obesity
- Treatment of Obesity
- Diets in Obesity - Starvation, Fasting, Fat diets
- Evaluation of some common diets, Protein-sparing modified High protein diets
- Balanced Energy Reduction
- Foods to include, fibre foods allowed as desired, alcohol, snacks and beverages
- Psychology of weight reduction
- Behavioural Modification - Psychotherapy, pharmacology, exercise & physical activity, Surgery, prevention of weight gain & obesity.
- Underweight - Etiology and Assessment, High calorie diets for weight gain, Diet plan, Suggestions for increasing calories in the diet, Anorexia Nervosa and Bulimia

Unit: 2 Diet in Disease of the Endocrine Pancreas Diabetes Mellitus and Hypoglycemia

- Classification
- Symptoms and disturbances, diagnosis (FBG and OGTT)
- Management of Diabetes Mellitus

- Clinical Vs Chemical control
- Exercise
- Dietary care and Nutritional Therapy - The Diet Plan, Meal planning with and without Insulin, Special Dietetic Foods, Sweeteners and Sugar Substitutes
- Hypoglycemia -classification, symptoms, fasting state hypoglycemia, Postprandial or reactive hypoglycemia, Early alimentary and late reactive hypoglycemia, Idiopathic hypoglycemia, Dietary treatment in reactive hypoglycemia.

Unit: 3 Diseases of the Circulatory System

- Atherosclerosis - Etiology, risk factors, diet
- Hyperlipidemias
- Brief review of Lipoproteins and their metabolism
- Clinical and nutritional aspects of Hyperlipidemias
- Classification and Dietary care of Hyperlipidemias
- Nutritional care in Cardiovascular disease (Ischemic heart disease Pathogenesis of sodium and water retention in Congestive Heart Disease. Acute and Chronic Cardiac Disease, Acute - Stimulants, food & consistency, Chronic - Compensated and decompensated states, Sodium Restriction in Cardiac Diseases, Diet in Hypertension - Etiology, Prevalence, Renin-Angiotensin mechanism, Salt and Blood pressure, Cerebrovascular diseases and diet in brief).

Unit: 4 Dietary cares in diseases of the Adrenal Cortex, Thyroid gland and Parathyroid gland.

- Functions of the gland and hormones and their insufficiency, metabolic implications, clinical symptoms.
- Dietary treatment as supportive to other forms of therapy
- Adrenal cortex insufficiency, Hyper and Hypothyroidism (goitre), Hypoglycemia.

Course Learning Outcome:

- At the end of the course the student will be able to recommend and provide appropriate nutritional care for the prevention and treatment of diseases such as obesity, diabetes mellitus, cardiovascular diseases and diseases of the adrenal cortex, thyroid gland and para thyroid gland.

Reference Books:

1. Anderson L., M. V. Dibble, P. R. Turkki, H. S. Mitchell and H. J. Rynbergen Nutrition in Health and Disease, 17th ed., J. B. Lippincott Co., Philadelphia, 1982.
2. Antia F. P.: Clinical Dietetics and Nutrition, 3rd ed., Oxford University, Press, Delhi, Reprinted in 1989.
3. Bennion M.: Clinical Nutrition, Harper and Row Pub. New York, 1979.
4. Frances, D. E. M.: Diets for sick children, Blackwell Scientific, Publications, 1974.
5. Hui, Y. H.: Human Nutrition and Diet Therapy, Wadsworth Health ScL Divs. 1983.
6. Karran, S. J. and K. G. M. M. Alberti (ed): Practical Nutritionsl Support, John Wiley and Sons. Inc. N. Y. 1980.
7. Krus M. V. and L. K. Madan: Food, Nutrition and Therapy, W. B. Saunders Company, London, 1984.
8. Lois, J and C. M. Peterson (ed): Nutrition and Diabetes, Alan R. Liss, Inc. N. Y., 1985.
9. Passemore R. and M.A. Eastwood: Human Nutrition and Dietetics, 8th ed. ELBS, Churchill Livingston, 1986.
10. Robinson, C. H, M. R. Lawlwr, W. L. Chenoweth and A. E. Garwick: Normal and Therapeutic Nutrition, 17th ed;, Mac Millan Pub. Co.
11. Suitor, Coo Woo and Moo F.. Hunter: Nutrition, Principles and Application in Health Promotion, J.. Boo Lippincott Co., Philadelphia, 1980..
12. Whitney, E. N. and C. B.. Cataldo: Understanding Normal and Clinical Nutrition, West Pub. S1. Paul, 1983.
13. Willims, S.. R.: Nutrition and DietTherapy, 4th ed., The C. V. Mosby Co., S1. Louis, 1981.
14. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
15. Thomas, B.: Manual of Dietetic Practice, 1996,.
16. ASPEN; Nutrition Support, Dietetics

PH03CFDN26 PRACTICAL BASED ON PH03CFDN25

(50 MARKS - 4 HOURS, CREDITS -2)

1. Planning of diets for various diseases with modification of the appropriate nutrients with respect to the disease condition.
2. Use of exchange lists for diet planning in appropriate disease condition

PH03CFDN27 DISSERTATION

(100 MARKS - 4 HOURS, CREDITS -4)

Objective:

- To provide students with the opportunity to work independently as researchers
- To make students better researchers

Content:

1. A topic for independent research is to be selected by the student in consultation with the guide on the basis of areas of current importance, facilities available in the department of research etc. (the topic selected should have the depth as the work is to be started in the III semester by the student and to be continued in the IV semester also)
2. The student will do extensive literature review on the selected topic
3. The following chapters/ parts of chapters of the research is to be completed by the end of the semester:
    a) Significance of the research
    b) Objectives
    c) Initiation of Review of literature
    d) Work plan
4. At the end of the semester the student will be making a presentation and submit a report of the same

PH03EFDN21 COMMUNITY NUTRITION

(100 MARKS - 4 HOURS, CREDITS -4)

Objectives:

- To learn the causes, consequences and prevention of malnutrition.
- To gain in – depth knowledge on various government programmes and schemes for improving the health and nutritional status of community.
- To gain knowledge on various methods of nutritional assessment of community.

Content:

Unit: 1 Assessment of nutritional status of community- Anthropometric and Clinical examination.

Unit: 2 Assessment of nutritional status of community- Biochemical methods, Radiological examinations, Biophysical method and Dietary survey.

Unit: 3 Malnutrition- Prevalence of malnutrition in India- Ecology, environment and socioeconomic factors, resources of the family, family size and composition, dietary practices including gender differences food habits, food consumption patterns, customs and prejudices, ignorance, food losses, synergism of nutrition and infection, grades of malnutrition.

Unit: 4 International, national and state level agencies & programmes for improving nutritional status of community.

Unit: 5 Vital statistics- crude death rate, birth rate, infant mortality, toddler mortality, maternal and infant mortality rate in India and their causes.

Unit: 6 Participatory Research Approach.

Course Learning Outcome:

The students will be able to-

- Describe about various methods to assess the nutritional status of community.
- Describe about various national and international agencies working for improving the nutritional status of the community.
- Describe about the major deficiency diseases prevalent in community and ways to combat them.

Reference Books:

1. Park K. : Preventive and Social Medicine, 19th Edition,
2. D.B. Jelliffe : The assessment of the Nutritional status of community.

PH03EFDN22 PRACTICAL BASED ON PH03EFDN21

(50 MARKS - 4 HOURS, CREDITS -2)

1. Conducting diet surveys for selected communities.
2. Preparation of baby food formula. Care of feeding equipment.
3. Preparation of low cost meaning foods rich in protein, vitamin A and calcium etc.
4. Planning, conducting and evaluating nutrition education programmes.
5. Preparation of project proposals for the assessment of the nutritional status of the community.

PH03EFDN23 FOOD PRODUCT DEVELOPMENT AND QUALITY ASSURANCE
(100 MARKS - 4 HOURS, CREDITS -4)

Objective:

- Gain an understanding of the processes involved in the invention process, formulation, and development of new food products.
- Develop an appreciation of the food industry and how innovation is critical to the industry.
- Cultivate basic food science principles to problem solve during product development.
- Develop and enhance team cooperation and communication skills.

Content:

Unit 1

Nutritional concept in food designing. Legal issues in product development. Factors which impact on food product development external factors (macro-environment) that impact on food product development, including the: economic environment– political environment– ecological environment– technological environment– internal factors (micro-environment) that impact on food product development, including: personnel expertise– production facilities, financial position.

Unit 2

Food formulations for various health claims such as infant, children, geriatrics, diabetes, heart diseases, hypertension, menopausal women etc. Speciality food- drought, defense services, sports person, food for space etc.Convenience foods, preparation, sensory analysis, nutrient analysis, storage stability, packaging, labelling and marketing. Modification of existing commercial food products.

Unit 3

Concept of quality: Quality attributes- physical, chemical, nutritional, microbial, and sensory; their measurement and evaluation; Sensory vis-à- vis instrumental methods for testing quality. Concepts of quality management: Objectives, importance and functions of quality control; Quality management systems in India; Sampling procedures and plans; Food Safety and Standards Act, 2006; Domestic regulations; Global Food safety Initiative; Various organizations dealing with inspection, traceability and authentication, certification and quality assurance (fssai, Agmark etc.); Labeling issues; International scenario, International food standards.

UNIT 4

Quality assurance, Total Quality Management; GMP/GHP; GLP, GAP; Sanitary and hygienic practices; HACCP; Quality manuals, documentation and audits; Indian & International quality systems and standards like ISO and Food Codex; Export import policy, export documentation; Laboratory quality procedures and assessment of laboratory performance; Applications in different food industries; Food adulteration and food safety. IPR and Patent.

Course Learning Outcome:

- Successfully produce food prototypes or food concepts.
- Formulate products by preparing laboratory samples and sourcing raw materials
- Develop formulations to meet cost targets, ingredient statement, nutrition profile and sensory attributes of desired product.
- Determine label and nutrition facts specifications according to regulations for nutrition, product naming, and claims
- Design effective food safety plans (HACCP).
- Create and present effective product development communication materials.

Reference Books:

1. Gupta R. K. , Bansal Sangita, MangalManisha : Health Foods : Concept, Technology and Scope, Vol . I and II, Biotech books, New Delhi.
2. Kamaliya M.K. and K. B. Kamaliya : Baking : Sciences and Industry . Volume I and II, 1st Edition, M.K. Kamaliya Publishers, Anand.
3. Brody, A.L. and Lord, J. 2008. Developing New Food Products for a Changing Marketplace, 2nd Edition. CRC Press, Boca Raton, FL. Campbell-Platt, G. 2009.
4. Food Science and Technology. Blackwell Publishing Ltd., Oxford, UK. deMan, J.M. 1999.
5. Principles of Food Chemistry, 3rd Ed. Aspen Publishers, Gaithersburg, MD. Fuller, G.W. 2011.
6. New Food Product Development, 3rd Edition. CRC Press, Boca Raton, FL. Moskowitz, H., Saguy, I. S., and Straus, T. 2009.
7. An integrated Approach to New Food Product Development. CRC Press, Boca Raton, FL. Murano, P. 2003.
8. Understanding Food Science and Technology. Wadsworth/Thompson Learning, Belmont, CA.
9. Inteas Alli : Food Quality Assurance : Principles and practices, CRC Press LLC.
10. Knechtes P.L.: Food Safety: Theory and Practice, Jones and Bartlett Learning, USA.
11. R.A Garg : The Food Safety and Standard Act, 2006 along with Rules and regulation, 2011. Commercial Law Publisher (India) Pvt. Ltd

PH03EFDN24 PRACTICAL BASED ON PH03EFDN23

(50 MARKS – 4 HOURS, CREDITS -2)

1. Planning of product
2. Optimization of the formula
3. Food product preparation
4. Sensory evaluation
5. Analysis of prepared food product for verification of various health claims.
6. Report writing

PH03EFDN25 NUTRIGENOMICS AND PERSONALIZED NUTRITION

(100MARKS - 4HOURS, CREDITS -4)

Objective:

- Students will discover food sources of nutrients, digestion, absoption and metabolism of nutrients, as well as their relationship to chronic disease.

Content:

Unit 1

Introduction, Concept of functional genomics, systems biology, nutrigenomics, nutrigenetics, personalised nutrition.

Unit 2

Molecular biology and focuses mainly on how the genome determines nutritional requirements and metabolic responses at cellular level.
The impact of a changing nutrient environment will also be covered. Introduction to molecular diagnostics: some important research tools to investigate molecular aspects of nutrition, examine how the genome influences the response to nutrients will be discussed.

Unit 3

Diet and gene expression: nutrients as regulators of activity and transcription factors. Nutrients as epigenetic exchange agents.

Unit 4

Diet in early life and metabolic programming.

Unit 5

Diet as a possible risk or preventive factor in illnesses. Gene polymorphisms and responses to diet. Examples related to cardiovascular disease, cancer, osteoporosis. Risk/benefit biomarkers.

Course Learning Outcome:

- Understand the six different classes of nutrients,their food sources, functions in the body, deficiencies and toxicities.
- Learn the principle of digestion and absorption of the nutrients.
- Understand the association between nutrient and chronic diseases.
- Understand the role of nutrition in promoting wellness

Reference Books:

1. Personalized Nutrition: Principles and Applications by Frans Kok, Laura Bouwman, Frank Desiere, CRC press
2. Nutrigenomics and Nutrigenetics in Functional Foods and Personalized Nutrition by Lynnette R. Ferguson, CRC press

PH03EFDN26 PRACTICAL BASED ON PH03EFDN25

(50 MARKS - 4 HOURS, CREDITS -2)

1. Visit to laboratory having gene expression, proteomics and metabolomics facilities.
2. Isolation of RNA and preparation of cDNA.
3. Gene expression usinf RT-PCR
4. Separation of proteins by gel electrophoresis.