Children's University, Gandhinagar

Department of Home Science (Family and Community Sciences)

M.Sc. Foods and Nutrition (CBCS)

Syllabus

With Effect From 2018-2019 Onwards

Children's University, Gandhinagar

Department of Home Science

M.Sc. Foods and Nutrition (CBCS)

Semester: I

Syllabus

Core Course (CC) **Total Credit/Week: Theory-4**

Course Code: FN 101 **Practical-2**

Title of Paper: Basic Physiology

Objective:

- **To enable the students to understand the anatomy and functions of human body.**

Unit 1.

a. Digestive organs, Structure and function in brief.
b. Role of liver, gallbladder, pancreas and their function in absorption
c. Meal related gastric secretion

Unit 2

a. Structure and function of RBC & WBC
b. Anemia's- Nutritional anemia-

1) Iron deficiency anemia-etiology and classification.
2) Folic acid and B12 deficiency-megaloblastic anemia, clinical features, prevention of B12 deficiency.

Unit 3

a. Basic anatomy of Endocrine Glands--Thyroid, Pituitary and pancreas (location, size, shape, structure)
b. Hormones : -Pituitary hormone-

1) Thyrotropin or TSH
2) Growth hormone,
3) Prolactin

4) FSH and LH
   - Thyroid hormone- T3 & T4
   - Pancreatic hormones- Insulin & Glucagon

Unit 4

a. Spermatogenesis, Oogenesis, Menstrual cycle
b. Embryo development
c. Physiology of Pregnancy and lactation- The mammary glands, menopause.

Practicals

1. Introduction to Microscope and its parts
2. Visualization of normal RBC and WBC
3. Visualization of microcytic and macrocytic anemia
4. Blood grouping
5. Hemoglobin measurement

References Books

1. Guyton AC & Hall (1996) Text book of Med. Physiology
2. Jain AK (1999) Text book of Physiology

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Semester: I

Syllabus

Core Course (CC) **Total Credit/Week: Theory-4**

Course Code: FN 102 **Practical-2**

Title of Paper: Human Nutrition

Objective:

- **To enable the students to understand the methods of determining nutrient requirements.**
- **To enable them to understand the practical guidelines for dietary needs at different stages of human life.**

Unit 1 Energy Metabolism-
- a. Components of energy metabolism-a review
- b. Current methodology for determining energy requirements.
- c. Current recommendation for energy intake of different age, and sex groups.
- d. Disorders of energy metabolism: obesity and undernutrition.

Unit 2 Carbohydrates
- a. Classification, digestion, absorption and utilization- A review
- b. Simple and Complex carbohydrates, non starch polysaccharides, fiber and their role in nutrition.
- c. Disorders related to carbohydrate metabolism

Unit 3 Lipids
- a. Classification, digestion, absorption, transport- A review
- b. Functions of essential fatty acids, PUFA in human metabolism
- c. Human requirements of essential fatty acids
- d. Role of n3 (LNA, EPA, DHA) and n6 (LA) fatty acids in health and disease
- e. Hyperlipidemia and nutritional aspect of atherosclerosis
- f. Recommended for heart friendly diets

Unit 4 Proteins
- a. Classification, digestion, absorption and transport- A review
- b. Non protein compounds and their biological functions
- c. Human requirements for proteins
- d. Metabolism of proteins- Role of liver and muscles

Unit 5 Vitamins and Minerals

a. Fat soluble vitamins (A,D,E,K)- Interaction with other nutrients, Toxicity and deficiency, RDA
b. Water soluble vitamins (B1,B2 B3, B6, Folic acid, Vit.C)- Interaction with other nutrients, deficiency and toxicity, RDA
c. Minerals (Ca, P, Fe, Cu, Zn, I) - Deficiency and toxicity, Interaction with other nutrients
d. Trace elements (Se, Cr, Na, K) Deficiency and toxicity

Practicals

1. Plan and prepare normal diet sheet.
2. Plan, prepare and calculate weight management diets.
3. Plan, prepare and calculate diet with low and high glycemic index foods.
4. Plan, prepare and calculate heart friendly diets.
5. Plan, prepare and calculate diet for iron deficiency anemia.

Reference Books

1. Shils ME, Olson JA, Shike M, Ross AC, Cabellaro B and Cousins RJ (2006). Modern nutrition in health and diseases. (10^{th} ed.). Lippincott, Williams and Wilkins publications.
2. Indian Council of Medical Research. Nutrient requirements and Recommended Dietary Allowances for Indians. Latest edition.
3. Bredanier C. Advanced Nutrition.

Journal

1. Journal of Nutrition
2. American Journal of Clinical Nutrition.
3. International Journal of Food Science and Nutrition.
4. Nutrition Research.

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Semester: I

Syllabus

Core Course (CC) **Total Credit/Week: Theory-4**

Course Code: FN 103 **Practical-2**

Title of Paper: Basic Microbiology

Objectives:

- **To enable students to understand the role of micro-organisms in human and environment.**
- **To enable them to understand the importance of micro-organism in food spoilage.**
- **To make students understand the procedures adopted in food operations to prevent food borne disorders.**

Unit 1 Food preservation

a. Importance in brief
b. Food spoilage
c. Food infection

Unit 2 Role and significance of microorganisms in weaning foods

a. Bacteria
b. Yeast
c. Mold

Unit 3 Importance of Prebiotics and Probiotics in human health

Unit 4. Principles involved in destruction of microorganisms for prolonged storage of foods

a. Physical methods- drying, freezing, heat treatment, irradiation
b. Chemical preservation and natural antimicrobial compounds.

Practicals

1. Microbiological examination of foods
2. Sterilization methods
3. Food preparations by using any two physical methods of preservation

Reference Books

1. William Frazier (2008) 4th edition. Food Microbiology. The McGraw Hill Co Inc., New York
2. Dr. K Vijaya Ramesh (2007). Food Micrology. MJP Publishers, Chennai.
3. Jay JM (2004). Modern Food Microbiology (7th edition) CBS Publishers and Distributors. Springer Publications, Delhi.

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Semester: I

Syllabus

Elective Course (EC) **Total Credit/Week: Theory-4**

Course Code: FN 104 **Practical-2**

Title of Paper: Prenatal Care and Education-I

Objectives:

- **To enable the students to understand the concept of pregnancy in Indian perspective.**
- **To enable the students to understand the importance of counseling.**
- **To enable the students to understand the social , cultural and spiritual context of progeny.**
- **To familiarize the students the concept of care and dietary management during prenatal.**

Unit 1 Concept of pregnancy in Indian perspective

1.1 Sociological aspect of progeny in Indian thought

a. Concept of family- Role of family
b. Marriage and Gruhasthashrama
c. Purusharth Chatushtaya
d. Need for progeny(Dev-Pitru-Rushi----)

1.2 Physiological aspect of progeny in Indian thought

a. "Tridosh" Sidhanta
b. Garbh-Sambhav Samagri-Rutu-Shetra, Ambu, Bij
c. Garbhadhan and Garbhavkranti
d. Garbhini Paricharya

Unit 2 Counseling- Preconception and Prenatal

a. Purpose of counseling
b. Types of counseling

Unit 3 Care during conception and pregnancy

a. Physical care , physiological changes in pregnancy, food, nutrition and lifestyle

b. Mental care - factors affecting stress, anxiety, depression and ways to overcome
c. Emotional changes during pregnancy

Unit 4 Social and Cultural Context

4.1 Cultural context of progeny

a. Cultural aspect of child-rearing
b. Beliefs, rituals & customs related to pregnancy
c. Socio- cultural need during pregnancy

4.2 Spiritual aspect of progeny

a. Sanskar Siddhant
b. Different level of consciousness
c. Spirituality of Love, awareness, self responsibility
d. Meditation & Conception in meditative stage- effects of different meditations on fetus.
e. Spirituality of "Love- Awareness-Self Responsibility".

Practicals

1. Effect of activities done by pregnant women in CU Tapovan
2. Method of Counseling of preconceptionals and pregnant women
3. Case study of CU Tapovan pregnant women and non Tapovan pregnant women in context to stress and anxiety and its effect on diet
4. Enumerate list of beliefs, rituals and customs related to pregnancy

Reference Books

1. Adarsh Mata- Utam Santan
2. Adhinan Shastra
3. Balshikshan
4. Parivar ni Pathshala, Children's University, Gandhinagar.
5. Children's University Margdarshika
6. Park's Textbook of Preventive and Social Medicine 23rd edi.
7. Tapovan Sanshodhan Kendra, Kendra Sanyojak Pathdarshika-4, Children's University, Gandhinagar.

OR

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Semester: I

Syllabus

Elective Course (EC) **Total Credit/Week: Theory-4**

Course Code: FN 104 **Practical-2**

Title of Paper: Nutritional Epidemiology

Objectives:

- **To enable the students to understand the recent developments in nutritional/ health status assessment methods.**
- **To enable the students to understand the role of epidemiological research in improving health systems and nutritional status.**

Unit 1 Introduction to Epidemiology- Aims of epidemiology

Unit 2 Types of Epidemiological studies

a. Observational studies
b. Experimental studies

Unit 3

a. Direct and indirect parameters of assessment of nutritional status used in community survey
b. Use of epidemiological data, recent developments
c. Planning of health and nutritional surveys

Unit 4 Use of Epidemiological Research in Strengthening Nutritional Interventions, National Programmes and Health Systems

a. Approaches and programmes for the control of undernutrition, stunting and wasting
b. Community Nutritional Programmes

Practicals

1. Visit to anganwadi centre for assessment of nutritional parameters.
2. Study of growth chart

3. Detailed survey and assessment of nutritional status of suitable community

Reference Books

1. Sathe, P.V. Sathe, A.P. (1991). Epidemiology and Management for Health Care. Popular Prakashan, Mumbai
2. policies for the control of nutritional anemia's, Vitamin A deficiency, Iodine deficiency disorders, Govt. of India
3. Park's Textbook of Preventive and Social Medicine 23rd edi.

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Semester: I

Syllabus

Interdisciplinary Course (IC) **Total Credit/Week:Theory-1**

Course Code: FN 105

Title of Paper: Statistics

Objectives:

- **To enable students to understand the meaning, use and misuse of statistics and be able to use a range of methods and to be able to decide on appropriate statistical method to analyze and interpret data.**
- **To enable students to understand the types of scales of measurements.**
- **To develop understanding of summarization and organization of the data.**
- **To provide students with the knowledge , skills and understanding necessary to analyze data with use of proper statistical techniques.**
- **To develop in students the ability to choose statistical techniques for analyses of data for hypotheses testing.**

Unit 1 Basic Concepts of Statistics

a. Statistics:- Meaning, Approaches for data analysis, Use and Misuse.
b. Scales of Measurement:- Nominal, Ordinal, Interval, Ratio.
c. Organization of the data:-
    i. Classification- Frequency Distribution of Ungrouped Data and Grouped Data.
    ii. Tabulation
    iii. Graphical Presentation of Data
    iv. Diagrammatic Presentation of Data
d. Summarization of Data:-
    i. Measures of Central Tendency-(1) Arithmetic Mean (2) Median, and (3) Mode
    ii. Measures of Dispersion: range, average deviation, quartile deviation, and standard deviation.
    iii. Skewnesss and Kurtosis
e. Level of significance / Confidence Level
f. Degree of Freedom
g. One Tailed and Two Tailed test
h. Errors in testing of null hypothesis: alpha and beta
i. t test
j. Chi square

Reference Books

1. Creswell, J.W. (2009). Research design: A qualitative, quantitative, and mixed method approaches. Thousand Oaks, CA: Sage. H62,.C6963 2009.

2. Creswell, J.W., & Plano, C.V.L. (2011). Designing and conducting mixed methods research. Los Angles, CA: Sage. H62.C6962 2011.
3. Desai H.G. and Desai, K.G. (1997). Research Methods and Processes. (6th ed.), Ahmedabad: University Granth Nirman Board, Gujarat State.
4. Edwards, A.L. (1968). Experimental Design in Psychological Research, New York, American Publishing Co. Pvt. Ltd.
5. Fisher, R.A., Statistical Methods for Research Workers, 13th ed. , New York: Hafner Publishing Co. Pvt. Ltd.
6. Fisher, R.A., The design of experiments, 7th rev. ed., New York: Hafner Publishing Co., 1960.
7. Good, Carter V., and Douglas, E. Scates, Methods of Research- Educational, Psychological, Sociological, New York: Appleton- Century- crofts, Inc., 1954.
8. Good William J., and Hatt, Paul K. Methods in Social Research, New York: McGraw- Hill, 1952.
9. Guilford, J.P., Psychometric Methods, New York: McGraw Hill, Inc., 1954.
10. John, Peter W.M., Statistical Design and Analysis of Experiments, New York: The Macmillan Co., 1971.
11. Keeves, J.P., (1988). Educational Research, Methodology and Measurement. An international Handbook Oxford, Pergamon Press.
12. Kerlinger, Fred N. and Pedhazur, Elazar J., Multiple Regression in Behavioural Research, New York: Holt, Rinehart and Winston.
13. Kothari, C.R., Quantitative Techniques, 2nd ed. , New Delhi:Vikas Publishing House Pvt. Ltd., 1984.
14. Maraneli, Gary M. (ed.), Scaling: A Source Book for Behavioural Scientists, Chicago: Aldine, 1974. 81. Maxwell, Albert E. , Analyzing Qualitative Data, New York: John Wiley & Sons, 1961.
15. Thorndike Robert L. and Hagen, Elizabeth P., Measurement and Evaluation in Psychology and Education, 4th ed., New York: John Wiley & Sons, 1977.
16. Thurstone, L.L., The Measurement of Values, Chicaga: University of Chicago Press: 1959.
17. Uchat, D.A., (1988). Research Vimarsh. Rajkot: Saurashtra University.
18. Uchat, D.A., (2000). Specific Research Methods. Rajkot: 3, Tagornagar, Amin Road.
19. Uchat, D.A., (2004). Research Processes on Data. Rajkot: 3, Tagorenagar, Amin Road.
20. Uchat, D.A., (2006). Qualitative Research. Rajkot: 3, Tagornagar, Amin Road.
21. Uchat, D.A., (2009). Research Methodology in Education and Social Sciences. Rajkot: 3, Tagornagar, Amin Road.
22. Winner, B.J. (1962). Statistical Principles in Experimental Design. Newyork: McGraw Hill.

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Semester: I

Syllabus

Non Creditable Course
(Prerequisite Course for B.A. Home Science and B.R.S. Home Science Students)

Course Code: FN 106

Title of Paper: Biology, Physics, Chemistry

1. Biology- cell structure, human body parts and various systems, blood components.
2. Chemistry- solutions, concept of acid, base and salt, neutralization reactions, PH, buffer solutions.
3. Physics- Temperature and its measurements guarantee and warrantee of household equipments and precautions while using.

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Semester: II

Syllabus

Core Course (CC) **Total Credit/Week: Theory-4**

Course Code: FN 201 **Practical-2**

Title of Paper: Clinical & Therapeutic Nutrition

Objectives:

- **To enable the students to make understand about estimation of recommended dietary allowance, deficiency of nutrients.**
- **To make understand the students the effect of various diseases on nutritional status and dietary and nutritional requirements.**
- **To enable the students to recommend and provide appropriate nutritional care for prevention and treatment of various diseases.**

Unit 1 Dietetic Techniques & Patient Counseling

a. Dietary prescription and nutritional care process.
b. Diet counseling: Definitions, Responsibilities of a counselor and a counsel and tips for successful counseling, Components of Counseling process, formulation of a proforma.

Unit 2 Gastrointestinal Diseases

(Aetiopathogenesis, clinical picture, diagnostic tests, treatment, preventive aspects)

1. Peptic Ulcer
2. Ulcerative Colitis
3. Diarrhea, dysenteries, malabsorption syndrome.
4. IBD

Unit 3 Liver and Renal Disease

(Classification, etiology, clinical features, diagnostic tests, prevention and treatment)

1. Liver disorders

a. Viral Hepatitis types A and B,C,E
b. Cirrhosis of Liver
c. Hepatic Coma

2. Renal Disease
   a. Glomerulonephritis
   b. Nephrotic Syndrome
   c. Acute and Chronic Renal Failure- Dialysis

Unit 4 Pediatric Nutrition

1. Common Nutrition problems among pediatric population
2. Nutritional Health management of severely acute malnutrition
3. Management of low birth weight babies, IUGR

Practicals

1. Visit to Gynecology ward in the hospital.
2. Visit to pediatric ward in the hospital.
3. Plan and prepare diet for liver disorder patient.
4. Plan and prepare diet for renal disorder patient.
5. Plan and prepare diet for GI disorder patient.
6. Market survey of commercial nutritional supplements.
   - Collection of information on commercial food formulae available in the market and their evaluation for suitability in treating various diseases.
     1. Neutraceutical products.
     2. Weaning Food for Babies
     3. Nutritional supplements for pregnancy & lactation
     4. Generic food products (OTC products like spirulina etc.)

Reference Books

1. H.A.Guthrie – Clinical & Therapeutic Nutrition
2. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
3. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
4. Guyton, A.C. and Hall, J.E. (1999): Textbook of Physiology, 9th Edition, W.B. Saunders Co.

   Journals and Other Reference Series
5. Nutrition Update Series
6. Nutrition Reviews

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Semester: II

Syllabus

Core Course (CC) **Total Credit/Week: Theory-4**

Course Code: FN 202 **Practical-2**

Title of Paper: Maternal and Child Nutrition-I

Objectives:

- **To enable the students to understand the physiological changes during pregnancy and lactation.**
- **To enable the students to understand various diseases and its dietary treatment.**
- **To enable the students to understand about antenatal care.**

Unit 1.

a. Importance of Maternal Nutrition.
b. Physiology and Endocrinology of pregnancy
c. Effect of undernutrition on mother and child during pregnancy.
d. Adolescent pregnancy
e. Nutritional requirement during pregnancy

Unit 2

a. Pregnancy and Tuberculosis
b. Pregnancy and diabetes mellitus
c. Pregnancy and AIDS

Unit 3

a. Antenatal Care
b. Pregnancy Stages- The Three Trimesters
c. Problems and treatment during pregnancy

Unit 4

a. Lactation- development of mammary tissue and role of hormones

b. Physiology and endocrinology of lactation
c. Nursing the child- Exclusive breast feeding

Practicals

1. Plan and prepare diet according to dietary principles for Pregnancy with T.B
2. Plan and prepare diet according to dietary principles for pregnancy with AIDS
3. Plan and prepare diet according to dietary principles for pregnancy with diabetes.
4. Develop, prepare and calculate low cost recipe from locally available foods for pregnant women.
5. Develop, prepare and calculate low cost recipe from locally available foods for lactating women.
6. Market survey of available commercial supplements for pregnant women (minimum 10 products)
7. Market survey of available commercial supplements for lactating mothers. (minimum 10 products

References

- Robinson, Normal and Therapeutic Nutrition
- Bamji MS, Rao NP & Reddy V. 1999. Text book of Human Nutrition. Oxford & IBH

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Semester: II

Syllabus

Core Course (CC) **Total Credit/Week: Theory-4**

Course Code: FN 203 **Practical-2**

Title of Paper: Assessment of Nutritional Status

Objectives: To enable the students to understand the methodologies applied in nutritional assessment and surveillance of human groups.

1. Nutritional assessment as a tool for improving the quality of life of various segments of the population including hospitalized patients.
2. Current methodologies of assessment of nutritional status, their interpretation and comparative applications of the following :
    - Food consumption
    - Anthropometry
    - Clinical and Laboratory
    - Rapid Assessment & PRA
    - Functional indicators such as grip strength, respiratory fitness, Harvard Step test, squatting test.
3. Nutritional Surveillance – Basic concepts, uses and setting up of surveillance systems.
4. Monitoring and Evaluation

Practicals

1. Training in all assessment techniques applicable for individuals and community, including ones used for hospital – based patients, Validity and reliability of these techniques.
2. Community based project for assessment of nutritional status of any vulnerable group.
3. A small evaluation study of a nutrition project.

Reference Books

1. Jelliffe, D. B. and Jelliffe, E.F.P. (1989): Community Nutritional Assessment, Oxford University Press.
1. Beghin, I., Cap, M. and Dujardan, B. (1988): A Guide to Nutritional Status Assessment, WHO, Geneva.
2. Gopaldas, T. and Seshadri, S. (1987): nutrition Monitoring and Assessment, Oxford University Press.
3. Mason, J.B., Habich, J.P., Tabatabai, H. and Valverde, V. (1984): Nutritional Surveillance, WHO.
4. Lee, R.D. and Nieman, D.C. (1993): Nutritional Assessment, Brown and Benchmark Publishers.
5. Sauberlich, H.E. (Ed.) (1999): Laboratory Tests for the Assessment of Nutrition Status, CRC Press.
6. Cameron, N. (1984): Measures of Human Growth, Sheridan house Inc. New York.
7. Scrimshaw, N. and Gleason, G. (Ed.)(1991): Rapid Assessment Methodologies for Planning and Evaluation of Health Related Programmes, published by (INFDC) International Nutrition Foundation for Developing Countries.
8. FAO Nutritional Studies No.4 (1953): Dietary Surveys: Their Technique and Interpretation, FAO.
9. Bingham, S.A. (1987): The Dietary Assessment of Individuals, Methods, Accuracy, new Techniques and Recommendations. Nutrition Abstracts and Reviews, 57: 705-743.
10. Collins, K.J. (Ed.)(1990) handbook of Methods for the Measurement of work performance, Physical Fitness and Energy Expenditure in Tropical Populations. International Union of Biological Sciences.
11. Ullijaszek, S.J. & Mascie-Taylor, C.G.N. (Ed.) Anthropometry: the individual and the Population. Cambridge University Press, Cambridge.
12. Shetty, P.S. and James, W.P.T. (1994): Body Mass Index A measure of Chronic Energy Deficiency in Adults. FAQ Food and Agriculture Organization of the United Nations, Rome.
13. Davies, P.S.W. and Cole, T.J. (Ed.): Body Composition Techniques in Health and Disease. Cambridge University, Cambridge.

14. Himes, J.H. (1991): Anthropometric Assessment of Nutritional Status. Wiley-Liss, New York,
15. Lohman, T.G.; Roche, A.F.; and Martorell, R. (Ed.) Anthropometric Standardization Reference manual, Human kinetics Books, IIinois.

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Semester: II

Syllabus

Elective Course (EC) **Total Credit/Week: Theory-4**

Course Code: FN 204 **Practical-2**

Title of Paper: Prenatal Care and Education-II

Objectives: To enable the students to understand

- To enable the students in developing skills in prenatal counseling.
- To enable the students to develop nurturing activities in holistic wellbeing during prenatal stage.
- To enable the students to understand the meal management during pregnancy.
- To enable the students to understand the importance of nutritional assessment and diet counseling in pregnancy.

Unit 1 Prenatal Counseling

a. Basic counseling skills- observation skills, questioning skills, communication skills (listening, feedback, nonverbal).
b. The counseling interview- interviewing (characteristics, types and techniques)
c. Role and characteristics of counselor
d. Counselor as a role model, counselor objectivity/ subjectivity, emotional involvement.

Unit 2 Nurturing activities of holistic wellbeing

a. Brain stimulating activities - puzzle
b. Artistic activities – music and drawing
c. Sensitive development- story telling, reading
d. Vihar

Unit 3 Planning meals for pregnant women

a. Points to consider while planning meals for pregnant women
b. Nutritional requirement

Unit-4 Nutritional Assessment and diet counseling for pregnant woman and lactating mothers.

a. Nutritional assessment of pregnant woman

b. Nutritional assessment of lactating mothers
c. Dietary counseling of pregnant woman
d. Dietary counseling of lactating mothers

Practicals:

1. To develop tool for counseling based on problem by-
   a. Questionnaire technique
   b. Observation technique
   c. Interview technique
2. Plan and prepare diet for pregnant women and calculate the nutrients
   a. Low cost diet plan
   b. Middle cost diet plan
   c. High cost diet plan
3. Brain stimulating activities
   a. Puzzle- mathematical and real life puzzles
   b. Development of sensitivity-
      - Technique of story telling
      - Reading
4. Nutritional assessment and diet counseling of –
   a. Pregnant women
   b. Lactating women

Reference Books

1. Adarsh Mata- Utam Santan
2. Adhinan Shastra
3. Balshikshan
4. Parivar ni Pathshala, Children's University, Gandhinagar.
5. Children's University Margdarshika
6. Park's Textbook of Preventive and Social Medicine 23rd edi.
7. Tapovan Sanshodhan Kendra, Kendra Sanyojak Pathdarshika-4, Children's University, Gandhinagar.

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Semester: II

Syllabus

Interdisciplinary Course (IC) **Total Credit/Week: 1**

Course Code: FN 205

Title of Paper: Field Training- 1 week

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Semester: III

Syllabus

Core Course (CC) **Total Credit/Week: Theory-4**

Course Code: FN 301 **Practical-2**

Title of Paper: Research Methodology

Objective:

- **To understand the students the significance of research methodology in Home Science**
- **To understand the students the type of researches, tools of research, and methods of research.**
- **To develop the ability to construct data gathering instruments appropriate to the research design.**

Unit 1

Research Methodology - Introduction, meaning of research, definition, characteristics and function, objectives, classification and kinds of research.
Research Problem - Introduction, selecting the problem, defining the problem, sources of problem, criteria for selection of the problem, delimiting a problem, assumptions about a problem, evaluating the problem.

Unit 2

Foundation of Hypothesis - Meaning, definitions, assumption, postulate and hypothesis, nature of hypothesis, functions of population and sampling, types of sampling designs, characteristics of a good sample, application of sampling technique in various types of researches.

Research plan/design and sampling - Meaning and definitions, of plan/design, design format, meaning and definition of sampling, functions of population and sampling, types of sampling designs, characteristics of a good sample, application of sampling technique in various types of researches.

Unit 3

Types of researches - Survey, historical, philosophical, experimental, case study, genetic.

Designs of experiments - Need and purpose, importance, characteristics of good experimental design, basic principles, types of basic experimental design.

Unit 4

Tools of Research - Questionnaire, schedule, rating scale, tests.

Collection of Data - Need, meaning, nature, constants, variables, variate, characteristics of quantitative data, types of data, data collection, organization of data.

Unit 5

Research Report and proposal writing- Need of research report, format of research report preliminary section, main section & reference section), mechanics of report writing, Writing research abstract, Writing research paper, need of research proposal for dissertation of Ph.D., to get funds from various sources.

Reference Books:-

1. Kothari R.C. (2005) : Research Methodology, 2nd edition, New Age International Publisher Ltd., New Delhi.
2. Uchat, D.A., (2009). Research Methodology in Education and Social Sciences. Rajkot: 3, Tagornagar, Amin Road.

Practicals:

1. Abstract writing.
2. Comprehensive writing in different scientific way.
3. Research proposal writing.

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Semester: III

Syllabus

Core Course (CC) **Total Credit/Week: Theory-4**

Course Code: FN 302 **Practical-2**

Title of Paper: Maternal and Child Nutrition-II

Objective:

- **To understand the students the role of nutrition during infancy and adolescent age.**
- **To enable the students to understand the various nutritional programmes for promoting maternal and child nutrition by national and international agencies.**

Unit 1

Nutrition in infants- Nutritional requirements of infants, assessment of infant growth, growth charts-Indian, WHO, infant feeding, weaning foods, feeding the premature infant, baby friendly hospitals, role of BPNI in promotion of breast feeding in India, Kangaroo mother care (KMC).

Unit 2

Nutrition in preschool age - Nutritional requirements in preschool age, assessment of nutritional status of pre-schoolers, growth and development of preschool children- nutrition and cognitive development, common nutritional problems in pre-schoolers - macronutrient and micronutrient deficiencies, prevalence of malnutrition in preschool age (SAM, kwashiorkor), RDA, balanced diet for pre-schoolers using an appropriate method.

Unit 3

Nutrition in school children- Nutritional requirements, assessment of nutritional status, common nutritional deficiencies in children, food habits, importance of packed lunch, school lunch programme, RDA, balanced diet for school going children using an appropriate method.

Unit 4

Nutrition during adolescence- Nutritional requirements, assessment of nutritional status, growth related changes, common nutritional problems of adolescence- obesity/overweight/skipping meals, eating disorders, RDA, balanced diet for and adolescent using an appropriate method.

Unit 5

Nutritional programmes for promoting maternal and child nutrition and health- national and international agencies.

Reference Books

3. Robinson C.H. , Lawler, M.R., Chenoweth, W.L., Garwich, A.E. Normal and Therapeutic Nutrition 7th Edition, Macmillan Publishing Co. New York 1994.
4. Davidson, S. Passmore, R. Brook, J.F. and Truswell, Human Nutrition and Dietetics, 9th edition, F. and S Livingstone Ltd., Edinburgh and London 1993
5. Shanti Gosh, The feeding and care of infants and young children, voluntary health association of India,, New Delhi 6th edition 1992.
6. Rao, D.H and Vijayaraghavan, K (1996), Anthropometric assessment of nutritional status in "Text Book of Human Nutrition", New Delhi; (eds. Bamji, M.S, Rao, N.P and Reddy, V.); Oxford and IBH Publishing Co. Pvt. Ltd., P 515.
7. Srilakshmi, B (2008), "Dietetics", New Delhi; New Age International (P) Ltd. Publishers, Pp 319-325.
8. Thimmayamma, B.V.S and Rao, P (1996), Dietary assessment as part of nutritional status in "Textbook of Human Nutrition", New Delhi
9. Indian Council of Medical Research (2010), "Nutrient requirements and Recommended Dietary Allowances for Indians", Hyderabad; National Institute of Nutrition
10. Mahan, L.K and Stump, S.E (2004), "Krause's Food Nutrition and Diet therapy", Philadelphia; WB Saunders Co., Pp 534-555.
11. Emma, M.L (2008), "Handbook of Nutrition and Food", London; CRC Press, Taylor and Francis group.
12. FAO/WHO/UNU (1985),"Energy and Protein Requirements", Geneva; World Health Organisation. . 11. Gopalan, C; Sastri, B.V.R and Balasubramanian, S.C (1989), "Nutritive Value of Indian Foods", Hyderabad; National Institute of Nutrition, ICMR, JOURNALS
13. Reports of the State of World's Children, Who and UNICEF, Oxford University.
14. Reports of National Family Health Survey, International Institute for Population Science, Mumbai.
15. World Development Reports, Investing in Health, World Development Indication.
16. Indian Journal of Medical Research, ICMR, New Delhi,
17. Indian Journal of Paediatrics.

Practicals:

1. Preparation of low cost weaning foods rich in calorie, protein, vitamin A , calcium and iron.
2. Plan and prepare balanced diet and calculate nutrients for the following age group:
   (i) Preschool children
   (ii) School children
   (iii) Adolescent girl and boy
3. Visit to ICDS and observe the counseling being given to mothers and submit the report.
4. Plan and arrange awareness programme on healthy food habits in anganwadi children.
5. Visit to hospital to observe infant and young child feeding practices.

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Semester: III

Syllabus

Core Course (CC) **Total Credit/Week: Theory-4,**

Course Code: FN 303 **Practical-2**

Title of Paper: Public Health Nutrition

Objective:

- **To understand the students the nutritional problems of the community.**
- **To gain skills in planning, executing and evaluating nutrition projects of the community.**

Unit 1

Concept of Public Health Nutrition - relationship between health and nutrition, role of public nutritionists in the health care delivery system.

Unit 2

Ecological, social-cultural, economic and demographic correlations of malnutrition, prevalence, etiology, biochemical and metabolic changes in vitamin A deficiency, PEM, iron deficiency anemia, IDD.

Unit 3

Maternal and infant mortality rate in India, vital statistics crude death rate, crude birth rate, infant mortality rate etc.; Importance of focusing health and nutrition interventions in first 1000 days of life and improving delivery of key nutrition interventions.

Unit 4

School Health Program in India (Mid Day Meal Program-MDM), problems in improving micronutrient deficiencies in children, pregnant/ lactating women and adolescent girls, National and International agencies engaged in various nutrition programs.

Unit 5

Methods of diet surveys-Direct and Indirect methods, assessment of nutritional status, importance of life style factors on nutritional status etc.

Reference Books

1. Park.K. (2009) ; Park's Textbook of Preventive and Social Medicine, 20th edition Banarsidas Bhanot Jabalpur, India.

2. Srilakshmi B (2009); Nutrition Science Third edition, New Age International (p): Limited, New Delhi.

3. Srilakshmi B (1997); Food Science, New Age International (P) Limited, New Delhi, Bangalore.

4. Chadha.R & Mathur P.(2015): Nutrition A Life Cycle Approach Orient Blackswan Private Ltd.

5. Swaminathan M (2010) Essentials of Food and Nutrition, Vol.1 & 2 The Bangalore Printing and Publishing Co Ltd.

6. Srilakshmi B (2014) Dietetics 7th edition 'New Age International (p) Limited , New Delhi.

Practicals

Field Training

1. Visit and training in health care centre run by Government Health Department.
2. Planning, conducting and evaluating nutrition education programmes (in a village/ community- through exhibition, puppet show, skit etc.) for vulnerable group-
   a. Children
   b. Adolescent girl and boy
   c. Pregnant women
   d. Lactating mothers
3. Presentation and report writing of the above practical.

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Semester: III

Syllabus

Elective Course (EC) **Total Credit/Week: Theory-2,**

Course Code: FN 304 **Practical-2**

Title of Paper: Food Product Development

Objective:

- **To understand the students the concept of product development, their sensory evaluation and quality control.**

Unit 1

Basic principles of food product development.Sensory properties of food and their role in product development**.**

Unit 2

Formation and evaluation of recipes at laboratory level. Bulk food preparation for food institutions and enterprises: servings, nutritive value and costing.

Unit 3

Evaluation of food objective and subjective methods, selection and training of judges, development of score cards and analysis of data.

Unit 4

Consumer evaluation development of schedule and data analysis. Packaging material, types for different products, food costing.

Unit 5

Food safety issues in product development, food quality regulations and standards, quality control and HACCP. Product formulation and development for general and therapeutic use.

Practicals:

1. Selection and modification of food product to be developed.
2. Formulation and standardization of food products.
3. Sensory evaluation, methods, training of judges, score card preparation.
4. Objective and subjective evaluation of the products.
5. Evaluation of consumer acceptability.
6. Packaging and sale of products.
7. Preparation of slides / video film for communication.

Reference Books

1. Altschul Aaron M. 1993. Low Calorie Foods. Marcel Dekker.
2. Goldberg I. 1994. Functional Foods: Designer Foods, Pharma Foods, Neutraceuticals. Springer.
3. Matz SA. 2004. Formulating & Processing Dietetic Foods. CHIPS Publ.

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Semester: III

Syllabus

Elective Course (EC) **Total Credit/Week: Theory-2,**

Course Code: FN 304 **Practical-2**

Title of Paper: Instrumentation

Objective:

- **To acquaint the students with principles, techniques and application of different methods of analysis for various nutrients.**

Unit 1

Familiarization to terms and calculations used in preparation of various standard solutions.

Unit 2

Sample and sampling techniques.

Unit 3

Principles, techniques and applications of calorimetric, spectrophotometer and atomic absorption spectrometer.

Unit 4

Principles, techniques and applications of colorimetric, spectrophotometer and atomic absorption spectrophotometer.

Unit 5

Principles, techniques and application of chromatography (paper chromatography, TLC, GLC, HPLC).

Reference Books

1. AOAC 1995. Association of Official Analytical Chemists. Washington, DC.

2. Gruenwedels DW & Whitakor JR 1984. Food Analysis: Principles and Techniques. Vols. I-VIII. Marcel Dekker

3. Joslyn MA. 1970. Methods in Food Analysis: Physical, chemical and Instrumental Methods of Analysis. Academic Press.

4. Pomeranze Y & Molean CE. 1977. Food Analysis Theory and Practice. A VI Publ.

5. Sawhney SK & Singh R. 2000. Introductory Practical Biochemistry.

Practicals:

1. Handling of equipment and instruments.
2. Preparation of samples, solutions, solutions and buffers.
3. Quantitative estimation of proximate principles, minerals and vitamins by use of colorimetry, flame photometry, UV spectrophotometer; chromatography, atomic absorption spectrophotometer and photoflurometry
4. Analysis of antinutritional factors.
5. Estimation of protein.
6. Starch digestibility. Fractionation of protein.
7. Food adulteration.

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Semester: III

Syllabus

Interdisciplinary Course (IC) **Total Credit/Week: 1**

Course Code: FN 305

Title of Paper: Seminar

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Semester: IV

Syllabus

Core Course (CC) **Total Credit/Week: Theory-2,**

Course Code: FN 401 **Practical-1**

Title of Paper: Food Safety and Laws

Objective:

- **To understand the students the importance of quality assurance in food industry.**
- **To understand the students about various tests used and standards for quality assessment and food safety.**
- **To understand the students various test used to detect food adulterants.**
- **To make students familiar with the fundamentals that should be considered for successful quality control programme.**

Unit 1

Introduction to quality assurance and food safety assurance-

Defination- Adulterant, Contaminant, Extraneous Matter, Food Additive, Package, Standard, Unsafe Food etc.

Current concepts of quality control, weights & measures.

Unit 2

Quality assurance programme: Quality plan, documentation of records, process control and HACCP, hygiene and housekeeping, corrective action, quality and programme and total quality process.

Unit 3

Product Evaluation:

- Sampling for product evaluation and line control.
- Specification and food standards, International, National.
- Mandatory, Voluntary.
- Sample preparations.
- Reporting results and reliability of analysis.

Unit 4

Food Adulteration

Unit 5

Consumer Protection

Reference Books

1. Early, R. (1995): Guide to quality Management systems for the Food Industry, Blackie, Academic and Professional, London.

2. Gould, W.A. and Gould, R.W. (1988): Total Assurance for the Food Industries, CTI Publication Inc. Baltimore.

3. Pomeranz, Y. ad Meloan, C.E. (1996): Food Analysis: for the Food Practice, CBS Publishers and Distributor, New Delhi.

4. Askar, A. ad Treptow, H. (1993): Quality Assurance in Tropical Fruit Processing, Springer-Verlag, Berlin.

5. Food Safety and Standards Act-2006, (2018), Ratilal L. Vagasiya, S.B.D. Publications, Ahmedabad, 2nd edition.

Practicals:

1. Detection and estimation of contaminants in foods for adulteration:
    a. Water including mineral water.
    b. Milk and milk products.
    c. Fats and oil including butter, ghee and hydrogenated fat.
    d. Cereals and pulses.
    e. Spices and condiments and salt, pickles, sauces and chutneys.
    f. Tea and coffee.

g. Adulteration of food additives.
h. Confectionery.
i. Ice creams and sherbats.
j. Specific food ingredients such as vinegar.
k. Fruit juices concentrates and beverages.

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Semester: IV

Syllabus

Core Course (CC) **Total Credit/Week : 20**

Course Code: FN 402

Title of Paper: Project/ Dissertation and Viva- voce