M. Sc. Home Science

COURSE SYLLABUS

(2021 onwards)

UNIVERSITY OFKERALA
Senate House Campus, PalayamThiruvananthapuram-695034
www.keralauniversity.ac.in

SCHEME AND SYLLABUS FOR POST GRADUATE DEGREE

IN

HOME SCIENCE

M.Sc HOME SCIENCE

BRANCH X-E

NUTRITION AND DIETETICS

SEMESTER SYSTEM

2021 ONWARDS

Programme Specific Outcome

PSO1: Develop interventions to affect change and enhance wellness in diverse individuals and groups

PSO2: Apply theoretical and practical knowledge in Nutrition and dietetics in various therapeutic and special conditions

PSO3: Acquire skills in counselling techniques to facilitate behaviour change.

PSO4: Demonstrate how to locate, interpret, evaluate and use professional literature to make ethical, evidence-based practice decisions.

PSO5: Devise research strategies for empowering and promoting healthy living in the community.

PSO6: Competent to take up careers in academics, health care and service industry

M.Sc. HOME SCIENCE COURSE STRUCTURE & MARK DISTRIBUTION

Branch XE Annexure Nutrition and Dietetics

Sem-ester	Paper Code	Title of the Paper	Distribution of hours per semester	Instructional hours/week		ESE duration	Maximum Marks		
				L	P	(Hrs)	CA	ESA	Total
I	HS211E	Human Physiology	110	6	-	3	25	75	100
	HS212E	Medical Nutrition Therapy	110	6	-	3	25	75	100
	HS213E	Nutritional Biochemistry	110	6	-	3	25	75	100
	HS214E	Research Methodology	120	7	-	3	25	75	100
	Total for S1		450	25	-	-	100	300	400
II	HS221E	Applied Food Science	110	6	-	3	25	75	100
	HS222E	Nutrition in Critical Care	110	6	-	3	25	75	100
	HS223E	Medical Nutrition Therapy (Practical)	110	-	6	3	25	75	100
	HS224E	Research Internship	120	-	7	-	25	75	100
	Total for S2		450	12	13	-	100	300	400
III	HS231E	Hospital Internship	110	-	6	-	25	75	100
	HS232E	Public Health Nutrition	110	6	-	3	25	75	100
	HS233E	Applied Nutrition	110	6	-	3	25	75	100
	HS234E	Statistics and Computer Applications	120	7	-	3	25	75	100
	Total for S3		450	19	6	-	100	300	400
IV	HS241E	Paediatric & Geriatric Nutrition	110	6	-	3	25	75	100
	HS242E	Advanced Human Nutrition	110	6	-	3	25	75	100
	HS243E	Pharmacology and Pathophysiology	110	7	-	3	25	75	100
	HS244E	Techniques in Clinical Nutrition (Practical)	120	-	6	3	25	75	100
	Total for S4		450	19	6	-	100	300	400
	HS245E	Dissertation						75	100
	HS246E	Comprehensive Viva						75	100
	Grand Total		-	75	25	-	400	1400	1800

(L – Lecture, P – Practical, ESE – End Semester Examination, CA – Continuous Assessment, ESA – End Semester Assessment)

UNIVERSITY OF KERALA
MSc –HOME SCIENCE-Semester System
(2021 ADMISSION ONWARDS)
Branch XE NUTRITION AND DIETETICS

Semester I

HS211E: Human Physiology
HS212E: Medical Nutrition Therapy
HS213E: Nutritional Biochemistry
HS214E: Research Methodology

Semester II

HS221E: Applied Food Science
HS222E: Nutrition in Critical Care
HS223E: Medical Nutrition Therapy (Practical)
HS224E: Research Internship

Semester III

HS231E: Hospital Internship
HS232E: Public Health Nutrition
HS233E: Applied Nutrition
HS234E: Statistics and Computer Applications

Semester IV

HS241E: Paediatric & Geriatric Nutrition
HS242E: Advanced Human Nutrition
HS243E: Pharmacology and Pathophysiology
HS244E: Techniques in Clinical Nutrition (Practical)

HS245E: Dissertation

HS246E: Viva Voce

Branch X E Nutrition & Dietetics

Semester	**C.A***	**ESA****	**Total**
Semester I	**100**	**300**	**400**
Semester II	**100**	**300**	**400**
Semester III	**100**	**300**	**400**
Semester IV	**100**	**300**	**400**
Dissertation			**100**
Comprehensive Viva Voce			**100**
Grand Total			**1800**

- *C A Continuous Assessment
- **ESA End semester assessment

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester I
Branch XE Nutrition and Dietetics
HS211E: HUMAN PHYSIOLOGY
(Common to Branches XD & XE)
SYLLABUS

Total hours: 110

Learning Objectives:

To enable the students to

1. Obtain an insight into the structure and functions of various organs in the body.
2. Understand the anatomy and physiology of the various systems in the human body
3. Gain knowledge on the functioning of various systems

Outcome: on completion of the course, student should be able to-

CO1: Explain the structure and functions of organ systems

CO2: Elaborate on functions of various hormones in the human body

CO3: Gain knowledge regarding immunity, immune mechanism and disorders

CO4: Understand organ and organ systems in human health and nutrition

Unit I -Blood and Circulatory System

Composition & Functions of the blood, Cellular Content of Blood- their properties and functions, Blood Groups, Blood transfusion, Bleeding disorders, lymph, Tissue fluids, Reticuloendothelial system, Blood volume, coagulation.

Structure of heart, Physiology and properties of cardiac muscle, Cardiac cycle, Cardiac output, Heart rate, Heart sound and ECG

Unit II -Digestive System

Physiology of digestive system-Structure, functions, secretions; movements of gastrointestinal tract, Digestion of protein, carbohydrate and fat

Unit III -Respiratory System

Structure of Respiratory organs, Mechanism of respiration, Exchange and transport of gases, Respiratory volume, Respiratory adjustments in health and diseases.

Unit IV -Excretory System

Physiology of the kidney, urine formation, Micturition - normal and abnormal constituents of urine, elementary principles of dialysis, maintenance of homeostasis.

Unit V -Endocrine and Reproductive System

Endocrinology- Hormones- pituitary, thyroid, parathyroid, adrenal, sex hormones, pancreas; Effects of Hypo and Hyper functions of the glands.

The female reproductive system, menstrual cycle; The male reproductive system; The process of reproduction

Unit VI -Immunology

Natural immune system, cell mediated and humoral immunity, components of immune mechanism (cellular and chemical). Role of inflammation/defense (acute and chronic), Immunoglobulins and production of antibodies. Disorders –Immune deficiency, Hypersensitivity

RELATED EXPERIENCE

1. RBC/WBC Count, Total count Determination of plasma proteins
2. Determination of Blood pressure
3. Qualitative test of urine for normal and pathological conditions

SUGGESTED REFERENCES

BOOKS

1. Elaine N. Marieb, Katja N. Hoehn; Human Anatomy & Physiology, Global Edition, Pearson Education Ltd,2016

2. Thomson, R.H.S. and King, E.O. Biochemical Disorders of Human Diseases A.P., New York.

3. Anne Waugh & Allison Grant, Ross and Wilson Anatomy and Physiology in Health and Illness, 12th Edition, Elsevier, New York, 2014

4. Stuart Fox, Human Physiology, 13th edition, McGraw-Hill Education publishers, 2012.

5. Bruce M. Koeppen, Bruce A. Stanton, Berne & Levy Physiology, 6th Edition, Elsevier, 2010
6. John E. Hall, Guyton & Hall Textbook of Medical Physiology, 13th edition, Elsevier, New York, 2016
7. Chatterjee, C.C; Human Physiology, 11th Edition, CBS Publishers and Distributors Pvt Ltd.
8. NM Muthaya (2010). Human Physiology.4th ed. Jaypee Brothers PVT LTD, New Delhi.
9. VidyaRatan (2004) Handbook of Human Physiology. 7th ed. Jaypee Brothers PVT LTD, New Delhi.
10. Sudha V Khanorkhar (2012) Insights in Physiology. 1st ed. Jaypee Brothers PVT LTD, New Delhi.
11. R Chandramouli (2010) Textbook of Physiology.3rd edition. Jaypee Brothers PVT LTD, New Delhi.
12. R L Bijlani& S Manjunatha (2010) Understanding Medical Physiology.4th edition. Jaypee Brothers PVT LTD, New Delhi.

JOURNALS

1. Israel Journal of Medical Sciences, Israel Medical Association, National Council for Research and Development.
2. The Journal of Laboratory and Clinical Medicine, C.V. Mosby Company.
3. The Indian Journal of Medical Research, ICMR. New Delhi

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester I
Branch XE Nutrition and Dietetics
HS212E: MEDICAL NUTRITION THERAPY
(Common to Branches XD & XE)
SYLLABUS

Learning Objectives:

To enable the students to

1. Understand the role of nutrition for good health.
2. Obtain knowledge of different Therapeutic diets and their preparation.
3. Develop capacity and attitudes for taking up dietetics as a profession

Course Outcomes: on completion of the course, student should be able to-

CO1: Apply the basic principles in planning diets for disease condition

CO2: Impart diet counselling to individuals based on their needs

CO3: Analyse and create individualized diet plan for diseased conditions

Total hours: 110

UNIT I Introduction to Dietetics

Meaning and scope of dietetics Role of dietician in hospital and community, Registered Dietitian, Indian Dietitians Association, Nutrition Society of India

UNIT II Hospital Diet

The Hospital Diet- Clear fluids. Liquid diet, Soft diet, Balanced normal diet, feeding methods, Enteral and Parenteral nutrition, Calculation of diet using the Ready Reckoner 1200 cal, 1500cal, 1800 cal, 2000cal. Commercial supplement available in the market, Nutrition Care Process, Common biochemical tests affecting nutritional needs–lipid profile, AC/PC, (fasting & post-prandial sugars), Liver Function tests, Kidney function tests.

UNIT III Febrile Conditions

Causes, Symptoms, metabolic changes, dietary modifications in Fevers of short duration and in chronic fevers – influenza, TB, Severe Acute Respiratory Syndrome (SARS), HIV/AIDS

UNIT IV Disease of the Gastrointestinal tract

Disorders of the gastro intestinal Tract- Peptic ulcer, Diarrhoea, Constipation, Crohn's Disease, Ulcerative colitis, Irritable Bowel Syndrome, Diseases of the liver-Hepatitis, Cirrhosis, ESLD

UNIT V NCDs and Kidney Diseases

Causes, types, symptoms, dietary modifications- Diabetes, Obesity, Cancers, Cardiovascular diseases (Atherosclerosis, Myocardial Infarction, Hypertension).

Food exchange list, my plate planner, insulin carb counting, Glycemic Index, Glycemic Load, Special Diets for Obesity- Keto, Low Carb diets, Low Calorie diets, Intermittent Fasting, Post Bariatric surgery diets; Anti-carcinogenic nutritional agents

Kidney Diseases- causes, symptoms and dietary modifications in Glomerulonephritis, Nephrosclerosis, Kidney stones, End stage renal disease; Dialysis-types and dietary Modifications

RELATED EXPERIENCE

1. Visit to Dietetics Kitchen.
2. Market survey of commercial nutritional supplements
3. Plan diets for various disease conditions using the Ready Reckoner
4. To conduct mock diet clinics and provide nutritional counselling
5. To design research study in clinical settings

JOURNALS

1. Journal of American Dietetic Association. The American Dietetic Association Mount Marries, Illinois, USA.
2. The American Journal of Clinical Nutrition USA
3. The Indian Journal of Medical Research. The Indian Council of Medical Research, New Delhi.
4. British Medical Journal UK
5. The American Journal of Clinical Nutrition, Published by the American Society for Clinical Nutrition, USA
6. Nutrition Abstracts and Reviews, CNB International, UK.
7. The Indian Journal of Nutrition and Dietetics, Sri Avinashilingam Home Science College for Women, Coimbatore. India

8. Clinical Nutrition, Bell and Bain Ltd, Scotland. UK
9. Food and Nutrition Bulletin, United Nations University, Press, Japan.
10. Indian Journal of Endocrinology and Metabolism, India
11. Nutrition Reviews, Nutrition Foundation, Washington. USA

TEXTBOOKS

1. Antia F.P. Clinical Dietetics and Nutrition, Oxford University Press, Mumbai, 1989

2. Corinee et.al. "Nutrition and Diet Therapy Principle and Practice" 2nd Edition, West Publishing Company, St. Paul 1989

3. Clare M Lewis, Nutrition and Nutritional therapy in Nursing, Appleton-Century Crofts, Connecticut, 1986

4. Davidson, S. Passmore, R. Brook, J.F. and Trustwell, Human Nutrition and Dietetics, 9th edition, F. and S Livingstone Ltd., Edinburgh and London 1993

5. B. Srilakshmi, Dietetics, New Age International Private Ltd, New Delhi, 1995

6. Nihal Thomas, K.J. (2012). A Practical Guide to Diabetes Mellitus (New Delhi: Jaypee).

7. Robinson C.H. , Lawler, M.R., Chenoweth, W.L., Garwich, A.E. Normal and Therapeutic Nutrition 7th Edition, Macmillan Publishing Co. New York 1994.

8. Krause M.V. Hunscher, M.A. Food, Nutrition and Diet Therapy, W.S. Saunders Co. Philadelphia, London, 1980

9. Maurice E Shills, James A Oslen, Moshe Shike, Modern Nutrition on Health and Disease" Vol I & II, VIII edition, Lea and Pebiger, Philadelphia 1984

10. World Cancer Research Fund and American Institute for Cancer Research; "Food, Nutrition and Prevention of Cancer. A Global Perspective, "American Institute for Cancer Research, Washington, 1997.

11. Current Topics in Nutrition- Joseph et.al. 2021 Romanson Publishing House Tvpm. ISBN 978-81-9466901-2

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester I
Branch XE Nutrition and Dietetics
HS213E: NUTRITIONAL BIOCHEMISTRY
SYLLABUS

Learning Objectives:

1. To enable the students to learn the chemistry, properties and metabolism of macronutrients
2. To understand the biophysical techniques

Course Outcome: on completion of the course, student should be able to-

CO1: Define the chemical/biochemical properties and metabolic pathways of carbohydrates, lipids, and proteins.

CO2: Describe the regulatory mechanisms of macronutrient metabolism and associated signaling pathways.

CO3: Enumerate the research techniques used in basic biochemistry and nutritional biochemistry research.

Unit I - Introduction to nutritional biochemistry

Meaning, development and contemporary interests

Unit II - Carbohydrate metabolism

Chemistry, classification, properties

Metabolism with energetics- Glycolysis, TCA cycle, Gluconeogenesis, Glycogenesis, Glycogenolysis, HMP pathway, Electron transport chain, oxidative phosphorylation, electron transport inhibitors.

Biosynthesis of Vitamin C

Unit III - Fat metabolism

Chemistry, classification, properties - fatty acids, phospholipids, steroids, Metabolism of fatty acids, cholesterol and phospholipids; Lipogenesis, Fatty liver, hyperlipoproteinemia's, Ketosis

Unit IV - Protein metabolism

Chemistry, classification, properties, metabolism: transamination, deamination and decarboxylation

Amino acid metabolism: Metabolism of tyrosine, tryptophan, phenylalanine Metabolism of methionine, leucine and arginine, Urea cycle, Metabolism of haemoglobin

Unit V - Biophysical Techniques

Separation of sugars and amino-acids by chromatography

Electrophoretic separation of protein, colorimetry, spectrophotometry & radioimmunoassay (Principle & Procedure)

Atomic absorption spectroscopy and flame photometry (Principle & Procedure), PCR (Principle & Procedure), Radio isotopes in clinical diagnosis

Biomarker enzymes: Heart, liver and kidney

Unit VI – Xenobiotics and Antioxidants

Artificial detoxification in the body

Metabolism of xenobiotics

Artificial and diet derived antioxidants, mode of action.

Role of free radicals in human pathology and disease

Related Experience

A visit to research institute to observe the biophysical techniques in nutrition.

References

1. Chaterjea, M. N and Shinde, R. Textbook of Medical Biochemistry, 2007, 7th edition.JayPeeBrothers. Medical Publishing Pvt Ltd. New Delhi.
2. Lehninger, A.L, Nelson, D.L and Cox,M.M. Principles of Biochemistry.2004,4th edition.CBS Publishers,Jain Bhavan, BhalaNatu Nagar.
3. Harold Varley, 2005. Practical Clinical Biochemistry. 4h edition, 2010, CBS Publishers& Distributors, New Delhi.
4. Martin DW, Mayes PA and Rodwell VW,1981.Harper's Review of Biochemistry, 18th edition, Large Medical Publications.

5. Harper's Illustrated Biochemistry (29th Edition) by Murray, Bender, Botham, Kennelly, Rodwell, and Well (McGraw Hill Publishers, ISBN-13:978-0-07-176576-3) http://accessmedicine.mhmedical.com/book.aspx?bookid=389)
6. A textbook of Biochemistry – A V S S Rama Rao, 9th edition, UBS Publisher's Distribution Pvt. Ltd.
7. Advanced Nutrition and Human Metabolism (5th Edition) by Gropper, Smith and Groff (Wadsworth Cengage Learning, ISBN-13: 978-0-495-11657-8)
8. Biochemistry – U Satyanarayana, U Chakrapani, Books & Allied (P) Ltd
9. Micronutrient Information Center, Linus Pauling Institute at Oregon State University: http://lpi.oregonstate.edu/infocenter/
10. Textbook of Biochemistry (for Medical students) – DM Vasudevan and S Sreekumari, 4th edition,Jaypee Brothers Medical Publishers (P) Ltd., New Delhi.
11. Ferrier, D.R., Lippincott's Illustrated Reviews: Biochemistry, 5 th or 6th Edition, Lippincott Williams & Wilkins, Baltimore, MD 2011 or 2013.
12. The Journal of Nutritional Biochemistry

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester I
Branch XE Nutrition and Dietetics
HS214E: - RESEARCH METHODOLOGY
(Common to Branches XC, D, E)
SYLLABUS

Total Hours: 110 hours

Learning Objectives:

1. To have a basic knowledge about research and its methodologies
2. To identify and define appropriate research problems
3. To organize and conduct research in a more appropriate manner
4. To understand various steps in writing a research report, thesis research proposal

Course Outcomes: on completion of the course, student should be able to-

CO1: Identify appropriate research problems and methodologies

CO2: Construct a research design and to formulate research reports

CO3: Recognize the ethics in Home science research

Unit I: Research Methodology, Research Problem

Research Methodology-Meaning, objectives and significance of research. Types of research, Research process and criteria of good research.

Research Problem- Selection of research problem, justification**,** Research gap, Development of hypothesis and its significance, hypothesis testing**,** Variables – types and characteristics.

Unit II: Review of literature

Functions, sources, steps in carrying out a literature review; types of review-Narrative, systematic, metanalysis, developing searching strategies, use of bibliographic databases, free reference management software- Mendeley, Zotero

Unit III: Research design

Meaning and needs, features of a good design; Important concepts relating to research design; Different research designs - Descriptive studies (correlation, case studies, cross-sectional surveys) – Analytical studies, Observational, case-control, cohort studies –

prospective and retrospective, Experimental studies (clinical / intervention trials including randomized controlled trials) Pilot studies

Unit IV: Methods and tools of Data Collection-

Interview, Case study, Survey, Scaling methods, Schedules and questionnaires, Reliability and validity of measuring instruments**.**

Unit V: Sampling design

Population and sample, Steps in sampling design, Criteria for selecting a sampling procedure, Different types of sampling techniques- probability sampling and non-probability sampling**.** Merits and demerits of sampling

Unit VI: Ethics in Research in Home Science and Scientific Writing

Ethical issues in human studies. Information fact sheet, Informed consent of participant, Ethics in Academic writing- Plagiarism and tools

Scientific Writing-Different forms – research articles / notes, review articles, monographs, dissertations and reports. Components of dissertation / research report / article. Importance of illustrations. Methods of presenting research findings – oral / poster. Formulation of research design / proposal

References

1. Best J M and Kahn, J.V. Research in education, 10th edition, Prentice Hall of India, New Delhi, 2006
2. Devadas, R.P. A Handbook on methodology of research. Sri Ramakrishna Vidyalaya, Coimbatore, 1989
3. Gosh B.N. Scientific methods and social research. 4th edition, Sterling Publishers Pvt. Ltd. New Delhi, 2012
4. Kothari, C. R. Research Methodology – methods and techniques, 3rd edition, New age International Publishers, New Delhi, 2014
5. Kulbir Singh, Sidhu. Methodology of Research in Education, Sterling Publishers Pvt.Ltd. New Delhi,
6. Sharma, B.A. V, Prasad, R.D. and Satyanarayana, P. Research methods in Social Science, Sterling Publishers Pvt. Ltd.,
7. Wilkinson, T.S and Bhandarkar, P.L. Methodology and Techniques of Social Research, Himalaya Publishing House, Bombay.

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester II
Branch XE Nutrition and Dietetics
HS 221E: APPLIED FOOD SCIENCE
SYLLABUS

Total hours: 110

Learning objectives:

To enable the students to

1. Gain knowledge on sources and properties of food.
2. Develop skills to judge the quality of cooked foods.
3. Apply the principles while preparing and cooking foods.

Course Outcomes: on completion of the course, student should be able to-

CO1: Understand the different physico chemical properties of food

CO2: Analyse and interpret the different factors for quality cooking in experimental cookery

CO3: Inculcate knowledge on recent trends in food science

UNIT I Physiochemical Changes

Introduction to food science, Different methods of cooking, Physical and physiochemical changes in foods in relation to cookery, Gel formation, denaturation of Proteins —properties of colloids, emulsions stabilizers, browning reactions, Enzymatic and non- enzymatic changes in cooking.

UNIT II Carbohydrates

Sugar Cookery — sources, uses and properties, Carbohydrates Crystallization of sugar, stages of sugar

Cookery. Starch Cookery: Sources and use of starch. Factors affecting, Gelatinization, syneresis and Retrogradation,

Types of Flours, baking qualities. Bread making –role of ingredients, proportion of ingredients, Dough development, method of dough mixing, dough chemistry

Leavening agents.

UNIT III Proteins

Meat- Structure, cuts of meat and post mortem changes -methods of cooking

Fish Kinds of fish, constituents, selection and cooking.

Eggs- structure, composition and selection, coagulation.

Milk and milk products, constituents, processing-clarification, homogenization, pasteurization. cheese making –basic steps.

Pulses and legumes processing- germination, fermentation.

UNIT IV Fats and Oils

Sources and extraction of edible fats and oils-characteristics of fats, physical, chemical properties. Changes in fat during storage and cooking - uses of fat-shortening, emulsifying and creaming agent

UNIT V Food Preservation

Needs, benefits, principles and methods of food Preservation, Use of irradiation and microwave for Preservation. Processing and specifications.

UNIT VI Evaluation of Food Quality

Introduction, International: FPO, Codex Alimentarius, FDA. National: FSSAI-Introduction, regulations, standard review groups (SRGs)

Food safety: The concept of food safety and its definition. Elements of food safety management.

Challenges in management of food safety and outlook. Hazards associated with foods

Sensory evaluation of food. Factors to be considered in food testing. Types of sensory tests. Sensory panel.

Food additives: Definition, Types of Food Additives, Food Adulteration

Convenience foods: Fast foods, ready to eat foods - merits, demerits.

TEXTBOOKS

1. Food Science: Fifth Edition (Food Science Text Series) 5th Edition.by Norman N. Potter and Joseph H. Hotchkiss

2. Introduction to Food Engineering, Fifth Edition (Food Science and Technology) Aug 16, 2013. R Paul Singh and Dennis R. Heldman
3. Essentials of Food Science (Food Science Text Series) 4th ed. 2014 Edition. Vickie A. Vaclavik and Elizabeth W. Christian
4. Lawrie's Meat Science, Eighth Edition; Woodhead Publishing Series in Food Science, Technology and Nutrition; Fidel Toldra.
5. Flavor, Satiety and Food Intake Beverly Tepper and Martin Yeomans. ISBN: 978-1-119-04489-5

JOURNALS

1. Herald of Health – India
2. World Health forum – Magazine of WHO
3. Food Processing U.S.A.

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester II
HS222E: NUTRITION IN CRITICAL CARE
SYLLABUS

Total Hours: 110

Learning Objectives

1. To understand the physiology, metabolism and special requirements of the critically ill
2. To familiarize the special nutritional support techniques and feeding formulations for critically ill

Course Outcome: on completion of the course, student should be able to-

CO1: Acquire knowledge on different methods of nutritional support

CO2: Demonstrate skill in screening and assessing the nutritional status of critically ill patients

CO3: Implement different feeding modalities in enetral and parentaral nutrition

CO4: Assess the nutritional requirements and management of critically ill patients

Unit I - Nutritional screening and nutritional status assessment of the critically ill

Unit II - Enteral Nutrition and Parenteral Nutrition

Enteral Nutrition-Indications, sites, tubes and care, types of feeds, advantages and disadvantages of home based feed, commercial formula feeds, requirements of nutrients according to problems viz renal, respiratory.

Parenetral Nutrition -Indications, importance, long term effects, uses, sites, care, composition

Unit III - Understanding special nutritional requirements

Goals and monitoring therapy in critical illnesses like: stroke, surgery, dialysis, respiratory failure, multi organ failure, cancer, hepatic failure, GI tract surgery, neurosurgery, trauma, sepsis, burns and ketoacidosis

Complications of nutritional support system-Refeeding syndrome and rehabilitation diets

Unit IV -Nutritional supports

Role of immune enhancers, conditionally essential nutrients, immune suppressants and special diets in critical care

Unit V - Diet related ethical issues in the terminally ill

Unit VI- Stress

Definition, Types, Stressors, Psychosomatic disorders

Biological effects on brain, cardiovascular system and respiratory system

Stress enhancing foods and nutrients and nutritional management of stress

References

1. Maurice E. Shils, James A. Olson, Moshe Shike, 2006.Modern Nutrition in Health & Diseases – Eds 10th edition, Vol I and II, Lippincott Willliams& Wilkins Publication.
2. Kathleen Mahan & Krause, Sylvia Escott Stump, 2004.11th edition. Food, Nutrition and Diet Therapy Sylvia Escott Stump, Saunders Co.
3. Kinney JM and Borum PR, 1989. Perspectives in Clinical nutrition. Urban & Schwarzenberg. Baltimore.
4. Shikora SA and Blackburn G L, 1999. Nutritional Support- Theory and Therapeutics, Chapman and Hall, International Thomson Publishing.
5. Jennifer Jamison, 2003. 1sted Clinical Guide to Nutrition and Dietary Supplements in Disease Management. Elsevier. Churchill Livingstone, USA.

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester II
Branch XE Nutrition and Dietetics
HS223E – MEDICAL NUTRITION THERAPY – PRACTICAL
SYLLABUS

Total Hours: 110

Learning Objectives

1. To have practical experience in planning and preparation of therapeutic diets
2. To develop skills in customized diet planning
3. To enable the use of ready reckoned in computing nutritional requirements

Course Outcome: on completion of the course, student should be able to-

CO1: Apply the basics principles in planning therapeutic diet

CO2: Demonstrate skills in planning diet for various disease conditions

CO3: Calculate therapeutic diets by using ready reckoner

CO4: Demonstrate skills in planning customized diets

1. Nutrition in fever and infections- tuberculosis, AIDS

2. MNT for gastrointestinal tract diseases- peptic ulcer, gastric surgery, crohn's disease, Irritable bowel syndrome

3. MNT for diseases of hepato- biliary tract- Hepatitis, Cirrhosis, Hepatic coma

4. MNT for Kidney diseases –Nephritis, Nephrosclerosis, Diet for dialysis

5. MNT for life style diseases – Diabetes- IDDM, NIDDM, Atherosclerosis, Cancer, PCOD

6. Special diets for Obesity- Low carb diet, Keto Diet, Intermittent Diet

Related Experience

- A record to be maintained and submitted for external valuation.

References

1. Mahan,L.K and Shump,S.E.Krause's Food Nutrition & Diet therapy, W.B Saunder'sCompany,XII edition, 2001.
2. Shills,E.M, Olson,S.J and Shiks,M.C.Modern Nutrition in health and disease Lea and Febringer,Philadelphia,8th edition,1994.
3. Srilakshmi,B.Dietetics,New Age International Publishers Pvt Ltd,Chennai,2006.
4. Antia, F.P.Clinical Dietetics and Nutrition,Oxford University Press, New Delhi.
5. Davidson,Passmoore,P and Break ,L.P Human Nutrition and Dietetics. English language book society.Livingstone,1986.
6. Robinson.Normal and Therapeutic Nutrition Oxford and LBM Publishing,Calcutta,17th edition,1990.

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester II
Branch XE Nutrition and Dietetics
HS224E: RESEARCH INTERNSHIP
SYLLABUS

Total Hours: 120

Learning Objectives:

1. To understand research principles and develop skills for research in clinical practice
2. To interact effectively with scientist, researchers and innovators
3. To acquire research techniques and its applications
4. To expose students to research ambience and develop precise in doing research and acquiring professional competency.

Course Outcomes: on completion of the course, student should be able to-

CO1: Apply scientific principles to research, innovation and development

CO2: Demonstrate practical proficiency in a food or nutrition or biochemistry laboratory.

CO3: Frame a novel research problem applying the research techniques learnt

CO4: Demonstrate effective oral and written communication skills.

CO5: Demonstrate the ability to critically evaluate current research and show originality in applying techniques of research

Full time research internship in a state/national/international research organization / Govt/ Govt aided/Non Govt/other reputed /centre/department affiliated to any university or private organizations/companies can be undertaken.

Contents:

Research Internship Report

- Research Institution-History, Organization, Departments, Functions, Services
- Research Methods, Equipments and Techniques
- Applications of research techniques
- Internship Outcome

A report to be maintained and submitted for external valuation

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester II
Branch XE Nutrition and Dietetics
HS 231E: HOSPITAL INTERNSHIP
SYLLABUS

Total hours: 110

Learning Objectives:

1. To attain exposure to the dietary department in a hospital setting
2. To understand the duties and responsibilities of dietitians
3. To cater customized diet plan for patients
4. To possess a sound knowledge of food and nutrition, quantitative food production, biological sciences, pathophysiology of disease, and the ability to act in a variety of capacities in clinical, administrative, and community settings.
5. To become competent to be a dietitian and to set up a diet clinic

Course Outcomes: on completion of the course, student should be able to-

CO1: Analyze and synthesize information related to the patient's needs and to show ability to make sound diagnosis and judgments.

CO2: Demonstrate an autonomous problem-solving approach to the management of the patients with in the context of both nutrition and inter professional practice.

CO3: Show ability to exercise initiative, show personal responsibility and manage themselves and others.

CO4: Development of teaching aids to impart awareness

CO5: Show aptitude for continuing to advanced professional development skills and their lifelong learning.

A full time one-and-a-half-month internship in a multi-specialty hospital under a registered dietitian during the semester wherein the student should undergo training in dietary department and should understand the duties of dietitian and working of dietary department and complete 3 case study on any diseases and should submit a report on internship and case study for evaluation.

Contents:

A. **Case–Study Approach–Interpretation of patient data handling:**

i) Nutritional status and Diagnostic tests

ii) Drawing-up of patients prescription

iii) Discharge diet plans and follow-up where possible

iv) Acceptability and compliance

v) Preparation of teaching aids

vi) Monitoring patients progress for any 3 diseases

B. **Internship Report**

i) Hospital- History, Organization, Departments, Functions, types of feeds, supervision and preparation of feeds, Schedule & Services with emphasis to dietary department

ii) Case Study–3diseasewithteachingaids

iii) Internship Outcome

A Report to be maintained and submitted for external valuation

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester III
Branch XE Nutrition and Dietetics
HS232E – PUBLIC HEALTH NUTRITION
(Common to Branches XD & XE)
SYLLABUS

Total hours: 110

Learning Objectives

1. To gain insight into the public health problems and their implications
2. To develop skills in organizing and evaluating nutrition projects in the community
3. To appreciate the national and international contribution towards nutrition improvement in India

Course Outcome: on completion of the course, student should be able to-

CO1: Demonstrate systematic knowledge and understanding of the commonly occurring nutritional problems

CO2: Gain awareness on the basic nutrition intervention programmes by national and international organizations

CO3: Apply different assessment techniques for nutritional screening

CO4: Describe the various strategies to combat malnutrition

Unit I - Public Health Nutrition – An Overview

Concept and importance of public health nutrition

Public health issues and problems

Health care system in India

Role of public nutritionist in health care delivery

Unit II - Public Health Problems - Prevalence and management

Non-Communicable diseases- Obesity, Cardio-vascular diseases, Diabetes, Cancer and their preventive measures

Nutrient deficiencies – PEM, severe acute malnutrition, anemia, Vitamin D, Folic acid, IDD

Unit III - Assessment of nutritional status in community settings

Methods of nutritional assessment - ABCD technique

Dietary assessment – family diet survey, assessment of dietary intake of individuals, qualitative diet surveys, institutional diet surveys, food balance sheet

Unit IV - Strategies to combat Public Health Problems

Improving food and nutrition security - Green White and Blue revolution

Nutrition education - Principles of planning –, where, when, whom, Kitchen garden, food fortification, food enrichment, PDS, PHC

Unit V - Nutrition Intervention programmes

National Nutrition Policy Preschool feeding programme, ICDS, MDM, SNP, WNP, ANP, BNP, NNAPP, FNB, NIDDCP, National Program for Prevention of Blindness due to Vitamin A Deficiency

Unit VI- Strategies to combat malnutrition

International organizations concerned with food and nutrition: FAO, WHO, UNICEF, CARE, AFPRO, CWS, CRS World Bank and others.

National organizations concerned with Food and Nutrition: ICMR, ICAR, CHEB, CSWB, SSWB

Economics of Nutrition: Malnutrition and its economic consequences; Economics in Nutrition – Food security, food production and food pricing

RELATED EXPERIENCE

- Weighment of food intake by a family for 7 days (report)
- Visiting a few local feeding centers and evaluating the conduct of the programmes.
- Planning, conducting and evaluating nutrition education programme in rural areas.

JOURNALS

1. Proceedings of the Nutrition Society of India, Nutrition Society of India, New Delhi.
2. Nutrition Newsletter, Food and Agricultural Organization of the United Nations.
3. Ecology of Food and Nutrition, Gordon and Breach Science Publishers, London.
4. Social Welfare, Central Social Welfare Board, New Delhi.

5. WHO Chronicle, WHO, Geneva.
6. Swasth Hind, Central Health Education Bureau, New Dan.
7. Journal of Home Science, Sri Avinashlingam Home Science College, Coimbatore.
8. The Indian Journal of Nutrition and Dietetics, Sri Avinashlingam Home Science College, Coimbatore.

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2. Gupta M.C., Mahajan B.K. 2003. Textbook of Preventive and Social Medicine. Third Edition. Jaypee Brothers Medical Publishers. New Delhi. India. Pp- 355-357.
3. Kishore J. 2007. National Health Programmes of India. 7th Edition Century Publication. New Delhi.Pp- 340-361.
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5. Public Health at the Crossroads – Achievements and Prospects. Robert Beaglehole and Ruth Bonita 2nd Edition Cambridge University Press
6. Maxcy-Rosenau-Last Public Health & Preventive Medicine, Fourteenth Edition Ed Robert Wallace, MD, et al.
7. Epidemiology and Management for Health Care: Sathe , P.V. Sathe, A.P., Popular Prakashan, Mumbai, 1991
8. International Public Health: Diseases, Programs, Systems, and Policies by Michael Merson, Robert E Black, Anne J Mills - Jones and Bartlett Publishers
9. Preventive and Social Medicine, K Park, BansaridasBhanot Publishing House.

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7. "Child Development Website". Source: Child Development programmes site (2009).

8. Programs to address malnutrition in India.
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10. The Indian exception". The Economist. 31 March 2011.
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UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester III
Branch XE Nutrition and Dietetics
HS233E – APPLIED NUTRITION
SYLLABUS

Total hours: 110

Learning Objectives

1. To understand the significance of nutrition in the different stages of life cycle and in special conditions
2. To gain knowledge about functional foods and nutraceuticals in health and disease

Course Outcome: on completion of the course, student should be able to-

CO1: Define nutritional requirements for various age groups

CO2: Develop in-depth knowledge regarding RDA

CO3: Understand basic information regarding novel approaches in the field of nutrition

CO4: Evaluate and rectify eating disorders in different age groups

Unit I - Menu Planning

Rationale for menu planning

Factors affecting food choice - Nutritional factors, other factors

Recommended daily allowances, portion sizes for different age groups

Food composition tables and their significance

Unit II - Nutrition during Pregnancy and lactation

Nutritional needs during pregnancy

Nutrition related disruptions in fertility (under and over nutrition)

Nutrient requirements during lactation

Benefits of Breast Feeding, Contraindications

Unit III - Nutrition during different stages of life

School going Children: Nutritional requirements for School going children, Factors influencing their eating habits, different meal patterns and processed food consumption

Adolescents: Nutritional requirements during adolescence, Challenges in adolescence – eating disorders

Unit IV - Nutrition for fitness and Sports

Nutritional requirements of athletes

Hydration, Sport supplements

Pre-competition, during competition and post competition meal

Unit V - Nutrition in special conditions

Nutritional requirements for extreme environments

Nutritional requirements for space missions

Unit VI - Nutritional regulation of Gene Expression, Epigenetics, Nutrigenetics & Nutrigenomics

Introduction to Gene Expression

Role of specific nutrients in controlling gene expression – Proteins, Lipids

Definition and principles – epigenetics, Nutrigenetics and nutrigenomics

Unit VII - Functional foods and nutraceuticals in health and disease

History, Definition, Classification, Sources, Physiological effects - effects on human health and potential applications in risk reduction of diseases of the following:

- Prebiotics
- Probiotics
- Symbiotic
- Non-digestible carbohydrates/oligosaccharides: Dietary fibre, Resistant starch, Gums
- Other Food Components
  - Polyphenols: Flavonoids, catechins, isoflavones, tannins
  - Phytoestrogens and Phytosterols
  - Pigments: Lycopene, Curcumin
  - Organo sulphur compounds

References

1. Food, Nutrition and Diet Therapy – Kathleen Mahan & Krause, Sylvia Escott Stump, Saunders 2004

2. Modern Nutrition in Health & Diseases – Eds – Maurice E. Shils, James A. Olson, Moshe Shike, 10th edition, Vol I and II, Lippincott Willliams & Wilkins Publication 2006.
3. Nutrition and Dietetics – Shubhangini A Joshi, 3rd edition, Tata Mc Graw Hill publication 2010
4. Wardlow's Perspectives in Nutrition – Gordon M. Wardlaw, Margaret Kessel, 9th edition, Mc Graw Hill Publication 2012.
5. Nutrition and Metabolism – Nutrition Society Textbook, 2nd edition, Eds – Michael J. Gibrey, Ian A Macdonald and Helen, Wiley-Blackwell publishing.2010
6. Human Nutrition – Geissler & Powers, 11th edition, Elsevier Publications, 2010.
7. Dietetics – B Srilakshmi, 7th edition, New Age International Publishers, 2014.
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Journals

1. Journal of American Dietetic Association USA – The American Dietetic Association.
2. Nutrition Reviews, New York Springton Verlog
3. The American – Journal of Clinical Nutrition – USA Official Journal of the American Society for Clinical Nutrition Inc
4. The Indian Journal of Nutrition and Dietetics

UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester III
Branch XE Nutrition and Dietetics
HS 234E: STATISTICS AND COMPUTER APPLICATIONS
(Common to Branch X- B, C, D & E)
SYLLABUS

Total hours: 120

Learning Objectives:

1. To enable the students to develop knowledge in statistical tools and computer applications.
2. To demonstrate the understanding of descriptive statistics by practical application of quantitative reasoning and data visualization
3. To distinguish between Karl Pearson's coefficient of correlation and Spearman's rank correlation coefficient.
4. To understand the meaning of correlation, regression and demonstrate the use of correlation and regression analysis for estimation and prediction purposes.
5. To demonstrate the concept of association of attributes and to derive criteria for the independence of attributes.
6. To discuss and demonstrate the use of various tests of significance for attributes, variables and draw inferences based on one or more population.
7. To develop the practical skill of students in using software so as to equip them with to classify, organise, analyse and draw inferences to various problems arising in different fields.

Course Outcome: on completion of the course, student should be able to-

CO1: To identify popular concepts in data management and statistical analysis

CO2: To calculate measure of central tendency and dispersion

CO3: To compute large and small sample test and interpretations

CO4: To estimate parametric and nonparametric tests in data analysis

CO5: To apply excel and SPSS in data analysis

Unit I- Part A: Introduction to Statistics (Topics for general awareness in Statistics which are not intended for Examination purpose)

Introduction to Statistics - Definition, importance and scope of statistics, limitations of statistics, distrust of statistics, Divisions of statistics- Descriptive and Inferential statistics.

Unit I- Part B: and Data Management

Raw data, ungrouped frequency distribution, grouped frequency distribution, relative frequency table, cumulative frequency tables, how to convert raw data to the form of a frequency distribution, the information that can be obtained from a frequency table, merits and demerits of a grouped frequency table. Graphs: histogram, frequency polygon, frequency curve, ogives.

Scales of measurement-nominal, ordinal, interval and ratio scales. Coding of data.

Unit II: Measures of central tendency and dispersion

Measures of central tendency- Definition, arithmetic mean-: simple and weighted arithmetic mean, median, mode, geometric mean, mid–range and its uses, merits and demerits.

Partition values – quartiles and percentiles.

Measures of dispersion –Definition, Absolute and relative measures of dispersion: range, variance, standard deviation, standard error, coefficient of variation.

Unit III: Normal Distribution and its applications

Probability- classical approach, random variable- discrete and continuous random variables, probability mass function and probability density function (Definition and examples only).

Normal random variable, characteristics and properties of a normal curve, standard normal distribution, converting raw scores into standard normalized scores, standard normal curve, making use of standard normal tables.

Examples of applications of the normal curve.

Unit IV: Correlation, Regression and Association of Attributes

Linear correlation- meaning and types of correlation, scatter diagram, Karl Pearson's coefficient of correlation, Spearman's Rank correlation coefficient (Definition and problems only. No derivation), coefficient of alienation, interpretation of correlation coefficient.

Linear Regression and Prediction: Concept of regression lines and regression equations, use of regression lines, role of coefficient of alienation in prediction.

Association of Attributes – Introduction, notation, dichotomy, classes and class frequencies, consistency of data, independence of attributes, association of attributes-Yule's coefficient of association, coefficient of colligation.

Unit V: Testing of Hypotheses

Definition, Hypothesis, concepts of statistical hypothesis-simple and composite, null hypothesis, alternative hypothesis, test of a statistical hypothesis, critical region, Type I error, Type II error, significance level, power of the test. Parametric and non-parametric tests (Definition and examples only).

Parametric test- Testing of hypothesis concerning the mean of a population, testing the equality of means of two populations, testing the hypothesis that proportion has a specified value, testing the equality of proportions of two populations, chi-square test, F test, ANOVA concepts, ANOVA-single factor.

Non parametric chi-square test- testing goodness of fit, independence of attributes, homogeneity of proportions.

Unit VI: Presentation using Power point, Statistical Analysis using Excel and Introduction to SPSS

Basics for creating a power point presentation.

Basics in Excel, statistical analysis using excel based on modules I, II, III, IV and V.

Introduction to SPSS, Presentation of data, Histogram, pie diagram, scatter diagram graphs using SPSS.

References

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2. Agarwal, Y. P. (1986). *Statistical methods' concepts, applications and computations*, Sterling publishers (pvt) Ltd. New Delhi.
3. Berk, K., & Carey, P. (2009). *Data analysis with Microsoft excel: updated for office 2007*. Nelson Education.
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UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester IV
Branch XE Nutrition and Dietetics
HS241E: PAEDIATRIC AND GERIATRIC NUTRITION
SYLLABUS

Total hours: 110

Learning Objectives:

1.Understand the inter-relationship between nutrition, growth and development during infancy and childhood.

2.Understand the specific needs of children and elders and the effects of various diseases on nutritional status and nutritional requirements

3.Familiarize the students with the multifaceted aspects of ageing

4.Make the students competent for nutritional and health care of infants and elderly

Course Outcomes: on completion of the course, student should be able to-

CO1: Assess and evaluate the nutritional status of infants and children

CO2: Explain the etiology, pathophysiology and clinical features of pediatric diseases and conditions that require dietary modification.

CO3: Plan healthy ageing strategies taking into consideration of principles of geriatric nutrition

Unit I –Paediatric Nutritional Assessment

Nutrition and development during infancy and childhood Anthropometric, biochemical, clinical and dietary assessment, Growth Monitoring, Measuring, recording and plotting growth, WHO & IAP standards, Feeding the infant, preschool child, school-aged child and preventing chronic diseases.

Unit II - Identification of sick new born

Detection of abnormal signs-cyanosis, jaundice, respiratory distress, bleeding, seizures, refusal of feed, abdominal distention, failure to pass meconium and urine, APGAR Score, Immunization

Unit III -Nutritional support of preterm, LBW, and children with developmental disabilities

Feeding Premature, LBW babies, children with developmental disabilities- Autism Spectrum Disorders, Attention Deficit Hypertensive Disorder(ADHD); characteristics, causes, complications.

Unit IV - Nutritional management

Nutritional concerns: Childhood Obesity& Underweight, dental caries

Inborn Errors of Metabolism: Nutritional Care Management of Disorders of Carbohydrate metabolism - Galactosemia, Glycogen storage disorder, Lactose intolerance, Fructose intolerance

Disorders of amino acid metabolism – alkaptonuria, Phenylketonuria, Maple syrup urine disease, Homocystinemia

Gastrointestinal diseases and disorders: Diarrhea, gluten sensitive enteropathy, constipation

Neurological disease in children: Epilepsy (Ketogenic diets), Cerebral palsy

Genetic disorders: Down syndrome, Neural tube defects, Wilsons disease

Pulmonary disease in children: Perinatal respiratory distress, Pneumonia, tuberculosis, Cysticfibrosis

Renal disease in children: Nephritic syndrome, Acute and chronic renal failure

Unit V - Geriatric Nutrition

The ageing process: Theories of ageing, physiological, socio-psychological, and

Metabolic aspects of ageing, changes inbody composition

Nutritional and health status of elderly: Factors influencing food and nutrient intake, nutritional problems of the elderly: causes and management

Chronic degenerative diseases–Osteoporosis, Dementia, Alzheimer's disease, Parkinson's disease

Related Experience

1. Measuring, recording and plotting growth of infants
2. Nutrition Problems of elderly-Report

References

1. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics,10th Edition, ChurchillLivingstone,NewYork
2. Mahan,L.KandEscottStump,S.2000.Krause'sFoodNutritionandDiet Therapy.10th edition,W.B SaundersLtd.
3. Modern Nutrition in Health &Diseases–Eds–Maurice E. Shils, James A. Olson, Moshe Shike, 10th edition, Vol I and II, Lippincott Willliams & Wilkins Publication2006.
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8. Rimple Sharma, 2013. Essentials of Paediatric Nursing. Jaypee Publishers(P) LTD. New Delhi.
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UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester IV
Branch XE Nutrition and Dietetics
HS242E- ADVANCED HUMAN NUTRITON
(Common to Branches XD & XE)
SYLLABUS

Total Hours.: 110

Learning Objectives:

To enable the students to

1. Obtain in-depth knowledge of both macro and micro nutrients.
2. Understand the basics for recommending dietary allowances
3. Understand the role of each nutrient in various stages of life and diseases due to their deficiencies and excess intake.

Course Outcomes: on completion of the course, student should be able to-

CO1: Demonstrate, understanding and knowledge of macro and micro nutrients

CO2: Understand the multifaceted role of each nutrient in the human body

CO3: Analyze and explain the requirements of each nutrient

CO4: Understand the techniques of determining energy expenditure in individuals

UNIT I - Energy

Energy content of food, energy measurement, direct and indirect calorimetry, basal metabolism, physical activity, specific dynamic actions of food, total energy requirements, energy balance.

UNIT II Carbohydrates

Functions, digestion, absorption, transport, storage, homeostasis, deficiency, toxicity; Dietary fibre -nutritional importance, types, sources.

UNIT III Proteins and Amino acids

Functions, digestion, absorption, transport, protein synthesis, nitrogen balance, deficiency, toxicity, dietary protein quality.

UNIT IV Lipids

Functions, digestion, absorption, transport, Lipids transformation in the liver, lipotropic factors, lipoproteins, role of essential fatty acids, deposition of fats in the body. Effects of deficiency and excess of fats.

UNIT V Macro elements and Micro elements

Macro elements-Calcium, Phosphorous- Concentration in the body, Functions in human health, absorption, transport, storage, homeostasis, calcium-phosphorous ratio, deficiency, toxicity, RDA

Microelements- Fluorine, Iodine, Iron- Concentration in the body, Functions in human health, absorption, transport, storage, homeostasis, deficiency, toxicity, RDA

UNIT VI Vitamins- Fat soluble vitamins and Water-soluble vitamins

Classification, physiological action, transport, absorption, storage, deficiency diseases and toxicity

BOOKS REFERENCES

1. Gray and Hill, S. The complete Handbook of Nutrition, Robert Spell and Sons Publishers Inc. New York, USA, 1972.
2. World Review of Nutrition and Diabetics, All the Volumes Published.
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JOURNAL REFERENCES

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UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester IV
Branch XE Nutrition and Dietetics
HS243E: PHARMACOLOGY AND PATHOPHYSIOLOGY
SYLLABUS

Learning Objectives

1. Enable students to understand the metabolic and physiological changes in disease conditions.
2. Relate an understanding of normal body functions to the pathologic changes that occur as a result of illness, as well as the body's ability to compensate for these illness-related changes.
3. Assess the multiple pathological factors which affect the patient's clinical presentation.
4. To be able to process the data available from history, physical signs and initial investigations of the selected clinical cases to achieve a meaningful conclusion about the possible diagnosis.
5. To Understand the basic concepts of pharmacology

Course Outcomes: on completion of the course, student should be able to-

CO1: Apply principles of normal anatomy and physiology of human body systems to the pathophysiologic processes of common health problems.

CO2: Demonstrate a basic understanding of the concepts and elements of disease as an alteration of homeostasis

CO3: Explain the aspects of pharmacodynamics, pharmacokinetics

CO3: Describe the types of cellular adaptation, injury, and necrosis

CO4: Demonstrate an understanding of the mechanisms of diseases

Unit I - Concepts of pathophysiology and adaptation in metabolic stress

Cellular response to injury and injurious agents

Systemic inflammatory response

Multiorgan dysfunction and multiorgan failure - Definition of the terms, characteristics, causes, pathogenesis and consequences

Metabolic response to Stress, burns and physiologic effects

Unit II – Introduction to Pharmacology

Definitions, Treminology, Use, Types, Classification

Unit III - Food drug and nutrient interactions

Pharmacologic aspects of food-drug interactions- Pharmacodynamics - Actions, therapeutic, adverse, toxic effects, Pharmacokinetics- Absorption, distribution, metabolism, interaction, excretion, Pharmacogenomics

Risk factors for food-drug interactions

Effects of food on drug therapy

Effects of drugs on nutrition and nutritional status

Unit IV - Pathophysiology of common diseases:

Peptic ulcer and inflammatory bowel disease. Cirrhosis and alcoholic liver diseases. Acute and chronic renal failure. Asthma and chronic obstructive airway diseases**,** Stroke (ischemic and hemorrhage). Hypertension. Angina. Myocardial infarction, Atherosclerosis. Diabetes mellitus.

Parkinsonism. Schizophrenia. Depression

References

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3. Lehninger,A.L, Nelson, D.L and Cox,M.M. Principles of Biochemistry.CBS Publishers,Jain Bhavan,BhalaNatu Nagar.2004 and Fourth edition.
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4. “Pathophysiology of coronary artery disease” Libby et al, Circulation 2005, 111: 3481-8• Fourth Universal Definition of Myocardial Infarction: https://doi.org/10.1016/j.jacc.2018.08.1038• Lecturer: Tang
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UNIVERSITY OF KERALA
M.Sc. HOME SCIENCE - SEMESTER SYSTEM
(2021 Admission)
Semester IV
Branch XE Nutrition and Dietetics
HS244E: TECHNIQUES IN CLINICAL NUTRITION (PRACTICAL)
SYLLABUS

Total hours: 120

Learning Objectives:

1. Understand the principles and applications of biochemical techniques used in the field of clinical nutrition
2. Develop practical skills in the estimation no biochemical parameters
3. Understand the variations in biochemical parameters in health and disease
4. Develop skills in biophysical techniques in clinical nutrition

Course Outcomes: on completion of the course, student should be able to-

CO1: Choose appropriate methods and instrumentation for analysis understanding working principles and applications

CO2: Apply biophysical techniques in analysis of biochemical parameters

CO3: Interpret variations in biochemical parameters in pathological conditions

1. **Analysis of blood for**
    a) Glucose
    b) Haemoglobin
    c) Cholesterol
    d) Serum A/ Gratio and total protein
2. **Analysis of urine for**
    a) Creatinine
    b) Urea
    c) Calcium

d) VitaminC

e) Protein

f) Glucose

Related Experience

- A record to be maintained and Submitted for external Evaluation
- A report on biophysical techniques observed in a research center

References

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