

Syllabus

HUMAN NUTRITION



Offered by

MORIGAON COLLEGE, MORIGAON

2020-2021

Department of Food Processing

NAME OF THE CERTIFICATE COURSE: HUMAN NUTRITION

DURATION OF COURSE: 3 MONTHS

TOTAL CREDITS: 6

Introduction

The nutritionist plays an increasingly important role as health has become a mainstream and topical issue in society. The programme is a scientific study of health and chemical aspects of food. It provides a strong academic training in nutrition and the related disciplines of food science, physiology, biochemistry etc. It will increase the awareness and understanding between student about their food habit and diet which prevent them from major disease. The programme content is wide and varied, ranging from the key scientific properties of food to the development of new and innovative food products. It provides an exciting opportunity for students to develop an in-depth scientific understanding of food, as well as important critical thinking and innovation skills needed by the food industry.

This course enables the students self-sufficient and self-dependent by enhancing their skill. Students will get sufficient knowledge which helps them to crack competitive exams related to medical field and food sector. The programme can helps in increasing self-employability and a good source of income. It provides a path to attract non-traditional students and bringing in new forms of revenue through workforce training and enrichment opportunities for our institution.

Course objectives:

1. Understand health functional properties of micro and macronutrients
2. Learn about the factors affecting energy and nutrient requirements.
3. Gain insights in to interrelationship between nutrients.
4. Understand the basic principles of meal planning.
5. Gain a comprehensive understanding of nutrition in different stages of life cycle.
6. Understand the relationship between nutrition, growth and development.
7. Familiarize with nutrition concerns and dietary recommendations for various age groups and physiological conditions.
8. Understand the principles of primary health care and the impact of social and cultural factors on food choice and health of individuals and families.

Course outcomes:

1. Describe the role of macronutrients and micronutrients in human health.
2. Apply the knowledge of biochemistry and physiology to human nutrient metabolism.
3. Explain the mechanisms of action and interactions of the nutrients.
4. Recognize the importance of food and nutrition in the maintenance of health and prevention of disease.
5. Assess the nutritional needs and provide recommendations for groups and individuals for each phase of the life span considering social and cultural factors.
6. Plan and prepare nutritious meal for various age groups and income levels.

SYLLABUS UNDER THE COURSE

Paper 1: Introduction to Human Nutrition

Paper: FPA-HNT-2001

Credits: 4

THEORY

Unit I Introduction to the study of nutrition Relationship between food, nutrition and health; brief history of nutrition; dietary reference intakes (DRI) – RDA and daily values (DV) and dietary guidelines for reference man and reference woman; Basis for estimation of nutrient requirements, formulation of RDA and RDA for Indians.

Unit II Energy Units of energy; Energy value of foods- gross and physiological values; Measurement of energy content of food (direct and indirect methods); Components of energy expenditure; Basal metabolic rate (BMR) - definition, factors affecting and determination of BMR; Energy requirements for various age groups.

Unit III Body composition Definition, concept of homeostasis, factors affecting changes in body composition.

Unit IV Energy Components of energy requirements: BMR, RMR, thermic effect of feeding, physical activity, Factors affecting energy requirements; Methods of measuring energy expenditure and estimating energy requirements; Energy balance – Concept and regulation (set point theory), control of food intake - role of leptin and other hormones.

Unit V Carbohydrates Review of sources, classification and nutritional significance of carbohydrates; Role of dietary carbohydrates on glycemic response, glycemic index and glycemic load of foods. Dietary fibre - types, sources, role and mechanism of action in health and disease.

Unit VI Proteins Review of sources, nutritional classification and significance of proteins; Factors affecting protein requirements and bioavailability. Vegetable vs animal protein in meeting protein requirements; protein quality evaluation- PER, DC, BV, chemical score, PDCAAS, DIAAS.

Unit VII Lipids Review of sources, nutritional classification and significance of fats; Nutritional significance of fatty acids: SFA, MUFA, PUFA - functions and deficiency; Sources and functions of n-3 and n-6 fatty acids.

Unit VIII Vitamins Review of structure, chemistry, sources, functions and requirements of fat soluble vitamins - A, D, E, K and water soluble vitamins - thiamin, riboflavin, niacin, pantothenic acid, pyridoxine, folic acid, vitamin B12, biotin and ascorbic acid. Metabolism - digestion, absorption, transport, storage and elimination; Bioavailability and factors affecting bioavailability; Interaction with other nutrients.

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Dept of Food Science

Unit IX Macrominerals- sources, functions and requirements of calcium, phosphorus and magnesium. Metabolism - digestion, absorption, transport, storage and elimination; Bioavailability and factors affecting bioavailability; Interaction with other nutrients.

Unit X Microminerals and electrolytes Review of structure, chemistry, sources, functions and requirements of iron, copper, manganese, iodine, zinc, selenium, sodium, potassium and chloride. Metabolism- digestion, absorption, transport, storage and elimination; Bioavailability and factors affecting bioavailability; Interaction with other nutrients.

Unit XI The rationale for the development of dietary guidelines and of nutrition policies in different countries.

Unit XII The role of diet in the development of chronic diseases, such as cardiovascular disease, cancer, diabetes, etc.

Sydney Cooper
Sept 9 food biochem

Paper 2: Practical
Paper: FPA-HNP-2002
Credits: 2

PRACTICAL:

UNIT I Nutritional analysis of foods:

- a) Moisture
- b) Ash
- c) Total carbohydrates
- d) Total lipids
- e) Proteins by Lowry's method/ Kjeldhal method
- f) Crude fiber
- g) Minerals - calcium, phosphorus and iron
- h) Vitamin C by titration

Unit II Estimating energy requirements using factorial method.

Unit III Calculating nutritive value of foods from food composition tables.

Unit IV Planning and preparing a balanced diet.

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Dept. of Food Processing (Agr.)

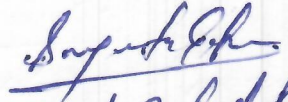
Reference Textbooks:

1. Bender D A. Introduction to nutrition and metabolism, CRS Press. 2014. 5th Edn.
2. Michael J Gibney, Ian A M and Helen M R. Nutrition and metabolism. Blackwell Publishing Co. U.K. 2003.
3. Michael J Gibney, Hester H V and Frans J K (Eds.). Introduction to human nutrition, Replika Press Pvt. Ltd., India. 2003. 2 nd Edn.
4. Swaminathan M. Essentials of food and nutrition, vol. I and II, Ganesh and Co., Chennai, India. 2010.
5. Sumati R Mudambi and M V Rajagopal. Fundamentals of food and nutrition, New Age International Pvt. Ltd. Publishers, New Delhi, India. 2007.
6. Nutrient Requirement and recommended dietary allowances for Indians. B.S. NarasingaRao and B. Shivakumar (Eds.), National Institute of Nutrition, ICMR, Hyderabad. 2010. 2 nd Edn.
7. Gopalan C, Rama Shastri B V, Balasubramanian. Nutritive value of Indian Foods. B.S. NarasingaRao, Deosthale Y G and Pant K C (Eds.), National Institute of Nutrition, ICMR, Hyderabad. 2012.

Suggested Readings:

1. Christos S. Nutrition and metabolism. Human Press, Springer Nature, Switzerland. 2009.
2. Sander T and Emery P. Molecular basis of human nutrition. Taylor and Francis, London. 2003.
3. Hester H Vorster, Michael J Gibeny, Susan A, Laham-New, Aedin Cassidy. Introduction to human nutrition, John Wiley and Sons Ltd. Publishers, U.K. 2013.


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