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ST. TERESA'S COLLEGE ERNAKULAM

(AUTONOMOUS)

Affiliated to Mahatma Gandhi University



CURRICULUM FOR MASTER'S PROGRAMME IN HOME SCIENCE (BRANCH C) FOOD SCIENCE AND NUTRITION

**Under Credit & Semester System
(2014 Admission)**

FOREWORD

The higher education environment is changing rapidly in India, and particularly so in the year 2014-15, when the government of Kerala decided to give autonomy to thirteen educational institutions in the state, with the aim of improving quality. Quality in higher education has been a matter of high concern and priority in India especially after the National Policy on Education, 1986 has very categorically questioned the impact of education and suggested many measures for bringing innovative practices in education.

St.Teresa's College, Ernakulam has been sanctioned autonomy vide UGC letter No.f.22-1-2014 (AC) dated 19/6/2014. The college has decided to function as autonomous from the academic year 2014-15.

The academic year 2014 - 15 will follow the same syllabus and guidelines as per MG University.

PROGRAMME STRUCTURE

(BASED ON MAHATMA GANDHI UNIVERSITY REGULATIONS FOR THE CONDUCT OF POST GRADUATE PROGRAMMES IN AFFILIATED COLLEGES)

1. All the Post Graduate programme in Home Science (Branches XA TO XE) will comprise of four semesters. Each semester will have 90 working days, inclusive of examination, distributed over a minimum of 18 weeks of 5 working days each.

2. GENERAL SCHEME OF THE SYLLABI:

The programme will include two types of courses, Programme Core (PC) courses and Programme Elective (PE) Courses. There shall be a Program Project (PP) with dissertation to be undertaken by all students. The programme will include assignments, seminars and practical viva .There shall be various elective courses for a programme for the choice of students subject to the availability of faculty and infrastructure in the institution. There will be 5 papers in each semester .The papers in the first three semesters will constitute the core element and the papers in the final semester will be the optional component, Which can vary from college to college.

PG PROGRAMME IN HOME SCIENCE - COURSE STRUCTURE AND CREDIT

TOTAL CREDITS - 80

SEMESTER	COURSE	TEACHING HOURS	CREDIT	TOTAL CREDITS
I	PC - 1	5	4	18
	PC - 2	5	4	
	PC - 3	5	4	
	PC - 4	5	4	
	PRACTICAL	5	2	
II	PC - 5	5	4	18
	PC - 6	5	4	
	PC - 7	5	4	
	PC - 8	5	4	
	PRACTICAL	5	2	
III	PC - 9	5	4	18
	PC - 10	5	4	
	PC - 11	5	4	
	PC - 12	5	4	
	PRACTICAL	5	2	
IV	PE	5	4	26
	PE	5	4	
	PE	5	4	
	PE	4	4	
	PRACTICAL	6	3	
	DISSERTATION	-	4	

	VIVA - VOCE	-	3	
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COURSE CODE:

Each course will have an alpha numeric code number which includes first two letters indicating the abbreviation of the subject in two letters, the second two letters denotes specialization area, the semester number, the code of the course and the serial number of the course (C-Programme Core Course, E- Programme Elective Course, P- Practical and D-Project with Dissertation).ie.HS indicates Home Science,next two letters denotes specialization(eg. DF for dietetics and food service management) next the semester number(1,2,3 or 4),CT for core theory, CP for core practicals,ET for elective theory ,EP for elective practical and then the course number (01,02 etc.). Courses with credits and scheme of instructional hours for core and elective courses are given under each Programme according to the specialization.

3. EXAMINATIONS

The evaluation of each course shall contain two parts such as Internal or In-Semester Assessment (IA) and External or End-Semester Assessment (EA). There will be University Examinations at the end of each semester for both theory and Practical with duration of 3 hrs. Project evaluation and comprehensive Viva-voce shall be conducted at the end of the programme only The ratio between internal and external examinations shall be 1:3.

4. EVALUATION AND GRADING

The internal and external examinations shall be evaluated using Direct Grading system based on a 5- point scale.

Internal or In-Semester Assessment (IA) and End –semester Assessment (EA)

Internal evaluation is to be done by continuous assessments. The internal assessment grade awarded to the students in each course in a semester shall be published on the notice

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board at least one week before the commencement of external examination. The components of the internal and external evaluation for theory and practical and their weights are as below.

THEORY

IA =Total weight=10

EA -Total weight-30

Components.	Pattern of question paper
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a. Attendance*- weight =1

Attendance	Grade
≥ 90%	A
≥85 and < 90	B
≥ 80 and < 85	C
≥ 75and < 80	D
< 75	E

b.Assignment - Weight=2

Components	Weight
Punctuality	1
Introduction	1
Content	2
Conclusion	1
Reference	1
General get up	1

One assignment as an internal component for every course. The topic for the assignment shall be allotted within 6th week of instruction.

Component	Weight
a. Punctuality	1
b.Topic &content	2
c.Presentation	3
d.Response to questions	1

c.Seminar– weight=3

Expected to train the student in self-study, collection of relevant matter from the books and internet resources, editing, document writing, typing and presentation.

d.Tests- weight-4

At least two class tests as an internal component for every course with a weight two each. The weighted average shall be taken for awarding

Section	Type	Weight	To Answer
A	Short answer type (within 1 page)	1	5 out of 8
B	Short essay/Problem solving type(not exceeding 2pages)	2	5 out of 8
C	Long Essay Type questions	5	3 out of 6

*Total weight=5+10+15=30

*Ensure that questions covering all skills are set (Knowledge acquired, Standard application of knowledge, ability to synthesise knowledge)

*Conducted at the end of every semester and will be of 3 hrs duration.

the grade for the class tes.

***Attendance:**

The attendance of students for each course shall be another component of internal assessment with weight one. The minimum requirement of aggregate attendance during a semester for appearing in the end semester examination shall be 75%.Condonation of shortage of attendance to a maximum of 10 days in a semester subject to a maximum of two times during the whole period of post graduate programme may be granted by the University.

If a student represents his/her institution, University, state or Nation in sports, NCC, NSS or Cultural or any other officially sponsored activities such as college union/ University union activities, he/she shall be eligible to claim the attendance for the actual number of days participated subject to a maximum of 10 days in a semester based on the specific recommendations of the Head of the department and Principal of the college concerned.

PRACTICAL

IA -Total weight=5

EA-Total weight=15

Components	Weight	Components	Weight
a. Attendance	1	Practical/Project/Record Each examination board can specify the components of practical/Project/Record and assign the weight according to their area of specialisation.	10
b. Lab involvement	1		
c. Written/Lab Test	1		
d. Record	1		
e. Viva	1		
		c.Viva Voce aspects -Knowledge of subject-3 -Communication Skill-1 -General Poise -1	5

The external examination of practical shall be conducted by the university at the end of each semester of three hours duration.

It can be done by one external and one internal examiner.

PROJECT/DISSERTATION

IA –Total Weight=5

EA –Total Weight=15

Components	Weight	Components	Weight
1. Punctuality	1	a.Valuation of dissertation	
		1.Title (Clarity,brevity,originality)	1
		2.Introduction (presentation of problem,Relevance, applicability,definition of terms,objectives in general)	1
		3.Review of Literature (Relevance, recent literature,Studies done in the field,organisation of materials)	2
2.Report	2	4.Methodology (specific objectives, research design,Tool-appropriateness ,preparation, standardisation,Sample-size, technique ofSelection, statistical techniques for data analysis)	2
		5.Results & Discussion (Presentation interpretation of results, Tables, figures,Descriptive or statisticalanalysis, interpretationof results with supportiveevidences, Relationship of results with variables studied &with general body of knowledge)	1
		6.Summary &Conclusion (Statement of problem, procedure Findings, conclusions, Recommendations) (in brief)	1
3.presentation	1	7.Bibliography/References Techniques of writing(consistentFormat-standard pattern,accuracy of referencereporting(text of thesis Vs bibliography)	1
		8.General Get-up Absence of mistakes(typographical errors,grammer,omission of sentences,pagination,style &clarity)	1
4.Viva	1	9. Presentation/Viva-Voce Aspects -knowledge of the topic-2 -Clarity of presentation-1 -communication skill -1 -general poise -1	5

*Project work shall be completed working outside the teaching hours.

*It shall be carried out under the supervision of a teacher in the concerned department/in certain cases permitted to work on the project in an industrial/research organization on the recommendation of the supervisor.

*The external evaluation of the project work is followed by presentation of work including dissertation and Viva-Voce.

*It shall be conducted by a Board of three examiners at the end of fourth semester. The Board shall have two external examiners and one internal examiner (the HoD or nominee) and can be scheduled by the chairman of the Board of Examiners.

COMPREHENSIVE VIVA-VOCE

IA -NIL

EA-Total Weight=20

	Components	Weight
No internal evaluation.	a.Knowledge of subject matter	16
	Aspects	
	-Knowledge from subject of interest	4
	-Knowledge on the fundamentals of the subject	4
	-Topics covering all semesters	6
	-Awareness of current and advanced topics connected with the subject	2
	b.Communication skill	2
c.General Poise	2	

- A team of external examiners will hold the same covering topics in the four semesters, giving equal weight.
- It shall be conducted by a Board of three examiners at the end of fourth semester .The Board shall have two external examiners and one internal examiner (the HoD or nominee) and can be scheduled by the chairman of the Board of Examiners which will be conducted along with the thesis/Project presentation.

SCHEME OF EXAMINATION AND WEIGHT DISTRIBUTION

COURSE NO.	TIME (Hrs)	INTERNAL (WEIGHT)	EXTERNAL (WEIGHT)		PROJECT	VIVA-VOCE	TOTAL
			Theory	Practicals			
SEMESTER I							
PC – 1	3	10	30	-	-	-	40
PC – 2	3	10	30	-	-	-	40
PC – 3	3	10	30	-	-	-	40
PC – 4	3	10	30	-	-	-	40
PRACTICAL	3	5	-	10	-	5	20
SEMESTER II							
PC – 5	3	10	30	-	-	-	40
PC - 6	3	10	30	-	-	-	40
PC - 7	3	10	30	-	-	-	40
PC - 8	3	10	30	-	-	-	40
PRACTICAL	3	5	-	10	-	5	20
SEMESTER III							
PC – 9	3	10	30	-	-	-	40
PC - 10	3	10	30	-	-	-	40
PC - 11	3	10	30	-	-	-	40
PC - 12	3	10	30	-	-	-	40
PRACTICAL	3	5	-	10	-	5	20
SEMESTER IV							
PE	3	10	30	-	-	-	40
PE	3	10	30	-	-	-	40
PE	3	10	30	-	-	-	40
PE	3	10	30	-	-	-	40
PRACTICAL	3	5	-	10	-	5	20
DISSERTATION	-	5	-	-	10	5	20
VIVA – VOCE	-	-	-	-	-	-	20

PASS REQUIREMENT

- A separate minimum of C Grade for Internal and External are required for a pass for every **course**.
- For the successful completion of a semester, a student should pass all courses and score a minimum Semester Grade Point Average(SGPA)of 1.50 (Grade C). However, a student is permitted to move to the next semester irrespective of her / his SGPA).
- For a pass in a **programme** a separate minimum Grade C is required for all the courses and must score a minimum Cumulative grade point average (CGPA) of 1.50 or an overall grade of C and above.

REAPPEARANCE OF FAILED CANDIDATES

There will be no supplementary examinations. A student who fails to secure a minimum grade for a pass in a course will be permitted to write the examination along with the next batch.

BRANCH X C

M.SC FOOD SCIENCE AND NUTRITION

INTRODUCTION

The P.G programme in Food and Nutrition is an interdisciplinary study of food science, macro and micronutrients, biochemistry, dietetics, public health nutrition, food safety and quality control and nutritional epidemiology. In the present scenario there is tremendous demand for trained personnel in the field of hospital dietetics and community nutrition. The master's programme in the area of foods and nutrition assumes importance in concern to the following:

- To impart knowledge and develop capacities of the students through state of the art higher education in the areas of human nutrition viz. food science, food safety and quality, food product development.
- To develop students to become professionals who can effectively play a role in academics, research, food industry, training, extension and community service.
- To develop capacities and abilities to pursue higher education and research in food science and human nutrition.
- Gain insight into National Nutrition Programmes and their management and develop skills in organizing and evaluating nutrition projects in the community.

An integration of theory, practicals, internship and hands on training as instructional methods aims at equipping the students with necessary proficiencies for a wide variety of career options as

- Member of teaching faculty in higher education and curriculum planners and nutritionists
- Research assistant/associates in institutes and undertaking research programmes in nutrition and health
- Project officer/co-ordinator of the health and nutritional development programmes of governmental and non-governmental organisations
- Dietitians in hospitals; diet consultants in hostels, industrial canteens etc.

- Food quality controllers in food processing units
- Project officers in nutrition programmes - FAO, WHO, UNICEF
- Nutritionists in food industries
- Self employment opportunities

ELIGIBILITY

For admission to the post graduate programme in Food Science and Nutrition (Branch X C) the applicant must have passed B.Sc. programme with specialisation in Food and Nutrition, Food Science and Quality Control, Clinical Nutrition and Dietetics, Food Technology or Home Science/Family and Community Science MODEL I and II with not less than 55% marks in part II. Graduates in Biochemistry or Zoology with P.G. diploma in Nutrition and Dietetics of any statutory university recognized by M.G. University are also eligible provided that such candidates should have not less than 55% of marks in part III at the graduation level.

In addition to the existing criteria a BSc. Degree holder of Food Service Management and Dietetics is also eligible. Weightage will be given to the above mentioned qualifying degrees. Degree holders of Zoology, Microbiology, Food Microbiology, Chemistry, Biotechnology with PG Diploma in Nutrition and Dietetics/Open Course in Nutrition for wellness/Dietetics and BSc. Nursing are also eligible.

BRANCH X C
FOOD SCIENCE & NUTRITION

COURSE OUTLINE
TOTAL CREDITS-80

SEM EST ER	COURSE	TITLE OF COURSE	TEACHING HOURS/ WEEK	CREDIT	TOTAL CREDIT
I	HFN1HP	Human Physiology	5	4	18
	HFN1AN	Advanced Nutrition I	5	4	
	HFN1NB	Nutritional Biochemistry	5	4	
	HFN1NLC	Nutrition through Lifecycle	5	4	
	HFN1ANFA	Advanced Nutrition and Food Analysis(Practicals)	5	2	
II	HFN2CND	Clinical Nutrition and Dietetics	5	4	18
	HFN2AN	Advanced Nutrition II	5	4	
	HFN2FSOM	Food Service Organisation and Management	5	4	
	HFN2RMS	Research Methods and Statistics	5	4	
	HFN2DFSM	Dietetics and Food Service Management (Practicals)	5	2	
III	HFN3FT	Food Science and Technology	5	4	18
	HFN3FB	Food Biotechnology	5	4	
	HFN3FMQ	Food Microbiology and Quality Control	5	4	
	HFN3SPF	Scientific Writing and Project Formulation	5	4	
	HFN3FM	Food Science and Microbiology (Practicals)	5	2	
IV	HFN4PHN	Public Health Nutrition	5	4	26
	HFN4BT	Biophysical Ttechniques	5	4	
	HFN4NSF	Nutrition in Sports and Fitness	5	4	
	HFN4EM	Entrepreneurship Management	4	4	
	HFN4PN	Public Health Nutrition(Practicals)	6	3	
	HFN4(PD)	DISSERTATION		4	
	HFN4(VV)	VIVA VOCE		3	

Elective 6- Food Processing and Technology, Elective 7- Food Product Development and Marketing, Elective 8- Food Safety and Quality Control, Elective 9- Nutritional Epidemiology

SEMESTER – 1

HUMAN PHYSIOLOGY

Course Code: HFN1HP

Teaching hours: 5hrs/week

COR

Credit: 4

Objectives:

- To advance their understanding of some of the relevant issues and topics of human physiology.
- To enable students to understand the integrated function of all systems and the grounding of nutritional sciences in physiology.
- To understand alterations of structure and function in various organs and systems in disease conditions

Course Outline

Module 1: General principles of Physiology and Cardiovascular system

Principles of Physiology, Blood and its composition, Functions of each constituent, Blood groups, Blood transfusion and its importance, Coagulation of Blood, Blood Vessels, Structure and Functions of Heart, Cardiac Cycle, Factors involved in healthy vascular system, pathogenesis of cardiovascular disease, dietary components and their effect on blood plasma lipids, Blood Pressure and it's relation to diet, Heart rate, Cardiac Output and Regulation.

Module 2: Digestive System

Structure and function of alimentary tract, Functions of various secretions and juices - Saliva, Gastric, Bile, Physiology of bile secretion and Enterohepatic circulation, adaptation of biliary response to the diet, Intestinal, Pancreatic, Functions of enzymes in digestion, Digestion of Nutrients-Proteins, Fats, Carbohydrates. Common problems of digestive tract-Vomiting, Constipation, Diarrhoea. Water balance in the gastrointestinal tract.

Module 3: Excretory System

Structure and function of excretory system, urine formation, composition of normal and abnormal urine, role of excretory system in homeostasis, Renal Function Tests, Fluid balance, Regulation of body temperature, Role of skin as an excretory organ.

Module 4: Respiratory System

Organs, Structure and Functions, Mechanism of respiration, Neural and chemical control of respiration.

Module 5: Nervous System

Structure of Nerve cell, Fibre, Classification of Nervous System Central Nervous System-Brain and Spinal Cord Structure and Function, Autonomic and Sympathetic Nervous System.The blood brain barrier and energy substrates.

Module 6: Glands and Endocrine System

Liver-Structure and Function, Pancreas-Structure and Function,Interaction between endocrine and exocrine pancreas, Endocrine Glands-Pituitary, Thyroid, Parathyroid, Adrenal Glands -Structure and Function, Hormones -Role in metabolism,Endocrine Disorders.

Module 7: Immune System

Types of ImmModuley, Cells of the Immune System, Immune System- Humoral ImmModuley, Cell Mediated ImmModuley, Immune changes in malnutrition, Micronutrients and immune function,probiotics and immune function. Immune Mechanisms in Infections, Auto-immModuley and hypersensitivity.

Module 8: Skeletal and Lymphatic System

Bone architecture and physiology, bone growth,teeth,Nutritional Rickets,Bone Calciumwith ageing, Specific nutrients and their effect on bone health,Lifestyle factors and Bone Health.Lymph, Lymph glands and Functions, Spleen- Structure and Functions.

References:

- Best, H. And Taylor, B (1991)'The Physiological Basis for Medical Practice', 8th Edition, The Williams and Wildins Company.
- Burke and Taylor (1986) The Living Body, Saunders Company.
- Chatterjee C C (1987)'Human Physiology', Volume I and II, Medical Allied Agency
- Guyton J. E (1991), 'Textbook of Medical Physiology',WB Saunders Publications, Philadelphia
- Michael J Gibney (2003) Ian A MacDonald, Helan M Roche, Nutrition and Metabolism, Blackwell Publishing.
- Samson and Wright (1989), 'Applied Physiology', Tandon Publications.

HUMAN PHYSIOLOGY
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Module	No. Of Hours	Section A-(5/8) 1 Weightage	Section B(5/8) 2 Weightage	Section C(3/6) 5 Weightage	Total (30/54)
1	18		1	2	12
2	10	1		1	6
3	10	2	2		6
4	10	1		1	6
5	8	1		1	6
6	18	1	2	1	10
7	8		3		6
8	8	2			2

M.Sc DEGREE EXAMINATION
FIRST SEMESTER
HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION
HFN1HP: HUMAN PHYSIOLOGY

Time: Three Hours

Maximum Weightage: 30

I. Answer any FIVE questions, not exceeding one page.Each question carries a weightage of one.

1. List the functions of bile.
2. What is micturition?
3. What is Glomerular FiltrationRate (GFR)?
4. Write a note on asphyxia.
5. What is hyperthyroidism?

6. Write a note on nutritional rickets.

7. List the functions of spleen.

8. What is a reflex action?

(5x1=5 weightage)

II. Answer any FIVE questions in two pages. Each question carries a weightage of two.

9. Write a note on leucocytes.

10. Discuss the structure of nephron.

11. Explain urine formation.

12. Write a note on the adrenal gland.

13. Discuss innate and acquired immunity.

14. Write a note on relationship between micronutrients and immune function.

15. Bring out the role of pancreas as an endocrine and exocrine organ.

16. Write a note on probiotics and immune function.

(5x2=10 weightage)

III. Answer any THREE questions not exceeding three pages.Each question carries a weightage of five.

17. Write an essay in the structure of the heart and cardiac function.

18. Explain internal and external respiration.

19. Discuss dietary lipids in detail and their effect on plasma lipids.

20. Explain the structural and functional aspects of the human gastrointestinal system.

21. Write an essay on the structure of the central nervous system.

22. Bring out the role of the pituitary as the master gland of the endocrine system.

(3x5=15 weightage)

ADVANCED NUTRITION -I

Course Code: HFN 1 AN

Teaching hours: 5hrs/week

COR

Credit:4

Objectives

- To have an indepth knowledge of the physiological role of macronutients and macrominerals and how they act and interact to maintain positive health and ward off diseases.
- To familiarise with the recent advances in nutrition and apply this knowledge in planning for public Health Programmes.

Course Outline

Module 1: Body Composition

Introduction, five levels of body composition, body compartments, Estimation of body composition, Body Composition changes during childhood, adolescence and elderly, Status/Length, Weight, Circumference measurements, Body Mass Index, skinfold, leg length.

Module 2: Energy

Some basic concepts, definition and conceptualisation of energy balance, Energy Intake, Sources, Regulation of food intake and factors influencing intake, Energy Expenditure, Components, Factors affecting energy expenditure, BMR, Thermic effect of Food and Energy expended in physical activity, methods of estimating energy expenditure and requirements. Factorial computation of energy expenditure of Indian Adult Population, RDA. Energy Imbalance-Over and Under nutrition, Classification, Etiology, Functional Consequences.

Module 3: Carbohydrates

Nutritional classification, Significance and changing trend in carbohydrate intake, Digestion, absorption, transport, distribution, storage and excretion. Glycemic index carbohydrates, metabolic utilisation and regulation of blood glucose concentration, Diabetes mellitus, Non glycemic carbohydrates- Fibre, components, properties, Physiological and metabolic effects, Nutritional and health significance, requirements. Resistant starch, factors influencing resistant starch content in foods and potential health benefits. Fructo-oligosaccharides and High Fructose Corn Syrup. Glycemic Index and Glycemic Load. Factors affecting GI. Carbohydrates and dental caries.

Module 4: Proteins

Overview, Essentiality, Classification and Functions of Amino acids, Functional categories of proteins. Digestion, absorption and transport of proteins, absorption and transport of amino acids. Evaluation of protein nutritional quality, Major sources, Improvement of quality of proteins in the diet, Turnover of proteins and amino acids, Amino acids as precursors of physiologically important nitrogen compounds, Protein and essential amino acid requirements of Indian adults.

Module 5: Lipids

Classification and Functions, triglycerides, fatty acids, phospholipids and sterols, Digestion, absorption, transport and storage, Role of n 3 and n 6 in health and disease, choice of cooking medium in the context of n3 n6 fatty acid ratio in Indian Diets, functions of essential fatty acids, functions of eicosanoids. Role of lipids and lipoproteins in atherogenesis, Recommendations of FAO, WHO on dietary fats, sources of fats in Indian Diets, Invisible and Visible fats, Recommended intake of dietary fat for Indians, fat intake in Indians-An Update.

Module 6: Macrominerals

Introduction and general functions of Minerals, Sources, absorption and excretion, assessment of mineral status and requirements, deficiency, toxicity of Calcium, Phosphorous, Magnesium, Sodium, Potassium, Chloride and Magnesium.

References

- James L Groff and Sareen S Gropper (2010) Advanced Nutrition and Human Metabolism, Fourth Edition, Wadsworth Publishing Company.
- Maurice B Shils, Moshe Shike. A, Catherine Ross, Benjamin Cabellero, Robert J Cousins (2006), Modern Nutrition in Health And Disease, Lippincott Williams Al Wilkins.
- Michael J Gibney, Ian A MacDonald and Helen M Roche (2003) Nutrition and Metabolism, The Nutrition Society Textbook Series, Blackwell Publishing First Edition.
- Nutrient Requirements And Recommended Dietary Allowances For Indians A Report Of The Expert Group Of The Indian Council Of Medical Research ICMR 2010.

ADVANCED NUTRITION -1

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Module	Hours	1 weightage 5/8	2 weightage 5/8	5 weightage 3/6	Total 30/ 54
1	10	-	1	1	7
2	15	2	1	1	9

3	15	1	2	1	10
4	15	2	1	1	9
5	15	2	1	1	9
6	20	1	2	1	10

M.Sc DEGREE EXAMINATION
FIRST SEMESTER
HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION
HFN1AN: ADVANCED NUTRITION -1

Time- Three hours

Maximum Weightage : 30

Part A

I. Answer any **FIVE** questions, not exceeding one page. Each question carries a weight of 1.

1. Classify life styles based on PAL
2. Give the WHO classification of BMI
3. Write a short note on lactose intolerance
4. What is meant by supplementary value of proteins?
5. Discuss nitrogen balance
6. How are fatty acids classified based on saturation level ?
7. Write a short note on hydrogenation of fat
8. Discuss the inhibitory factors on calcium absorption (5x1= 5 weightage)

Part B

II. Answer any **FIVE** questions not exceeding one page. Each question carries a weight of 2.

9. Describe briefly the applications of body composition measurements
10. Discuss the methodology for determining the RDA of energy for Indians
11. What are resistant starches (RS)? Enlist the types of RS

12.Describe the process of glycogenesis

13.Discuss the methods to evaluate protein quality

14.Discuss the functions of fat

15.Discuss the signs and symptoms of magnesium deficiency

16.Discuss the functions of phosphorus (5x2=10 weightage)

Part C

III. Answer any **THREE** questions, not exceeding three pages. Each question carries a weight of 5.

17. Discuss the different methods used in the assessment of body composition

18. Discuss the current methodology for determining energy requirements

19. Discuss fiber under the following heads; a) Types b) The importance of fiber in human nutrition c) Requirement for adults

20. How can protein be classified based on chemical Composition? Bring out the biological functions of protein

21. Discuss fats under the following heads: a) Digestion b) Absorption c) Transport and storage

22. Describe the role of Vitamin D, Calcitonin and PTH on calcium regulation

(3x5=15 weightage)

NUTRITIONAL BIOCHEMISTRY

Course Code: HFN1NB

Teaching hours:5hrs/week

COR

Credit:4

Objectives

- To impart advanced comprehensive concepts in the area of carbohydrate ,protein and lipid metabolism
- To understand the interrelationship between different metabolic pathways in the body.

Course Outline

Module 1:Carbohydrates

Structure, Classification and Properties of Monosaccharides, Disaccharides and Polysaccharides. Intermediary Metabolism- Glycolysis, TCA Cycle, HMP Shunt, Gluconeogenesis, Glycogenesis, Glycogenolysis. Regulation of Carbohydrate metabolism at Organ, Enzyme and hormonal level. Disorders of Carbohydrate metabolism-galactosemia, glycogen storage disease, pentosuria, abnormal levels in blood glucose.

Module 2:Biological Oxidation

Energy release and consumption in chemical reactions, High energy phosphate bond, Coupled reactions in transfer of energy, Electron Transport Chain and Oxidative Phosphorylation

Module 3:Proteins

Structure and Classification of Amino acids , Peptide bond formation , Structure of Proteins, Protein Metabolism –Transamination ,Deamination and Urea Cycle, Amino acid pool, Regulation of Protein metabolism at Organ , Enzyme and Hormonal level. Protein biosynthesis. Inborn errors of metabolism-phenyl ketonuria, cystinuria, albinism, alkaptonuria, maple syrup disease.

Module 4: Lipids

Definition, Classification, Structure, Physical and Chemical Properties. Metabolism of Lipids – De novo Synthesis of fatty acids, Beta (β) Oxidation. Cholesterol biosynthesis and regulation. Ketone bodies, Prostaglandins – significance. Plasma lipoproteins and Hyperlipidemias.Disorders of lipid metabolism - Dyslipidemia and Lipid storage diseases.Regulation of Lipid metabolism at enzyme, hormonal and organ level.

Module 5:Nucleic Acids

Composition and Classification. Structure and properties of DNA and RNA. DNA replication, DNA mutation and repair. Metabolism of Purines, Metabolism of Pyrimidines. Disorders of nucleic acid metabolism- Gout, aciduria, xanthinuria

Module 6: Vitamins and Minerals

Major vitamins with coenzyme functions, mode of action of Thiamine, riboflavin, niacin, pyridoxine, biotin and folic acid. Interactions of nutrients- Carbohydrate, protein and fats on vitamins; macrominerals with other nutrients; interaction of microminerals.

References:

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NUTRITIONAL BIOCHEMISTRY

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Module	No. Of Hours	Section A-(5/8) 1 Weightage	Section B(5/8) 2 Weightage	Section C(3/6) 5 Weightage	Total (30/54)
1	20	2	-	2	12
2	8	1	-	1	6
3	18	1	2	1	10
4	18	1	2	1	10
5	18	1	2	1	10
6	8	2	2	-	6

M.Sc DEGREE EXAMINATION

FIRST SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN1NB: NUTRITIONAL BIOCHEMISTRY

Time: Three Hours

Max. 30 weightage

Part A

I. Answer any **FIVE** questions, not exceeding one page. Each question carries a weightage of 1

- 1 Ketone bodies
- 2 Glycogenesis
- 3 Non Essential Amino Acids
- 4 Coupled reactions in energy transfer
- 5 Transdeamination
- 6 Free Radicals
- 7 Structure of Sucrose
- 8 Structure of DNA

(5 x 1 = 5 weightage)

Part B

II. Answer any **FIVE** questions, not exceeding two pages.Each question carries a weightage of 2.

- 9 Give an account of beta oxidation of fatty acids
 - 10 Write a note on interaction of micronutrients with examples
 - 11 Explain DNA replication mechanism
 - 12 Write a note on trans deamination
 - 13 Differentiate between DNA and RNA
 - 14 Write the nutritional classification of proteins
 - 15 Describe De novo synthesis of fatty acids
 - 16 Briefly explain the role of any three B vitamins as coenzymes
- (5 x 2 =10 weightage)

Part C

III. Answer any **THREE** questions not exceeding three pages. Each question carries a weightage of 5.

- 17 Give an account of protein biosynthesis
 - 18 Give an account of biosynthesis of cholesterol in the human body
 - 19 Explain the process of gluconeogenesis
 - 20 Explain Citric acid cycle. Add a note on its energetics
 - 21 Describe the technique of Recombinant DNA technology
 - 22 Give an account of electron transport chain and oxidative phosphorylation
- (3 x 5 =15 weightage)

NUTRITION THROUGH LIFE CYCLE

Course Code: HFN1NLC

Teaching hours:5hrs/week

Credit:4

COR

Objectives

- To enable students to understand the basics of human nutritional requirements and the role of nutrition in different stages of the life cycle.

Course Outline

Module 1:Understanding Nutrition

Methods for studying human nutritional requirements, Principles of computation of RDA for Indian adults by ICMR – Energy, Protein, Fats, Mineral and Vitamin requirements (Calcium, Phosphorus, Iron, Zinc, Thiamine, Folic acid, Vitamin C, Vitamin A, Vitamin D) and Dietary Fiber.

Module 2: Nutrition in Pregnancy

Physiological stages of Pregnancy and nutrition demands, Pregnancy weight gain, Principles of estimating nutritional needs in Pregnancy, Physiological adjustments that may affect nutrient needs of pregnancy, Effect of Under nutrition on Mother and Child Health, Diet in Pregnancy, Adolescent Pregnancy, Pregnancy and AIDS

Module 3: Nutrition in Lactation

Physiology and Endocrinology of Lactation –Synthesis of Milk, regulation of milk production, Let Down Reflex, Human Milk Composition, Factors Affecting Breast Feeding, Effect of Breast Feeding on Maternal and Child health, Management of Lactation- Prenatal Breastfeeding Skills, Rooming In Problems, Nutritional Requirements and dietary modifications during lactation, Exclusive Breast Feeding- Baby Friendly Hospital Initiative, Breast Feeding in the age of AIDS

Module 4: Nutrition in Infancy

Pre Term and Low Birth Weight Infants-Nutritional management, Feeding of Pre Term and Low Birth Weight Infants, Importance of Good Weaning, ARF, Growth monitoring

Module 5: Nutrition in Childhood

Normal Pattern of Growth and Development, Norms/ Standards for Growth in children, Nutritional requirements of children, Malnutrition and Mental Development, PEM- Types, Etiology, Classification, Nutritional Management

Module 6: Nutrition in Adolescence

Normal Pattern of Growth and Development, Nutritional requirements of adolescents, Eating Disorders in Adolescents

Module 7: Geriatric Nutrition

Socio economic and psychological factors of elderly, Physiological changes in old age affecting nutrition, Nutritional requirements and food modifications in old age.

Module 8: Nutrition in special events

Space nutrition, High altitude nutrition , Nutrition in Cold/Polar environments.

References:

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NUTRITION THROUGH LIFECYCLE

Module	No. of hours	Section A(5/8) 1 weightage	Section B(5/8) 2 weightage	Section C(3/6) 5 weightage	Total 30/54
1	20	1	1	1	8
2	15	2	1	1	9
3	12	1	1	2	13
4	12	1	1		3
5	9	1	1	1	8
6	10	1	1		3
7	6		1	1	7
8	6	1	1		3

M.Sc DEGREE EXAMINATION

FIRST SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN1NLC: NUTRITION THROUGH LIFE CYCLE

Time: 3 hrs

Max: 30 Weightage

Part A

I. Answer any FIVE questions, not exceeding one page. Each question carries a weightage of 1.

1. RDA computation of calcium for adults
2. Pre eclampsia
3. Pregnancy and AIDS
4. Let down reflex
5. Spina bifida
6. ARF
7. Malnutrition and mental development
8. Space Nutrition

(5x1=5 weightage)

Part B

II. Answer any FIVE questions not exceeding two pages. Each question carries a weightage of 2.

9. What are the methods for studying human nutritional requirements?
10. What are the principles of planning a diet for a woman with gestational diabetes mellitus?
11. What are the factors influencing breast feeding?
12. Write a note on the mode of feeding premature infants.
13. Write notes on the importance of weaning and ARF as a weaning food.
14. Explain the normal pattern of growth and development during adolescence.
15. Discuss the dietary modifications to be followed for a geriatric diet. Justify
16. Give an account of the physiological changes that occur at high altitudes.

(5x2=10weightage)

Part C

III. Answer any THREE questions not exceeding three pages. Each question carries a weightage of 5.

17. Outline the principles of computation of RDA for energy requirements of Indians.
18. What are the complications that can occur during pregnancy?
19. Explain the physiological adjustments during lactation and role of hormones in milk production.

20. Discuss the etiology and prevention of PEM in India
 21. Explain the changes that occur during old age that affect dietary intake.
 22. Give reasons for lactation failure and factors affecting the volume and composition of milk.
- (3x5=15weightage)

ADVANCED NUTRITION AND FOOD ANALYSIS - PRACTICALS

Course Code: HFN1ANFA

Teaching hours: 5hrs/week

CORE

Credit: 2

Objectives

- To enable students to get practical experience in lab and develop skill in Food Analysis
- To gain knowledge in applying concepts of Advanced Nutrition.

A. ADVANCED NUTRITION

i. Energy

- Calculating BMR(Kymograph method),
- Calculating energy balance
- Calculating energy expenditure

ii. Carbohydrates

- Percent energy of CHO
- Survey high fibre products in the market.

iii. Protein

- Chemical score computation
- NDP cal%
- Evaluation of protein quality

- Planning suitable dishes for supplementary feeding programmes based on protein quality.

iv. **Balance Studies**

- Calcium balance study
- Nitrogen balance study

B. FOOD ANALYSIS

Estimation of the following in food samples:

- i. Total Ash
- ii. Moisture
- iii. Fat
- iv. Crude Fibre
- v. Energy(Bomb calorimeter)
- vi. Protein(Kjeldahl's method)
- vii. Iron(Colorimeter)
- viii. Phosphorous(Colorimeter)
- ix. Vitamin C
- x. Total carotene(Spectrophotometry)
- xi. Sodium (Flame photometry)
- xii. Potassium(Flame photometry)
- xiii. Calcium(Macro method)
- xiv.** Determination of Ph; Preparation of chloride and phosphate buffers.

C.PROJECT:

Project Report on:-

An experimental study based on any topic within the syllabus

OR

An internship in Food Analysis or Advanced Nutrition at a laboratory/industry

ADVANCED NUTRITION AND FOOD ANALYSIS - PRACTICALS

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MOD ULE	No. of Hour s	Sectio n A- 1 Weigh tage	Sectio n C 2 Weigh tage	Sectio n D 6 weigh tage	Tota l (10)
A	36	2	1	-	4
B	54	-	-	1	6
C	Project or interns hip				

M.Sc DEGREE EXAMINATION

FIRST SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN1ANFA: ADVANCED NUTRITION AND FOOD ANALYSIS

Weightage: 10

Time: 3 hrs

A. ADVANCED NUTRITION

1. Calculate the BMR of an adult ofyears, weighing... kg,using predictive equation proposed by ICMR.

Weightage -1

2. Calculate the NDP Cal% of a recipe having Kcal of energy,..... gm of protein andchemical score

Weightage-1

3. Calculate the chemical score of..... andusingvalue using reference protein.Find the limiting amino acid. Weightage -2

B.FOOD ANALYSIS

1.Estimate the amount ofin 100 grams of the food sample.

Principle-1, Procedure-2,Skill-1,Calculation-1,Result-1(Weightage-6)

SEMESTER – II

CLINICAL NUTRITION AND DIETETICS

Course Code: HFN2CND

Teaching hours: 5hrs/week

COR

Credit:4

Objectives:

- To understand the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient needs.
- To know the effect of various diseases on nutritional status and nutritional and dietary requirements.
- To be able to recommend and provide appropriate nutritional care for prevention and treatment of various diseases.

Course Outline

Module 1: Diet therapy and Nutritional Care in Disease

The Nutritional Care process, Care plan, Assessment and therapy in patient care, Implementation of Nutritional care.Nutritional Intervention and Diet modifications-types of hospital diets. Diet prescriptions and psychology of feeding the patient. Nutrition in Physiological Stress-Physiological stress and its effect on body,nutritional implications. Fevers and infections, Surgery and Management of Surgical Conditions, Parenteral Nutrition - Types, mode, and composition of feeds, Tube feeding, Enteral Nutrition - Routes, modes, composition, care to be taken during feeding, Dietary guidelines for Burns, Nutritional Management of Patients with HIV, AIDS .

Module 2: Diseases of the Gastro Intestinal system

Pathogenesis of GI disease with special reference to upper GI tract and ulcers. Diseases of Oesophagus and Dietary care, Diseases of Stomach and Dietary care. Intestinal Diseases-

Flatulence, Constipation, Irritable Bowel Syndrome, Diarrhoea, Steatorrhoea, Inflammatory Bowel Disease, Ulcerative Colitis, Diverticular disease-Treatment and Dietary care. Malabsorption Syndrome -Coeliac disease, Tropical Sprue, Intestinal Brush Border deficiencies, Protein losing Enteropathy -Dietary care Process.

Module 3: Diet in Diseases of Liver, Pancreas and Biliary System

Nutritional care in Liver Disease- Hepatitis, Cirrhosis and Hepatic Encephalopathy. Nutritional care in Pancreatitis-Acute and Chronic Biliary Dyskinesia, Cholelithiasis, Cholecystitis, Cholecystectomy.

Module 4: Diet in Diabetes Mellitus

Classification, Physiological Symptoms and Disturbances, Diagnosis-Fasting Blood Glucose, Oral Glucose Tolerance Test, Glycosylated Haemoglobin and Urine testing. Oral Hypoglycemic agents and Hormone therapy. Dietary management-Exchange lists, dietetic foods, sweeteners, glycemic index and glycemic load. Gestational Diabetes Mellitus and Management.

Module 5: Diseases of the Circulatory System

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

Module 6: Diet in Renal Diseases

Physiology and function of normal kidney - a brief review Diseases of the kidney, classification, Glomerulonephritis - Acute and Chronic - Etiology, Characteristics, Objectives, Principles of Dietary Treatment and Management. Nephrotic syndrome - objectives, principles of Dietary Treatment and Management.Uremia and Renal FailureHistory, General Principles of Protein Nutrition in Renal Failure and Uremia. Acute Renal Failure - Causes, dietary management, fluid, sodium and potassium balance, protein and energy requirements. Chronic renal failure - medical treatment, Renal transplants. Dialysis and types- hemodialysis, Peritoneal Dialysis and Continuous Ambulatory Peritoneal Dialysis (CAPD). Dietary Management in conservative treatment, dialysis and after renal transplantation. Use of Sodium and Potassium Exchange lists in Renal diet planning. Chronic renal failure in patients with diabetes mellitus. Nephrolithiasis - Etiology, types of stones, Nutritional care, alkaline-ash diets.

Module 7: Nutrition in Cancer

Types, symptoms, detection, Cancer therapies and treatment - side effects and nutritional implications, Goals of care and guidelines for oral feeding, Accommodating side effects. Enteral tube feeding - Nasogastric, Gastrostomy, Jejunostomy, Parenteral Nutrition. Pediatric patients with cancer.

Module 8: Interactions between Drugs, Food and Nutrients

Effect of drugs on Food and Intake, Nutrient Absorption, Metabolism, and Requirements, Drugs affecting intake of food and nutrients, Absorption, Metabolism and excretion, Nutritional status, Summary of action of some common drugs, Effect of food, nutrients and nutritional status on absorption and metabolism of drugs .

References

- Garrow JS, James WPT and Ralph AC, (1993) Nutrition and Dietetics, Churchill Livingstone
- Mahan L.K, and Stump S.E, (2001), Krause's Food, Nutrition and Diet Therapy, WB Saunders Limited. 10th Edition
- Shils N.E, Olson J.A., Shike A, Ross A.C,(2006), Modern Nutrition in Health and Disease, 9th Edition, William and Wilkins.

CLINICAL NUTRITION AND DIETETICS

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Module	No. Of Hours	Section A-(5/8) 1 Weightage	Section B(5/8) 2 Weightage	Section C(3/6) 5 Weightage	Total (30/54)
1	18		1	2	12
2	10	1		1	6
3	10	2	2		6
4	10	1		1	6
5	8	1		1	6
6	18	1	2	1	10
7	8		3		6
8	8	2			2

M. Sc DEGREE EXAMINATION
SECOND SEMESTER
HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION
HFN2CND: CLINICAL NUTRITION AND DIETETICS

Time: Three Hours

Maximum Weightage: 30

I. Answer any five questions, not exceeding one page. Each question carries a weightage of one.

1. Write a note on lactose intolerance.
2. What is dyslipidemia?
3. Write a note on one drug nutrient interaction in the human body.
4. Write a note on steatorrhea.
5. What is hepatic encephalopathy?
6. Write a note on reversal of Albumin to Globulin ratio.
7. Discuss how drugs influence the absorption of nutrients in the body
8. Why is it essential to have soluble fiber in the diet? (5x1=5 weightage)

II. Answer any five questions in two pages. Each question carries a weightage of two.

9. Discuss the advantages and disadvantages of enteral versus parental feeding.
10. What is a macrobiotic diet?
11. Discuss role of phytochemicals in the prevention of cancer.
12. Write a note on acid and alkaline ash diet.

13. Discuss the etiology and dietary management in nephritic syndrome.
14. Enumerate the dietary factors known to cause cancer.
15. Bring out the principles of dietary management in hepatitis.
16. Write a note on acute pancreatitis.

(5x2=10 weightage)

III. Answer any three questions not exceeding three pages. Each question carries a weightage of five

17. Write an essay on hypertension and dietary management in hypertension.
18. Explain the principles of dietary management in Diabetes mellitus.
19. Elaborate the principles of dietary management in acute and chronic renal failure.
20. Explain the etiology and dietary management in AIDS.
21. Write an essay on the etiology and principles of dietary management in Inflammatory Bowel Disorders.
22. Write an essay on types of nutritional support in a critically ill individual.

(3x5=15 weightage)

ADVANCED NUTRITION -II

Course Code: HFN2AN

COR

Teaching hours: 5hrs/week

Credit:4

Objectives

- To have indepth knowledge of the physiological role of microminerals and vitamins and how they act and interact to maintain positive health and ward off diseases.
- To familiarise with the recent advances in nutrition and apply this knowledge in planning for public Health Programmes.

Course Outline

Module 1: Microminerals

Introduction, food sources, metabolism, functions, deficiency, toxicity, requirements. Assessment of Nutritional status of Iron, Zinc, Copper, Selenium, Chromium, Manganese, Iodine and Fluorine.

Module 2: Fat Soluble Vitamins

Vitamins- An overview, Introduction, Food sources, absorption, transport, storage, excretion, functions, deficiency, toxicity, requirements and assessment of vitamin status- Vitamin A, D, E and K.

Module 3: Water Soluble Vitamins

Introduction, Food Sources, Absorption, Storage, Excretion, functions, deficiency, requirements and assessment of vitamin status of Thiamine, Riboflavin, Niacin, Pyridoxine, Folate, Cyanocobalamin and Ascorbic Acid.

Module 4: Compounds other than nutrients with health benefits

Carnitine, Homocysteine, Cysteine, Taurine, Glutamine and Arginine. Phytochemicals- Phenol compounds, carotenoids, phytosterols, sulfur containing compounds.

Module 5: Water

Functions, distribution, regulation of water balance, water intoxication and dehydration.

Module 6: Free Radicals and Anti oxidants

Free Radicals and Reactive Oxygen Species (ROS), Role of anti oxidants

References

- James L Groff and Sareen S Gropper, (2009) Advanced Nutrition and Human Metabolism, Fourth Edition, Wadsworth Publishing Company.
- Maurice B Shils, Moshe Shike A, Catherine Ross, Benjamin Cabellero, Robert J Cousins, 2006, Modern Nutrition in Health and Disease Lippincott Williams al Wilkins.
- Michael J Gibney, Ian A Macdonald and Helen M Roche (2003) Nutrition and Metabolism,. The Nutrition Society Textbook Series, Blackwell Publishing, First Edition.
- Nutrient Requirements and Recommended Dietary Allowances for Indians, A Report Of The Expert Group Of The Indian Council Of Medical Research, ICMR 2010.

- Sheila Chander, Vir Woodhead(2011) Public Health Nutrition in Developing Countries Publishing India, Part I & II.

ADVANCED NUTRITION II

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Module	Hours	1weightage 5/8	2 weightage 5/8	5 weightage 3/6	Total 30
1	20	2	2	1	11
2	25	1	1	2	13
3	30	2	1	2	14
4	5	1	2	-	5
5	5	1	-	1	6
6	5	1	2	-	5

M. Sc DEGREE EXAMINATION

SECOND SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN2AN: ADVANCED NUTRITION II

Time: Three Hours

Maximum Weight: 30

Part A

Answer any *five* questions, not exceeding *one page*. Each question carries a weight of 1

1. Functions of fluoride
2. Inhibitors of zinc absorption
3. Calcitriol
4. Scurvy
5. Extrinsic factor
6. Homocysteine
7. Functions of water
8. Antioxidant role of selenium

(5x1= 5 weightage)

Part B

Answer any *five* questions not exceeding one page. Each question carries a weight of

9. Explain the functions and sources of selenium
10. Differentiate between haem and nonhaem iron
11. Discuss the micronutrients which can influence birth weight of new born infants
12. Describe Vitamin K cycle
13. Write a note on assessment of vitamin A status
14. What do you mean by water intoxication?
15. Write on the functional roles of poly phenols
16. How does plant foods help in fighting against free radicals

(5 x 2=10 weightage)

Part C

Answer any *three* questions, not exceeding three pages. Each question carries a weight of 5

17. Explain the causes and types of iodine deficiency disorders
18. Describe the digestion and absorption of vitamin A
19. Discuss vitamin K under the following heads: Sources b) Functions c) Assessment of nutritional status
20. Describe the functions and deficiency signs of niacin
21. Elaborate on the nutritive and functional roles of ascorbic acid. Discuss the criteria for assessment of ascorbate status
22. Explain the mechanisms of maintaining water balance?

(3x5=15 weightage)

FOOD SERVICE ORGANISATION AND MANAGEMENT

Course Code: HFN2FSOM

Teaching hours: 5hrs/week

COR

Credit:4

Objectives

- To understand the organisation of food service establishments and management of human, material and financial resources

- To be familiar with various concepts involved in quantity and quality food production and service
- To understand the need for efficient personnel management in the food industry

Course Outline

Module 1: Development, Scope and Types of Food Service Establishments

History, scope and development of food service institutions, factors affecting development, recent trends, Types of food service establishments (commercial and non-commercial) and their characteristic features. Planning for a food service Module - Planning, Investment, Project Report, Registration (License and Inspection)

Module 2: Food Service Organisation and Management

Types of Organization, Division of Labour, Organisation Chart, Tools of Organization, Principles of Management, Functions of Management (Planning, Organising, Directing, Coordinating, Evaluating, Controlling,) Total Quality Management (TQM), Management by Objectives (MBO), Work Design, Job Design, Work Study and Simplification.

Module 3: Quantity Food Preparation

Methods of purchase (formal and informal), Identifying needs, Selection, Receiving, Storage types, Issuing, Menu Planning- Importance, Functions of Menu, Types, Steps in Menu Planning, Requisites in Designing a Menu Card, Sequence of courses in Indian and Continental Menu, Quantity food preparation- food production systems management, Production control - Standardisation of recipes, Stepping up of recipes, portion control, Quality control in food preparation. Food Laws

Module 4: Quantity food service

Food Service Delivery Systems (Centralised and Decentralised) Type of food service systems (conventional, commissary, ready prepared, assembly), Service Styles (table, counter, tray, silver, plate, cafeteria, buffet), Specialized forms of service (hospital, airline, rail, home deliver, catering and banquet, room and lounge service).

Module 5: Table Setting and Arrangement

Indian and Western Styles of Table Setting, Table Appointments, Napkin folding styles, Flower arrangement, Table Etiquettes.

Module 6: Organisation of Space and Equipment

Design and layout of kitchen, Types of kitchens, storage and service areas, Determining Work Centres. Equipments – types, planning, Factors affecting selection and purchase.

Module 7: Financial Management

Book keeping(Single and Double entry system), Books of Accounts, Journal, ledger, trial balance, balance sheet, Type and Behaviour of costs, profit analysis, Records and Controls, Budget, Food cost control methods.

Module 8: Personnel Management

Styles of Leadership, Effective Leadership and Communication, Staff Planning and Management, Employment, Staff Recruitment, Selection, Placement, Induction, Training, Evaluation and Appraisal, Labour laws.Sanitation and Safety in food service industry-Personnel hygiene, Safety at work, measures adopted.

References

- Dennis L.Foster(1995), 'An Introduction to Hospitality', McGraw Hill International Edition.
- Dennis, R. Lillicrap, Jnan, A.Cousins(1993), 'Food and Beverage Service', Older and Stoughten Publishers Ltd, England, IV Edition.
- Jack D. Ninemeier (1995), 'Food and Beverage Management', 2nd Edition, American Hotel and Motel Association, U.S.A.
- Lendal H.Kotschevar and Richard Donnely (1993)'Quantity Food Purchasing, McMillan Publishing Co., New York, IV Edition.
- Mahmood A. Khan,(1987), 'Food Service Operations', AVI, U.S.A.
- Marian C. Spears(1995), Food Service Organistion', IIIrd Edition, Prentice Hall Inc., USA
- Mohini Sethi and Surjeet Malhan (1993), 'Catering Management- An Integrated Approach', 2nd Edition, Wiley Publication, Mumbai.
- Sudhir Andrews (1997), 'Food and Beverage Service- Training Manual', 23rd Reprint, Tata McGraw Hill Publishing Co.
- West, B Bessie and Wood, Levelle (1988), 'Food Service In Institutions', 6th Edition, Macmillian Publishing C., New York

FOOD SERVICE ORGANISATION AND MANAGEMENT

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Module	No. of hours	Section A (5/8) 1 weightage	Section B (5/8) 2 weightage	Section C (3/6) 5 weightage	Total 30/54
1	10	1	1	1	8
2	11	1	1	1	8
3	15	1	1	1	8
4	10	1	1	1	8
5	6	-	1	-	2
6	8	1	1	1	8
7	15	1	1	-	3
8	15	2	1	1	9

M. Sc DEGREE EXAMINATION

SECOND SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN2FSOM: FOOD SERVICE ORGANISATION AND MANAGEMENT

Part A

Time: Three Hours

Maximum Weight: 30

Answer any FIVE questions, not exceeding one page. Each question carries a weightage of

Curriculum and Syllabus, 2014 admission

- 1 Welfare catering
- 2 Job Design
- 3 Table d hote menu
- 4 Banquet service
- 5 Cover
- 6 Work triangle
- 7 Break even analysis
- 8 HACCP

(5x1=5 weightage)

Part B

II. Answer any FIVE questions not exceeding two pages. Each question carries a weightage of 2.

9. How will you prepare a project report for establishing a food service Module?
10. What are the methods of work simplification?
11. What is the need for portion control? How can it be achieved?
12. Explain the food delivery systems.
13. Elaborate on the rules of table setting in a fine dining restaurant and explain the different styles.
14. Explain the work centres required in a multi cuisine restaurant and sketch its layout.
15. Explain the steps in planning of budgets.
16. Write the need for proper communication in an organization and mentions the principles of effective communication .

(2x5=10 weightage)

Part C

III Answer any THREE questions not exceeding three pages. Each question carries a weightage of 5.

17. Give the classification of establishments. Explain the features of the various commercial establishments.
18. Elaborate on the functions of management.
19. What are the functions of a menu to the consumer and establishment? What are the factors to be considered while planning a menu in a school canteen?
20. Explain the styles of food service
21. Give the classification of equipments. What are the factors involved in determining the need for equipment in a food industry.
22. What measures are to be taken to ensure sanitation and safety of food and personnel in the food production and service areas?

(3x5=15weightage)

RESEARCH METHODS AND STATISTICS

Course Code: HFN2RMS

Teaching hours:5hrs/week

COR

Credit:4

Objectives

- To understand the significance of research methods and statistics in Home Science research.
- To understand the types, tools and methods of research and develop the ability to construct data gathering instruments appropriate to the research design.
- To understand and apply the appropriate statistical techniques to analyse numerical data and draw inferences.

Course Outline

Module 1 – Introduction to Research

Definition, Objectives and Characteristics of research, Types of Research – Basic, Applied and Action research, Exploratory and Descriptive, Ex-post facto research.

Module 2 – Identification of Research Problem

Sources of research problem, Criteria for the selection of research problem. Research design, Rationale, Statement of problem, Setting objectives, Definition of concepts, operational definition, variables – independent and dependent, control and intervening variables, limitations and delimitation. Hypothesis – Meaning and importance, types of hypotheses.

Module 3 – Sampling

Population and Sample, Sampling techniques, Size of sample, Merits and Limitations of sampling, Sampling and Non sampling errors.

Module 4 – Research methods and tools

Methods – Survey, observation, interview, experimental, clinical methods. Tools – Questionnaire, Schedule (for interview and observation) Rating Scales, Attitude Scales. Reliability and validity.

STATISTICS

Module 5 - Descriptive Statistics:

Measures of Central Tendency – Mean, Median, Mode; Partition Values – Quartiles, Deciles and Percentiles, Measures of Dispersion – Range, Quartile deviation, Standard deviation. Absolute and Relative measures of dispersion, Coefficient of variation.

Module 6 - Correlation and Regression:

Correlation and Regression. Scatter diagram, Correlation, Coefficient of Correlation – Karl Pearson and Rank Correlation Coefficients. Interpretation of Calculated co- efficiencies. Concept of Regression, Regression Lines and their estimation.

Module 7 - Concept of Probability and Random Variable.

Concept of Probability and Random Variable. Normal distribution and its properties. Standard normal distribution and calculation of probability of events. Importance and use of distribution in research.

Module 8 - Sampling distributions

Sampling distributions, F and χ^2 distributions. Central Limit theorem, Standard error and its importance and applications. Testing of Hypothesis – Hypothesis, Null and Alternative hypothesis, Type I and Type II errors, Significance Level and size of test, Critical Region, Testing Procedure concept of P Value in testing. Large and small sample tests (z, t, f and χ^2 statistics)

Related Experience

A five day training in using SPSS or similar package used in statistical analysis of data.

References

- Bandarkar, P.L. and Wilkinson T.S. (2000) : Methodology and Techniques of Social Research, Himalaya Publishing House, Mumbai.
- Batnagar, G.L. (1990) : Research Methods and Measurements in Behavioural and Social Sciences, Agri. Cole Publishing Academy, New Delhi.
- Dooley, D. (1995) : Strategies for Interpreting Qualitative Data: Sage Publications, California.
- Gay, L.R. (1981, 2nd Ed) : Educational Research, Columbus, Ohio.
- Long, J.S. (Ed) (1988) : Common Problems Proper Solutions: Avoiding Errors in Quantitative Research, Beverly Hills, Sage Publications, California.
- Mukherjee, R. (1989) : The Quality of Life: Valuation in Social Research, Sage Publications, New Delhi.

RESEARCH METHODS AND STATISTICS

BLUE PRINT OF QUESTION PAPER

Module	Hours	Part A (1weightage) 5/8	Part B (2 weightage) 5/8	Part C (5 weightage) 3/6	Total 30 weightage
1	11	1	1	-	3
2	11	1	1	1	8
3	11	1	1	1	8
4	11	1	1	1	8
5	12	1	1	1	8
6	11	1	1	1	8
7	11	1	1	1	8
8	12	1	1	-	3

M. Sc DEGREE EXAMINATION
SECOND SEMESTER
HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION
HFN2RMS: RESEARCH METHODS AND STATISTICS

Maximum : 30 Weightage

Time: 3 hrs

PART – A

I Answer any FIVE questions, not exceeding one page. Each question carries a weightage of 1

1. Define intervening variables
2. What are partition values ? Give the different partition values
3. Define a standard normal distribution
4. What is standard error ?

5. What is a scatter diagram?
6. Write on the types of questionnaires?
7. What is sampling error?
8. Pictograph

(5x1=5 weightage)

PART-B

II. Answer any FIVE questions not exceeding two pages. Each question carries a weightage of 2.

9. Distinguish between absolute and relative measures of dispersion
- 10 Briefly explain the types of research
11. Differentiate between interview and observation
12. Explain the advantages and limitations of questionnaires as a research tool.
13. Calculate the correlation coefficient from the following data sheet:

$$\sum X = 444 \quad \sum Y = 443 \quad \sum X^2 = 19806 \quad \sum Y^2 = 20065 \quad \sum XY = 19711 \quad n = 10$$

14. Define 'variable' and discuss the types of variables
15. What are the properties of normal distribution ?
- 16 . The following data was obtained in an investigation about the effect of vaccination for hepatitis. Examine whether vaccination is effective in preventing hepatitis.

	Vaccinated	Not Vaccinated
Attacked by hepatitis	3	12
Not attacked by hepatitis	8	5

(5x2=10 weightage)

PART -C

III. Answer any THREE questions not exceeding three pages. Each question carries a weightage of 5.

17. Define Interview .Construct an interview schedule on any relevant topic based on your interest.
18. The BMI of people follows a normal distribution with mean 20 and standard deviation 3. Find probability that a person selected at random is having BMI

- a) Between 16 and 23 b) Above 25 c) Below 20

19. Define sample. Briefly explain different types of sampling.
20. Discuss briefly on any two tools used in research
21. Compare the merits and demerits of mean, median and mode.
22. The following are the marks of 10 students before and after training. Test whether the training is effective.

Mark before training: 91 95 81 83 76 88 89 97 88 92

Mark after training: 89 101 85 88 81 92 92 99 97 87

(3x5=15 weightage)

DIETETICS AND FOOD SERVICE MANAGEMENT-PRACTICALS

Course Code: HFN2DFSM

Teaching hours:5hrs/week

COR

Credit: 2

Objectives

This course is designed to enable students to:

- Understand the etiology, physiologic and metabolic anomalies of acute and chronic diseases and patient needs.
- Know the effect of various diseases on nutritional status and nutritional and dietary requirements.
- Be able to recommend and provide appropriate nutritional care for prevention and treatment of various diseases.
- To get a practical experience in organising and managing quantity food production and service.

Course Outline

Module 1

Market Survey of commercial nutritional supplements and nutritional support substrates.
Compilation of market survey information in the form of a report.

Module 2

Planning and Preparation of Therapeutic Diets for the Following Conditions

1. Diabetes mellitus
2. Atherosclerosis
3. Chronic Renal Failure
4. Glomerulonephritis
5. Hepatitis
6. Cirrhosis
7. Hepatic Encephalopathy
8. Peptic Ulcer
9. Gluten Sensitive Enteropathy
10. Hypertension
11. Obesity
12. Underweight

Module 3

Commonly used tests for diagnosis of various diseases, Interpretation of patient data and
Diagnostic tests and drawing up of patient diet prescription using a case study approach.

Module 4

Preparation of diet counselling aids for common disorders.

Module 5

One month Internship in a well established Dietary Department of a Reputed Hospital with
Compilation of Case study Reports of 3 to 5 patients during the period of Internship.

FOOD SERVICE MANAGMENT

Module 1

Quantity Food Preparation and Service

- Selection and Standardisation of Recipes based on a theme
- Stepping up of standardized recipes
- Planning, Purchasing, Preparation and Service of Food for 30-50 portions
- Cost and profit analysis

Module 2

One week Internship in any Food Service Establishment with special focus on Food Production and F & B service departments to study the following aspects;

1. Layout and design of the food service establishment.
2. Work Areas, work centres, flow of work, work simplification techniques.
3. Equipment types, design and layout.
4. Food purchasing, selection and storage practices
5. Costing, pricing and profit calculation.
6. Sanitation and hygienic practices followed.
7. Quality control in various stages of food service.

M. Sc DEGREE EXAMINATION

SECOND SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN2DFSM: DIETETICS AND FOOD SERVICE MANAGEMENT- PRACTICALS

COMPONENTS	Total (15)
1-DIETETIC INTERNSHIP REPORT	5
2-FOOD SERVICE MANAGEMENT INTERNSHIP REPORT	5
3-VIVA VOICE	5
TOTAL	15

SEMESTER – III

FOOD SCIENCE AND TECHNOLOGY

Course Code: HFN3FT

Teaching hours: 5hrs/week

COR

Credit:4

Objectives:

- To understand the principles and chemistry of food
- To apply theoretical knowledge in various preparations

Course Outline

Module 1: Introduction to Food Science as a discipline and modern developments

Module 2: Food Polysaccharides and their Applications

Classification: Sugars- Chemistry, Functional role of sugars in foods, sweeteners, food Polysaccharides and their applications- native and modified starches, food hydrocolloids, non-starch polysaccharides; algal polysaccharides; seed gums, exudates gums, microbial polysaccharides.

Module 3: Proteins

Classification, Structure and functional properties, chemical and enzymatic modification – denaturation, non-enzymatic, textured proteins; protein isolates, concentrates, protein hydrolysates and their applications.

Module 4: Fats and Oils (Lipids)

Classification, Functional properties of lipids, deteriorative changes in fats and oils, Antioxidants

Module 5: Enzymes and Pigments

Applications of Enzymes in Food Industry, Natural Colours Used in Foods, Novel Sources of Natural Colourants, Stability of Natural Colourants in Foods.

Module 6: Colloids, Colloid Systems and Applications

Classification of Colloidal Systems, Properties of Sols, Gels, Foams and Emulsions.

Module 7: Methods of Food Processing

Traditional Methods, Modern techniques- thermal, dehydration, concentration, freezing, microwave processing, irradiation, fermentation, deep fat frying.

Module 8: Primary processing of cereals, pulses and oilseeds

Chemical, Physical and Nutritional Alterations Occurring in Foods during Processing and Storage – Cereals and Legumes, Nuts, Oilseeds, Fruits and Vegetables, Milk and milk products, Meat, Poultry, Fish, Egg and Spices

Module 9: Product Development and Evaluation

Need for product development, Steps in development; Evaluation of food Quality by sensory and objective methods

References

- Bowers, J (1992): Food Theory and Applications, 2nd MacMillan Publishing Co., New York.
- Charley, H (1982): Food Science, 2nd Edition, John Wiley & Sons, New York.
- Peckham, G and Freeland-Graves, G.H (1979):Foundations of Food Preparation
- Pomeranz, Y (1991): Functional Properties of Food Components, 2nd Edition, Academic Press, New York.
- Potter, N. and Hotchkiss, J.H (1996): Food Science, 5th Edition, CBS Publishers and Distributors, New Delhi.

Journals

- Journal of Food Science
- Advances in Food Research
- Journal of Food Science and Technology
- Cereal Science
- Journal of Dairy Science

FOOD SCIENCE AND TECHNOLOGY

BLUE PRINT OF QUESTION PAPER

Module	Hours	1 weightage 5/8	2 weightage 5/8	5 weightage 3/6	Total 30/ 54
1	2	2			2
2	15		2	1	9
3	10	1	2	1	10

4	10	2	1	1	9
5	10	2	1	1	9
6	10		2	1	9
7	8	1	2		5
8	15			2	11
9	10		2	1	9

M. Sc DEGREE EXAMINATION

THIRD SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN3FT: FOOD SCIENCE AND TECHNOLOGY

Time: 3hrs

Maximum: 30 Weightage

PART A

I. Answer any FIVE questions, not exceeding one page. Each question carries a weightage of 1.

1. Food hydrocolloids
2. Denaturation
3. Protein hydrosylates
4. Rancidity
5. Emulsions
6. Non-nutritive sweeteners
7. Pasteurisation.
8. Functional foods

(5x1=5 weightage)

PART-B

II. Answer any FIVE questions not exceeding two pages. Each question carries a weightage of 2.

9. Give an account of microbial polysaccharides citing examples.
10. Discuss the functional properties of food lipids.
11. Write on the applications of enzymes in the food industry.
12. Bring out the role of probiotics in health.
13. What are the properties of sols?
14. Write on protein concentrates.
15. Explain flavour reversion in oils
16. What are the steps involved in the development of a new product?

(5x2=10 weightage)

PART –C

III. Answer any THREE questions not exceeding three pages. Each question carries a weightage of 5.

17. Bring out the importance of sensory evaluation in the food industry and discuss the different tests
18. Write a note on food polysaccharides and their applications.
19. Give an account of the processing of milk.
20. Write a note on functional foods, sources and their health benefits.
21. Give the structure and functional properties of lipids.
22. Explain the physical and chemical changes that occur in eggs on storage and write a note on its preservation.

(3x5=15 weightage)

FOOD BIOTECHNOLOGY

Course Code: HFN3FB

Teaching hours: 5hrs/week

COR

Credit: 4

Objectives

- To understand the application of biotechnology in the field of Food and Nutrition
- To be aware of the growing importance of Biotechnology in areas related to healthcare.

Course Outline

Module 1: Introduction to Biotechnology

Definition and pathways of biotechnological development, Application of genetics to food production, Genetically Modified foods

Module 2: Molecular Aspects of Nutrition

Core concepts in molecular biology-The genome, the genetic code and gene expression. The Human Genome Project. Research tools to investigate molecular aspects of nutrition-Animal models, Tissue cultures, molecular cloning, PCR.

Module 3: Fermentation Systems

Fermentation – objectives, process of fermentation. Bioreactors/ fermenters, Microbial products- Amino acids, Vitamins and Lipids

Module 4: Plant and Animal Culture

Plant cultures- Tissue culture, Lab, Media, Techniques and applications, Animal cultures- cell lines, media, techniques and applications, Plant and Animal Cloning

Module 5: Regulatory Aspects in Biotechnology

Ethical issues in biotechnology, Intellectual Property Rights

Module 6: Enzyme Technology

Soluble enzymes and Immobilised enzymes; Methods of immobilization, Application of enzymes in food industries.

Module 7: Microbial Production of Foods and Beverages

Fermented food and alcoholic beverages, Single cell protein, Mushroom culture, Fermented soya based foods, Fermented meat products, Vinegar production

Module 8: Functional Foods

Definition, classification, **Probiotics** – important features of probiotic micro- organisms. Health effects, mechanism of action, probiotics in various foods – fermented milk products, non- milk products etc.**Prebiotics** –definition, chemistry, sources, bio-availability, effects on human health and applications in risk reduction of diseases (non-digestible carbohydrates/oligosaccharides, dietary fibre, resistant starch, gums)

Module 9: Xenobiotics

Definition, components and drug interactions, Industrial chemicals and overall metabolic fate of xenobiotics

References:

1. Satyanarayana U.2006.Books and Allied (P) Ltd.Kolkatta.India
2. Trehan K.1997.Biotechnology.4th ed.New Age International (P)Ltd.
3. Kumar.HD.2000.Biotechnology,Saris Publications, Kanyakumari.
4. Singh B.D. 2000. Biotechnology, Kalyani Publications, New Delhi.
5. Dubey, R.C. S .2002.A text book of Biotechnology Chand & Co, New Delhi.

FOOD BIOTECHNOLOGY

BLUE PRINT OF QUESTION PAPER

Module	No. of Hours	Section A- (5/8) 1	Section B(5/8) 2	Section C(3/6) 5	Total (30/54)
1	5	1		1	6
2	10	1	1		3
3	10	1	1	1	8
4	13	1	1	1	8
5	10	1	1		3
6	12	1	1		3
7	15	1	1	1	8
8	7	1	1	1	8
9	8		1	1	7

M. Sc DEGREE (CSS) EXAMINATION

THIRD SEMESTER-HOME SCIENCE (c) FOOD SCIENCE AND NUTRITION

HFN3FB : FOOD BIOTECHNOLOGY

Time: 3 hrs

Max: 30 Weightage

Part A

I. Answer any 5 questions not exceeding one page. Each question carries a weightage of 1.

1. GM foods
2. PCR
3. Intellectual Property Rights
4. Human Genome Project
5. Immobilised enzymes
6. Factors influencing yeast biomass production
7. Resistant Starch
8. Biotransformation of xenobiotics

(5x1=5 weightage)

Part B

II. Answer any five questions, not exceeding two pages. Each question carries a weightage of 2.

9. Give an account of techniques and applications of animal cloning
10. Explain microbial vitamin production

11. Give an account of media used in animal cultures
12. Give an account of methods of enzyme immobilization
13. Explain the terms: a) Genome b) Genetic Code c) Gene expression
14. Explain the technique of animal cloning. Explain the process in the manufacture of beer.
15. Bring out the health benefits of probiotics
- 16 Describe conjugation reactions in detoxification

(5x2=10 weightage)

Part C

III. Answer any 3 questions not exceeding 3 pages. Each question carries a weightage of 5.

17. Bring out the application of genetics in food production
18. Explain structure and working of a bioreactor. Explain the stage course of fermentation
19. Explain the technique of Plant tissue culture.
20. Discuss probiotics and its health benefits

21. Explain the process involved in spirulina culture. Bring out the advantages of spirulina.
22. Elaborate on overall metabolic fate of Xenobiotics.

(3x5=15 weightage)

FOOD MICROBIOLOGY AND QUALITY CONTROL

Course Code: HFN3FMQ

Teaching hours: 5hrs/week

Credit:4

COR

Objectives

- To gain an insight of the types and role of micro-organisms affecting man and the environment
- To understand the importance of micro organisms in food spoilage
- To learn the advanced techniques used in food preservation
- To understand the legal procedures adopted in various operations to prevent food borne disorders and legal aspects involved

Course Outline

Module 1: History, scope and importance of food microbiology, Economic Importance of moulds, yeast and bacteria

Module 2: Micro-organisms in food

Primary sources in foods, biochemical activities. Micro- organisms found in air, soil, water, plants and animals. Normal flora of skin, nose, throat, GI tract.

Module 3: Factors affecting the survival and growth of micro-organisms in food

Intrinsic and extrinsic parameters that affect microbial growth (Nutrient, Ph, buffer, anaerobic/aerobic conditions, moisture content, temperature, gaseous atmosphere)

Module 4: Microbiological examination –Methods of isolation and detection of micro-organisms or their products in foods; Conventional methods; Rapid methods (Newer techniques)

Module 5: Spoilage of different groups of foods

Cereals, vegetables and fruits, meat, eggs, poultry, fish, milk and milk products, canned foods.

Module 6: Food Preservations and applications to different types of foods

Physical methods- Dehydration, low temperature, high temperature, irradiation, high pressure, aseptic packaging, MAP, Chemical preservatives, natural antimicrobial compounds, Biological based preservation systems

Module 7: Food borne infections and diseases

Significance to public health, food hazards and risk factors, bacterial and viral food borne-diseases, mycotoxins (Bacillus, Campylobacter, Brucella, Staphylococcus, Clostridium, E.Coli, Aeromonas, Vibrio Cholera, Listeria, Mycobacterium, Salmonella, Shigella), Reporting of a food borne outbreak.

Module 8: Quality Control/Quality Assurance

Legislation for food safety- natural and international criteria, sampling schemes, records, risk analysis, QC-microbial source, code, Indicators of food safety and quality

Microbiological criteria of foods and their significance; HACCP and food safety in controlling microbial hazards

Module 9: Toxicants and Contaminants

References

- Adams, M.R and Moss M.G (1995): Food Microbiology, 1st Edition, New Age International (P) Ltd.

- Atlas, M. Ronald (1995), Principles of Microbiology, 1st Edition, Mosby-Year Book, Inc, Missouri, USA.
- Banwart, G(1989) Basic Food Microbiology, 2nd Edition, CBS Publishers
- Frazier, W.(1988) Food Microbiology, Mc Graw Hill Inc.4th Edition
- Jay, James, M (2000) Modern Food Microbiology, 6th Edition, Aspen Publishers, Inc., Maryland.
- Pelczar, M.I and Reid, R.D (1993), Microbiology, McGraw Hill Book Company, New York, 5th Edition.
- Pommerville C. Jeffrey, (2004)Fundamentals of Microbiology, 7th Edition
- Ramesh K. Vijaya (2007), Food Microbiology, MJP Publishers,
- Roday, S (1999) Food Hygiene and Sanitation, 1st Edition, Tata McGraw Hill, New Delhi.

FOOD MICROBIOLOGY AND QUALITY CONTROL

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Module	No. of Hours	Section A- (5/8) 1 Weightage	Section B(5/8) 2 Weightage	Section C(3/6) 5 Weightage	Total (30/54)
1	8		1		2
2	10	1		1	6
3	10	2	2		6
4	10	1		1	6
5	8	1		1	6
6	18	1	2	1	10
7	8		3		6
8	8	2		1	7
9	10			1	5

M. Sc DEGREE EXAMINATION

THIRD SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN3FMQ: FOOD MICROBIOLOGY AND QUALITY CONTROL

Time: 3hrs

Maximum: 30 Weightage

PART – A

I. Answer any FIVE questions, not exceeding one page. Each question carries a weightage of 1.

1. Coliform bacteria
2. Effect of ph of microbial growth
3. Phosphatase test
4. Canning
5. Ropy bread
6. Botulism
7. Microbiological standard
8. HACCP

(5x1=5 weightage)

PART-B

II. Answer any FIVE questions not exceeding two pages. Each question carries a weightage of 2.

9. Bring out the economic importance of molds.
10. What are the sources and micro-organisms that contaminate water?
11. Write on any two intrinsic parameters that affect microbial growth.
12. What are the causes of spoilage and types of contamination in fish?
13. What are the principles and methods of preservation of fruits and vegetables?
14. Explain Salmonellosis in terms of causes, foods involved, symptoms and prevention.
15. What are the microbiological criteria of foods?
16. Explain how food can be examined for the presence of viable micro-organisms.

(5x2=10 weightage)

PART –C

III. Answer any THREE questions not exceeding three pages. Each question carries a weightage of 5.

17. Write a note on the physical agents used in food preservation.
18. What are the procedures involved in assaying a food sample for Total Plate Count(TPC).
19. Explain HACCP in maintaining quality in a food processing industry.
20. Discuss in detail microbiological spoilage of fruits and vegetables.
21. Give an account of the international and national organizations involved in ensuring food standards.
22. Write an essay on the natural toxicants present in foods.

(3x5=15 weightage)

SCIENTIFIC WRITING AND PROJECT FORMULATION

Course Code: HFN3SPF

Teaching hours: 5hrs/week

COR

Credit:4

Objectives

- To be able to appreciate and understand importance of writing scientifically.
- To develop competence in writing and abstracting skills.

Course Outline

Module 1: Scientific writing as a means of communication

Different forms of scientific writing. Articles in journals, Research notes and reports, Review articles, Monographs.Dissertations, Bibliographies, Book chapters and articles.

Module 2: How to formulate outlines

The reasons for preparing outlines: as a guide for plan of writing, as skeleton for the manuscript, Kinds of outlines, Topic outlines, Conceptual outline, Sentence outlines, Combination of topic and sentence outlines

Module 3: Drafting titles, Sub titles, tables, illustrations

Preliminary processing of data, Classification and organization of data, Objectives of classification, Tabulation of data, General rules of tabulation. Tables , Parts of a table, Types of tables. Representation of data – Significance of diagrams and graphs, Types of diagrams and graphs, advantages and limitations

Module 4: The writing process

Getting started, Use outlines as a starting device, Drafting, Reflecting, re-reading ; Checking organization, Checking headings, Checking content, Checking clarity; Checking grammar, Brevity and precision in writing, Drafting and re-drafting based on critical evaluation

Module 5: Parts of dissertation/research report/article

Introduction, Review of literature, Methods, Results and discussion, Summary and abstract, References. Ask questions related to: content, continuity, clarity, validity, internal consistency and objectivity during writing each of the above parts.

Module 6: Writing for Grants

The question to be addressed, Rationale and importance of the question being addressed, Empirical and theoretical framework, Presenting pilot study/data or background information, Research proposal and time frame; Speciality of methodology, Organization of different phases of study, Expected outcome of study and its implications, Budgeting, Available infra-structure and resources, Executive summary.

References

- APA (1994).Publication Manual of American Psychological Association (4th Edition), Washington : APA.
- Cooper, H.M. (1990) Integrating research: A guide for literature reviews (2nd Edition). California : Sage.
- Dunn, F.V. & Others. (Ed.) (1994). Disseminating research: Changing practice. NY : Sage.
- Harman, E &Montagnes, I. (Eds.) (1997). The thesis and the book. New Delhi:Vistaar.
- Locke, L.F. and others (1987). Proposals that work : A guide for planning dissertations & Grant proposals (2nd Ed.). Beverly Hills : Sage.
- Mullins. C.J. (1977). A guide to writing and publishing in social and behavioural sciences. New York : John Wiley & Sons. Richardson, L. (1990) Writing strategies. Reaching diverse audience. California: Sage.
- Sternberg, R.J. (1991) , The psychologist's companion: A guide to scientific writing for students & researchers. Cambridge : CUP.
- Thyer, B.A. (1994) Successful publishing in scholarly journals. California : Sage.
- Wolcott, H.F. (1990). Writing up qualitative research. Newbury Park : Sage

Module	No. of hours	Section A (5/8) 1 weightage	Section B (5/8) 2 weightage	Section C (3/6) 5 weightage	Total 30/54
1	10	2	1	1	9
2	5	1	1	1	8
3	15	2	2	1	11
4	10	1	2	1	10
5	10	1	1	1	8
6	10	1	1	1	8

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M.SC DEGREE (CSS) EXAMINATION

THIRD SEMESTER-HOME SCIENCE (FOOD SCIENCE AND NUTRITION)

HFN3SPF : SCIENTIFIC WRITING AND PROJECT FORMULATION

Maximum: 30 Weightage

Time: 3 hrs

PART A

- I. Answer any FIVE questions, not exceeding one page. Each question carries a weightage of 1.
- 1 Objectivity in research.
 - 2 Budgeting a project.

- 3 Executive summary.
- 4 Importance of bibliography.
- 5 General rules of tabulation
- 6 Importance of setting a time frame.
- 7 Presentation of a project proposal.
- 8 Foot notes.

(5x1=5 weightage)

PART B

II. Answer any FIVE questions not exceeding two pages. Each question carries a weightage of 2.

- 9 Explain the parts of a table.
- 10 What are the objectives of classification of data?
- 11 What are the important points to be mentioned while writing the introduction of a dissertation?
- 12 Explain the importance of the graphical presentation of data. Briefly mention its limitations.
- 13 How do you write a review article?
- 14 What is the significance of reviewing the literature?
- 15 Briefly explain the principles of report writing.
- 16 What are the advantages and limitations of graphs?

(5x2=10 weightage)

PART C

III. Answer any THREE questions not exceeding three pages. Each question carries a weightage of 5.

- 17 Explain the following, citing their advantages, limitations and areas of application
a Bar diagram (b) Line graph
- 18 Choose a research topic related to your field of study and write a research proposal for securing a university grant.
- 19 Briefly explain the parts of a dissertation.
- 20 What are the salient points to be borne in mind while writing research articles for journals?
- 21 What are the points to be borne in mind while explaining the results of a study and discussing it?
- 22 Briefly explain how to formulate outlines. Add a note on the kinds of outlines while reporting a research finding.

(3x5=15 weightage)

FOOD SCIENCE AND MICROBIOLOGY - PRACTICALS

Course Code: HFN3FM

Teaching hours: 5hrs/week

Credit: 2

CORE

Course Outline

A. Food Science

i. Cereals and Flours

- Gelatinisation temperature of flours
- Determination of gluten content
- Determination of alcoholic acidity in a given sample of flour

ii. Fats And Oils

- Determination of Acid value, Free fatty acids
- Iodine Number
- Saponification Number
- Determination of peroxide value
- Purity tests of oils and fats

iii. Milk

- Physical characteristics and additives
- Fat content
- SNF%
- Total Solids
- Protein content

iv. Honey

- Determination of total reducing sugar

- Determination of sucrose content
- Adulteration with commercial sugar

v. Sensory Evaluation of Foods

- Primary taste test
- Sensory profiling of a new product

vi. Colloidal Chemistry

- Preparation of a stable emulsion
- Demonstration of effect of foaming in preparation of meringue
- Additives on egg white foaming

vii. Fruits and Vegetables

- Peroxidase inactivity test
- Method of blanching
- Moisture removal techniques
- Rehydration test for dried samples

Microbiology

- Preparation of common lab media and special media for cultivation of bacteria, yeasts and moulds
- Staining and identification of bacteria (gram staining, acid-fast, spore, capsule), yeasts and moulds
- Cultivation and identification of importance moulds and yeasts(slides and mould culture)
- Isolation of micro organisms
- Bacteriological analysis of processed and unprocessed foods
- Bacteriological analysis of water and milk

PROJECT:

Project Report on

- An experimental study based on any topic within the syllabus

OR

- An internship in Food Science or Microbiology at a laboratory/industry

M. Sc DEGREE EXAMINATION

THIRD SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN3FM: FOOD SCIENCE AND MICROBIOLOGY - PRACTICALS

Components of evaluation	Tot (15
1- INTERNSHIP REPORT	5
2-RECORD	5
3-VIVA VOCE	5
TOTAL	15

SEMESTER IV

PUBLIC HEALTH NUTRITION

Course Code: HFN4PHN

Teaching hours: 5hrs/week

ELECTI

Credit:4

Objectives

- To develop a holistic knowledge base and understanding of the nature of nutritional problems and their prevention and control for the disadvantaged and upper socioeconomic strata in society.
- To understand the causes/determinants and consequences of nutritional problems in society.
- To be familiar with various approaches to nutrition and health interventions programmes and policies.

Course Outline

Module 1: Food and Nutrition Situation in India

Hunger in India, India state Hunger Index(ISHI)Food and Nutrition security, production and availability of foods in India, consumption pattern, trends in nutrient intake and nutritional status

Module 2: Principles of epidemiology and epidemiological methods

Introduction to epidemiology, aims, classifyingepidemiological study methods, nutrition epidemiology and public health nutrition.

Module 3: Assessment of nutritional status in Community setting

Nutritional assessment, Importance and Objectives, Indirect assessment of Nutritional status – Age, specific mortality rates, cause specific mortality rates, nutritionally relevant morbidity rates, ecological factors. Direct assessment of nutritional status - Nutritional Anthropometry-Height,length,weight,waist circumference, waist hip ratio, body fat, skin fold measurements. Clinical assessment of Nutritional disorders, Biochemical assessment for nutritional deficiencies and Dietary assessment-Family diet survey, Individual diet survey, quantitative diet surveys, Institutionalised surveys and Food balance sheet.

Module 4: Epidemiology of Nutritional disorders

Prevalence, Aetiology, Consequences and treatment of-PEM-Clinical syndromes, prevention of malnutrition, managing PEM

Vitamin A Deficiency-Consequences,epidemiology,aetiological factors, intervention strategies for preventing Vitamin A deficiency disorders(VADD)

Iron Deficiency Anaemia-Epidemiology,Prevalence,aetiological consequences,approaches for prevention and control of anaemia, National Nutritional Anaemia Control Programme.

Iodine Deficiency Disorders-Epidemiology,aetiological factors,consequences of IDD,IDD as a public health problem,elimination of IDD-An International focus,National Iodine Deficiency Disorders Control Programme Of India

Zinc Deficiency-Epidemiology,public health significance,clinical manifestations of zinc deficiency,Zinc supplementation in pregnancy, Flourosis

Module 5: Organisations and Programmes in the field of nutrition monitoring and Interventions

Brief outline ofWHO, FAO, UNICEF,CARE, NFHS,NNMB,ICDS, ICMR,ICAR

Module 6: Nutrition Education

Definition,Significance,Design and implementation of NHE Programme Receiver,Communicator,Message Channel,Theories of Nutrition Education,Evaluation-Purpose and Types of evaluation.

Module 7: Food Fortification

Technical considerations, technology for food fortification, fortificants, planning food fortification intervention, fortification of selected food items

Module 8: Nutrition related non communicable chronic disorders

Prevalence at global and national level, cardiovascular disease, hypertension,obesity, diabetes mellitus,cancer.Risk factors for Non Communicable Diseases-Community based programmes for primary prevention,Health education and role of mass media,secondary and tertiary prevention.

REFERENCES

- Modern Nutrition in Health and Disease edited by Maurice B Shils, Moshe Shike.A, Catherine Ross, Benjamin Cabellero, Robert J Cousins, Lippincott Williams al Wilkins 2006.
- Nutrient Requirements and Recommended Dietary allowances for Indians. A report of the expert group of the Indian Council of Medical Research ICMR 2010.
- Public Health Nutrition in Developing Countries Edited by Sheila Chander Vir Woodhead Publishing India. Part I & II. 2011

**PUBLIC HEALTH NUTRITION
BLUEPRINT OF QUESTION PAPER**

Module	Hours	1 weightage 5/8	2 weightage 5/8	5 weightage 3/6	Total 30/ 54
1	5	1	1	1	8
2	10		1		2
3	15	2	1	1	9
4	15	2	1	2	14
5	10		1	1	7
6	10	1	1		3
7	10	1	1		3
8	15	1	1	1	8

**M. Sc DEGREE EXAMINATION
FOURTH SEMESTER
HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION**

HFN4PHN: PUBLIC HEALTH NUTRITION

Time: 3hrs

Maximum: 30 weightage

PART – A

I. Answer any FIVE questions, not exceeding one page. Each question carries a weightage of 1.

1. Write a note on ISHI.
2. What is a Food Balance Sheet?
3. What are vital health statistics?
4. Write a note on Iodine Deficiency disorders.
5. What is flourosis?
6. Significance of Nutrition education.
7. What is food fortification?
8. Prevalence of obesity

(5x1=5 weightage)

PART B

II. Answer any FIVE questions not exceeding two pages. Each question carries a weightage of 2.

9. Discuss the nutrition transition in India.
10. What is nutrition epidemiology? Give the epidemiological study methods.
11. Explain the biochemical assessment of nutritional status.
12. Discuss prevention and management of Protein Energy Malnutrition.
13. Bring out the role of NFHS in Community nutrition.
14. Elucidate the principles of effective nutrition education
15. Discuss in detail technical considerations and impact of food fortification.
16. What are the risk factors of non-communicable diseases?

(5x2=10 weightage)

PART C

III. Answer any THREE questions not exceeding three pages. Each question carries a weightage of 5.

17. Explain the current food and nutrition security situation in India.
18. Explain assessment of Nutritional status by anthropometry.

19. Write an essay on the prevalence, aetiology, consequences and treatment of Iron Deficiency Anaemia in India.

20. Discuss the prophylaxis programmes in India.

21. What are the International agencies involved in improving nutritional status of the Community?

22. Give an account of the Community based programmes for primary, secondary and tertiary prevention of non communicable diseases.

(3x5=15 weightage)

BIOPHYSICAL TECHNIQUES

Course Code: HFN4BT

Teaching hours:5hrs/week

ELECTI

Credit:4

Objectives

- To introduce students to various modern instrumental techniques in nutrition research.
- To understand the applications, strengths and limitations of biophysical methods.

Course Outline

Module 1: Chromatography

Principles and applications of chromatography – Paper, Ion exchange, Adsorption, Thin layer gas chromatography, HPLC, Gel filtration of biologically important compounds.

Module 2: Electrophoresis

Principles and applications of electrophoresis – Paper, Starch gel, Agar gel, Polyacrylamide gel, Moving boundary electrophoresis, Immuno electrophoresis, Iso electric focusing.

Module 3: Instruments for Food Science applications.

Principles and applications of measurement of viscosity, consistency, texture. Rheological properties of food, Relative humidity and Water activity. Measurement of specific gravity, freezing point, melting point, refractive index, measurement of colour, gel strength, densitometry, refractometry & polarimetry.

Module 4: Enzymes

Introduction, classification of enzymes, Mechanism of action, Factors affecting enzyme activity, enzyme inhibition – competitive, non-competitive and uncompetitive inhibition, Clinical applications of enzymes, Enzyme kinetics – Michael's Menten equation. Coenzymes and role of coenzymes in enzyme catalysis, ELISA

Module 5: Basics of Instrumentation– Physico-chemical principles and methodology

Principles and applications of colorimetry, Fluorimetry, Spectrophotometry- UV, Visible, AAS and AES, Infrared spectrometry, Flame photometry. Electron microscopy-Principle, Instrumentation and Applications.

Module 6: Radioactive Isotopes and Bioassays.

Radioactive and stable isotopes used in biological investigations. Applications of isotopes in Food and Nutrition research. Animal studies, Human studies and Microbiological assays.

References:

- DeMan J.M.,Voisey, P.W.,Rasper, V.F and Stanley, D. 1976. Rheology and Texture in Food Quality,The AVI Publishing Co.Inc, West Port.
- Fung, D.Y.C and Mathews, R. 1991. Instrumental methods for Quality Assurance in Foods. Marcel Dekker Inc.New York.
- Pomeran,Y. and MeLoan,C.E. 1996. Food Analysis –Theory and Practice, 3rd Ed. CBS Publishers and Distributors, New Delhi.
- Skoog, D.A., Holler, F.H and Nieman. 1998. Principles of Instrumental Analysis. Saunders College Publishing, Philadelphia.

BIOPHYSICAL TECHNIQUES

BLUEPRINT OF QUESTION PAPER

Module	Hours	1weightage 5/8	2 weightage 5/8	5 weightage 3/6	Total 30/ 54
1	15	1	2	1	10
2	15	2	1	1	9
3	15	-	1	1	7
4	15	2	1	1	9
5	15	2	1	1	9
6	15	1	2	1	10

M. Sc DEGREE EXAMINATION

FOURTH SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN4BT: BIOPHYSICAL TECHNIQUES

Time: 3hrs

Maximum: 30 Weightage

PART – A

I. Answer any FIVE questions, not exceeding one page. Each question carries a weightage of 1

1. Define the terms electrophoresis and chromatography.
2. What is ELISA? Give two applications.
3. Write a note on isoenzymes.
4. Discuss enzyme inhibition.
5. Basic principle of colorimetry?
6. Discuss biochemical applications of isotopes.
7. What are the applications of a spectrophotometer?
8. List the classes of enzymes.

(5x1=5 weightage)

PART B

II. Answer any FIVE questions not exceeding two pages. Each question carries a weightage of 2.

9. Write a note on factors affecting enzyme quality.
10. Discuss High Performance Liquid Chromatography.
11. Enumerate the factors affecting the rate of migration of ions in electrophoresis.
12. Discuss microbiological assay of amino acids.
13. Describe the procedure of Polyacrylamide Gel Electrophoresis.
14. Explain isoelectric focusing of proteins.
15. Differentiate optical and electron microscope.
16. Give an account of the index water activity

(5x2=10 weightage)

PART –C

III. Answer any THREE questions not exceeding three pages. Each question carries a weightage of 5.

17. Discuss the biochemical applications of radioisotopes.
18. Discuss Michaelis-Menten equation and its derivatives.
19. Elaborate on various theories related to enzyme substrate complex formation.
20. Write an essay on the use of isotopes in food and nutrition research.
21. Write an essay on different types of chromatography.
22. Write an essay on the various instruments used for food science applications.

(3x5=15 weightage)

NUTRITION FOR SPORTS AND FITNESS

Course Code: HFN4NSF

Teaching hours: 5hrs/week

Credit:4

ELECTI

Objectives

- To understand the components of health and fitness and the role of nutrition in these.
- To make nutritional, dietary and physical activity recommendations to achieve fitness and well-being.
- To develop ability to evaluate fitness and well-being
- To understand physiological changes and nutritional requirements during sports events.

Course Outline

Module 1: Physical fitness and health

- a) Introduction to physical fitness and wellness
- b) Contributing factors to health
- c) Objectives of physical fitness
- d) Motivation for a physically active life, motivational strategies
- e) Principles of nutrition for health.

Module 2: Weight management and fitness

- a) Body weight components
- b) Body composition assessment
- c) Regulation of bodyweight(energy)
- d) Weight imbalance- underweight, overweight and obesity(types)
- e) Management of obesity

Module 3: Dietary management for health

- a) Critical review of various dietary regimes for weight and fat reduction
- b) Dietary guidelines appropriate to health and fitness with special reference to obesity, cardiovascular diseases and diabetes.

Module 4: Exercise Performance and Nutrition

- a) Energy expenditure during physical activity

- b) Carbohydrates and performance
- c) Fat metabolism and performance
- d) Effect of exercise on protein requirements
- e) Vitamins and Minerals
- f) Fluid and electrolyte loss and replacement in exercise

Module 5: Sports nutrition

- Sports physiology
- Nutritional requirements in sports events- team, power, endurance events
- pre-game and post-game regime
- Carbohydrate loading, water and electrolyte balance
- Role of nutrition, stress, fracture and injury.

Module 6: Nutritional Ergogenics

Ergogenic aids and Supplements-Types, Potential and Concerns

Module 7: Measures of performance and physical fitness

References:

- Bamji S.M.,Rao NP and Reddy V.1998.Text book of Human Nutrition.Oxford and IBH Publishing C. New Delhi.
- Fink H.H.,Mikesky E.A and Burgoon A.L.2012.Practical Applications in Sports Nutrition.3 rd ed.Jones and Barlett Learning.USA.
- Gibney J.M. Macdonald A.I and Roche M.H.2003.Nutrition and Metabolism.Blackwell Publishing.
- Modern Nutrition in Health and Disease edited by Maurice B Shils,Moshe Shike.A,Catherine Ross,Benjamin Cabellero,Robert J Cousins, Lippincott Williams al Wilkins 2006.
- Nutrition for Health, Fitness and Sport, eighth edition, by Melvin Williams, 2007, McGraw-Hill.
- Practical Nutrition for a Fit Life, by Cherie Moore, 2004, Kendall-Hunt Publishers

- WHO.1995.Physical Status:The Use and interpretation of Anthropometry.Report of a WHO Expert Committee,Geneva.

NUTRITION FOR SPORTS AND FITNESS

BLUE PRINT OF QUESTION PAPER

MODULE	Hours	1weightage 5/8	2 weightage 5/8	5 weightage 3/6	Total 30/ 54
1	15	1	1	1	8
2	15	2	2	1	11
3	15	1	1	1	8
4	15	1	2	1	10
5	15	1	1	1	8
6	10	1	1		3
7	5	1		1	6

M. Sc DEGREE EXAMINATION

FOURTH SEMESTER

HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION

HFN4NSF: NUTRITION FOR SPORTS AND FITNESS

Time: 3 hrs

Max: 30 weightage

Part A

I. Answer any 5 questions not exceeding one page. Each question carries a weightage of 1.

1. Motivational strategies for fitness.
2. Densitometry
3. Significance of body composition measures
4. Guidelines for fat reduction by athletes
5. Fluid requirements of athletes.
6. Carbohydrate loading
7. Concerns regardingl ergogenics

8. Negative effects of alcohol on performance

(5x1=5weightage)

Part B

II. Answer any five questions, not exceeding two pages. Each question carries a weightage of 2.

9. Describe the principles of sports nutrition

10. Describe the methods for assessing body composition

11. Discuss weight imbalance with regard to overweight and leanness.

12. Give an account of the measures to be taken for safe and effective weight loss of an athlete

13. Discuss the protein requirements in exercise

14. Explain the physiology of energy release during exercise

15. Give an account of nutritional requirement of an sports man taking part in endurance events

16. Give an account of popular supplemental ergogenic aids

(5x2=10 weightage)

Part C

III. Answer any 3 questions not exceeding 3 pages. Each question carries a weightage of 5.

17. Discuss motivational factors and dietary guidelines for health and fitness

18. Explain effect of exercise on body composition.

19. Critically compare various dietary regimes for weight reduction

20. Bring out role of carbohydrates on exercise performance. Describe the principles of sports nutrition

21. Elaborate on the role of nutrition in preventing injury. Discuss the nutritional guidelines for injury prevention

22. Discuss the need for endurance testing. Elaborate on various methods.

(3x5=15weightage)

ENTREPRENEURSHIP MANAGEMENT

Course Code: HFN4EM

Teaching hours: 4hrs/week

ELECTI

Credit:4

Objectives

- To gain an understanding of the various aspects and types of business organizations
- To impart information on the various sources of finance and also on the process of setting up small enterprise.
- To enable students to understand the relevance of entrepreneurship and to develop effective entrepreneurship skills among students.

Course Outline

Module 1: Entrepreneurship and its development

Entrepreneurship-Definition, types, characteristics, Entrepreneurship development for employment generation- importance, Factors affecting entrepreneurial growth- economic, social, cultural and personal factors.

Module 2: Women and Employment

Women employment in India - categories of employment, problems related to employment, Unemployment in India- causes & remedies, Importance of self employment.

Module 3: Forms of Entrepreneurial Organizations

Scope and Objectives of modern business, Essentials of successful business, Sole proprietorship, Partnership, Joint Stock company, State enterprises and Co-operative societies – meaning, merits and demerits of each, Types of important documents of companies

Module 4: Entrepreneurship and Institutional support

Objectives, functions and assistance given by SIDCO, SIDO, SFCK, IDBI, SIDBI, KSIDC, KSWDC, KITCO, SEWA,SGSY (Swarnjayanti Gram Swarozgar Yojana), JGSY (Jawahar Gram Samridhi Yojana) , Agencies promoting entrepreneurship – role of NSIC (National Small Industry Corporation) , Small Industry Extension Training Institute (SIETI), Central Small Industry Organisation (CSIO) DCK, DRDA, KVIC (Khadi and Village Industry Commission)

and other voluntary organizations, Small Scale Industries (SSI) - Definition, types, procedure for setting a small scale Module, training facilities for small scale Module, Problems faced by emerging small scale Modules and remedies

Module 5: Source of Finance

Importance of finance- sources of company finance - long term and short term, Role of banks and other financial institutions, Basics of Costs and Cost Control, Project Appraisal

Module 6: Book keeping & Accounting

Concepts and Basics of accounting methods- Journal and ledger, balancing, trial balance, cash book, subsidiary books, Brief study of Financial Statements, Basics of Auditing , Sales Tax- meaning and types, Registration of business, turnover, filing & assessment of returns.

Module 7: Marketing & Sales promotion

Marketing- Marketing mix, Functions, types, Advertising & Salesmanship, Public relations, Personal selling, Interpersonal skills, factors affecting the entrepreneur's skill

Related Experience:

- 1 Visits to agencies involved in development of entrepreneurship
- 2 Preparation of a project proposal by
 - Selection of a trade
 - Visits to 1 or 2 Modules related to trade
 - Study the infrastructural requirements
 - Records to be maintained
 - Procedure for obtaining loan

REFERENCES

- Arora, S. P., Business Organization, Vikas Publishing House Pvt. Ltd. New Delhi, (1980)

- Bhattacharyya, S.K Accounting for Management, Vikas Publishing House Pvt. Ltd., New Delhi
- Bhushan, Business Organization, Sultan Chand & Sons, New Delhi, (1985)
- Chetnakal, Women and Development, Discovery Publishing House, New Delhi (1991)
- Desai V., Entrepreneurial Development- Vol -3,Himalaya Publishing House, New Delhi (1993)
- Gupta C.B. (Dr.), Office Organization and Management, Sultan Chand & Sons, New Delhi, (1999)
- Kanikar Entrepreneurs and Micro Enterprises in Rural India, New Age International Publishers Ltd., New Delhi (1995)
- Khanka S.S, Entrepreneurial Development, S.Chand & Co.Ltd., New Delhi, (1999)
- Ramesh Babbu's Handbook of Entrepreneurs, Business Intelligence Publications
- Sherlekar S.A, Principles of Business Management, Himalaya Publishing house, New Delhi, (1999)
- Shukla M.C., Business Organisation, S. Chand & Co. New Delhi, (1970)

ENTREPRENEURSHIP MANAGENENT

BLUEPRINT OF QUESTION PAPER

Module	No. of hours	Section A (5/8) 1 wt	Section B (5/8) 2 wt	Section C (3/6) 5 wt	Total 30 wt
1	5	1	1	0	1
2	5	1	1	1	8
3	10	1	1	1	8
4	10	1	1	1	8
5	10	1	1	1	8
6	15	2	2	1	11
7	10	1	1	1	8

M. Sc DEGREE EXAMINATION
FOURTH SEMESTER
HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION
HFN4EM: ENTREPRENEURSHIP MANAGENENT

Time: Three Hours

Maximum: 30 weightage

PART A

Answer any five of the following (1 weightage each).

1. Define entrepreneurship and its importance.
2. What is Joint Stock Company?
3. Explain balance sheet.
4. What is auditing?
5. Define women entrepreneur?
6. What are the benefits of self employment?
7. Explain the importance of advertising.
8. Describe a Fabian entrepreneur.

(5x1 = 5 weightage)

PART B

II. Answer any five of the following (2 weightage each).

9. What are the objectives of KITCO?
10. What are the problems faced by small scale industries? Write a note on its remedies.
11. What are the accounting methods?
12. Explain the procedure for registration of a business.
13. Explain any 5 types of enterprises.
14. Explain the contents of a project proposal.
15. What are the important documents of companies?
16. What are different types of tax?

(5x 2 =10 weightage)

PART C

III. Answer any three of the following (5 weightage each).

17. What is marketing? What are the different types of marketing techniques? Explain its merits and demerits.

18. Explain the concept of small scale industries. What are the steps in setting up a small scale industry?
19. What do you mean by marketing mix? What is the importance of public relation in marketing.
20. Elaborate the functions, role and support of following organizations
(a) IDBI (b) KITCO (c) KVIC
21. Prepare a project proposal for starting a handicrafts Module in your locality.
22. What are the causes and remedies of unemployment in India?

(3x5 =15 weightage)

PUBLIC HEALTH NUTRITION PRACTICALS

Course Code: HFN4PN

Teaching hours: 6hrs/week

ELECTI

Credit: 3

Objectives

- To develop skill in field level application of the techniques of assessing nutritional status
- To acquire skill in organising and implementing Community nutrition projects
- To give an insight into the various low cost ingredients available in market and prepare low cost nutritious dishes for vulnerable segments in the Community.

Course Outline

1. Assessment of nutritional status of preschoolers
2. Use and interpretation of Growth Charts
3. Preparation of low cost recipes, Cyclic menu and one dish meal
4. Formulating messages for Nutrition and Health Education
5. Development, Use and Evaluation of methods and aids for NHE
6. Assessing Nutritional concerns among vulnerable groups – Use of anthropometry, biochemical tests, clinical assessment, dietary assessment or Rapid assessment techniques

7. Planning and implementation of a Nutrition and Health Education programme in the community
8. Development of tools to assess Nutrition Knowledge, Attitudes and Practices
9. Study of a Community Agency

M. Sc DEGREE EXAMINATION
FOURTH SEMESTER
HOME SCIENCE (C) FOOD SCIENCE AND NUTRITION
HFN4PN: PUBLIC HEALTH NUTRITION(PRACTICALS)

Components of evaluation	Total Marks (100)
1-PROJECT REPORT	50
2-RECORD	50
3-VIVA VOCE	50
TOTAL	150

FOOD PROCESSING AND TECHNOLOGY

Teaching hours: 4hrs/week

ELECTIVE

Credit:4

Objectives

- To impart systematic knowledge of basic and applied aspects of food processing and technology.
- To provide the necessary knowledge of basic principles and procedures in the production of important food products.

- To orient the students to potential use of various by-products of food industry, handling storage and processing; Chemical and biochemical reactions affecting food quality and safety.
- To processing technology of foods and nutritional implications for the following:

Module 1: Cereals and Pulses

Wheat grain characteristics and products; wheat milling process; milling of durum or semolina; macaroni or pasta products, noodles, wheat starch and gluten fractionation, baking technology, production of bread, biscuits and cakes; **Corn** wet milling; zein separation; corn starch products;**Barley** malting; dry milling and air classification; wet fractionation of barley pearling; Storage and quality of cereal grains; **Rice** processing, fractionation, quick-cooking rice, parboiled rice, rice based instant foods; **Pulses** – processing, elimination of toxic factors, quick-cooking dals, fermentation and germination; Oilseed pressing, solvent extraction, purification (degumming, refining, bleaching, deodorization), hydrogenation, plasticizing and tempering, products – butter, margarine, shortening, mayonnaise and salad dressing, inter-esterification and production of MCT.

Module 2: Fruits and Vegetables

Structure, composition, physiological and biochemical changes during ripening, handling and storage; Varietal, harvesting and pre-processing considerations for vegetables; post harvest processing practices. Processing of vegetables, canning, freezing, dehydration, pickles and chutneys; Potato processing – Raw material handling and storage, raw material quality and suitability for chips, French fries, dehydrated granules and boiled/canned potatoes; processing for chips, French fries and dehydrated granules; Fruit processing – Citrus juices, apple juices, slices and dehydrated products, grape juice and raisins. Canning, fruit-based beverages and concentrates, squashes, jams, jellies, ketchups, sauces, high sugar, high acid products.

Module 3: Milk and Milk Products-

Milk processing – Classification, separation and standardization, pasteurization, of-flavour removal, homogenization, packaging; UHT sterile milk.**Milk products** – fortified milk, skim milk, concentrate milks, cream, butter, cheese, cultured milk products, dehydrated milk products, ice creams. Indigenous milk products: khoa, channa, paneer, curd, yoghurt, ghee, kulfi.

Module 4: Meat, Fish and Eggs

Chemistry of processed meats, ageing and tenderizing, curing, smoking and freezing of meat, fresh storage of meat. Fish preservation and processing. Meat and fish products: preservation by curing, smoking, salting and pickling and dehydration.

Module 5: Additives and Preservatives

Definition of food additives; acids, bases, buffer systems and salts, chelating agents, antimicrobial agents, sweeteners, stabilizers and thickeners, fat replacers, firming texturizers, appearance control and clarifying agents.

Flavour enhancers, aroma substances, sugar substitutes, sweeteners, antioxidants, Anticaking agents, bleaching agents, protective gases. Spices - Processing and extraction of essential oils and colours, stability, storage and preservation.

References

- Arthey, D and Ashurst, P.R. (1996), Fruit Processing, Blackie Academic & Professional, London.
- Askar, A. Freptor, H. (1993) Quality Assurance in Tropical Fruit Processing, Springer-Verlag, Berlin.
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- Gould, G.W.(1995), New Methods of Food Preservation, Blackie Academic & Professional, London.
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- Oliveira, A.R., Oliveira, J.C. (1999), Processing Foods Quality Optimization and Process Assessment, CRC Press, Boca Raton.
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- Salunkhe, D.K. and S.S.Kadam (1995), Handbook of Fruit Science and Technology: Production, Composition, Storage and Processing, Marcel Dekker INC. New York.
- Stadelman, W.J. and Cotterill, D.J. (1986), Egg Science and Technology, AVI Publishing Co., INC., Westport.
- Von LOesecke, H.W. (1998), Food Technology Series: Drying and Dehydration of Foods, Allied Scientific Publishers.

FOOD PRODUCT DEVELOPMENT AND MARKETING

Teaching hours: 4hrs/week

ELECTI

Credit:4

Objectives

- To understand and know various aspects of food product development including Food Science and Technology, Marketing and Consumer research, finance and communication.
- To develop products which meet consumer needs and nutritionally and commercially viable.
- To recognize the potential for entrepreneurship through marketing.

Course Outline

Module 1: New Food Products

Definition, Classification, Characterization Factors shaping new product development-Social concerns, health concerns impact of technology and market place influence. Reasons for new food product development (corporate, market place, technological and governmental influences) Assessing needs from various perspectives.

Module 2: Brief introduction to Phases in Food Product Development.

Idea generation, Screening (Feasibility, Consumer studies Financial Review), Development Production, Consumer trials and Test Market.

Module 3: Generation of New Product Ideas

Internal sources of ideas; External sources of ideas; Market place analysis

Module 4: Screening

Team Approach and involvement of various departments; Objectives of screening; Criterion of screening

Module 5: Development Process

Market Sector perspective and Market research.Technical development – Recipe development and scale up, food safety and food spoilage.Newer food stabilising systems : Thermal processing, ohmic heating, stabilizing with high pressure, other non-thermal stabilizing systems, control of water, controlled/modified atmosphere packaging, irradiation, hurdle technology, low temperature stabilization.Use of various new ingredients to suit product functions.Packaging, Design Graphics and Labeling.

Module 6: Refining the Screening Procedure for the product

Sensory Evaluation, Shelf life Testing, Product Integrity and conformance to standards

Module 7: Test Marketing; Evaluating results and analyzing

Module 8: Entrepreneurship: Plant location, investment, Financing the project

Module 9: New products in Food Service Industry and Food Ingredient industry.

PRACTICALS

1) Market Survey, Consumer survey to identify new products in terms of

- Line Extension
- Repositioning Existing Products
- New form/Reformulation
- New packaging of existing products
- Innovative products
- Creative Products

2) Tapping traditional foods and unconventional sources of foods.

Minimizing post harvest losses.

3) Identification of product for development

- Concept
- Market research the concept and concerned product

- 4) Development and Screening the products, developing criteria for screening scaling up
- 5) Test Marketing
- 6) Project Report

References

- Fuller, G.W.(1994) News Food Product Development: From Concept to Market place CRC Press, New York.
- Man, C.M.D. and Jones A.A (1994) Shelf life Evaluation of Foods, Blackie Academic and Professional, London.

FOOD SAFETY AND QUALITY CONTROL

Teaching hours: 4hrs/week

ELECTI

Credit: 4

Objectives

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

Course Outline

1. Introduction to quality assurance and food safety assurance. Current concepts of quality control.
2. Quality assurance programme: Quality plan, documentation of records, products standards products and purchase specifications, process control and HACCP, hygiene and housekeeping corrective action, quality and programme and total quality process.
3. Quality Costs: Measurement and analysis.
4. Product Evaluation :
 - Sampling for product evaluation and line control.
 - Statistical quality and process control

- Specifications and food standards. International, National-Mandatory, Voluntary.
- Sample preparation
- Reporting results and reliability of analysis.
- Tests for specific raw food ingredients and processed. Foods including additives:
 - a) Proximate principles
 - b) Nutrient analysis
 - c) Quality parameters and tests of adulterants.

5. Consumer protection

Food safety

Food standards.

References

- Graf, E. and Saguy, I.S. (1991) Food Product Development : From Concept to the Market Place, Van Nostrand Reinhold New York.
- Oickle, J.G. (1990) New Product Development and Value Added. Food Development Division Agriculture, Canada.
- Proc. Food Processors Institute : A key to Sharpening your Competitive Edge. Food Processors Institute, Washington, DC.
- Shapton, D.A. and Shapton, N.F. (1991) Principles and Practices for the Safe Processing of Foods. Butterworth Heinemann Ltd, Oxford.

Journals

- Critical Reviews in Food Science and Nutrition.
- Food Technology
- International Journal of Food Science and Technology.
- Journal of Food Technology
- Trends in Food Science and Technology

PRACTICALS

Objectives

1. To test different foods for their quality
2. To detect adulteration in different foods
3. To be familiar with tests used for quality control.

Course Outline

1. Assessment of purity and quality using appropriate standard tests for the following:
 - Water including mineral water.
 - Milk and milk products
 - Fats and oils including butter ghee and hydrogenated fat.
 - Ice creams and sherbets
 - Cereals and cereal products
 - Pulses and legumes
 - Spices and condiments and salt, pickles, sauces and chutneys.
 - Tea and coffee
 - Canned, dehydrated, frozen and bottled fruit/vegetable products
 - Confectionery
 - Flesh foods
 - Specific food ingredients such as glycerine, vinegar
 - Fruit juices, concentrates and beverages
2. Detection/Estimation of Food Additives and Contaminants

References

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

- Bryan, F.L. (1992): Hazard Analysis Critical Control Point Evaluations. A Guide to Identifying Hazards and Assessing Risk Associated with Food Preparation and Storage. World Health Organisation, Geneva.
- Bureau of Indian Standards: Specifications and Standard Methods.
- Early, R. (1995): Guide to Quality Management Systems for the Food Industry, Blackie, Academic and Professional, London.
- Food and Agricultural Organisation (1980): Manuals of Food Quality Control. 2. Additives Contaminants Techniques, Rome.
- Gould, W.A. and Gould, R.W. (1988): Total Quality Assurance for the Food Industries, CTI Publications Inc. Baltimore.
- Hagstad, H.V. and Hubbert, W.T. (1986): Food Quality Control, Foods of Animal Origin Iowa State University Press, AMES.
- James, C.S.(1995) : Analytical Chemistry of Foods, Blackie Academic and Professional (Chapman and Hall), Madras.
- Kirk, R.S. and Sawyer, R. (1991): Pearson's Composition and Analysis of Foods, Longman Scientific and Technical. 9th Edition, England.
- Marth, E.H. (1978): Standard Methods for the Examination of Dairy Products 14th ed or edition. Interdisciplinary Books and Periodicals, Washington, E.C.
- Nielsen, S.S. (1994): Introduction to the Chemical Analysis of Foods, Jones and Barlet Publishers, Boston.
- Pomeranz, Y. and MeLoan, C.E. (1996): Food Analysis: Theory and Practice, CBS Publishers and Distributor, New Delhi.
- Ranganna, S. (1986): Handbook of Analysis and Quality Control for Fruit and Vegetable Products, 2nd edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- World Health Organisation (1998): Guidelines for Drinking Water Quality, 2nd edition, Vols. 1, 2 and 3, Geneva.

NUTRITIONAL EPIDEMIOLOGY

Teaching hours: 4hrs/week

ELECTI

Credit:4

Objectives

- To understand the principles of Epidemiology nutritional epidemiology and its importance in Community and Public Health.
- To be able to design and evaluate studies/nutritional programmes.
- To be aware of characteristics and use of biological markers in understanding mechanistic basis for association revealed from epidemiological studies.

Course Outline

1) Introduction to Epidemiology and Branches of Epidemiology

Types of Epidemiology

2) Epidemiological Information: Collecting epidemiological data, secondary routine data.

3) Patterns of Disease:

Descriptive Epidemiology, Cross sectional Analysis, Prevalence and Incidence, Risk, factors, Risks and Odds.

Relative and Attributable risks.

4) Principles of Nutritional Epidemiology.

5) Measurement Issues, Measurement of disease, Occurrence and Measures of association, Exposure and Outcome.

6) Assessment of Food Consumption, Intake and validation of Assessment.

7) Biochemical Markers of nutrient intake and nutritional status.

8) Socio demographic and psycho social variables.

9) Anthropometric measurements.

10) Design and planning of Nutritional Epidemiological studies.

11) Assessing, Applying and Evaluating Epidemiological Studies.

Related References

Discussion of selected case studies.

References

- Anisa Basheer (1995) Environmental Epidemiology, Rawat Publications, Jaipur
- Armstrong, B.K., White, E., and Saracci, R. (1992) : Principles of Exposure Measurement in Epidemiology, Oxford University Press.
- Cox, B. Blaxter, M. Buckle, A. et al (1987), Health and Lifestyle Survey, 1984-85. Health Promotion Research Trust, London.
- Dunn, G (1989) Design and analysis of reliability studies, Edward Arnold, London.
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- Dwyer, J.h. Feinleib, M, Lipert, P., Hoffmeister, h(ed) (1992) Statistical Models for Longitudinal Studies of Health, Oxford University Press, Oxford.
- Farmer, R. Miller, D. and Lawerson, R. (1996) Lecture Notes on Epidemiology and Public
- Gibson, R.S.(1990) Principles of Nutritional Assessment, Oxford University Press, Oxford.
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- Janes, C., Stall R. and S. Fifford (1986) : Anthropology and Epidermiology: Interdisciplinary approaches to the Study of Health and Disease Reidel, Dordrecht.
- Kiely, M.(ed) (1991). Reproductive and Perinatal Epidermiology, CRC Press.
- Kok, F.J. and Van't Veer, P. (ed) (1991) Biomarkers of Dietary Exposure. Smith – Gordon, London.
- Margetts b.m. AND Nelson, M. (1998) Design Concepts in Nutritional Epidemiology. Oxford, New York..
- Moon, G. Gould, M, (2000) Epidemiology: An Introduction, Open University Press, Philadelphia.
- Morris, J. (1975) The uses of Epidemiology, Oxford, New York.
- Norell, S.E. (1998) Workbook of Epidemiology, Oxford: University Press, New York.

- Ohlin, A; Ahlander, E,M. Ekberg, A and Bruce,(A) (1994): Bibliography on Validations of Dietary Assessment Methods, National Food Administration, Uppsala, Sweden.
- Thompson, F.E: Moter, J; E; Freedman, L; Clifpred, C, and Willet, E.C.(1994) Dietary Assessment Calibration/Validation Studies Register. National Cancer Institute, Bethesda, Maryland.
- UK Nutritional Epidemiology Group (1993) Diet and Cancer : A review of the epidemiological literature. The Nutrition Society, London.