

**Department of Foods and Nutrition
(Syllabus of M. Sc.)**



**Course Distribution, Syllabus and
Text References**



**College of Community Science
VNMKV, Parbhani**

M. Sc. (Home Science) in Foods and Nutrition

COURSE LAY OUT FOR POST GRADUATE DEGREE PROGRAMME

Summary of Credit Load Layout

S. No.	Subjects	Credit Load
1	Major subjects	20-21
2	Minor subjects	9
3	Supporting Courses	5
4	Seminar	1
5	Research	20
Total Credits		55

Credit Load Layout for M. Sc. programme

Semester	Course credits					NCCC
	Major	Minor	Supporting	Seminar	Total	
First	9	6	3	--	18	2
Second	9	3	3	--	15	2
Third	3	--	--	--	3	2
Fourth	--	--	--	1	1	--
Total	21	9	6	1	37	6

Semester Wise Distribution of Courses

Semester I

S.No	Course No.	Title of the course	Credits
Major Courses : 9credits			
1	FN 501	Advanced Food Science	2+1
2	FN502	Advanced Nutrition	3+0
3	FN 504	Advances in community Nutrition	1+2
Minor courses : 6 credits			
1	EXT504	Research Methods in Behavioral Sciences	2+1
2	FST612	Neutraceuticals and Health Foods	2+1
Supporting courses : 3 credits			
1	Stat-511	Statistical Methods for Applied Sciences	2+1
Total Credits:			12+6

Semester II

S. No	Course No.	Title of the course	Credits
Major Courses : 9credits			
1	FN 503	Food Analysis	1+3
2	FN 507	Nutrition during Life cycle	3+0
3	FN 513	Food Product Development	1+1
Minor courses : 3 credits			
4	EXT 507	Human Resource Development	2+1
Supporting Courses			
5	AG Stat 531	Data Analysis Using Statistical Packages	0+2
		Master's Research	0+4
Total credits :			7+11

Semester III

S. No	Course No.	Title of the course	Credits
1	FN 509	Advanced Diet Therapy	2+1
		Master's Research	0+6
Total Credits			2+7

Semester IV

S. No	Course No.	Title of the course	Credits
1	FN 591	Masters Seminar	0+1
		Master's Research	0+10
Total Credits			0+11

Non-Credit Compulsory Courses (NCCC)

Semester I

S. No	Course No.	Title of the course	Credits
1	PGS 501	Library and Information Services	0+1
2	PGS 504	Basic Concepts in Laboratory Techniques	0+1

Semester II

S. No	Course No.	Title of the course	Credits
1	PGS 502	Technical Writing and Communication Skills	0+1
2	PGS 503	Intellectual Property and Its Management in Agriculture	1+0

Semester III

S. No	Course No.	Title of the course	Credits
1	PGS 506	Disaster Management	1+0
2	PGS 505	Agricultural Research Ethics and Rural Development Programmes	1+0

Note: The Non Credit Compulsory Courses are to be offered to all the students of M. Sc from the academic year 2009-2010

Syllabus

FN 501

ADVANCED FOOD SCIENCE

3(2+1)

- **Theory**
- **UNIT I**

Colloidal chemistry as related to foods; evaluation of food by subjective and Objective methods. Carbohydrates in foods sources and characteristics of sugar, starch, cellulose, pectin and gums characteristics in foods, effect of cooking and processing techniques.

- **UNIT II**

Protein in foods: Plant and animal foods; chemical and physical properties related to foods; effect of cooking and processing techniques. Properties, uses, processing techniques, changes during heating and other processing and storage of fats and oils.

- **UNIT III**

Classification, importance, composition of fruits and vegetables and effect of cooking and other processing on their nutritive value.

- **UNIT IV**

Classification and importance of beverages, food pigments, browning reaction. Definition, classification, uses and legal aspects of food additives: classification, nature and uses of leavening units.

- **Practical**

Microscopic structure of different starch granules; evaluation of food by subjective and objective methods; changes in color , texture and flavor of foods due to processing; effect of cooking on protein, fat and carbohydrates; product preparation using leavening agents; project work related to text .

- **Suggested Readings**

- Borgstrom G (1968) Principles of Food Science. Vol. I, II. Macmillan.
- Desrosier NW & Desrosier JN(1997) The Technology of Food Preservation. AVI Publ.
- Griswold RM (1962) The Experimental Study of Foods. Houghton Mifflin.
- Khader V (1999) Text Book on Food Storage and Preservation. Kalyani.
- Krishna Swami K (2000) Nutrition Research – Current Scenario. Oxford & IBH.
- Lowe B. 1955 Experimental Cookery. John Wiley & Sons.
- Manay NS & Shadaksharaswamy M. 1997. Foods, Facts and Principles. New Age International.

- McWilliams M. 1993. Foods, Experimental Perspectives. Macmillan.
- Meyer LH. 1976 Food Chemistry. AVI Publ.
- Potter NN & Hotchkiss HJ. 1996. Food Science. CBS.
- Subbulakshmi G & Udipi SA. 2006. Food Processing and Preservation. New Age International.

FN 502

ADVANCED NUTRITION

3(3+0)

Theory

- **UNIT I**

Functions, sources, requirements, digestion and absorption of carbohydrates; definition, composition, classification, functions and role of dietary fiber in various physiological disorders.

- **UNIT II**

Basis of requirement, functions, sources, digestion and absorption of protein; Methods of assessing protein quality .Basis of requirement, functions, sources, digestion, absorption and deficiency disorders of lipids; essential fatty acids and eicosanoids.

- **UNIT III**

Requirements, functions, sources, deficiencies and toxicities of fat and water soluble vitamins.

- **UNIT IV**

Requirement, functions, sources, deficiency, toxicity and factors affecting absorption and utilization of macro and micro minerals .Water balance; acid and base balance.

- **Suggested Readings**

- Anderson L, Dibble, Turkki PR, Mitchell HS & Rynbergen HJ(1982) Nutrition in Health and Disease. JB Lippincott.
- Bamji MS, Rao NP & Reddy V. 1999. Text Book of Human Nutrition. Oxford & IBH.
- FAO/WHO/UNU 1985. Energy and Protein Requirement. Tech. Report 7824, WHO.
- Guthrie HA. 1989. Introductory Nutrition. Times Mirror/Mosby College Publ.
- ICMR. 1990. Nutrient Requirement and Recommended Dietary Allowance for Indians. A
- Report of Expert Group of the ICMR, NIN,Hyderabad.

- James WPT & Schofield EC. 1990. Human Energy Requirements – A Manual for Planners and Nutritionists. Oxford University Press.
- Jelliffe DB. 1966. The Assessment of the Nutrition Status of the Community. WHO.
- Jolliffe N. 1962. Clinical Nutrition. Hoeber Medical Division.
- Khader V, Sumathi S & Manorama R. 1998. Course Manual of the Short course on "Recent Advances in Vitaminology", Center for Advanced Studies, Department of Foods and Nutrition, Post Graduate and Research Centre ANGRAU, Hyderabad.
- Packer L & Fuchs J. 1997. Vitamin C in Health and Disease, Marcel Dekker.
- Passmore R & Eastwood MA. 1986. Human Nutrition and Dietetics. Elba Churchill.
- Pike RL & Brown ML. 1988 Nutrition - An Integrated Approach. John Wiley & Sons.
- Proceedings of the Nutrition Society of India, NIN, Hyderabad.
- Robinson CH & Lawler MR. 1986. Normal and Therapeutic Nutrition. Macmillan.
- Shills ME, Olson JA, Shike M & Ross AC. 1999 Modern Nutrition in Health and Disease. Williams & Wilkins.
- Swaminathan MS. 1985. Advanced Text Book on Food and Nutrition Vols. I, II The Bangalore Printing & Publ. Co.

FN 503

FOOD ANALYSIS

4(1+3)

- **Theory**

- **UNIT I**

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

- **UNIT II**

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

- **UNIT III**

Principles, techniques and applications of spectrophotometer fluorimetry, flame photometry and electrophoresis.

- **UNIT IV**

Principles techniques and application of chromatography (paper chromatography, TLC, GLC, HPLC). Introduction to animal assay.

- **Practical**

Handling of equipment and instruments; preparation of samples, solutions and buffers; quantitative estimation of proximate principles, minerals and vitamins by use of colorimetric, flame photometry, UV spectrophotometer; chromatography, atomic absorption spectrophotometer and photofluorometry, analysis of anti-nutritional factors; estimation of protein digestibility; bioavailability of nutrients.

- **Suggested Readings**

- AOAC 1995. Association of Official Analytical Chemists. Washington, DC.
- Gruenwedels DW & Whitaker JR 1984. Food Analysis: Principles and Techniques. Vols. I-VIII. Marcel Dekker.
- Joslyn MA. 1970. Methods in Food Analysis: Physical, Chemical and Instrumental Methods of Analysis. Academic Press.
- Pomeranz Y & Mole an CE. 1977. Food Analysis Theory and Practice. AVI
- Publ.Shawnee SK & Singh R. 2000. Introductory Practical Biochemistry.Nervosa.

FN 504

ADVANCES IN COMMUNITY NUTRITION

3(1+2)

- **Theory**

- **UNIT I**

Assessment of the nutritional status at individual, household and institutional level: direct and indirect methods.

- **UNIT II**

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

- **UNIT III**

Major nutritional problems of the state, nation and world. Nutrition intervention- Definition, importance, methods of nutrition intervention and their impact evaluation.

- **UNIT IV**

National nutritional programmes and policies; nutritional surveillance. National programmes and policies regarding food production and distribution.

- **Practical**

Market survey for food availability and their cost; development of low cost nutritious recipes suitable for various vulnerable groups; visit to the ongoing public health nutrition programme and report writing; Techniques of assessment of nutritional status.

- **Project Work:-**

Studying existing diet and nutrition practices, planning and conducting survey, analyzing data and writing report; development, implementation and evaluation of community nutrition and health programmes.

- **Suggested Readings**

- Gopaldas T & Seshadari S. 1987. Nutrition Monitoring and Assessment. Oxford University Press.
- Jeannette B Endres. 1990 Community Nutrition Challenges and Opportunities. Merrill.
- Jelliffe DB. 1966. The Assessment of the Nutritional Status of the Community. WHO.
- Jolliffe N. 1962. Clinical Nutrition. Hoeber Medical Division.
- McLaren DS. 1977. Nutrition in the Community. John Wiley & Sons.
- Nutrition Foundation of India Bulletin. New Delhi.
- Nutrition News. NIN, Hyderabad .
- Park JE & Park K. 2000. Text Book of Preventive and Social Medicine. Banarsidas Bhanot Publ.
- Rao BSN, Deosthale YG & Pant KC. 1998 (Revised and updated). Nutritive Value of Indian Foods by Gopalan C, Ramashastry BV & Balasubramaniam SC. NIN, Hyderabad.
- Shukla PK. 1982. Nutritional Problems of India. Prentice Hall of India.

- **Objective**

To enable the students to know physiological changes and nutritional requirements during various stages of life cycle.

- **Theory**

- **UNIT I**

Adulthood: sex, occupation, income. Pregnancy: physiological changes in pregnancy, weight gain during pregnancy, food and nutrient requirements, storage of nutrients during pregnancy and impact of good nutrition on the outcome of pregnancy, complications of pregnancy and their nutritional management. Lactation: Physiology of lactation, impact of nutrition on efficiency and milk production, food and nutrient requirements during lactation.

- **UNIT II**

Infancy: role of nutrition on physical and mental development, rate of growth - weight as an indicator, assessment of growth, nutrient requirement during infancy, feeding of infants – value of breast feeding, breast milk composition, breast feeding Vs artificial feeding, types of milk and their use in infant feeding, methods of formula preparation, weaning and supplementary foods, weaning practices in the community, special nutritional concern in infant feeding, feeding the premature and low birth weight infants. Nutritional disorders and common ailments in infancy, feeding the sick child, immunization schedule and growth charts.

- **UNIT III**

Preschool age: growth and development – Physical and mental, prevalence of malnutrition in preschool years and food habits, nutritional requirements during preschool year and supplementary foods. School age: growth and development, nutritional requirements of school age children, specific problems in feeding school children.

- **UNIT IV**

Adolescence: physical and physiological changes, nutritional requirements of adolescents, Food preferences and nutritional problems. Elderly: physical and physiological changes, nutritional requirement, problems of old age, nutrients influencing aging process.

- **Suggested Readings**

- Anderson L, Dibble MV, Turkki PR, Mitchell HS & Rynbergen HJ. 1982. Nutrition in Health and Disease. JB Lippincott Co.
- Beal VA. 1980. Nutrition in the Life Span. John Wiley & Sons.

- Falkner F & Tanner JM. 1978. Human Growth. Vols. I-III. Plenum Press.
- FAO/WHO/UNU. 1985. Energy and Protein Requirement. Tech. Report 724. WHO.
- Ghosh S. 1988. The Feeding and Care of Infant and Young Children.
- Voluntary Health Association of India, New Delhi.
- Guthrie HA. 1989. Introductory Nutrition. Times Mirror/Mosby College Publ.
- ICMR. 1990. Nutrient Requirement and Recommended Dietary Allowance for Indians. A Report of Expert Group of the ICMR, NIN, Hyderabad.
- Khetarpaul N, Katyal Sudha K & Grover I. 2001 Infant Health and Nutrition. Agro Tech. Publ. Academy.
- Krause MV & Mahan LK. 1990. Food, Nutrition and Diet Therapy. WB Saunders.
- Robinson CH & Lawler MR. 1986. Normal and Therapeutic Nutrition,McMillan.
- Williams SR, Worthington RS, Sneholinka ED, Pipes P, Ress JM & Mahal KL.1988.IntroductionNutrition throughout the Life Cycle. Times Mirroe/Mosby College Publ.

FN 509

ADVANCED DIET THERAPY

3(2+1)

- **Theory**
- **UNIT I**

Role of dietician in a health care team in hospital and community. Newer concepts in dietary management of various nutritional disorders and disease conditions: fevers, infections.

- **UNIT II**

Dietary management during burns, allergy, gastrointestinal and liver diseases.

- **UNIT III**

Dietary management of cardiovascular diseases, renal disorders and obesity.

- **UNIT IV**

Dietary management of diabetes, cancer and HIV. Nutrition in critical care.

- **Practical**

Formulation of food exchanges. Therapeutic modifications of diet in terms of nutrients, consistency and composition for various disorders and diseases. Preparation of SOAP notes and case studies. Visits to hospitals.

- **Suggested Readings**
- Robinson, Lawler, Chenoweth & Garwick, 1987. Normal & Therapeutic Nutrition. 17th Ed. Macmillan Publishing Co.
- Shills ME & Young VR. Modern Nutrition in Health & Disease 7th Ed. Lea & Febiger. Stanfield PS, Hui YH & American Dietetics Association 1992. Nutrition & Diet Therapy. 2nd Ed. Jones & Bartlett Publ

FN 513 FOOD PRODUCT DEVELOPMENT 2(1+1)

- **Theory**
- **UNIT I**

Basic principles of food product development. Sensory properties of food and their role in product development. Formulation and evaluation of recipes at laboratory level. Bulk food preparation for food institutions and enterprises: servings, nutritive value and costing.

- **UNIT II**

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

- **UNIT III**

Consumer evaluation-development of schedule and data analysis. Packaging material, types for different products. Food labeling.

- **UNIT IV**

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

- **Practical**

Sensory evaluation, methods, training of judges, score card preparation. Selection and modification of food product to be developed. Formulation and standardization of products. Objective and subjective evaluation of the products. Evaluation of consumer acceptability. Packaging and sale of products. Preparation of video film for media.

- **Suggested Readings**
- Altschul Aaron M. 1993. Low Calorie Foods. Marcel Dekker
- Goldberg I. 1994. Functional Foods: Designer Foods, Pharma Foods, Nutraceuticals. Springer.
- Metz SA. 2004. Formulating & Processing Dietetic Foods. CHIPS Publ.