

M.Sc.(Home Science)
Semester-I Examination - Winter-2010,
Semester-II Examination - Summer-2011

Prospectus No. 2011199

संत गाडगे बाबा अमरावती विद्यापीठ
SANT GADGE BABA AMRAVATI UNIVERSITY

गृहविज्ञान विद्याशाखा
(FACULTY OF HOME SCIENCE)

PROSPECTUS

OF

M.Sc. (Home Science) (Food Science and Nutrition)
Semester-I, Winter-2010
Semester-II, Summer-2011



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I N D E X

M.Sc. (Home Science) (Food Science and Nutrition)

(Semester-I & II)

(Prospectus No.2011199)

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SANT GADGE BABA AMRAVATI UNIVERSITY

SPECIAL NOTE FOR INFORMATION OF THE STUDENTS

- (1) Notwithstanding anything to the contrary, it is notified for general information and guidance of all concerned that a person, who has passed the qualifying examination and is eligible for admission only to the corresponding next higher examination as an ex-student or an external candidate, shall be examined in accordance with the syllabus of such next higher examination in force at the time of such examination in such subjects, papers or combination of papers in which students from University Departments or Colleges are to be examined by the University.
- (2) Be it known to all the students desirous to take examination/s for which this prospectus has been prescribed should, if found necessary for any other information regarding examinations etc. refer the University Ordinance Booklet the various conditions/provisions pertaining to examinations as prescribed in the following Ordinances-

| | | |
|-------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ordinance No. 1 | : | Enrolment of Students. |
| Ordinance No.2 | : | Admission of Students |
| Ordinance No. 4 | : | National Cadet Corps |
| Ordinance No. 6 | : | Examination in General (relevant extracts) |
| Ordinance No. 18/2001 | : | An Ordinance to provide grace marks for passing in a Head of passing and Improvement of Division (Higher Class) and getting Distinction in the subject and condonation of defficiency of marks in a subject in all the faculties prescribed by the Statute NO.18, Ordinance 2001. |
| Ordinance No.9 | : | Conduct of Examinations (Relevant extracts) |
| Ordinance No.10 | : | Providing for Exemptions and Compartments |
| Ordinance No. 19 | : | Admission Candidates to Degrees |
| Ordinance No.109 | : | Recording of a change of name of a University Student in the records of the University |
| Ordinance No.6 of 2008: | : | For improvement of Division/Grade. |
| Ordinance No.19/2001 | : | An Ordinance for Central Assessment Programme, Scheme of Evaluation and Moderation of answerbooks and preparation of results of the examinations, conducted by the University, Ordinance 2001. |

Dineshkumar Joshi
Registrar
Sant Gadge Baba Amravati University

PATTERN OF QUESTION PAPER ON THE UNIT SYSTEM

The pattern of question paper as per unit system will be boradly based on the following pattern.

- (1) Syllabus has been divided into units equal to the number of question to be answered in the paper. On each unit there will be a question either a long answer type or a short answer type.
- (2) Number of question will be in accordance with the unit prescribed in the syllabi for each paper i.e. there will be one question on each unit.
- (3) For every question long answer type or short answer type there will be an alternative choice from the same unit. However, there will be no internal choice in a question.
- (4) Division of marks between long answer and short answer type question will be in the ratio of 40 and 60.
- (5) Each short answer type question shall Contain 4 to 8 short sub question with no internal choice.

**Syllabus Prescribed for M.Sc. (Home Science) (Food Science and Nutrition)
Semester-I**

**Subject Code 112FS47
Food Science**

Theory : 4 Periods/Wk (4 Credits)
Practical : 4 Periods/Wk (2 Credits)

Theory Paper : 60
Theory Internal : 40
Practical Marks : 35
Practical Internal : 15
Total Marks : 150

Learning objectives : After completion of course students will be able to-

- provide an understanding of composition of various food stuffs
- familiarize students with changes occurring in various food stuffs as a result of processing and cooking
- enable students to use the theoretical knowledge in various applications and food preparations

Theory

Unit 1 : Water and food dispersions

- 1.1 Physical properties of water
- 1.2 Structure of water molecule
- 1.3 Bound water
- 1.4 Colloidal systems
- 1.5 Types of food dispersions – sol, gel, emulsion and foam

Unit 2 : Polysaccharides and sugars

- 2.1 Starch
 - Flour mixtures – batters and dough
 - Leavening agents – physical, chemical and biological
 - Gluten formation
 - Gelatinisation
 - Dextrinisation
- 2.2 Sugar
 - Stages of sugar cookery
 - Crystallisation

Unit 3 : Fats and oils

- 3.1 Functional properties of fats
- 3.2 Role of fats and oils in cooking
- 3.3 Trans fatty acids
- 3.4 Fat substitutes
- 3.5 Fat deterioration and antioxidants

Unit 4 : Proteins

- 4.1 Milk and milk products- Composition of milk, properties of milk, effect of heat on milk, milk products and milk substitutes
- 4.2 Meat, fish and poultry - Composition, cooking methods, effects of cooking.
- 4.3 Fish and sea foods - Composition, changes during processing
- 4.4 Pulses and legumes - Composition, processing toxic constituents
- 4.5 Eggs - Composition, functional properties of eggs, use in cooking, egg processing, egg products
- 4.6 Protein concentrates, hydro lysates and texturised vegetable proteins

Unit 5 : Fruits and Vegetables

- 5.1 Enzymes and pigments in fruits and vegetables
- 5.2 Enzymic browning in fruits and vegetables

Practicals

- 1) Standardisation of recipes and methods of reporting recipes
- 2) Experiments on crystallisation of sugar
 - Stages of sugar cookery
 - Crystalline and non crystalline candies
- 3) Fat and oils – smoking temperatures, factors affecting absorption of fat
- 4) Experiments with eggs to study the properties of coagulation, foaming, emulsifying agent and leavening agent
- 5) Preparation and evaluation of recipes out of milk, meat and poultry
- 6) Factors affecting colour, texture and flavour of vegetables and fruits

References

- 1) Potter N. and Hotchkiss J.H. (1996) Food Science. 5th edition, CBS publishers and distributors, New Delhi
- 2) Charley H. (1982) Food Science. 2nd edition, John Wiley and sons, New York
- 3) Peckham G. and Freeland Grages G.H. (1979) Foundations of Food Preservations
- 4) Meyer L.H. (1998) Food Chemistry. CBS publishers and distributors, Shahdara, Delhi 110032
- 5) Manay M.S., Shadaksharaswamy M. (1997) Food Facts and Principles. 3rd edition, New Age International (P) Ltd. publishers, New Delhi
- 6) C. Gopalan, B.V. Rameshastri, S.C. Balasubramanian (2004) Nutritive Value of Indian Foods. National Institute of Nutrition, ICMR, Hyderabad
- 7) Fox B. (1985) Food Science A Chemical Approach. Hoddir and Stoughton Educational, Bungay Suffolk.

Subject Code : 113HP48
Human Physiology

Theory : 4 Periods/Wk (4 Credits)

Theory Paper : 60
Theory Internal : 40
Total Marks : 100

Learning objectives :

After completion of course students will be able to understand relationship of physiology and role of nutrition.

Theory

- Unit 1 : Introduction to Physiology**
1.1 Physiology of growth and development
1.2 Physiology of aging
- Free radical theory of aging
- Physiological mechanisms to limit free radical damage
- Caloric restriction, antioxidants and aging
- Unit 2 : Enzymes**
2.1 Introduction to enzymes and coenzymes
2.2 Nomenclature and classification of enzymes
2.3 Role of enzymes and coenzymes in metabolism
2.4 Enzymes in clinical diagnosis
- Unit 3 : Hormones**
3.1 Introduction to hormones
3.2 Classification of hormones
3.3 Role of hormones in nutrition and health
- Unit 4 : Nutrogeomics**
4.1 Genes and disease
4.2 Genetic variation and dietary response
4.3 Gene nutrient interactions
4.4 Role of nutrients in gene expression
- Unit 5 : Maintenance of Body Homeostasis**
5.1 Homeostasis – An introduction
5.2 Body fluids – essential to maintain body homeostasis
5.3 Methods of measuring body fluids

References

- 1) Applied Physiology, MFM 001 Course, Indira Gandhi National Open University
- 2) Vander A.J., Sherman J.H., Luciono D.S. (2000) Human Physiology. 7th edition, New York, McGraw Hill
- 3) Jain A.K. Textbook of Physiology. Vol. I and II, Avichal publishing co., New Delhi
- 4) Guyton A.C. and Hall J.B. (1996) Textbook of Medical Physiology. 9th edition, W.B. Sanders Company, Prism Books (Pvt.) Ltd., Bangalore.

Subject Code : 112FH49
Food and Human Behaviour

Theory : 2 Periods/wk/(Credits 2)
Practical : 2 Periods/wk/(Credits 1)

Theory Paper : 35
Th. Int.Asst.Mks. : 15
Pra.Int.Ass.Mks. – 25
Total Mks. : 75

Learning Objectives :- After completion of the course, students will be able to-

- understand indicators of human behaviour.
- know various factors influence dietary practices of individual.
- understand consequences of the behaviour on health.
- know means of modifying food behaviour.
- develop skill of developing scale.

Unit-I : Indicators of Human Behaviour :

- Knowledge.
 - Attitude
 - Practice.
- Meaning, measuring techniques and tools.

Unit-II : Relation of knowledge, attitude and practice about food in changing food behaviour for good nutrition.

Unit-III : ■ Factors affecting food Behaviour :

- Agricultural
- Economic
- Environmental

- Socio-cultural
 - Psychological
 - Religious.
- Role of industrialization, urbanization, work pattern, mass media etc. in changing food behaviour.

Unit-IV : • Food behaviour and linkages with health.

Unit-V : Communication strategies for modifying food behaviour (knowledge, attitude and practice)

Practical Internal Assessment :-

- (1) Study of KAP Tools (Scales)
- (2) Developing KAP scales for food behaviour study.
- (3) Study of Indigeneous/traditional dietary pattern of community and factors affecting.
- (4) Study of facts, fallacies and beliefs – indentifying positive, neutral and negative implications.

References :-

- (1) Sanjur, D. (1982), Social and Cultural Perspectives in Nutrition, Prentice Hall, Inc.
- (2) Long, P.J., Shann, B. (1983), Nutrition and Inquiry into the issues, Prentice Hall, Inc.
- (3) Blix, G. (1978), Food Cultism and Nutrition Quackery, Almgust and Wiksels, Uppasala.
- (4) Gillespie, S. Mc Neil, G. (1992), Food, Health and Survival in Developing Countries, Oxford University Press.
- (5) Oskamp, Stuart, (1987), Attitudes and Opinions, Prentice Hall.
- (6) Okediji, O.F. (1973) Theoretical and Methodological Critique of surveys of knowledge, Attitude and Practice of Family Planning in Africa. International Review of Modern Sociology, Vol.3(i), March.
- (7) Davis, D. and T.Ostrom (1987), Attitude Measurement in concise Encyclopaedia of Psychology (ed) J.Ramond Cossini, John Wiley and Sons, New York.
- (8) Goode j., Wand P.K.Hatt (1952), Methods in Social Research, McGraw Hill, New York.

Subject Code : 112NP50
Nutrition Programme Design and Evaluation

Theory : 2 Periods/wk/(Credits 2)
Practical : 4 Periods/wk/(Credits 2)

Theory Paper : 35
Th. Int.Asst.Mks. : 15
Pra.Int.Ass.Mks. – 50
Total Mks. : 100

Learning Objectives :- After completing this course, students will be able to-

- understand the process of programme design.
- develop ability in planning nutrition programmes.

Unit-1 : Programme Planning and Implementation :

1.1 Planning

- Meaning and importance.
- Pre-requisites for developing plan (short and long term)
- Programme Planning Processes.

1.2 Implementation

- Aspects of execution
- Factors responsible for successful conduct of programme.

Unit-2 :

2.1 Evaluation

- Meaning and purpose of Evaluation.
- Types and tools of Evaluation.

2.2 Follow up

- Need for follow up.
- Methods of follow up

2.3 Documentation

- Need for reporting and recording.
- Aspects to be covered.

Unit-3 : Nutrition Programme Design

- 3.1 Formulation of objectives and target group.
- 3.2 Resource Mapping.
- 3.3 Administrative Structure.
- 3.4 Implementation process.
- 3.5 Monitoring and evaluation of designed programme.

Unit-4 : Study the programme design and evaluation aspects of following ongoing nutrition programme-

- 4.1 ICDS.
- 4.2 Nutrient Deficiency Control Programme.
- 4.3 Supplementary Feeding Programmes
- 4.4 Food Security Programmes.

Unit-5 : Management Informations System -MIS.

Practical :-

- Design nutrition awareness/ skill development counselling / diagnostic / assessment programme. Implement, Evaluate and take follow up and document.
- Visit ongoing nutrition programmes.

References :-

- 1) Albrecsht, H. et. al. (1989). Rural Development Series Agricultural Extension Vol. I & II. Basic concepts and methods, Wiley Eastern Limited, New Delhi.
- 2) Chaubey, B.K. (1979). A Handbook of Extension Education, Jyoti Prakashan; Allahabad.
- 3) Dahama, O.P. and Bhatnagar, O.P. (1987). Education and Communication for development. Oxford and IBH Publishing Co., Pvt. Ltd.; New Delhi.
- 4) Extension Education in Community Development. (1961). Ministry of Food and Agriculture. Government of India, New Delhi.
- 5) Pankajam, G. (2000). Extension - Third Dimension of Education, Gyan Publishing House ; New Delhi.
- 6) Ray, G.L. (1999). Extension Communication and Management. Naya Prokashi; Calcutta.
- 7) Reddy, A. (1999). Extension Education, Sree Lakshmi Press, Bapatla.
- 8) Sandhu, A.S. (1994) Extension Programme Planning. Oxford & IBH Publishing Company Private Limited, New Delhi.
- 9) Singh, R. (1987) Textbook of Extension Education. Sahitya Kala Prakashan, Ludhiana.
- 10) Supe, S.V. (1982). Introduction to Extension Education. Oxford Publishers; New Delhi

Subject Code : 111CA51
Computer Application in Food Statistics

Practical : 4 Periods/wk (Credits 2)

Practical Mks. : 35
Pra.Int.Ass.Mks. – 15
Total Mks. : 50

Learning Objectives :- After completing course students will be able to-

- understand use of excel in analysis of data related to food and nutrition.
- develop skill of drafting text, tables, figures, etc.

Practical :

- (1) Computer Basics
 - 1.1 Computer Hardware and software.
 - 1.2 Input and out put devices.
 - 1.3 Basic Operations in data handling (copy, paste, prepare file / folder, burn CD's etc.)
- (2) MS Word
 - 2.1 Introduction to MS Word.
 - 2.2 Use for drafting letters and reports.
- (3) MS Excel
 - 3.1 Introduction to MS Excel.
 - 3.2 Drafting tables.
 - 3.3 Use for statistical analysis in Nutrition.
Descriptive Statistics – Mean, standard deviation.
Correlation – Pearson correlation between two or more variables.
Parametric test – t test, z test, analysis of variance.
Non-parametric text – chi test.
 - 3.4 Graphical Presentation – Graphs and bar diagrams.
- (4) Introduction to applicable statistical analysis softwares.

References :-

- (1) Literature of MSCIT.
- (2) Garrett, Henry E. (1971), Statistics in Psychology and Education, David Hanley and Co.
- (3) Edward, Experimental Design in Psychological Research.
- (4) Kerlinger, Foundation of Educational Research.

**Syllabus Prescribed for M.Sc. Home Science (Food Science and Nutrition)
Semester – II**

**Subject Code : 122FM52
Food Microbiology**

Theory : 3 Periods/Wk (3 Credits)
Practical : 2 Periods/Wk (1 Credit)

Theory Paper : 45
Theory Internal : 30
Practical Marks : 20
Practical Internal : 05
Total Marks : 100

Learning objectives : After completion of course students will be able to

- gain knowledge of role of microorganisms in humans and environment
- understand the importance of microorganisms in food spoilage
- understand the role of microbes in food borne disorders and integrated approach to food safety

Theory

- Unit 1 :** **Food Microbes :**
1.1 Microorganisms in foods
1.2 Factor affecting multiplication and survival of microorganisms
1.3 Control of microbial growth in foods
- Unit 2 :** **Food Spoilage**
2.1 Causes of food spoilage
2.2 Role of microbes in food spoilage
2.3 Factors affecting food spoilage
2.4 Changes in foods caused by microbes
- Unit 3 :** **Modes of disease transmission**
3.1 Routes of disease transmission
3.2 Source of contamination
- Unit 4 :** **Food borne illnesses**
4.1 Types of food borne illnesses
4.2 Control of food borne illnesses
- Unit 5 :** **Food Safety**
5.1 Concept and importance of safe foods
5.2 Importance of sanitation and hygiene in foods
5.3 Integrated approach to food safety
- Good hygiene practice (GHP)
- Good manufacturing practice (GMP)
- Hazard analysis critical control point (HACCP)
- Microbial risk assessment
- Quality management ISO series
- Total quality management

Practicals

- 1) Preparation of common laboratory media and special media for cultivation of bacteria, yeast and moulds.
- 2) Preparation of bacterial smears, simple staining, differential staining, spore staining, staining of moulds and yeast.
- 3) Isolation of microorganisms – different methods and maintenance of cultures of microorganism.
- 4) Bacteriological analysis of water.
- 5) Bacteriological analysis of foods.
- 6) Visits to food processing unit or any other organization dealing with advanced methods in food microbiology.

References

- 1) Ranganna S. (1986) Handbook Analysis and Quality Control for Fruit and Vegetable Products. 2nd Edition, Tata McGraw Hill publishing Co. Ltd., New Delhi
- 2) Roday S. (1999) Food Hygiene and Sanitation. 1st Edition, Tata McGraw Hill publishing Co. Ltd., New Delhi
- 3) Chris Bell, Paul Neaves and Anthony Williams (2005) Blackwell publishing
- 4) William Frazier and Dennis Westhoff (1995) 4th Edition, Tata McGraw Hill publishing Co. Ltd., New Delhi

Subject Code : 122NB53
Nutritional Biochemistry

Theory : 3 Periods/Wk (3 Credits)
Practical : 4 Periods/Wk (2 Credits)

Theory Paper : 45
Theory Internal : 30
Practical : 35
Practical Internal : 15
Total Marks : 125

Objectives : After completion of course students will be able to-

- augment the biochemistry knowledge acquired at the under graduate level
- understand the mechanism adopted by human body for regulation of metabolic pathways
- become proficient for specialization in nutrition
- perform biochemical analysis with accuracy and reproducibility

Theory

Unit 1 : Human Energy Requirements

- 1.1 Definition and components of energy requirement
- 1.2 Factors affecting energy expenditure and requirement
- 1.3 Methods of estimation of energy expenditures and requirements

Unit 2 : Carbohydrates

- 2.1 Review of chemistry of carbohydrates
- 2.2 Metabolism of carbohydrates, oxidation of glucose by glycolysis and Krebs cycle. Glycogen synthesis and breakdown. Regulation of blood glucose

Unit 3 : Proteins

- 3.1 Review of chemistry of proteins
- 3.2 Transamination, deamination
- 3.3 Urea cycle
- 3.4 Metabolism of amino acids – Glycine, tyrosine, tryptophan and methionine
- 3.5 Metabolic disorders of amino acids

Unit 4 : Lipids

- 4.1 Review of chemistry of lipids
- 4.2 Metabolism of lipids
- 4.3 Oxidation of fatty acids
- 4.4 Cholesterol biosynthesis and regulation
- 4.5 Ketosis

Unit 5 :

- 5.1 Review of chemistry of vitamins and minerals
- 5.2 Biochemical role of water soluble and fat soluble vitamins
- 5.3 Biochemical role of macro and micro minerals

Practicals

- 1) Introduction to Laboratory Equipments – Digital weighing balance, pH meter, Photo Electric Colorimeter, Spectro photometer etc.
- 2) Estimation of glucose in blood.
- 3) Estimation of serum protein
- 4) Analysis of lipids from serum
- 5) Analysis of food
 - Total protein content
 - Total fat content
 - Total carbohydrate content
- 6) Estimation of vitamin 'C' in foods
- 7) Estimation of calcium in foods
- 8) Estimation of iron in foods
- 9) Chromatographic separation of amino acids in food stuffs
- 10) Survey of Pathological Laboratories – To obtain information about the methods used for blood / urine analysis and submit a report.

References

- 1) Deb A.C. (2008) Fundamental of Biochemistry. 9th edition, New Central Book Agency (P) Ltd., 8/1 Chintamani Das Lane, Kolkatta
- 2) Satyanarayana C., U.Chakrapani (2007) Biochemistry. 3rd edition, Biochemistry Books and Allied (P) Ltd. Shubham Plaza, Kolkatta
- 3) Cox M.M., Melson D.L. (2008) Lebninger Principles of Biochemistry. 5th edition, W.H. Freeman and Company, New York
- 4) Sathe A.Y. (1999) A First Course in Food Analysis. New Age International (P) Ltd. publishers, New Delhi.
- 5) Berwal J.S., Grewal R.B., Kapoor C.M., Garg M.K. (2004) Practical Methods in Food Analysis. Agrotech publishing academy, Udaipur

Subject Code : 122CA54
Communication Approaches in Nutrition

Theory : 3 Periods/Wk (3 Credits)
Practical : 4 Periods/Wk (2 Credits)

Theory Paper : 45
Theory Internal : 30
Practical Internal : 50
Total Marks : 125

Objectives : After completion of course students will be able to-

- understand use of communication approaches in improving nutritional status of the population of different sector
- develop skill of preparing tools of communication

Theory

Unit 1 : Approaches of Communication in Nutrition

- 1.1 Traditional Approach
Folk media – songs, story, shows
- 1.2 Modern Approach
 - Participatory
 - Analytical
 - Dialogue
 - Persuasive
 - Educational
- 1.3 Modified Approach
Combination of traditional and modern approaches
- 1.4 Presentation of above approaches

Unit 2 : Methods of Communication

- 2.1 Individual communication
- 2.2 Group communication
- 2.3 Mass communication
- 2.4 Planning and preparation of communication methods

Unit 3 : Projected tools of communication

- 3.1 Transparencies for OHP
- 3.2 Soft copy of presentation (CD and Pen drive) for computer and computer aided projectors
- 3.3 Other E. learning material
- 3.4 Script for radio and TV
- 3.5 Preparation and presentation of projected tools

Unit 4 : Non projected tools of Communication

- 4.1 Model – Working, non-working
- 4.2 Print material – Leaflets, folders, posters, charts, flash cards, news letter, circular letter, bulletin
- 4.3 Preparation of non projected tools

Unit 5 : Themes and Messages

- Themes for nutrition education
- Messages for nutrition education
- 5.2 Strategies in nutrition education
 - Individual
 - Community
 - Presentation of the operation of strategies

Practicals

- Identify themes of nutrition education through literature research, experiences, pilot study/survey and prepare, present and evaluate following projected and non projected tools for effective communication. Posters, Banners, Slogans, Charts, Flash cards, Folder, Leaflets, Games, Transparencies, CD, Scripts.
Note : Any two out of projected and two out of non projected tools.

References

- 1) Maan, Gurmeet Singh (1987) The Story of Mass Communication : An Indian Perspective. New Delhi, Harnam Publishers.
- 2) Tiwari I.P. (1987) Communication Technology and Development. New Delhi, Ministry of Information and Broadcasting.
- 3) Sharma S.C. (1987) Media Communication and Development. Jaipur, Rawat Publishers.
- 4) Gamble M.W. and Gamble T.K. (1989) Introducing Mass Communication. IIInd Ed. New York, McGraw Hill Book.
- 5) Day P.R. (1977) Methods of Learning Communication Skills. Oxford, Peragamon.
- 6) Hartman, Paul and others (1986) The Mass Media and the Village Life : An Indian Study. New Delhi, Sage Publication.
- 7) Melkote S.R. (1991) Communication for Development in Third World : Theory and Practice. New Delhi, Sage.
- 8) Bhatnagar S. and Satyapal A. (eds.) (1988) education and Communication Technology : Perspective, Planning and Implementation. New Delhi.
- 9) Scott B. (1986) The Skills of Communication. Aldershot Gower Press.
- 10) Joshi P.C. (1989) Culture Communication and Social Change. New Delhi, Vikas Publications.
- 11) Mahajan K. (1990) Communication and Society. New Delhi, Classical Publications.

Subject code : 122ED55
Entrepreneurship Development in Food

Theory : 3 Periods/Wk (3 Credits)
Practical : 2 Periods/Wk (1 Credit)

Theory Paper : 45
Theory Internal : 30
Practical Marks : 20
Practical Internal : 05
Total Marks : 100

Objectives : After completion of course students will be enable to

- provide conceptual inputs regarding entrepreneurship development in food
- sensitise and motivate towards entrepreneurship development
- orient and impart knowledge towards identifying and implementing entrepreneurship opportunities

Theory

Unit 1 : Conceptual Framework

- 1.1 Concept, need and process in entrepreneurship development
- 1.2 Types of enterprise – merits and demerits
- 1.3 Role of enterprise in national and global economy

Unit 2 : The Entrepreneur

- 2.1 Entrepreneurial motivation – dynamics of motivation
- 2.2 Entrepreneurial competency – concepts
- 2.3 Developing entrepreneurial competencies – requirements and understanding the process of entrepreneurship development, self awareness, interpersonal skills, creativity, assertiveness, achievement, factors affecting entrepreneur's role

Unit 3 : Launching and Organising an Enterprise

- 3.1 Environment scanning – information, sources, schemes of assistance, problems
- 3.2 Enterprise selection, enterprise, feasibility study, SWOT analysis
- 3.3 Resource mobilization – finance, technology, raw material, site and man power
- 3.4 Market assessment, costing and quality control

Unit 4 : Areas of Entrepreneurship

- 4.1 Production and marketing of value added food products, therapeutic products, low cost nutritious food products, indigenous food products, supplementary foods
- 4.2 Consultancy areas – Diet counseling through diet clinics, Health clubs, Diagnostic/Assessment centre of nutritional status
- 4.3 Services – Catering daily meals, therapeutic diets, pack lunch, meals for occasions, food analyser

Unit 5 : Agencies for Development of Entrepreneurship

- 5.1 Government of India's policy towards promotion of entrepreneurship reservations and sanctions for small scale sector
- 5.2 Role of SSI, Procedures and formalities for setting up SSI
- 5.3 Role of banks and other agencies for development of entrepreneurship

Practicals

- 1) Enlist entrepreneurial opportunities in Food Science and Nutrition.
- 2) Select any enterprise and prepare a report of SWOT analysis.
- 3) Visit to funding agencies offices for understanding the formalities for registrations and the licences for enterprise.
- 4) Prepare and use the business games for development of entrepreneurial qualities.

References

- 1) Hisrich R.D. and Peters M.P. (1995) Entrepreneurship – starting, developing and managing a new enterprise. Richard D. Irwin INC, USA.
- 2) Meredith C.G. et al (1982) Practice of Entrepreneurship. ILO , Geneva.
- 3) Deshpande M.V. (1984) Entrepreneurship of small scale industries, concept, growth and management. Deep and Deep Publication D-1/24, R-Garden, New Delhi.
- 4) Parekh U. and Rao T.V. (1978) Personal Efficacy in Development Entrepreneurship, Learning system. New Delhi.
- 5) Vasant Desai (1991) Entrepreneurship and Entrepreneur Development, Vol. I, II, III, Himalaya Publishing House.
- 6) Maratha Chamber of Commerce, Industrial Development of Maharashtra, Latest edition.

Subject code : 122RM56
Research Methods in Nutrition

Theory : 3 Periods/Wk (3 Credits)
Practical : 2 Periods/Wk (2 Credits)

Theory Paper : 45
Theory Internal : 30
Practical Internal : 25
Total Marks : 100

Objectives : After completion of course students will be able to

- know importance of research in food science and nutrition
- understand the types, tools applicable to research problem
- construct common data collection tools
- develop skills of preparing out line of research work

Theory

Unit 1 : Foundation of Scientific Research

- 1.1 Research – meaning and definition
- 1.2 Need of research in food science and nutrition
- 1.3 Research process
 - Selection and formulation of research problem
 - Specifying objectives
 - Formulating hypothesis
 - Deciding variables

Unit 2 : Design Strategies in Research

- 2.1 Descriptive studies
 - Correlation studies
 - Case studies
 - Cross sectional/Survey
- 2.2 Analytical studies
 - Observational studies
 - Cohort studies
 - Cross sectional studies/Survey

Unit 3 : Methods of Sampling

- 3.1 Characteristics of good sampling
- 3.2 Probability or random sampling
- 3.3 Non probability sampling

Unit 4 : Research Tools

- 4.1 Levels of data measurements and characteristics of good measurement
- 4.2 Types of tools and their uses
 - Questionnaire
 - Schedule
 - Rating scale
 - Attitude scale
 - Interview – structured and unstructured
 - Observation – participant and non participant
- 4.3 Concept of data
 - Types of Data – Qualitative and Quantitative data
 - Analysis of Data – Qualitative and Quantitative data analysis

Unit 5 : Statistical Testing of Hypothesis

- 5.1 Application of parametric tests
 - r test
 - t tests
 - Z test
 - F test
 - ANOVA
- 5.2 Application of non parametric tests
 - Chi square test
 - Spearman's Rank correlation

Practicals

- 1) List research areas in food science and nutrition
- 2) Prepare synopsis/outline of dissertation work
 - Select problem for dissertation from literature research, experience of guide & teachers, and experiment/pilot study.
 - Find out key words, their meaning and definitions from dictionary and encyclopedias.
 - Design conceptual model of the study.
 - Collect review on selected variables from national and international journals and prepare note cards and reference cards (follow the rules of scientific writing)
 - Decide and prepare tools of measurement of variables
 - Specify objectives

- Frame hypothesis
 - Select locale of the study
 - Decide sample size and sampling techniques
 - Decide applicable statistical tests
- 3) Conduct pilot study for calculating validity, reliability and usability of the tools.
 - 4) Prepare master table for analysis
 - 5) Prepare time schedule and facilities required for your dissertation work.

References

- 1) Van Maanen (1983) Qualitative Methodology. Sage Publication
- 2) Sumati Mulay and Sabarathanam V.E. (1980) Research Methods in Extension Education. New Delhi, Sole Selling Agents, MANASHYAN, 32.
- 3) Bryman A. and Cramer D. (1994) Quantitative Data Analysis for Social Scientist
- 4) Aravindra Chandra and Saxena T.P. Style Manual for Writing : Thesis, Dissertations and Papers in Social Sciences. New Delhi, Metropolitan Book Co. Pvt. Ltd.
- 5) Kerlinger, Foundation of Educational Research
- 6) Ingle P.O. Scientific Report Writing. Nagpur, Sarla P. Ingle.

(Note : The syllabi for General Interest Course shall be as per Science faculty.)
