University of Pune

UNIVERSITY OF PUNE

Third Year (Food Science & Nutrition) Syllabus For The Three-Year Integrated Bachelor of Science (B.Sc.) In Home Science Degree Course

To be introduced from Academic Year 2015-16

Semester - V

Faculty of Home Science

Three Year Proposed curriculum structure to be implemented from June 2015

Semester	No. of Papers (T)	No. of Practical (P)	Theory (60 marks)	Practical (40 marks)	Total (100)	Workload*		
I	5	5	300	200	500	5Tx4*=20 5Px3*=15	35	35
II	5	5	300	200	500	5Tx4*=20 2Px3*=15	35	
III	5	5	300	200	500	5Tx4*=20 5Px3*=15	35	35
IV	5	5	300	200	500	5Tx4*=20 5Px3*=15	35	
V	5	5	300	200	500	5Tx4*=20 5Px3*=15	35	35
VI	5	5	300	200	500	5Tx4*=20 5Px3*=15	35	
Internship					**50**			
Total	**30**	**30**	**1800**	**1200**	**3050**		**210**	**105**

B. Sc. (Home Science)
Third Year – Food Science & Nutrition
Third year B.Sc. Home Science curricular includes two semesters.

Semester – V

Paper No. Subject		Exam scheme													
		Theory								Theory				Exam	
		External		Internal		External		Internal		External		Internal			
		Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	At	By
41	Basic Nutritional Biochemistry	50	20	10	04	-	-	-	-	50	20	10	04	The end of Sem	The College
42	Food Microbiology	50	20	10	04	-	-	-	-	50	20	10	04		
43	Food Preservation	50	20	10	04	-	-	-	-	50	20	10	04		
44	Normal and Therapeutic nutrition	50	20	10	04	-	-	-	-	50	20	10	04		
45	Finishing Skills Skill	50	20	10	04	-	-	-	-	50	20	10	04		
Pr 46	Based on Paper No. 1	-	-	-	-	30	12	10	04	30	12	10	04	The end of Sem	The College
Pr 47	Based on Paper No. 2	-	-	-	-	30	12	10	04	30	12	10	04		
Pr 48	Based on Paper No. 3	-	-	-	-	30	12	10	04	30	12	10	04		
Pr 49	Based on Paper No. 4	-	-	-	-	30	12	10	04	30	12	10	04		
Pr 50	Based on Paper No. 5	-	-	-	-	30	12	10	04	30	12	10	04		
Total		250		50		150		50		400		100			

T.Y. B. Sc. (Home Science) – Sem.- V
Paper 41 : Basic Nutritional Biochemistry

Theory - 4lec./week	Theory -60 marks
Practical -	Practical -40 marks

Unit I	**Biochemistry**	4
	• Introduction, Definition, objectives, scope and inter relationship between Biochemistry and nutrition. • Metabolism – Digestion & Absorption of different nutrients in the human system.	
Unit II	**Carbohydrates**	12
	• Structure & Function. • Classification, Properties (physical & chemical) • Metabolism of carbohydrates- Glycolysis, TCA cycle, glycogen metabolism, HMP shunt, ATP production . • Energy Metabolism – BMR, heat regulation in the body, Biological oxidation, reduction, Electron transport chain. • Altered energy metabolism in different conditions of over nutrition & under nutrition	
Unit III	**Proteins**	8
	• Structure & Function. • Classification • Metabolism of proteins – Transamination, deamination, oxidative decarboxylation, urea cycle. • Changes in protein metabolism in different disease studies.	

Unit IV	**Fats**	8
	• Structure & Function. • Classification of fatty acids & its significance in health and disease. • Beta oxidation of fats. • Ketone bodies & their significance. • Essential fatty acids, omega 3 and 6 their sources and role in health.	
Unit V	**Enzymes & Hormone**	8
	• Definition, Nomenclature & classification. • Mecanism of enzyme action. • Factors affecting enzymes. • Enzyme inhibition. • Types & role of coenzymes.	
Unit VI	**Inborn errors of metabolism** • Nutraceuticals and phytochemicals for prevention of non communicable diseases like cardiovascular diseases, cancer, diabetes, cholesterol management, obesity and joint pain, immune enhancement, age-related muscular degeneration, endurance performance and mood disorders	8

Practical:

1. Qualitative and Quantitative tests for **determination of** carbohydrates, lipids, hormone, proteins, amino – acids and vitc.
2. Estimation of ascorbic acid by titirmetirc method
3. Determination of starch, sugar, and analysis of proximate Constituents of foods.
4. Estimation of energy requiremet. BMR Energy Expenditure on physical activities.
5. Assessment of micronutrient status Iron Calculim
6. Estimation of Urea, Estimation of Creatinine
7. Enzymes – Effect of PH and temperature on enzyme activity. Effect of salivary amylase on starch, Pepsis on proteins and lipase on facts.
8. Determination of functional properties of protein.

Reference

1. Swaminathan, M. 1985, Advanced text book on food Nutrition vol I & II Bapcco, Banglore.
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3. Okoye, Z.S.C., 1992, Biochemical Aspects of Nutrition Prentice Hall of India, New Delhi.
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9. ISI (1985) Hand book of Food and Analysis Part –I to XI Manak Bhawan, New Delhi.
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11. West E. S., Todd W. R., Mason H. S. and Van Bruggen J. T. (1994) 4th Ed. Textbook of biochemistry, Amerind Publishing Co. Pvt. Ltd.
12. White A., Handlar P., Smith E.L., Sletter D. W. (1959), 2nd Ed. Principles of Biochemistry, large Medical Book.
13. Murray, R. K. , Goranner D. K., Mayes P. A. and Rodwell V. W. (1993) 23rd Ed. Harper's Biochemistry, Large Medical Book.
14. Lehniger A. L., Nelson D. L. and Core M. M. (1993), 2nd Ed. Principles of Biochemistry, CBS Publishers and distributors.
15. Devlin T. M. (1986) 2nd Ed. Text Book of Biochemistry with clinical correction, John Wiley and Sons.
16. Stryles L. (1995) : Biochemistry Freeman WH and Co.

T.Y. B. Sc. (Home Science) – Sem.- V

Paper 42 : Food Microbiology

Theory - 4lec./week	Theory -60 marks
Practical -	Practical -40 marks

Unit I	• Brief history of food microbiology and introduction to important microorganisms in foods.	**6**
Unit II	• Cultivation of micro organisms - Nutritional requirement of micro organism. • Types of media used. • Methods of isolation and identification of microorganisms.	**6**
Unit III	• Primary sources of contamination of micro organisms in foods. • Physical and chemical methods used in the destruction of micro organisms (sterilization and disinfection)	**6**
Unit IV	• Fundamentals of controls of micro organisms in food. • Extrinsic and intrinsic parameters affecting growth and survival of microbes.	**6**
Unit V	• Food spoilage - contamination and micro organisms in the spoilage of different kinds of foods and their presentation. • Cereal and cereal products, vegetable and fruits, fish and other sea foods, meat and meat products, eggs and poultry, milk and milk products, canned foods.	**6**
Unit VI	• Public health hazards due to contaminated foods. • Food borne infections and intoxications symptoms, mode and sources of transmission and methods of prevention. • Food borne disease outbreak.	**6**
Unit VII	• Fermented foods and their benefits. • Traditional fermented foods, oriental fermented foods, probiotics.	**6**
Unit VIII	• Indicator organism milk and water sanitary quality. • Microbiological criteria of Foods microbial standards.	**6**

Practical :

1. Demonstration of the different parts of the microscope, their use and care of the microscope including oil immersions lens.
2. Preparation of bacterial smears and Gram staining
3. Differential staining of bacteria.
4. Preparation of nutrient agar and PDA for cultivation of bacteria, yeast and moldes.
5. Isolation of micro organisms by pour plate method spread plate and streak plate methods.
6. Morphological identification of important molds and yeast in foods (slides & cultures) Rhizopus, Mucor, Aspergilus, Penicilium, Atternaaia, Helminthosporium
7. Sampling of air, water, dust, soil, food, handlers to study the various sources of transmission of micro organisms in food.
8. Demonstration of microbiological analysis of water, milk and food for Enumeration of standard plate count and coli form count.
9. Assessment of surface sanitation of kitchens by swab rinse method.

References

1) Frazier, W. C. and Westhoff, D. C. (1988) : Fourth Edition, Food Microbiology, Mc Graw Hill inc.
2) Jay James, M. (1986) : Third Edition, Modern Food Microbiology, Van Nostrand Reinhold company Inc.
3) Pelezar, M. I. and Reid, R. D. (1978) : Microbiology Mc Graw Hill Book Company, New York.
4) Benson Harald, J. (1990) : Microbiological application Wn. C. Brown Publishers, U.S.A.
5) Collins. C. H. and Lyne. P. M. (1976) : Microbiological methods, Buttersworth, London.

T.Y. B. Sc. (Home Science) – Sem.- V

Paper 43 : Normal and Therapeutic Nutrition

Theory - 4lec./week	Theory -60 marks
Practical -	Practical -40 marks

Unit I	**Menu planning:** • Definition, importance and factors to be considered while planning meal **Nutritional & Food Requirement for Infants** • Growth & Development • Nutritional Requirements. • Food Requirements.	6
Unit II	**Nutrition during Pregnancy and Lactation**	6
Unit III	**Diet during Infancy:** • Breast Feeding, weaning and introduction to supplementary feeding	6
Unit IV	**Diet during Preschoolers and school age:** • Food habits and Nutritional requirements	6
Unit V	**Diet during adolescent:** • Food habits and Nutritional requirements	6
Unit VI	**Geriatric (elderly)Nutrition:** • Physiological changes, Nutritional Requirement and Dietary Modification.	6
Unit VII	**Therapeutic Nutrition:** • Dietary management of gastrointestinal disorders- diarrhea, constipation and fever (acute and chronic)	6
Unit IX	**Role of Dietician in hospital:** • Responsibilities. • Diet Counseling.	6

Practical :

1) Standardization of common food preparations for portion size. (02)

2) Planning and preparation of normal diet. (02)

5) Planning and preparation of low fat and low calorie recipes. (02)

6) Planning and preparation of high fiber recipes. (02)

7) Planning and preparation of low fiber and low residue recipes. (01)

8)Planning and preparation of weaning foods. (01)

9) Planning and preparation of low cost recipes for different age groups (01)

References

1) Anderson L., Dibble M.V., Turkki P.R., Mitchall H.S. and Rynbergin H.J. (1982) : Nutrition in health and disease, 7th Ed., J.B. Lippincott & Co., Philadelphia.
2) Antia F.P. (1973) : Clinical dietetics and nutrition, 2nd Ed., Oxford University Press, Delhi.
3) Mahan L.K., Arlin M.T. (1992) : Krause's food, nutrition and diet therapy, 8th Ed., W.B. Saunders Co., London.
4) Robinson C.H., Lawler M.R., Chenoweth W.L. and Garwick A.E. (1986) : Normal and therapeutic nutrition, 17th Ed., Macmillan Pub. Co.
5) Williams S.R. (1989) : Nutrition and diet therapy, 6th Ed., Times Mirror/Mosby college Pub. St Louis.
6) Raheena Begum (1989) : A textbook of foods, nutrition and dietetics, Sterling Pub., New Delhi.
7) Joshi S.A. (1992) : Nutrition and dietetics, Tata McGraw Hill Pub., New Delhi

T.Y. B. Sc. (Home Science) – Sem.- V
Paper 44 : Food Preservation

Theory - 4lec./week	Theory -60 marks
Practical -	Practical -40 marks

Unit I	**Food preservation**	10
	• Definition and objectives. • Importance, brief history & traditional methods of food preservation	
Unit II	• Food spoilage causes and effects • Stability of foods and factors affecting storage stability. • Different types of storage and ideal storage conditions for different foods in brief.	10
Unit III	• Different types of storage and ideal storage conditions for perishable, semi perishable and non perishable foods	8
Unit IV	• Asepsis. • Use of high temperature: blanching, pasteurization, sterilization and UHT processing, canning, extrusion cooking, dielectric heating, microwave heating, baking, roasting and frying, etc. • Use of low temperature. - refrigeration, freezing, CA, MA, and dehydro-freezing. • Drying or dehydration. • Use of chemical preservations and food additives. • ultra- filtration, reverse osmosis. • Processing and preservation by non-thermal methods, irradiation, high pressure, pulsed electric field, hurdle technology. food	12

	fermentations, pickling, smoking etc.	
Unit V	**Food Packaging** • Importance and types of packaging materials. • Passive packaging, Active packaging, Smart and intelligent packaging	8

Practical:

1) Introduction to aseptic handling in laboratory.

   Principles of food preservation and sources of contamination.

2) Preparation of pickles (on basis of expected shelf life) Short and long shelf life. Pickles, sweet pickles, spicy and sour pickles with or without oil.

3) Preparation of jam, jelly, morabbas, marmalade, fruit candies, candied peels, guava cheese, toffees.

4) Sauces – tomato ketchups, tomato sauce, red chilli sauce, green chilli sauce, tamarind sauce

5) Chutney – Tomato chutney, various dry chutneys.

6) Syrups and squashes – Lemon squash, orange squash, pineapple squash, grape squash, mango squash.

7) Instant foods – Masalas.

8) Freezing of fruits and vegetables.

9) Regional / common dehydrated foods.

10) Quantity foods production of some foods.

11) Visit to canning, cold storage plants and various food industries for developing an Awareness of commercial techniques of food preservation and packaging.

References

1) Frazier W. & Westhoff D. (1988) : Food Microbiology, Tata Mc Graw – Hill Publishers.
2) Desorosier N. W. (1963) : The Technology of Food Preservation. The AVT Publishing Company.
3) Salunke D. K. (1974) : Storage, Processing and Nutritional Quality of Fruits and Vegetables, C. R. S. Press, Cleveland Ohio.
4) Subbulakshmi G. and Udipi S. A. (2002) : Food Processing and Preservation, New Age International (P) Ltd. Publication.
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6) Home scale processing and preservation of Fruits and Vegetables CFTRI Mysore, 1967.
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8) Desrosier NW & James N.1977. Technology of Food Preservation. 4th Ed. AVI. Publ.
9) Fellows PJ. 2005. Food Processing Technology: Principle and Practice. 2nd Ed. CRC.
   Jelen P. 1985. Introduction to Food Processing. Prentice Hall.
10) Potter NN & Hotchkiss 1997. Food Science. 5th Ed. CBS.
11) Potty VH & Mulky MJ. 1993. Food Processing. Oxford & IBH.
12) Ramaswamy H & Marcotte M. 2006. Food Processing: Principles and Applications. Taylor & Francis.

T.Y. B. Sc. (Home Science) – Sem.- V
Paper 45 : Finishing Skills

Theory - 4 Lec./week Practical -100 marks
Practical -

Unit I	**Introduction to soft skills** • What are soft skills • Importance • Attributes • Top soft skills • Practicing soft skills	04
Unit II	**Self discovery** • What is SWOC • SWOC analysis • Analysis Grid • Benefits of analysis • Self image.	04
Unit III	**Enhancing communicating** Types of communication, verbal skills & non verbal skills • Speaking skills, formal & informal communication, barriers of communication, effective communication, public speaking, overcoming fear of public speaking • Writing skills, importance of effective writing creative writing , drawbacks of written communication • Non verbal (body) communication – forms of body parts of body language uses of body language, improving body language.	08
Unit IV	**Etiquette & Manners** • Introduction to manners and etiquettes • Classification of etiquettes • Benefits of etiquettes • Poor manners of etiquettes special manners & etiquettes, - accompanying woman/men, taboo topics, driving, flight mobile office professional & various occasional manners & etiquettes.	08
Unit V	**Group discussion** • Introduction & meaning of group discussion • Need, types, and skills required, essential elements of group discussion, • Etiquettes of group discussion • Preparation for group discussion • Techniques of group discussion	06

	• Non verbal communication in group discussion • Characters & traits tested in group discussion	
Unit VI	**Time management** • Introduction • Features of time • 80.20 rules • Time management matrix • Difficulties in the management • Time wasters • Time savers • Realizing the value of time • Importance of time management	04
Unit VII	**C V writing** • Introduction and meaning, • Difference among bio data, CV & resume, purpose types, tips, design, content and cover letter.	04
Unit VIII	**Interview skills** • Introduction & meaning • Types of interview • Basic tips, dos and don'ts, before during & after the interview • How to present well in interview • Typical questions asked	06
Unit IIX	**Team work and team building** • Aspects, skills for team building, Team vs. Group • Characters of effective team • Role of team leader and team members • Difficulties in team building and team work	04

Practical:

1. Measurement of soft skills
2. SWOC analysis
3. Testing handwriting
4. Introduction of body language.
5. Group discussion on suitable topic and its analysis
6. Testing etiquettes of manners.
7. Writing CV and covering letter
8. Testing the fine management skills.
9. Practicing interview / mock interview

References

1. Dr. K. Alex, 2011, Revised edition, soft skills - S. Chand Publication, ISBN – 81 – 219 – 3192 – 4
2. Essentials of business communication, Rajendra Pal, J.S.Korlanhalli, S. Chand & Sons, New Delhi.
3. Effective Bussiness communication, Asha Kaul, Prentice, Hall of India, Pvt. Ltd, New Delhi.
4. Effective Teamwork, Michael A. West, BPS Blackwell.
5. Principles of management, P.C. Pripath, P.N. Reddy, the McGraw Hill.
6. How to write better letters, S.K.Tarafder, A.P.H. publishing corporations.
7. Professional presentations, Malcolm Goodale, Cambridge University press.
8. The motivation manual,Gisela Hagemann, multi-tech publishing co.
9. Basic Managerial skills for all, E.H.MaGrath, S.J. Prentice, Hall of India, Pvt. Ltd, New Delhi.

Semester - VI

Semester – VI

Paper No.	Subject	Exam scheme													
		Theory				Practical				Total				Exam	
		External		Internal		External		Internal		External		Internal			
		Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	At	By
51	Institutional food service management	50	20	10	04	-	-	-	-	50	20	10	04	The end of Sem	The College
52	Community Nutrition	50	20	10	04	-	-	-	-	50	20	10	04		
53	Food product development and quality control	50	20	10	04	-	-	-	-	50	20	10	04		
54	Diet Therapy	50	20	10	04	-	-	-	-	50	20	10	04		
55	Finishing Skills	50	20	10	04	-	-	-	-	50	20	10	04		
Pr 56	Based on Paper No. 1	-	-	-	-	30	12	10	04	30	12	10	04	The end of Sem	The College
Pr 57	Based on Paper No. 2	-	-	-	-	30	12	10	04	30	12	10	04		
Pr 58	Based on Paper No. 3	-	-	-	-	30	12	10	04	30	12	10	04		
Pr 59	Based on Paper No. 4	-	-	-	-	30	12	10	04	30	12	10	04		
Pr 60	Based on Paper No. 5	-	-	-	-	30	12	10	04	30	12	10	04		
Total		250		50		150		50		400		100			

T.Y. B. Sc. (Home Science) – Sem.- VI

Paper 51 : Institutional Food Service Management

Theory - 4lec./week
Practical -

Theory -60 marks
Practical -40 marks

Unit I	**Food service systems and their development** • Introduction to food service industry. • Types of food service. • Styles of food service. • Menu planning.	8
Unit II	**Types of organization** • Different types and their organizational structure. • Management • Attributes and responsibility of managers. • Principles of management	8
Unit III	**Food Material Management** • Definition, importance • Food selection • Methods of purchasing, receiving and store room management.	8
Unit IV	**Financial Management** • Book Keeping, Accounting, Organization Management. • Pricing of food • Factors affecting & Cost control	8
Unit V	**Plant and equipment management** • Maintenance, sanitation, safety, • Garbage disposal, pest control. • Floor Planning & lay out & equipment planning. • Emphasis on traffic patterns and activity centers.	8
Unit VI	**Laws** • Laws affecting food service operations. • Labor policies and legislations. • Environment protection Act 1986 • Essential commodities Act1937 • Food Safety – FSSA 2006	8

Practical:

1) Menu planning for hundred peoples (Breakfast, Lunch, Snacks, Dinner)
2) Development of recipe book.
3) Preparation of various menu cards
4) Table setting
5) Maintenance of accounts and record keeping
6) Visit to different food service industry.

References

1) Boella M.J. (1963) : Personnel management in the hotel and catering industry, 3rd Ed., Hutchinson, London.
2) Drucker P.F. (1975) : Management, Allied Publishers, New Delhi.
3) Feam D. (1969) : Management systems for the hotel catering and allied industries.
4) Hitchcock M.J. (1980) : Food service systems administration, Macmillan, New York.
5) Koontz H., Dannel D. Weicrich H. (1983) : Essentials of management, Indian Ed.
6) Kotas R. (1972) : Accounting in the hotel and catering industry, Intertext Books, 3rd Ed. Butler and Tanner, London.
7) Moore C.L. and Jaediicke R.K. : Managerial accounting, South Western Publishing Co.
8) Sethi M., Malhan S. (1993) : Catering management : An integrated approach, Wiley Eastern, New Delhi.
9) Terry G.R. (1972) : Principles of management, 6th Ed. Irwin Dorsey Inter-national: London.
10) West B.B., Wood L. Revised by Harger V.F., Shugart G.S., Payne-Palacio J. (1989) : Food service in institutions, 6th Ed., Macmillan Pub. Co., New York.

T.Y. B. Sc. (Home Science) – Sem.- VI
Paper 52 : Community Nutrition

Theory	- 4lec./week	Theory	-60 marks
Practical	-	Practical	-40 marks

Unit I	**Assessment of Nutritional status** • Definition and methods • Anthropometry • Clinical Assessment • Biochemical Analysis • Biophysical methods • Diet surveys	**10**
Unit II	**Major** Nutritional Problems Prevalent India • PEM, • Vitamin A,Znic, Iron and Iodine Deficiencies, causes ,manifestation and prevention.	**10**
Unit III	**Food Behavior:** • Factors affecting food behavior agricultural, economic, environmental, socio-cultural, psychological, religious. • Role of industrialization, work patterns and mass media. • Food behavior and linkages with health. **Food habits** • Knowledge, attitudes, practice. • Food habits and dietary patterns in different regions and communities in India. • Factors affecting food habits – family size, composition, structure, economic status, working status of mother, education	**12**
Unit IV	**Nutrition education** • Definition • Objectives, principles and importance of nutrition education • Methods of Nutrition Education	**8**
Unit V	**Nutrition policies and programmes** • Food Security Bill • Prophylaxis programme (Vit. A, Iron, Iodine midday meal programme, ICDS) • Maternal & Child Health Programmes	**8**

Practical :

1) Anthropometric Measurements:

- Height, weight, circumference measurements, head, chest, mid-upper arm, waist, hip
- Precautions to be taken, Accuracy, precision and reliability of measurements.
- Intra and inter observer variability and errors.
- Tools used and sensitivity.

2) Comparison with norms and interpretation to assess nutritional Status (01)

- WHO standards
- Weight for age, height for age, weight for height, MUAC, Z-scores, standard deviation, BMI, waist to hip ratio and significance.

3) Tests for body composition – methods in brief and significance (01)

- Measurement of fat using skin-fold thickness.

4) Growth charts-plotting of growth charts, growth monitoring and promotion. (01)

5) Clinical assessment and signs of nutrient deficiency for the following - (01)

- PEM (Kwashiorkor, Marasmus), vitamin A, anaemia, rickets, B-complex deficiencies.

6) Bio-chemical parameters commonly used for assessing nutritional status (01)

- Blood and Urine values: Normal and cut-off points for desirable, at risk/deficiency
- Proteins – total protein, albumin, transferin, haemoglobin, ferritin
- TIBC, UIBC, plasma, iron, vitamins- fat soluble and water soluble
- Minerals, lipids

7) Estimating food and nutrient intake:

- 24 hours diet recall method, weigh men method, food diaries, food frequency data and food logs and situations in which each can be used.
- Merits and limitations of each – formulation of the tool, collection of data, estimation of intakes.

8) Field visits to observe nutritional and health programmes. (02)

References

1) Agrawal A. N. (1981) : Indian economy problems of development and planning. Jelliffie D. B. (1968) : Child health in the tropics.
2) Ghosh S. (1989) : You and your child.
3) Misra S.K. and Puri V.K. (1992) : Indian economy.
4) Shukla P.K. (1982) : Nutritional problems in India.
5) Thankamma J. (1976) : Food adulteration.
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7) Preventive of food adulteration act (1994) : Government of India.
8) Jelliffie D. B. (1968) : Assessment of the nutritional status of the community, World Health Organization.
9) Sain D.R., Lockwood R. and Scrimashaw N.S. (1981) : Methods for the evaluation of the impact of food and nutrition programmes, United nations university.
10) Ritchie J.A. (1967) : Learning better nutrition, FAO, Rome.
11) Gopalan C. : Nutrition and health care, Nutrition Foundation of India, Special publication series.
12) Beghin I., Cap M. and Dujardan B. (1968) : A guide to nutrition status assessment, W.H.O. Geneva.
13) Gopaldas T. and Seshadri S. (1987) : Nutrition monitoring and assessment, Oxford University Press.
14) Mason J.B., Hachicht J.P., Tabatabai H. and Valverde V. (1984) : Nutritional surveillance, W.H.O.

T.Y. B. Sc. (Home Science) – Sem.- VI
Paper 53 : Food Product development and quality control

Theory	- 4lec./week	Theory	-60 marks
Practical	-	Practical	-40 marks

Unit:I	Importance and scope of product development.	8
Unit:II	Selection and storage of raw materials, methods of preparations.	8
Unit:III	Sensory evaluation, standardization of food products.	8
Unit:IV	Self life of food product and Packaging.	8
Unit:V	Hazards in supply chain (biological, chemical and physical) and food adulteration.	8
Unit:VI	Quality, importance of quality control, National, International food laws regulation and standards, Quality assurance, sampling procedures and food additives.	10

Practical:

1. Market survey of food products and it's cost
2. Study of food labeling and legal requirements.
3. Study of requirements of food product under BIS and Agmark.
4. Product Development and Shelf life studies.
5. Study of pack house and Export facility centers
6. HACCP Principles, Decision tree.
7. Detection of adulterants.
8. Microbial standards of food products.

T.Y. B. Sc. (Home Science) – Sem.- VI
Paper 54 : Diet Therapy

Theory - 4lec./week	Theory -60 marks
Practical -	Practical -40 marks

Unit I	**Basic concept of diet therapy** • Therapeutic adaptations of normal diet. • Principals & classification of therapeutic diets. **Routine Hospital Diet** • Regular, Light, Soft, Fluid Diet. • Parenteral & Enteral Feeding. • Per- & post-operative Diets	8
Unit II	**Diet in Obesity & Underweight** • Etiology and assessment • Prevention and treatment • Dietary management **Diet in Fever** • Causes • Types • General dietary consideration. • Typhoid, Influenza, Malaria. • TB	8
Unit III	**Diet in Gastrointestinal Diseases** -Etiology, Symptoms, & management of, • Peptic Ulcer. • Acidity **Diet in Liver Diseases** • Functions of liver • Liver function test • Etiology, Symptoms, & management of, -Cirrhosis of Liver -Viral Hepatitis -Hepatic Coma	8
Unit IV	**Diet in Diabetes Mellitus** • Classification, Symptoms, Diagnosis, Management of Diabetes Mellitus. • Oral Hypoglycemic agents. • Nutritional Management. • Special Diabetic Foods. • Artificial Sweeteners. • Patient Education.	8
Unit V	**Diseases of Cardiovascular System**	8

	• Hypertension: Type, Etiology, Causes, Symptoms, Nutritional Management. • Atherosclerosis: Etiology & Risk Factors, Nutritional Management. • CVD **Diet in Kidney Diseases** • Functions of Kidney. • Etiology, Symptoms, Nutritional Management. -Acute Renal Failure -Chronic Renal Failure -Urinary Calculi • Dialysis : Types, Dietary Management	

Practical

- Planning & preparation of full fluid food preparation.
- Planning & preparation of clear fluid food preparation.
- Planning and preparation of diets, without insulin, with insulin, adult and juvenile, diabetes in pregnancy, diabetes and illness.
- Formulation of low sodium & low cholesterol recipes.
- Planning and preparation of diets hypertension.
- Planning and preparation of diets for acute renal failure.
- Planning and preparation of diets for chronic renal failure.
- Planning and preparation of diets for dialysis.

References

1) Anderson L., Dibble M.V., Turkki P.R., Mitchell H.S. and Rynbergin H.J. (1982) : Nutrition in health and disease, 17th Ed., J.B. Lippincott and Co. Philadelphia.
2) Antia F.P. (1973) : Clinical dietetics and nutrition, 2nd Ed., Oxford University Press, Delhi.
3) Mahan L.K., Arlin M.T. (1992) : Krause's food nutrition and diet therapy, 8th Ed., W.B. Saunders Co., London.
4) Robinson C.H., Lawler M.R., Chenoweth W.L. and Garwick A.E. (1986) : Normal and therapeutic nutrition, 17th Ed., Macmillan Pub. Co.
5) Williams S.R. (1989) : Nutrition and diet therapy, 6th Ed., Times Mirror/Mosby college Pub. St Louis.
6) Raheena Begum (1989) : A textbook of foods, nutrition and dietetics, Sterling Pub., New Delhi.
7) Joshi S.A. (1992) : Nutrition and dietetics, Tata McGraw Hill Pub., New Delhi.
8) Bamji M. S. Rao, P. N. Reddy V (Eds) (1996) Textbook of Human nutrition, Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.

T.Y. B. Sc. (Home Science) – Sem.- VI
Paper 55 : Finishing Skills

Theory - 4lec./week	Theory -60 marks
Practical -	Practical -40 marks

Unit I	**Dietary counseling** • Counseling process& its significance • Assessment of need of patient • Establishing rapport • Communication process • Patient education • Pre requisites & preparation for setting up a counseling center • Calorie requirements for different activities (pre & post workout)	10
Unit II	**Traditional Indian Food Products** • History of traditional recepies of different states of the country • Value addition of traditional recepies & meals • Nutrient composition of traditional v/s value added meals	05
Unit III	**Bakery & Confectionery** • Selection, properties & functions of ingredients used in bakery & confectionary • Emulsifiers used in bakery • Tools & techniques used in bakery • Quality control of bakery products	10
Unit V	**Food Analysis** • Importance & history of food Analysis • Sample & sampling techniques • Principles & methods of estimation of different nutrients in foodstuffs.	8
Unit VI	**Application and scope of entrepreneurship development in the field of Home Science** • Entrepreneurship management like resource management (man, machine, material and human behavior) • Small enterprises – definition, characteristics, relation between small and large unit, objectives and scope, opportunities for entrepreneur carrier their role in economics development and problems	05
Unit VII	**Computer skills** • Introduction to computers, evaluation of computer characteristics, classification, functions of computers, data representation,	10

	• Computer hardware- central processing unit, input/output devices, microprocessors (fundamentals), • Computer software – Ms- world , PowerPoint, excel, Coral draw	

Practical:

1. Case study- selection of 2-3 patients, clinical, nutritional & biochemical profile, therapeutic modification of diet, report writing.
2. Market survey of different supplements with reference to their source, benefit, cost, contents.
3. Enlisting traditional recepies of different states of the country
4. Preparation of meals of different states
5. Use of different bakery equipments
6. Standard methods of making different types of biscuits, cookies, cakes, bread, etc.
7. Visit to quality control laboratory & food processing industries
8. Market survey of processed foods for quality assurance
9. Preparation of reagent
10. Running canteen for one week & report writing
11. Preparation of MS-word file, excel sheet & power point presentation

References

1) Jose Paul, N. Ajit Kumar, Entrepreneurship Development and Management, Himalaya Publishing.
2) Khanka S. S. Chand and Co. Ram Nagar, New Delhi, Entrepreneurship Development
3) M. Gangadhara Rao, "Entrepreneurship and Entrepreneurical development, Kanishka Publishing House, New Delhi – (1992).
4) Vasant Desai – Entrepreneurship Development, Himalaya Publishing House (1991)
5) Sami Uddin – Entrepreneurship Development in India, Mittal Publication, New Delhi.
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15) Baianu I. C. (Editor) : Physical (Chemistry) of food process, Vol –1 fundamental Aspects, AVI Books, New York.
16) Fennema, O. R. (Editor) : Food chemistry, 2nd Edn. Marcel Dekker inc. New York. (1985)
17) Hawk P. B., Oser, B.K. and Summerson, W. H. 1965, Practical Physiological Biochemistry. T ata McGraw Hill Publishing Co. Ltd., New Delhi.
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19) A. O. A. C. 1996. Official Methods of Analysis Association of official Agricultural Chemistry, Washington.
20) Ranganna, S. 1964 Hand Book of Analysis and Quality Control for Fruit and Vegetable Products Tata McGraw Hill Publishing Co. Ltd. New Delhi.
21) Orten, J. M. and Neuhans, O. W. 1982. Human Biochemistry C. V. Mosbey Co, London.

Internship Marks = 50
(for both Specification : 1. Food Science and Nutrition 2. Textile)