

Savitribai Phule Pune University, Pune

Third year B.Sc. (Home Science) Food Science and Nutrition effect from (2021-2022)

Semester V

Course Code	Course	Teaching scheme Hours/Week			Examination Scheme and Marks					Credit	
		Theory	Tutorial	Practical	CIA	End-Sem	CIA	PR	Total	TH	PR
HS-501	Nutritional Biochemistry	03	01	04	30	70	20	30	150	3	1.5
HS-502	Diet Therapy I	03	01	04	30	70	20	30	150	3	1.5
HS-503	Health, Hygiene and Microbiology	03	01	04	30	70	20	30	150	3	1.5
HS-504	Dietary Management for health and fitness	03	01	04	30	70	20	30	150	3	1.5
HS-505	Personality and Soft Skill Development – I	3	--	--	15	35			50	2	
HS-506	Entrepreneurship Development– I	3	--	--	15	35			50	2	
		18	4	16	150	350	80	120	700	16	6
Total Credits										22	

Semester VI											
Course Code	Course	Teaching scheme Hours/Week			Examination Scheme and Marks					Credit	
		Theory	Tutorial	Practical	Theory		Practical		Total	TH	PR
		Theory	Tutorial	Practical	CIA	End-Sem	CIA	PR	Total	TH	PR
HS-601	Institutional Food Service Management	03	01	04	30	70	20	30	150	3	1.5
HS-602	Community Nutrition	03	01	04	30	70	20	30	150	3	1.5
HS-603	Food Product Development and Quality Control	03	01	04	30	70	20	30	150	3	1.5
HS-604	Diet Therapy II	03	01	04	30	70	20	30	150	3	1.5
HS-605	Bakery Science – I	3	--	--	15	35			50	2	
HS-606	Internship or Project – I	3	--	--	15	35			50	2	
		18	4	16	150	350	80	120	700	16	6
Total Credits										22	

Semester V

HS-501 Nutritional Biochemistry(Th)

Objectives:

1. This course will enable students to:
2. Understand the fundamentals of metabolic processes occurring in the body.
3. Develop awareness about the significance of various metabolic processes / pathways.
4. Develop the ability to apply the significance of these processes to different physiological / metabolic conditions.

Credits-03+1.5

Theory: 4 Lectures/week

Theory: 100 Marks

Practical: 4 Lectures

Practical: 50 Marks

Units	Content	No of Lectures
Unit 1	<ul style="list-style-type: none">• Introduction, Definition, objectives, scope and inter relationship between Biochemistry and nutrition.• Metabolism – Digestion & Absorption of different nutrients in the human system.	05
Unit 2	Carbohydrate metabolism: Classification of Carbohydrate <ul style="list-style-type: none">• Various Biological pathways -- site, significance, with, enzymes, ,• Glycolysis, TCA [Kreb's cycle], chemical structure of tCa Gluconeogenesis, Glycogenesis• Glycogenolysis	8
Unit 3	Lipid Metabolism: <ul style="list-style-type: none">• Biosynthesis of fatty acids, regulation of synthesis.• Ketosis and Ketogenesis• Triglycerides synthesis --- Intestinal resynthesis of triglycerides, synthesis in Liver.• Introduction of Cholesterol – Control of cholesterol metabolism• Plasma Lipoproteins, Metabolism of Chylomicrons, LDL, HDL and VLDL	8

Unit 4	Protein Metabolism Trans-amination,role of pyridoxine,significance Uric acid and gout Metabolic fate of the carbon skeleton of amino acids – glucogenic, ketogenic and glucogenic and ketogenic amino acids.	8
Unit 5	Enzymes & Hormone Definition, & classification.. Factors affecting enzymes. Enzyme inhibition. Types & role of coenzymes	8
Unit 6	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 Inborn errors of metabolism PhynylketonureaMaple syrup urin disease,Tyrosinemia Galactosemia,Wilsan disease	8

Practicals

1. Qualitative Estimation of Normal Constituents of Urine.
2. Qualitative Estimation of Carbohydrates
3. Abnormal Constituents of Urine.

Quantitative Estimation in Urine.

3. Urea
4. Uric acid
5. Glucose

Quantitative estimation in serum / blood.

6. Urea
7. Total protein
8. Albumin
9. Cholesterol

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7. Chatterjee M.N., Shinde R. "Textbook of Medical Biochemistry" 8th Edition (2012) Jaypee Brothers, Medical Publishers.
8. Nelson DL & Cox MM. 5th Edition, 2009. "Lehninger's Principles of Biochemistry". Freeman and Co.
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11. "Murray Harper's Illustrated Biochemistry" 29th Edition, (2012) Prentice Hall Int.
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13. H. Varley, A. H. Gowenlock, and M. Bell, "Practical Biochemistry, Vol. 1", London, UK, 5th Edition, (1976), Edited by: I. W. Heinemann.
14. Godkar P.B. Godkar D.P Textbook of Medical Laboratory Technology (2006), 2nd Edition, Bhalani Publishing House.
15. Burtis C.A, Ashwood E.R, Bruns D.E. (2007), "Tietz Fundamentals of Clinical Chemistry", 6th Edition, Elsevier Health Sciences.
16. **Davidsohn, I (Editor) & Henry, J B (Editor)** "Todd-Sanford Clinical Diagnosis by Laboratory Methods" (1984), 17th Edition. W.B. Saunders.

Semester- V
HS-502- Diet Therapy-I

Objectives

This course will enable students to:

1. Understand the etiological factors and physiological changes associated with specific disease conditions.
2. Develop an insight into the role of modified diets in specific conditions.
3. Acquire the ability to modify the normal diet to suit individuals suffering from specific diseases and lifestyle disorders

Credits-03+1.5

Theory - 4lec./week

Marks -100

Practical -4lec/week

Marks -50

Sr No	Content	No of Lecture Weightage
Unit I	Basic concept of diet therapy Therapeutic adaptations of normal diet. Principals & classification of therapeutic diets. Role and Responsibilities of Dietitian Indian Dietetics Association	04
Unit II	Routine Hospital Diet Regular, Light, Soft, Fluid Diet. Parenteral & Enteral Feeding. Pre & post-operative Diets	04
Unit III	Diet in Obesity Etiology and assessment Types of Obesity Complications of Obesity Prevention and treatment Dietary management Importance of exercise - aerobic, weight training.	08
	Diet in Underweight Etiology Nutritional and Food Requirement Prevention and treatment	04
Unit IV	Diet in Fever Causes Types General dietary consideration. Typhoid, Influenza, Malaria. TB.	04
Unit V	Diet in Diabetes Mellitus Classification, Symptoms, Diagnosis,	08

	Normal Blood Glucose level Management of Diabetes Mellitus. Oral Hypoglycemic agents.and insulin Role of diet in the management of IDDM and NIDDM Special Diabetic Foods. Artificial Sweeteners. Patient Education Food Exchange List	
Unit VI	Dietary management in cardiovascular disorders coronary artery disease, Atherosclerosis, Role of Fat in the development of Atherosclerosis Hypertension classification (mild, moderate, severe) Hypercholesterolemia Dietary modification and low sodium foods and salt alternatives. Fat Substitute Physical activity and Heart Disease Dylipidemia a) Role of diet in management of high cholesterol b) Role of diet in management of high Triglycerides c) Role of Omega 3 in management of dyslipidemia.	13

Practicals

1. Planning & preparation of full fluid food preparation
2. Planning & preparation of clear fluid food preparation
- 3.Planning & preparation of Low calorie Diet for Obesity.
- 4.Planning & preparation of High calorie Diet for Underweight Patient
- 5.Planning and preparation of diets, without insulin, with insulin, adult and juvenile, diabetes in pregnancy, diabetes and illness
- 6.Formulation of low sodium & low cholesterol recipes
- 7.Planning and preparation of diet For hypertension

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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

Semester V

HS-503-Health, Hygiene and Microbiology (Th)

Objectives :-To enable students -

- (1) To know the environmental hygiene
- (2) To understand the value of sanitation
- (3) To understand basic microbiology
- (4) To know the personal and community hygiene
- (5) To understand the physical environment

Credits -03+1.5

Theory: 4 Lectures/week

Practical: 4 Lectures

Theory: 100 Marks

Practical: 50 Marks

Unit	Content	No of Lectures
Unit 1	Concept of health. Dimension of Health: Physical, mental, social, spiritual, emotional, vocational. DeterminantsofHealth: Heredity,Environment,Life style, Socio-EconomicConditions. IndicatorsofHealth: Mortalityindicators,Morbidity indicators,disabilityrates,nutritionalstatusindicator. Health care delivery indicator, utilizationrates. Indicatorofsocialandmentalhealth.	08
Unit 2	General characteristics and classification of micro-organisms. Bacteria, virus, yeast,mould. Useful micro-organisms in food industry Fermented milk, cheese, alcoholic beverages &vitamins. Destruction of Micro-organisms: Methods of sterilization & disinfections.	08
Unit 3	Water and water born ediseases. Sources of water, Definition of pure and portable water. Water Pollutants, Purification of water on small & large scale. Water borne diseases: - Cholera, typhoid, dysentery. Air borne diseases – COVID 19 Measles, chicken pox, whooping cough, diptheria.	08
Unit 4	Diseases transmitted by mosquitoes, housefly, lice, their life cycle, control methods Structure, life cycle, mode of infection,	08

	harmful effects of Entamoeba, Hook worm. Tape worm, Thread worm Diseases carried by direct social contacts – Syphilis, Gonorrhoea, AIDS.	
Unit 5	National Tuberculosis Control Programme. National Malaria Eradication Program . National family welfare programme. Importance of personal hygiene in life and its maintenance	03
Unit 6	Contamination and spoilage of cereals, milk, egg ,meat, fruits and vegetables and Food Borne Diseases Food Poisoning and Infections: Definitions and differentiation between: Food poisoning and infections. Salmonella and Botulism E.coli and S. aureus	10

Practicals

1) Use of microbial instruments.

- Autoclave.
- Incubator
- Oven
- Refrigerator
- Laminar air flow

2) Staining methods of bacteria.

3) Preparation of culture media composition and uses

4) Study of disinfectants

5) Visit to Primary Health Centre.

7) Bacteriological Analysis of Water.

8) Bacteriological analysis of milk.

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3. Guthrie ,R.K.[ed].1972.Food sanitation Inc.Eaglewood Cliff,N.J
4. Jay,1978.Modern food microbiology.Van Nostrand Reinhold Company ,New York
5. Marriot .N.G.[,1995]Principles of Food Sanitation .4th edition Edward Arnold
6. Pelczar ,M.L .,and R.D Reid -1972 Microbiology.McGraw &Hill ,New York
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12. Pelczar ,M.L .,and R.D Reid -1972 Microbiology.McGraw &Hill ,New York
13. Reid,G.[ed]1982.Prescott and Dunn's industrial microbiology AVI Publishing Co.,Inc ., Westport ,Conn
14. Stanier,R.Y.,E.A.Adelberg,and Ingraham .1976 .The microbial world .4th ed.Prentice Hall

Semester V

HS504-Dietary Management for Health and Fitness (Th)

Objectives

This course will enable students to:

1. Understand various aspects of health and fitness
2. Adopt a holistic approach towards health management and disease prevention.
3. Develop the ability to provide guidance on healthy diet, exercise & life style modifications for disease prevention and management.

CREDITS 03+1.5

Theory - 4lec./week
Practical -4lec/week

Theory Marks -100
Practical marks-50

Unit	Content	No of Lecture
Unit 1	Introduction to Health and Fitness Definition of Health and fitness (WHO) Important terms – Exercise, Physical Activity Stamina, Endurance, Intensity, VO ₂ max, Duration, Flexibility, Muscle strength, Muscle endurance, Agility Healthy behaviors: Physical activity, Healthy Food Choices, Weight Control, Stress Management.	8
Unit 2	Different Aspects of Fitness Evaluation of fitness Wrong exercise practices and injuries Body Composition through the life span, its significance in fitness and body composition evaluation techniques. Stress: Its effect on health and its management through Relaxation and Meditation	8
Unit 3	Energy Systems Energy usage during anaerobic and aerobic exercises Energy usage in weight reduction and maintenance of body weight Nutrition, Exercise and Immunity Role of nutrients & exercises in the promotion of immunity	8
Unit 4	Life style modification for the following conditions: Reproductive health before Pregnancy Polycystic ovarian disease Bone health during Life Span. Chronic Degenerative diseases: Syndrome X	8

Unit 5	Performance Enhancement through the use of Nutritional Supplements: (General information, Uses and Disadvantages) 1. Ergogenic Aids 2. Protein Supplements 3. Vitamin and Mineral Supplements.	8
Unit 6	Popularly used slimming techniques : 1. Meal replacers 2. Fat burners 3. Appetite Suppressants 4. Fad Diets 5. Spot reductions, Bariatric Surgery 6 Quackery in Diets and Exercies	05

Practicals

- 1) Assignments of physical fitness
- 2) Strength assessment - Muscular Strength -lifting weight, working with resistance bands climbing stairs, hill walking, cycling, push up sit-ups.
- 3) Cardio-vascular endurance assessment; squats, on treadmill work-out etc
- 4) Cardio respiratory Endurance –running and walking events, skipping on the treadmill workout etc
- 5) Strength assessment - Muscular Strength -lifting weight, working with resistance bands climbing stairs, hill walking, cycling, push up sit-ups.
- 6) Cardio-vascular endurance assessment; squats, on treadmill work-out etc
- 7) Cardio respiratory Endurance –running and walking events, skipping on the treadmill workout etc
- 8) Agility–coordination forward running, lateral running, side to side drills, jump box, shuttle run, medicine ball throw, zig-zag run etc.
- 9) Flexibility assessment –yogic exercise aerobics exercise, gymnasium etc. Demonstration of Personal Exercise for Physical Fitness-yoga, pranayam, Relaxation techniques
- 10) Case Study-Observation and presentation of five case study to assess the impact of exercise on physical fitness
- 11) Planning and preparation of diet for physically active individuals
- 12) Visit to a Physical Fitness Center, sports club

References

1. Elenor N., Whitney S., Rady R. (1993): Understanding Nutrition, West Publishing Company, Minneapolis
2. Wardlaw (1993): Perspectives in Nutrition, Paul Insel Mosby.
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14. <http://www.brianmac.co.uk/plan.htm>
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16. <http://www.heartfoundation.org.au/SiteCollectionDocuments/GP-besity-fact-sheet.pdf>
17. <http://www.who.int/mediacentre/factsheets/fs311/en/>
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19. <http://www.who.int/features/factfiles/obesity/facts/en/index5.html>
20. Dr Leena Raje,Amruta Bahel ,Dietary management for Health and Fitness Smt P.N.Doshi Womens College Ghatkoper Mumbai.

Semester- V
Skills Enhancement

HS-505-Personality and Soft Skills Development

Objective-

- 1) To develop all round personalities with a mature outlook to function effectively in different circumstances
- 2) To develop effective communication (spoken and written) and presentation Skills.
- 3) To develop self effectiveness by mastering interpersonal skills and leadership skills.
- 4) To get acquainted with need competencies, skills and motivation of self empowerment.

CREADITS 02

Theory
- 3lec./week

Marks-50

Unit I	<p>Personality – Meaning of Personality, The personality pattern, individuality, persistence in personality, change in personality, some important personality determinants, level of adjustment, Hazards in personality development.</p> <p>Introduction to soft skills What are soft skill, Importance Attributes, Top soft skills Practicing soft skills</p> <p>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</p>	08
Unit II	<p>Communication Skills</p> <p>Types of communication, verbal skills & non verbal skills</p> <p>Speaking skills, formal & informal communication, barriers of communication, effective communication, public speaking, overcoming fear of public speaking</p> <p>Non verbal (body) communication – forms of body parts of body language uses of body language, improving body language.</p> <p>Writing skills, importance of effective writing creative writing , drawbacks of written communication</p>	08

Unit III	C V writing Introduction and meaning, Difference among bio data, CV & resume, purpose types,tips, design, content and cover letter. Interview skills Introduction & meaning Types of interview Basic tips, dos and don'ts, before during & after theinterview How to present well in interview Typical questions asked	08
Unit IV	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 Time management 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	06

References

1. Personality Development. Hurlock, E.B. Tata Mc GrawHill, New Delhi.
2. Fundamentals of modern psychology. Banerjee J.C., Allied Publishers Pvt.Ltd., Calcutta
3. Motivation and Personality. Maslow, A.H. Pearson Education India.
4. Dr. K. Alex, 2011, Revised edition, soft skills - S. Chand Publication, ISBN – 81 – 219 –3192 – 4
5. Essentials of business communication, Rajendra Pal, J.S.Korlanhalli, S. Chand & Sons, New Delhi.
6. Effective Business communication, Asha Kaul, Prentice, Hall of India, Pvt. Ltd, New Delhi.
7. Effective Teamwork, Michael A. West, BPS Blackwell.
8. Principles of management, P.C. Pripath, P.N. Reddy, the McGraw Hill.
9. How to write better letters, S.K. Tarafder, A.P.H. publishing corporations.
10. Professional presentations, Malcolm Goodale, Cambridge University press.

11.The motivation manual,Gisela Hagemann, multi-tech publishing co.

12.Basic Managerial skills for all, E.H.MaGrath, S.J. Prentice, Hall of India, Pvt. Ltd, NewDelhi.

SE-HS-506- Entrepreneurship Management (Th)

Objectives:

To enable the students to:

- 1) To understand the nature of entrepreneurial activities.
- 1) To make aware about self employment
- 2) To asses their Strength and weaknesses as entrepreneurs and identify how to strengthen their skills.

Credits-02

Theory: 3 Lectures/week

Theory: 50 Marks

Units	Content	Lectures
Unit I	Entrepreneurship – Definition, Scope Characteristics, factors affecting entrepreneur development, Entrepreneur Vs Intrapreneur, classification of entrepreneur, Role of entrepreneur in economic development.	08
Unit II	Women entrepreneurs – Definition, status in India, steps taken for the promotion of entrepreneurs, problems faced by women entrepreneurs.	08
Unit III	EDP–Definition, steps, agencies conducting EDP, agencies for entrepreneurial support – KITCO, SIDCO, KVIC, DIG, STED, SIDO, NSIC, TCO, SISI, SIDBI, WDC (Women Development Corporation)	08
Unit IV	Project – definition, types, steps, project life cycle, project appraisal, project report preparation, SWAC Analysis.	06

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2. Prescott, A and Proctor, B.B. (1987), Food Technology, Mc Graw Hill Book Co. , New York.
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4. Desai, N. (1996).Entrepreneurial development – Principles, Programmes, Policies (Vol I), Formulation Appraisal and Financing (Vol II) and Programmes and Performance (Vol III), Himalaya Publishing House, Bombay.
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9. Vasant Desai – Entrepreneurship Development, Himalaya Publishing House (1991)
9. Sami Uddin – Entrepreneurship Development in India, Mittal Publication, New Delhi

Semester-VI
Institutional Food Service Management (Th)

Objectives

1. To understand the applications of basic principles to bulk production of the food
2. To gain knowledge regarding selection and purchase of food
3. To develop skills in menu planning for quality preparation
4. To understand the different styles of food service.
5. To gain knowledge of food service layout
6. To gain knowledge to develop skills in handling equipment and maintenance Practical –

CREDITS 03+1.5

Theory - 4lec./week
Practical -4lec/week

Theory Marks -100
Practical marks-50

Units	Contents	No of Lectures
Unit I	Institutional Food Management Food service systems and their development Introduction to food service industry. <ul style="list-style-type: none"> • Styles of food service. • Types of food service • Management, Principles and function • Tools of management • Attribute and qualities of Manager 	08
Unit II	Management of Space and Equipment Kitchen Space Storage Space Service Space Catering Equipment Selection of Equipment Equipment Design Installation and Operation Care and maintenance of Equipment	08

Unit III	Food Material Management Food Purchasing Methods of purchasing Function of Purchasing Menu planning <ul style="list-style-type: none"> • Definition, importance • Food selection • Characteristics of food • Types of food • Definition of Menu Objectives in Meal planning Types of Menu Construction of Menu Guidelines in Menu Making	08
Unit IV	Receiving and Storage of Foods Receiving Procedure Storage Organization of Storage Storage Procedure	06
Unit V	Financial Management <ul style="list-style-type: none"> • Book Keeping, Accounting, Organization Management. • Pricing of food Factors affecting & Cost control	07
Unit VI	Sanitation ,Safety and Laws Sanitation and safety in food service institutions, Personal hygiene garbage disposal, pest control. Laws Personnel Management	08

Practicals:

1. Standardization of four selected recipes from each of the following cuisines-
2. South Indian
3. North Indian,
4. East Indian and
5. West Indian.
6. Development of recipe book.
7. Preparation of various menu cards
8. Table setting
9. Visit to different food service industry.
10. Running canteen for one week & report writing

References

1. Institutional Food Management(2018) Mohini Sethi ,Ne age International Publication,New Delhi.
2. Food service system and Lewis J. Minor, Ronald. Cichy, Avi Publishing Co.
3. Food Service operations: Mahmood A. Khan,Avi Publishing Co 1987
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6. Dorothy Tompikins (1969). Table Layout and Decoration, Wardlock & co Ltd
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8. Besbe, B., West, Le Velle, (1986) Revised by HArger V. Shugant M.S. June Payne Palacio, MacMillan Publishing Co.
9. Mass Catering WHO Publishing.
10. Avery-A.A, (1980). Modern Guide to Food Service Equipment, C.B.I Publishing Inc. Anderson F, (1976). Home Appliances Servicing Taraporewala Sons & Co. 11)Johnston J.B, (1965). Equipment for Modern Linings, MacMillan Co.
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12. Mohini Sethi and Surjet Malhan, (1987). Catering Management, “An Integrated Approach. Wiley Eastern Ltd

HS-602 Community Nutrition (TH)

Objectives:

This course will enable students to:

1. Identify the causes of commonly prevalent nutritional problems in the country.
2. Understand various methods of assessment of the nutritional status in the community.
3. Know about strategies and intervention programmes undertaken by the government, national and international voluntary agencies to combat nutritional problems.

CREDITS 03+1.5

Theory - 4lec./week

Practical -4lec/week

Theory Marks -100

Practical marks-50

Units	Topics	No of Lectures
Unit1	Introduction to Community Nutrition Definition and general characteristics of community Nutritional problems in India and factors contributing to it (PEM, nutritional anemia, IDD, Vitamin A & D deficiency, fluorosis, (metabolic syndrome).	04
Unit II	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	04

<p>UnitIII</p>	<p>Assessment of Nutritional Status of Community:</p> <p>Importance of sampling in community nutrition.</p> <p>Anthropometry: Importance of anthropometry especially for vulnerable sections (0-6 yrs, adolescent).</p> <p>Indices : Weight, height, MUAC, Head chest circumference, growth -chart, thinness chart, how to measure and significance of Indices) Name the reference standards. (WHO, IAP, NCHS, ICMR.)</p> <p>Dietary Assessment</p> <p>Importance and its types</p> <p>Clinical Assessment</p> <p>Bio-chemical assessment: it's Significance and limitations</p> <p>Vital Statistics</p> <p>Significance of vital statistics. Definition and present-India data of IMR, MMR, Neonatal Mortality rate.</p>	<p>12</p>
<p>Unit IV</p>	<p>Strategies and intervention for improving nutritional status of the community</p> <p>Nutrition – Health Education</p> <p>Importance of Nutrition ,Principles of Nutrition exhibition/ demonstration and dramatization</p>	<p>08</p>
<p>Unit V</p>	<p>Intervention Programmes –</p> <p>Objective, services and beneficiaries of the following : Supplementary feeding programme (MDMP/ school lunch programme, SNP, ICDS, NNAPP, NIDDCP, Vit - A prophylaxis programme.</p>	<p>08</p>

Unit VI	Role of National, international and voluntary agencies: NIN, ICMR, ICAR, VHAI, FAO, WHO UNICEF, CARE, CFTRI	08
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Practicals

1) Training students to use questionnaire.

- Family size, composition
- Family income/per capita income.
- Age/sex/qualification.

Anthropometrics: clinical & Dietary Survey :

2) Diet and Nutrition Surveys

Select any one vulnerable group :

- Infant
- Preschool Children
- Adolescent
- Pregnant women
- Lactating woman.

2) Knowledge, Attitude, Behaviour & Practice.

Methods of extension used in nutrition education

Demonstration:

Demonstration of nutritious recipes, using locally available ingredient of low cost in various urban and rural slum complexes and welfare centres.

Field Visit:

- Observation of different nutritional problems faced by all the vulnerable section.

Train students to identify various sign and symptoms of deficiency diseases

3) Preparation of Audio-visual aids for nutrition education of community

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1. Park J.E. (1983) Textbook of Preventive and Social Medicine. 9th Edition. Banarsidas Bhanot Publishers, Jabalpur, India.
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5. Ghosh S. (1977) The Feeding and Care of Infants and Young Children. 1st Edition. Voluntary Health Association of India, New Delhi.
6. Rao V.K. (1982) Food, Nutrition and Poverty in India. 1st Edition. Vikas Publishing House Pvt Ltd, Noida, Uttar Pradesh, India.
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Advanced references:

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8. Cashman, K. D., Sheehy, T., & O'Neill, C. M. (2018). Is vitamin D deficiency a public health concern for low middle-income countries? A systematic literature reviews. European journal of nutrition, 1-21.
9. Links
10. www.cdc.gov/nutritionreport/99-02/part_3.html

2. www.fao.org/ag/agn/nutrition/ind_en.stm
3. nihfw.org/pdf/Brochure_Public%20Health%20Nutrition.pdf
4. www.unicef.org/india/nutrition_1556.htm
5. nutritionfoundationofindia.res.in/.../Nutrition%20Transition%20in%20in...

Semester- VI
HS-603-Food Product Development and Quality Control(Th)

Objectives

This course will enable students to:

1. Understand the market and develop new food product.
2. Formulate, prepare and conduct shelf life studies of a new product.
3. Design packaging and nutrition labeling.

CREDITS-3+1.5

Theory - 4lec./week
Practical -4lec/week

Marks -100
Marks-50

UNIT	Content	No of Lecture
Unit I	<p>What is Food Product Development</p> <ul style="list-style-type: none"> • The need for developing new Product • Rising demand of convenience foods • Rising demand of health foods • Rising demand of healthy alternatives of convenience foods 	08
Unit II	<p>Development of product</p> <ul style="list-style-type: none"> • Recipe standardization • Definition how to standardize • Advantages of standardization • Writing in recipe format • Filling and indexing of recipes <p>Market Survey</p> <ul style="list-style-type: none"> • The need of market survey • Different survey methods and techniques • Market demand and need for a particular product 	08
Unit III	<ul style="list-style-type: none"> • Food Packaging and labeling • Importance of packaging • Food Labeling • Importance of labeling • Rules, food laws, regulations and bar coding • Standards of labeling for processed and fresh/perishable foods • Food packaging laws 	08

Unit IV	Sensory Evaluation <ul style="list-style-type: none"> • Significance of sensory evaluation, sensory characteristics of foods • Panels, environment, sample preparation and presentation for sensory evaluation • Use of different sensory tests in evaluation of foods • Detection of basic tests, threshold tests, difference tests, preference tests 	08
Unit V	Food Adulteration <ul style="list-style-type: none"> • Classification incidental adulteration • Food laws and regulations • Agencies in food quality control • International agencies • Quality, importance of quality control, National, International procedures and food additives. • Standards for food product quality and safety 4) HACCP Good hygiene practice (GHP) 5) Good manufacturing practice (GMP) 6) Hazard analysis critical control point (HACCP) 7) Quality management system 	08
Unit VI	Food Safety-Basic concepts of physical, chemical and biological hazards associated with foods <ul style="list-style-type: none"> • Cleanliness with regard to hand, habits, working attire/cloths, jewelry • Health of a food handler <ul style="list-style-type: none"> 1. Hygiene in handling and service of food • Physical facilities and environment including equipment • Food storage, preparation and service of food • Food handling practices 	05

1) **Practicals**

- 2) Identify a food product to be developed using Market surveys,
- 3) Standardization of the food product.
- 4) Sensory evaluation and shelf life study of the food product.
- 5) Nutrition labeling
- 6) Budget management/ food costing
- 7) Food adulteration
- 8) Detection simple test for food adulterants
- 9) Study of food labeling and legal requirements.
- 10) Study of requirements of food product under BIS and Agmark.

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- 11) Product Development and Shelf life studies.
 - 12) Study of pack house and Export facility centers

References

1. Fuller G.W. (1994) – New Product Development : From concept to market place, CRC Press, New York.
2. Craft, E and Saguy I.S. (1991) – Food Product Development : From concept to market place, Van Nostrand Reinhold, New York.
3. Oickle, J.G. (1990) – New Product Development and Value Added. Food Development Division Agriculture, Canada.
4. Frazier W. and Westhoff. D. (1988) : Food microbiology, Tata McGraw-Hill Publisher
5. Subbulakshmi G. and Udipi S.A. (2001) : Food Processing and Preservation, New age international (P) ltd. Publication
6. Banwart G.J. (1989) : Basic food microbiology, Chapman and Hall publication, New York

Journals :-

- (1) International Journal of Food Science and Technology.
- (2) Food Technology
- (3) Journal of Food Technology.
- (4) Trends in Food Science and Technology

HS-604 Diet Therapy II (Th)

Objectives:

This course will enable students to:

1. Understand the basic principles of diet therapy.
2. Be aware of the physiological changes associated with specific diseases.
3. Understand the relationship between dietary modifications and physiological changes observed in specific disease conditions.
4. Acquire the ability to modify the normal diet to suit individual needs in specific disease conditions.

CREDITS-3+1.5

Theory - 4lec./week

Marks -100

Practical -4lec/week

Marks -50

Units	Topics	No of Lectures
Unit 1	Basic Concept of Diet Therapy : Definitions : Therapeutic diet, Types of diet acute, chronic, symptoms Principles of diet therapy. Principles of planning therapeutic diet. Modification of normal diet in consistency and nutrients Nutritional care in the hospital	08
Unit2	<ul style="list-style-type: none">● Dietary counseling● Counseling process& its significance● Assessment of need of patient● Establishing rapport● Communication process● Patient education	08

Unit3	<p>Modification of diet in GI disorders:</p> <p>Peptic ulcer, diarrhea, constipation.</p> <p>- Etiology, symptoms and principles of diet in the specific conditions, drugs commonly used.</p> <p>- Other terms: Achlorhydria, Dumping syndrome, endoscopy.</p>	08
Unit4	<p>Diet in Renal Disorders:</p> <p>Physiology of Kidney. causes of renal disorders.(in brief)</p> <p>- Introduction to acute and chronic nephritis.</p> <p>- Principle of Diet therapy in Renal calculi etiology symptoms.</p> <p>- Modification of the diet.</p> <p>Renal calculi for types of stones.</p> <p>- Alkaline and acid ash diet</p>	08
Unit5	<p>Diet in Liver disorders:</p> <p>Functions of the liver.</p> <p>Dietary modification for:</p> <p>- Infective hepatitis - causes, symptoms, modification of the diet.</p> <p>- Cirrhosis of liver- symptoms and modification of the diet.</p> <p>- Terms : Ascites, Oesophnageal varices and hepatic coma.</p>	08
Unit 6	<p>Diet in Cancer</p> <p>Risk Factors</p>	05

	Etiology Symptoms Dietary Management in Cancer Nutritional Problems of Cancer patients	
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Practicals

- 1) Planning & preparation of full fluid food preparation.
- 2) Planning & preparation of clear fluid food preparation.
- 3) Planning and preparation of diet for peptic ulcer
- 4) Planning and preparation of diets for cirrhosis of Liver
- 5) Planning and preparation of diets for acute renal failure.
- 6) Planning and preparation of diets for chronic renal failure.
- 7) Planning and preparation of diets for dialysis.
- 8) Planning and preparation of diets for cancer therapy

References:

1. Srilakshmi, B. (2019) Dietetics, 8th Edition, New Age International (P) Limited Publishers, New Delhi, India.
2. Krause, M. M., Mahan, L.K. and Escott, S. S. (2003) Krause's – Food, Nutrition and Diet Therapy, 11th Edition, W. B. Saunders, Philadelphia, U.S.A.
3. Williams, S. R. (1995) Diet Therapy, 1st Edition, Mosby Year Book Inc, St. Louis, Missouri, U.S.A.
4. Williams, S. R. (1990) Essentials of Nutrition and Diet Therapy, 5th Edition, Times Mirror / Mosby College Publishing, St. Louis, Missouri, U.S.A.
5. Whitney, E. N., Cataldo, B. C., DeBruyne, L. K., and Rolfes, S. R. (1996) Nutrition for Health and Health Care, 1st Edition, West publishing Company, St. Paul, U.S.A.
6. Smolin, L. A. and Grosvenor, M. B. (2007) Nutrition – Science and Applications, 4th Edition, Wiley
7. Garrow J. S. and James, W. P. T. (2000) Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone Publishers, Edinburgh, U.K.
- 8.Sizer, F. and Whitney, E. (2006) Nutrition – Concepts and Controversies, 10th Edition, Wadsworth Thomson Books Inc, London, U.K.

9. 9)Antia, F. P. (1989) Clinical Nutrition and Dietetics, 3rd Edition, Oxford University Press, New Delhi, India.

Skill Enhancement

HS-605 -Bakery Science (Th)

Objectives:

This course will enable students to:

1. Knowledge of the evolution of baking and emerging trends in baking
2. Understand the principles involved in baking various products and confectionery and Organoleptic evaluation
3. Knowledge to set up a bakery unit and handling of the equipments
4. Develop entrepreneurial skills and responsibility for setting up bakery and confectionery

CREDITS-02

Theory -3lec./week

Marks -50

Units	Contents	No of Lectures
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Unit 1	<p>Wheat Processing</p> <p>History of baking, Structure and Composition of the Wheat Kernel, 15</p> <p>Steps in Wheat Milling, By products of wheat, Enrichment of Flour and Bread.</p> <p>Quality aspects of flour and dough</p>	07
Unit2	<p>Principles of Baking</p> <p>Classification of Baked Foods, Role of Ingredients – Water, Yeast,</p> <p>Sugar, Shortening, Milk, Egg, Butter, Salt, Leavening Agents, Spices, Flavorings, Fruits and Nuts, Food Colors, Setting Materials, Cocoa and Chocolate ,emulsifiers, flour</p> <p>improvers, recipe balance, storage of baked products, selection of packaging materials</p>	08
Unit3	<p>Factors for Setting up a Bakery Unit 15</p> <p>Factors to be considered for Setting up a Bakery Unit</p> <p>Types of Ovens – Construction and Working of Conventional and Modern</p> <p>Ovens, Study and Maintenance of Major and Minor Equipments</p> <p>Bread Making – Steps and Methods, Role of Ingredients</p> <p>Variety Breads, Qualities of a Good Loaf, Bread Faults, bread diseases</p>	08

Unit4	<p>. Preparation and Decoration of Baked Foods</p> <p>Cake Making – Functions of Ingredients</p> <p>Cake Mixing Methods, Types of Cakes, Cake Judging, Cake Faults and remedies</p> <p>Biscuit, Cookie and Pastry Making, Types and techniques of Icing,</p> <p>Frosting and fillings. Sensory evaluation of baked products- objective and subjective methods</p>	07
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References

1. Dubey, S.C. (2012), Basic Baking IV Edition, The Society of Indian Bakers, New Delhi.
2. Bakers Handbook on Practical Baking (2008) Compiled and Published by US Wheat Associates, New Delhi.
3. NIR Board, The Complete Technology Book on Bakery Products, National Institute of Industrial Research, New Delhi (2010)
4. Yogambal Ashokkumar Textbook of Bakery and confectionery second edition PHI learning private limited New Delhi.2012

Reference Books:

1. Fellows, J.P. (1998), Food Processing Technology – Principles and Practice, Ellis Horword Limited, London.
2. Avantina Sharma, (2006), Text Book of Food Science and Technology, International Book Distributing Co., Chaman Studio Building, Charbagh, Lucknow

Skill Enhancement

HS-606- INTERNSHIP

Objectives:

This course will enable students to:-

1. Develop skills as per requirement of the agencies/institutions.
2. Develop abilities to perform the given tasks and confidence to deal with people effectively.
3. Acquire hands-on experience in working in thrust areas.

Guidelines: Duration: 6 weeks.

- Areas of placements: Food and allied industries, Hospitals, health clubs, NGO's working in health related areas.

Credits-02

Marks: 50 Marks

or

HS-606- PROJECT

Objectives:

This will enable students to:

1. Develop research skills.
2. Develop reviewing, report writing and presentation skills

Credits-02

Theory: 50 Marks

Guidelines:

The department will assign suitable topics for project works in areas of
1) Market research, Community nutrition.2) Food product development: Therapeutic foods, Speciality products3)The students may work individually or in groups-Report writing, Report presentation