Scheme & Syllabus of

Bachelor of Science (Honors) Nutrition and Dietetics

[B.Sc. (Honors) Nutrition and Dietetics]

Batch 2018 onwards

By

Board of Study Food Engineering

Department of Academics

IK Gujral Punjab Technical University

Bachelor of Science (Honors) in Nutrition & Dietetics
[B.Sc. (Honors) Nutrition and Dietetics]

It is a Under Graduate (UG) Programme of 4 years duration (8 semesters)

Eligibility for Admission: A Candidate who has passed 10+2 or equivalent with Physics, Chemistry and Mathematics/Biology/ Agriculture/Home Science with at least 50% marks in aggregate.

Courses & Examination Scheme:

Semester First

Course Code	Course Title	Load Allocation			Marks Distribution		Total	Credits
		L	T	P	Internal	External		
BSND111-18	Principles of Human Nutrition	3	1	0	40	60	100	4
BSND112-18	Introduction to Food Science	3	1	0	40	60	100	4
BSND113-18	Food Microbiology & Food Safety	3	1	0	40	60	100	4
BSND114-18	Human Physiology	3	1	0	40	60	100	4
BSND115-18	Principles of Human Nutrition (Lab)	0	0	2	30	20	50	1
BSND116-18	Introduction to Food Science (Lab)	0	0	2	30	20	50	1
BSND117-18	Food Microbiology & Food Safety (lab)	0	0	2	30	20	50	1
BSND118-18	Human Physiology (lab)	0	0	2	30	20	50	1
BTHU103-18	English	1	0	0	40	60	100	1
BTHU104-18	English (Lab)	0	0	2	30	20	50	1
HVPE101-18	Human Values, De-addiction and Traffic Rules	3	0	0	40	60	100	3
HVPE102-18	Human Values, De-addiction and Traffic Rules (Lab/ Seminar)	0	0	1	25	--	25*	1
BSND119-18	Mentoring and Professional Development	0	0	1	25	--	25*	1
	Total	**16**	**4**	**12**	**440**	**460**	**900**	**27**

*The Human Values, De-addiction and Traffic Rules (Lab/ Seminar) and Mentoring and Professional Development course will have internal evaluation only.

Semester Second

Course Code	Course Title	Load Allocation			Marks Distribution		Total	Credits
		L	T	P	Internal	External		
BSND121-18	Basics of Cooking	3	1	0	40	60	100	4
BSND122-18	Food Processing & Preservation	3	1	0	40	60	100	4
BSND123-18	Food Chemistry	3	1	0	40	60	100	4
BSND124-18	Food Packaging	3	1	0	40	60	100	4
BSND125-18	Basics of Cooking (Lab)	0	0	4	30	20	50	2
BSND126-18	Food Processing & Preservation (Lab)	0	0	4	30	20	50	2
BSND127-18	Food Chemistry (Lab)	0	0	4	30	20	50	2
EVS102-18	Environmental Science	2	0	0	40	60	100	2
BSND128-18	Basics of Computer	2	0	0	20	30	50	2
BSND129-18	Mentoring and Professional Development	0	0	1	25	--	25*	1
	Total	**16**	**4**	**13**	**335**	**390**	**725**	**27**

*The Mentoring and Professional Development course will have internal evaluation only.

Semester Third

Course Code	Course Title	Load Allocation			Marks Distribution		Total	Credits
		L	T	P	Internal	External		
BSND211-18	Normal and Therapeutic Nutrition	3	1	0	40	60	100	4
BSND212-18	Community Nutrition	3	1	0	40	60	100	4
BSND213-18	Health, Hygiene and Sanitation	3	1	0	40	60	100	4
BSND214-18	Normal and Therapeutic Nutrition (Lab)	0	0	4	30	20	50	2
BSND215-18	Community Nutrition (Lab)	0	0	4	30	20	50	2
BSND216-18	Health, Hygiene and Sanitation (Lab)	0	0	4	30	20	50	2
BSND217-18	Nutraceuticals, Functional Foods & Nutrigenomics	3	1	0	40	60	100	4
BSND218-18	Mentoring and Professional Development	0	0	1	25	--	25*	1
	Total	**12**	**4**	**13**	**275**	**300**	**575**	**23**

*The Mentoring and Professional Development course will have internal evaluation only.

SEMESTER

FIRST

BSND111-18: PRINCIPLES OF HUMAN NUTRITION

Total Marks: 100	L	T	P
	3	1	0

UNIT- I

Introduction to Nutrition: Concept and definition of terms Nutrition, Food groups: Food and its functions - energy giving, body building, protecting and regulating. Malnutrition and Health. Nutritional status using dietary survey, anthropometry, clinical signs and biochemical methods. Brief History of Nutritional Science, Scope of Nutrition. Concept of balanced diet, Minimal Nutritional Requirements and RDA- Formulation of RDA and Dietary Guidelines- Reference Man and Reference women. Nutrition education, nutrition policies and their implementation. Non-conventional foods and their use.

Functions, metabolism, sources and deficiency of water

UNIT- II

Functions, metabolism, sources and deficiency of energy

Functions, metabolism, sources and deficiency of CHO

UNIT- III

Functions, metabolism, sources and deficiency of proteins

Functions, metabolism, sources and deficiency of fats

UNIT- IV

Functions, metabolism, sources and deficiency of vitamins

Functions, metabolism, sources and deficiency of minerals

Recommended Readings:

1. Shubhangini A. Joshi,(1992)' "Nutrition and Dietetics"Tata Mc Grow- Hill publishing Company Ltd, New Delhi.
2. Srilakshmi. B – "Nutrition Science", V Edn, New Age International (P) Ltd, Publishers, Chennai
3. Passmone R.and Eastwood M.A,(1986), "Human Nutrition and Dietetics",English language book Society/Churchill Livingstone,Eigth edition, Hong Kong.

BSND112-18: INTRODUCTION TO FOOD SCIENCE

Total Marks: 100	L	T	P
	3	1	0

UNIT- I

Introduction to Foods: Definition, functions, food groups, classification of foods. Study of different cooking methods, merits and demerits, Solar cooking, Microwave cooking. Introduction to food science.

Nutrients and functions of food *viz*. Carbohydrates, Protein, Lipids, Vitamins, Minerals. Changes in nutrients during processing and storage of food.

Water: Physical properties of water and Ice, chemical, nature, structure of the water molecule. Absorption phenomena, types of water solutions and collidative properties; Free and bound water; Water activity and Food spoilage; Freezing and Ice structure.

UNIT- II

Food Dispersions- Introduction, structure and stability of different types of food dispersions

Composition and nutritive value of plant foods

Cereals: General outline, Composition & Nutritive value, Structure of wheat and Rice, use in variety of preparation, selection, variety, storage, nutritional aspects and cost. Changes during cooking and germination.
Pulses & Legumes: Composition, Nutritive value, Antinutritional factors Changes during cooking, Factors affecting cooking time, Germination, Changes during germination.

UNIT- III

Composition and nutritive value of plant foods

Nuts & Oilseeds: Composition, sources of proteins and oil, Processing of oil seeds - Soya bean, coconut, Protein isolates, Texturized vegetable protein.
Fruits & Vegetables: Composition, Classification, Nutritive value, Vegetable Cookery, Changes during cooking, Ripening, Climacteric, Non climacteric fruits, Changes during ripening.
Spices & herbs: Definition, Classification, Chemical composition, use of spices & herbs

UNIT- IV

Composition and Nutritive Value of Flesh Foods

Eggs: Structure, Composition, Nutritive value of egg, Grading Changes during cooking & storage.
Fish: Composition, Nutritive value of fish, effect of different processing.

Meat: Structure, composition, types and nutritive value of meat, effect of different processing

Composition and Nutritive Value of dairy products

Milk: Definition, composition, nutritive value of milk and milk products; changes during processing and storage of milk and milk products

Health Foods

Health foods: Functional foods, Prebiotics, Probiotics, Nutraceuticals, organic foods, GM foods

Recommended Readings:

1. Deman JM, Principles of Food Chemistry, 2nd ed. Van Nostrand Reinhold, NY 1990
2. Meyer LH, Food Chemistry, CBS Publication, New Delhi, 1987
3. Manay NS and Shadaksharaswamy M, Food-Facts and Principles, New Age International (P) Ltd. Publishers, New Delhi, 1987
4. Potter NH, Food Science, CBS Publication, New Delhi, 1998
5. Ramaswamy H and Marcott M,Food Processing Principles and Applications CRC Press, 2006
6. De S, Outlines of Dairy Technology, Oxford Publishers, 1980
7. Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004

BSND113-18: FOOD MICROBIOLOGY & FOOD SAFETY

Total Marks: 100	L	T	P
	3	1	0

UNIT- I

Introduction to Food Microbiology: History and Development of Food Microbiology, Definition and Scope of food microbiology

Types of Microorganisms in Food: Classification and Nomenclature, Morphology and Structure Importance in food (bacteria, fungi and viruses) Significance of spores

Microbial Growth in Food: Bacterial growth curve, Factors affecting the growth of micro organisms in food.

UNIT- II

Microbial Food Spoilage: Sources of Microorganisms in foods, Some important food spoilage bacteria, Spoilage of some specific food groups

Food Fermentations: Fermentation –definition and types, Microorganisms used in food fermentations, Fermented Foods-types, methods of manufacture for vinegar, sauerkraut, yoghurt , soya sauce, wine and traditional Indian foods

Food borne Diseases: Types – food borne infections, food borne intoxications and toxin infections, Origin, symptoms and prevention of some commonly occurring food borne diseases

UNIT- III

Enumeration techniques & control of microorganisms in foods: Qualitative and quantitative methods-conventional as well as rapid, Principles and methods of preservation (thermal and non thermal), Introduction to Hurdle Technology

Introduction to Food Safety: Definition, Types of hazards, biological, chemical, physical hazards, Factors affecting Food Safety

UNIT- IV

Hygiene and Sanitation in Food Service Establishments: Introduction, Sources of contamination, Control methods using physical and chemical agents, Waste Disposal, Pest and Rodent Control, Personnel Hygiene

Food Safety Management Tools: Basic concept, Prerequisites, HACCP, ISO series, TQM and Risk Analysis.

Recommended Readings:

1. Frazier William C and Westhoff, Dennis C. 2004 Food Microbiology, TMH, New Delhi,
2. Jay, James M. 2000 Modern Food Microbiology, CBS Publication, New Delhi,
3. Garbutt, John.1997 Essentials of Food Microbiology, Arnold, London,
4. Pelczar MJ, Chan E.C.S and Krieg, Noel R 1993 Microbiology, 5th Ed., TMH, New Delhi
5. Lawley, R., Curtis L. and Davis,J. , 2004 The Food Safety Hazard Guidebook , RSC publishing.
6. De Vries, 1997, Food Safety and Toxicity, CRC, New York,
7. Marriott, Norman G. , 1985, Principles of Food Sanitation, AVI, New York,

8. Forsythe, S J , 1987,Microbiology of Safe Food, Blackwell Science, Oxford, 2000 65 &Sons; USA,

BSND114-18: HUMAN PHYSIOLOGY

Total Marks: 100	L	T	P
	4	0	0

UNIT- I

CELL

Introduction - cell under e/m. Recent concepts.

TISSUES

Classification, structure and function.

PHYSIOLOGY OF NERVE AND MUSCLE

Conduction of nerve impulses - Physiology of muscle contraction.

UNIT- II

NERVOUS SYSTEM

General anatomy of nervous system, functions of the different parts, reflexes, autonomic nervous system.

BLOOD

Composition, constituents, functions, wounds, hemorrhage, reticule- endothelial system, body defense against diseases.

HEART AND CIRCULATION

Anatomy of the heart-structure of .the heart and blood vessels, properties of cardiac muscle, origin and conduction of heart beat, cardiac cycle, cardiac output, heart sounds, blood pressure - definition and factors affecting blood pressure and ECG.

UNIT- III

SENSE ORGANS

Physiology of vision, hearing, taste', smell and coetaneous sensations.

RESPIRATORY SYSTEM

Anatomy and physiology of respiratory organs. Gaseous exchange in the lungs, mechanism of respiration.

DIGESTIVE SYSTEM

Anatomy of gastro-intestinal tract. Digestion and absorption of carbohydrates, proteins and fats.

UNIT- IV

EXCRETORY SYSTEM

Structure of kidney, formation of urine, acid-base balance, skin-temperature regulation,water balance.

ENDOCRINOLOGY

Pituitary, thyroid, parathyroid, adrenal and pancreas - functions of the homones and their relationships.

REPRODUCTIVE SYSTEM

Anatomy of male and female reproductive organs, hormonal regulation of female reproductive function, menstruation, fertilization, pregnancy, lactation - hormone influence.

Recommended Readings:

1. Guyton, A.C. Functions of the Human Body, W.B. Saunders Co., Philadelphia.
2. Vander, A.J , Sherman, J.H. and Luciano, D.S. Human Physiology - the Mechanisms of Body Functions, 2nd ed., TMH Publishing Co., Ltd.,
3. Subramaniam, S. and Madhavan Kutty, K. 1971. The Text Book of Physiology, 1st ed., Orient Longman Ltd.
4. Best, CH and NB Taylor, The living body, latest edition, Asia publishing house, Bombay.
5. Ham, A.W., Histology, Latest edition. Pitman Medical Publishing Ltd., London.

BSND115-18: PRINCIPLES OF HUMAN NUTRITION (LAB)

Total Marks: 50	L	T	P
	0	0	2

Course Content

1. Estimation of calorific value of food.
2. Qualitative identification of carbohydrates – glucose, fructose, galactose, sucrose, maltose, lactose.
3. Preparation of Osazones and their identification.
4. Qualitative identification of amino acids – histidine, tyrosine, tryptophan, cysteine, arginine.
5. Qualitative identification of lipids – solubility, saponification, acrolein test, Salkowski test, Lieberman-Burchard test.
6. Qualitative tests for minerals.
7. Quantitative estimation of glucose.
8. Computation of energy requirements on the basis of physical activity and adult consumption units.
9. Standardization of snacks and meals. Planning and preparation of balanced diets for the adults in family.
10. Diet survey and anthropometric measurements of vulnerable groups in community.

BSND 116-18: PRINCIPLES OF FOOD SCIENCE (LAB)

Total Marks: 50	L	T	P
	0	0	2

Course Content

1. Orientation to foods.
2. Working instructions in cooking laboratory.
3. Equipment, tools, weights and measures used in the kitchen.
4. Methods of measuring and weighing dry ingredients and liquids.
5. Market survey of essential raw and processed food products.
6. Preparation of spices, their combination and mixtures.
7. Preparation of dishes and beverages using cereals, pulses, fruits, vegetables, milk and milk products, egg, fish and meat.
8. Use of leftover foods.

BSND117-18: FOOD MICROBIOLOGY & FOOD SAFETY (LAB)

Total Marks: 50	L	T	P
	0	0	2

Course Content:

1. Introduction to the Basic Microbiology Laboratory Practices and Equipments
2. Preparation and sterilization of nutrient broth and media
3. Microscopic identification of microorganisms (prepared slides).
4. Isolation of pure culture – Streak plate method, Serial dilution method.
5. Hanging drop preparation for motility of bacteria.
6. Staining of bacteria – simple staining using Methyl violet, methylene blue, carbol fuschion.
7. Staining of Bacteria- gram staining.
8. Microbiology of air.
9. Microbiology of water.
10. Microbiology of soil.
11. Microbiological analysis of processed food.
12. Microbiological analysis of unprocessed food.
13. Testing quality of milk – Detection of Acidity (Clot on Boiling test, Alcohol test), Direct microscopic count, Standard plate count, Methylene Blue Reductase test, Phosphatase test, Turbidity test.

BSND118-18: HUMAN PHYSIOLOGY (LAB)

Total Marks: 50	L	T	P
	0	0	2

Course Content

1. Microscopic study of different tissues - Epithelial, connective, muscular & nervous tissues
2. Microscopic study of digestive organs - Pancreas, stomach, small intestine, liver
3. Microscopic study of respiratory organs - Lung, trachea
4. Microscopic study of excretory system - Kidney, nephron
5. Blood Grouping
6. Microscopic examination of prepared slides - Fresh mount of blood and stained blood smear
7. Estimation of Haemoglobin by Sahli's Method

BTHU103-18: ENGLISH

Total Marks: 100	L	T	P
	1	0	0

UNIT- I

Introduction

- Theory of Communication
- Types and modes of Communication

UNIT- II

Language of Communication

- Verbal and Non-verbal
- (Spoken and Written)
- Personal, Social and Business
- Barriers and Strategies
- Intra-personal, Inter-personal and Group communication

UNIT- III

Reading and Understanding

- Close Reading
- Comprehension
- Summary Paraphrasing
- Analysis and Interpretation
- Translation(from Hindi/Punjabi to English and vice-versa)
- Literary/Knowledge Texts

UNIT- IV

Writing Skills

- Documenting
- Report Writing
- Making notes
- Letter writing

Recommended Readings:

1. *Fluency in English* - Part II, Oxford University Press, 2006.
2. *Business English*, Pearson, 2008.
3. Language, Literature and Creativity, Orient Blackswan, 2013.
4. *Language through Literature* (forthcoming) ed. Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas
5. *On Writing Well*. William Zinsser. Harper Resource Book. 2001
6. *Study Writing.* Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.

BTHU104-18: ENGLISH (LAB)

Total Marks: 100	L	T	P
	2	0	0

Interactive practice sessions in Language Lab on Oral Communication

- Listening Comprehension
- Self Introduction, Group Discussion and Role Play
- Common Everyday Situations: Conversations and Dialogues
- Communication at Workplace
- Interviews
- Formal Presentations
- Monologue
- Effective Communication/ Mis- Communication
- Public Speaking

Recommended Readings:

1. *Fluency in English* - Part II, Oxford University Press, 2006.
2. *Business English*, Pearson, 2008.
3. Practical English Usage. Michael Swan. OUP. 1995.
4. *Communication Skills*. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
5. *Exercises in Spoken English*. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

HVPE101-18: HUMAN VALUES, DE-ADDICTION AND TRAFFIC RULES

Total Marks: 100	L	T	P
	3	0	0

UNIT- I

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Understanding the need, basic guidelines, content and process for Value Education
2. Self Exploration–what is it? - its content and process; 'Natural Acceptance' and Experiential Validation- as the mechanism for self exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. Method to fulfill the above human aspirations: understanding and living in harmony at various levels

UNIT- II

Understanding Harmony in the Human Being - Harmony in Myself!

1. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
2. Understanding the needs of Self ('I') and 'Body' - *Sukh* and *Suvidha*
3. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
4. Understanding the characteristics and activities of 'I' and harmony in 'I'
5. Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail
6. Programs to ensure *Sanyam* and *Swasthya*- Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT- III

Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

1. Understanding harmony in the Family- the basic unit of human interaction
2. Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*;
   Trust (*Vishwas)* and Respect (*Samman)* as the foundational values of relationship

3. Understanding the meaning of *Vishwas*; Difference between intention and competence
4. Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship
5. Understanding the harmony in the society (society being an extension of family): *Samadhan, Samridhi, Abhay, Sah-astitva* as comprehensive Human Goals
6. Visualizing a universal harmonious order in society- Undivided Society (*Akhand Samaj),* Universal Order (*Sarvabhaum Vyawastha)*- from family to world family!- Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT- IV

Understanding Harmony in the Nature and Existence - Whole existence as Co-existence

1. Understanding the harmony in the Nature
2. Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature

3. Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
4. Holistic perception of harmony at all levels of existence - Practice Exercises and Case Studies will be taken up in Practice Sessions.

UNIT- V

Implications of the above Holistic Understanding of Harmony on Professional Ethics

1. Natural acceptance of human values
2. Definitiveness of Ethical Human Conduct
3. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
4. Competence in professional ethics:
   a) Ability to utilize the professional competence for augmenting universal human order,
   b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,
   c) Ability to identify and develop appropriate technologies and management patterns for above production systems.
5. Case studies of typical holistic technologies, management models and production systems
6. Strategy for transition from the present state to Universal Human Order:
   a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers
   b) At the level of society: as mutually enriching institutions and organizations

Recommended Readings:

1. Ivan Illich, 1974, *Energy & Equity*, The Trinity Press, Worcester, and HarperCollins, USA
2. E.F. Schumacher, 1973, *Small is Beautiful: a study of economics as if people mattered*, Blond & Briggs, Britain.
3. A Nagraj, 1998, *Jeevan Vidya ek Parichay*, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, *How the Other Half Dies*, Penguin Press. Reprinted 1986, 1991
5. PL Dhar, RR Gaur, 1990, *Science and Humanism*, Commonwealth Purblishers.
6. A.N. Tripathy, 2003, *Human Values*, New Age International Publishers.
7. Subhas Palekar, 2000, *How to practice Natural Farming*, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, *Limits to Growth – Club of Rome's report*, Universe Books.
9. E G Seebauer & Robert L. Berry, 2000, *Fundamentals of Ethics for Scientists & Engineers* , Oxford University Press
10. M Govindrajran, S Natrajan & V.S. Senthil Kumar, *Engineering Ethics (including Human Values)*, Eastern Economy Edition, Prentice Hall of India Ltd.
11. B P Banerjee, 2005, *Foundations of Ethics and Management*, Excel Books.
12. B L Bajpai, 2004, *Indian Ethos and Modern Management*, New Royal Book Co., Lucknow. Reprinted 2008.
13. R R Gaur, R Sangal, G P Bagaria, 2009, *A Foundation Course in Value Education*.

Relevant CDs, Movies, Documentaries & Other Literature:

1. Value Education website, *http://uhv.ac.in*
2. Story of Stuff, *http://www.storyofstuff.com*
3. Al Gore, *An Inconvenient Truth*, Paramount Classics, USA
4. Charlie Chaplin, *Modern Times*, United Artists, USA
5. IIT Delhi, *Modern Technology – the Untold Story*

HVPE102-18: HUMAN VALUES, DE-ADDICTION AND TRAFFIC RULES (LAB/ SEMINAR)

Total Marks: 25	L	T	P
	0	0	1

One each seminar will be orgnizied on Drug De-addiction and Traffic Rules. Eminent scholar and experts of the subject will be called for the Seminar atleast once during the semester. It will be binding for all the students to attend the seminar.

BSND119-18: MENTORING AND PROFESSIONAL DEVELOPMENT

Total Marks: 25	L	T	P
	1	0	0

Guidelines regarding Mentoring and Professional Development

The objective of mentoring will be development of:

- Overall Personality
- Aptitude (Technical and General)
- General Awareness (Current Affairs and GK)
- Communication Skills
- Presentation Skills

The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are:

Part – A (Class Activities)

1. Expert and video lectures
2. Aptitude Test
3. Group Discussion
4. Quiz (General/Technical)
5. Presentations by the students
6. Team building Exercises

Part – B (Outdoor Activities)

1. Sports/NSS/NCC
2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.

Evaluation shall be based on rubrics for Part – A & B Mentors/Faculty incharges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.

SEMESTER SECOND

BSND121-18: BASICS OF COOKING

Total Marks: 100	L	T	P
	4	0	0

UNIT- I

Kitchen attire and equipment's. Terminology used in cooking.
Cooking of food- heat and heat transfer methods. Effects of cooking on food and its nutritive value.

UNIT- II

Principles and practices of boiling, simmering, streaming, frying, stewing, pressure cooking, roasting, baking for different food groups.

UNIT- III

Principles and practices of braising, grilling, infrared, microwave cooking and combined methods of cookery for different food groups.

UNIT- IV

Basics of culinary practices. Thickening and binding agents. Flavoring stocks, essence, glazes, sauces, soups and garnishes.

BSND122-18: FOOD PROCESSING & PRESERVATION

Total Marks: 100	L	T	P
	4	0	0

UNIT- I

Scope and importance of food preservation, Historical developments in food processing. Types of foods and causes of food spoilage. Definition of shelf life, perishable foods, semi perishable foods, shelf stable foods. Principles of Food Preservation.

Food Microbiology: microorganisms associated with foods- bacteria, yeast and mold, Importance of bacteria, yeast and molds in foods. Classification of microorganisms based on temperature, pH, water activity, nutrient and oxygen requirements, typical growth curve of micro-organisms. Food infection, food intoxication.

UNIT- II

Food Preservation by Low temperature

Freezing and Refrigeration: Introduction to refrigeration, cool storage and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, introduction to thawing, changes during thawing and its effect on food.

Food Preservation by high temperature

Thermal Processing- Commercial heat preservation methods: Sterilization, commercial sterilization, Pasteurization, and blanching.

UNIT- III

Food Preservation by Moisture control

Drying and Dehydration - Definition, drying as a means of preservation, differences between sun drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying, normal drying curve, names of types of driers used in the food industry.

Evaporation – Definition, factors affecting evaporation, names of evaporators used in food industry.

UNIT- IV

Food Preservation by Irradiation

Introduction, units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry, concept of cold sterilization.

Food Preservation by Preservatives: Uses and effects of class I and class II preservatives in foods.

Recommended Readings:

1. Sivasankar, B. (2014). *Food processing and preservation:* Hall of India Pvt., New Delhi.
2. Fellows, P. J. (2009). *Food processing Technology: Principles and Practice:* Woodhead Publishing.
3. Brennan, J. G. (2006). *Food Processing Handbook:* Weinheim: Wiley-VCH.
4. Zeuthen, P. & Bogh- Sprensen, L. (2003). Food Preservation Techniques: CRC Press, Boca raton.
5. Vonloesecka, H. W. (1998). *Drying and Dehydration of Foods:* Allied, Bikaner.
6. B. Srilakshmi, Food science, New Age Publishers,2002
7. Meyer, Food Chemistry, New Age,2004

8. Bawa. A.S, O.P Chauhan etal. Food Science. New India Publishing agency, 2013
9. Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004

BSND123-18: FOOD CHEMISTRY

Total Marks: 100

L	T	P
4	0	0

UNIT- I

Introduction to Food Chemistry: Definition, Composition of food.

Water: Definition of water in food, Structure of water and ice, Types of water, Sorption phenomenon, Water activity and packaging, Water activity and shelf-life.

UNIT- II

Lipids: Classification of lipids, Physical properties-melting point, softening point, specific gravity, refractive index, smoke, flash and fire point, turbidity point. Chemical properties-reichert meissel value, polenske value, iodine value, peroxide value, saponification value. Effect of frying on fats; Changes in fats and oils- rancidity, lipolysis, flavor reversion; Auto-oxidation and its prevention; Technology of edible fats and oils- Refining, Hydrogenation and Interesterification, Fat Mimetics

Proteins: Protein classification and structure; Nature of food proteins (plant and animal proteins); Properties of proteins (electrophoresis, sedimentation, amphoterism and denaturation); Functional properties of proteins eg. organoleptic, solubility, viscosity, binding gelation / texturization, emulsification , foaming.

UNIT- III

Carbohydrates: Classification (mono, oligo and poly saccharides); Structure of important polysaccharides(starch, glycogen, cellulose, pectin, hemicellulose, gums); Chemical reactions of carbohydrates –oxidation, reduction , with acid & alkaki; Modified celluloses and starches

UNIT- IV

Vitamins: Structure, Importance and Stability; Water soluble vitamins; Fat soluble vitamins.

Flavour: Definition and basic tastes; Chemical structure and taste; Description of food flavours; Flavour enhancers.

Recommended readings:

1. Fennema, Owen R, Food Chemistry, 3rd Ed., Marcell Dekker, New York, 1996
2. Whitehurst and Law, Enzymes in Food Technology, CRC Press, Canada, 2002
3. Wong, Dominic WS, Food Enzymes, Chapman and Hall, New York, 1995
4. Potter,N.N.and Hotchkiss,J.H, Food Science, 5th Ed., Chapman & Hall,1995
5. DeMan, J.M., Principles of Food Chemistry, AVI, NewYork, 1980

BSND124-18: FOOD PACKAGING

Total Marks: 100	L	T	P
	4	0	0

UNIT- I

Introduction to Food Packaging: Packaging Functions and Requirements,, Printing of packages .Barcodes & other marking, Labeling Laws Glass: Composition, Properties, Methods of bottle making, Types of closures.

UNIT- II

Food Packaging Materials: Paper and paper-based materials, corrugated fiber board (CFB). Plastics, formation- Injection molding, Blow molding, Types of plastics, Lamination, Biodegradable plastics, Edible packaging and Bio-composites. Environmental Concerns- recycling and disposal of plastic waste.
Metal packaging- Metals: Tinplate, tinning process, components of tinplate, tin free can (TFC), types of can, metallic films, lacquers.

UNIT- III

Package Designing for Foods: Package design for fresh horticultural produce and animal foods, dry and moisture sensitive foods, frozen foods, fats and oils, thermally processed foods and beverages.

UNIT- IV

Testing and Regulatory Aspects of Food Packaging: Testing Procedures for Packaging Materials- thickness, tensile strength, puncture resistance, bursting strength, seal strength, water vapor permeability, CO_2 permeability, oxygen permeability, grease resistance, Testing Procedures for Packaged Foods - Compatibility and shelf life studies, evaluation of transport worthiness of filled packages. Food Packaging Laws and Regulations.

Packaging Machinery and Systems: Bottling machines, Cartoning systems, Seal and Shrink packaging machine; Form, Fill and Sealing machine (FFS).
Vacuum, Controlled and Modified atmosphere packaging systems; Aseptic packaging systems; Retort packaging, Active and Intelligent packaging systems

Recommended readings:

1. Robertson GL, Food Packaging – Principles and Practice, CRC Press Taylor and Francis Group,2012
2. Paine FA and Paine HY, A Handbook of Food Packaging, Blackie Academic and Professional, 1992
3. Coles R, McDowell D, Kirwan MJ Food Packaging Technology. Blackwell, 2003

BSND125-18: BASICS OF COOKING (LAB)

Total Marks: 50	L	T	P
	0	0	4

Course Contents:

1. Preparation of recipes from different food groups such as
    a. Cereals
    b. Pulses
    c. Eggs
    d. Vegetables
    e. Fruits and
    f. Milk.
2. Preparation of food products using various cooking methods-
    a. Boiling
    b. Steaming
    c. Frying
    d. Stewing
    e. Roasting
    f. Braising
    g. Grilling
    h. Microwave cooking and
    i. Methods in combination.

BSND126-18: FOOD PROCESSING & PRESERVATION (LAB)

Total Marks: 50	L	T	P
	0	0	4

Course Contents:

1. Sampling techniques and preparation of test samples.
2. Concept of shelf life of different foods
3. To study the concept of Asepsis and sterilization
4. Determination of pH of different foods using pH meter.
5. Study quality characteristics of foods preserved by drying/dehydration/ freezing.
6. To perform pasteurization of fluids using different methods.
7. To perform blanching of different plant foods.
8. Pickling and curing of foods,
9. Determination of sodium chloride in brine,
10. Determination of moisture content in fresh and dried food samples,
11. Effect of pH on microbial stability of food,
12. Dehydration of foods
13. Use of chemical preservatives in food
14. Preservation of food by canning(Fruit/Vegetable/meat)
15. Cut-out analysis of canned food
16. Comparison of conventional and microwave processing of food

BSND127-18: FOOD CHEMISTRY (LAB)

Total Marks: 50	L	T	P
	0	0	4

Course Content:

1. Preparation of primary and secondary solutions
2. Estimation of moisture content
3. Determination of gelatinization temperature range (GTR) of different starches and effect of additives on GTR.
4. Determination of refractive index and specific gravity of fats and oils.
5. Determination of smoke point and percent fat absorption for different fat and oils.
6. Determination of percent free fatty acids
7. Estimation of saponification value
8. Estimation of reducing and non-reducing sugars using potassium ferricyanide method.

EVS102-18: ENVIRONMENT STUDIES

Total Marks: 100	L	T	P
	2	0	0

UNIT- I

Introduction to environmental studies

- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

UNIT- II

Ecosystems

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems:
    a) Forest ecosystem
    b) Grassland ecosystem
    c) Desert ecosystem
    d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT- III

Natural Resources : Renewable and Non-•-renewable Resources

- Land resources and landuse change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water : Use and over-•-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-•-state).
- Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

UNIT- IV

Biodiversity and Conservation

- Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots
- India as a mega-•-biodiversity nation; Endangered and endemic species of India
- Threats to biodiversity : Habitat loss, poaching of wildlife, man-•-wildlife conflicts, biological invasions; Conservation of biodiversity : In-•-situ and Ex-•-situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

UNIT- V

Environmental Pollution

- Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management : Control measures of urban and industrial waste.
- Pollution case studies.

UNIT- VI

Environmental Policies & Practices

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

UNIT- VII

Human Communities and the Environment

- Human population growth: Impacts on environment, human health and welfare.
- Resettlement and rehabilitation of project affected persons; case studies.
- Disaster management : floods, earthquake, cyclones and landslides.
- Environmental movements : Chipko, Silent valley, Bishnois of Rajasthan.
- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

UNIT- VIII : Field work

- Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.
- Visit to a local polluted site-•-Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems-•-pond, river, Delhi Ridge, etc.

***Recommended readings*:**

1. Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R.1993. *This Fissured Land: An Ecological History of India*. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999.*Global Ethics and Environment*, London, Routledge.
4. Gleick, P. H. 1993. *Water in Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll.*Principles of Conservation Biology*. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science*, 339: 36-•-37.
7. McCully, P. 1996. *Rivers no more: the environmental effects of dams*(pp. 29-•-64). Zed Books.
8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971.*Fundamentals of Ecology*. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. *Waste Water Treatment*. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012.*Environment*. 8th edition. John Wiley & Sons.

13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. *Environmental law and policy in India*. *Tripathi 1992*.
14. Sengupta, R. 2003. *Ecology and economics*: An approach to sustainable development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. *Conservation Biology*: *Voices from the Tropics*. John Wiley & Sons.
17. Thapar, V. 1998. *Land of the Tiger*: *A Natural History of the Indian Subcontinent*.
18. Warren, C. E. 1971. *Biology and Water Pollution Control*. WB Saunders.
19. Wilson, E. O. 2006.*The Creation: An appeal to save life on earth*. New York: Norton.
20. World Commission on Environment and Development. 1987.*Our Common Future*. Oxford University Press.

BSND128-18: BASICS OF COMPUTERS

Total Marks: 50	L	T	P
	2	0	0

UNIT-I

1. Computer fundamentals -Theory Information concepts and processing. Definition, Need , Quality and value of Information Data processing concepts

2. Elements of a Computer System. Definitions, Characteristics of Computers, Classification of Computers, Limitations.

3. Hardware Features and uses. Components of Computer , Generation of Computers, Primary and secondary storage concepts. Data entry devices. Data output devices.

UNIT- II

4. Software Concepts. System Software, Application Software. Language Classification. Compliers and interpreters.

5. Operating System / Environment - Theory BASICS OF MS-DOS, Internal Commands, External Commands

6. Introduction to Windows, GUI/ Features, Parts of a typical window and their functions.

Recommended Readings :

1. Fundamental of Computers, Prentice Hall India
2. Mastering Microsoft Office, Lonnie. E. Moseley, BPB Publications

BSND129-18: MENTORING AND PROFESSIONAL DEVELOPMENT

Total Marks: 25	L	T	P
	1	0	0

Guidelines regarding Mentoring and Professional Development

The objective of mentoring will be development of:

- Overall Personality
- Aptitude (Technical and General)
- General Awareness (Current Affairs and GK)
- Communication Skills
- Presentation Skills

The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are:

Part – A (Class Activities)

1. Expert and video lectures
2. Aptitude Test
3. Group Discussion
4. Quiz (General/Technical)
5. Presentations by the students
6. Team building Exercises

Part – B (Outdoor Activities)

1. Sports/NSS/NCC
2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.

Evaluation shall be based on rubrics for Part– A & B. Mentors/Faculty in charges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.

SEMESTER

THIRD

BSND 211-18 NORMAL AND THERAPEUTIC NUTRITION

Total Marks: 100 L T P
3 1 0

UNIT I

Food, nutrition, and health; Factors influencing food intake and food habits;
Meal planning, Importance of meal planning and factors to be considered while planning meals.

Food Groups and Food Exchange List ,Use of food groups and exchange list, calorie consumption units in planning meals for a family. Recommended Dietary Allowances (RDA).

Modification of normal diet to therapeutic diets and its importance. Normal and artificial methods of feeding.

UNIT II

Maternal Nutrition; Physiological changes and nutritional requirements during pregnancy and lactation.

Growth, development and nutritional requirements during infancy, Breast feeding vs bottle feeding and complementary feeding.

Growth, development, food habits and nutritional requirements of pre-schoolers, school going children

UNIT III

Growth, development, food habits and nutritional requirements of adolescents.

Physiological changes during old age and meeting their nutritional requirements.

Causes, symptoms and dietary management in fevers, diarrhoea, Gastrointestinal diseases

UNIT IV

Causes, symptoms and dietary management in constipation, obesity, liver diseases, cardiovascular diseases, hypertension, diabetes,
Lactose intolerance, Gluten intolerance (Celiac Diseaes), Keto diet

Recommended Readings:

1. A.M. Gordon & K.W. Browne, 2000., "Beginings and Beyond", 5th edition, Delmar Thomson Learning, united states of America, p-p 323-324.
2. Antia F.P. (1989). Clinical Dietetics and Nutrition. Third Edition. (pp- 226-239), Bombay, Oxford University Press.
3. Bamji . S.M., Rao,P.N., and Reddy, V. Textbook of Human Nutrition. Pp-360-67. Oxford and IBH publishing Co Pvt Ltd
4. Corinne H. Robinson, Marilyn R. Lawler, Wanda L. Chenoweth, Ann E. Garwick. (1982). Normal and Therapeutic Nutrition. (pp- 1-16). New York, Macmillan Publishing Company.
5. Edited by Gibney M J, Macdonald I.A. & H M Roche. (2004). Oxford, UK. Black Well Science Publishers.
6. Faye Kinder, Nancy R.Green, Natholyn Harris. (1984). (pp-89-91). Sixth Edition, New

York, Macmillan Publishing Company.

7. Garrow, J.S. and James WPT. Human Nutrition and Dietetics, 9th Ed.
8. Gordon Wardlaw Gordon M. &Insel Paul M. (1992). Contemporary Nutrition.(p-p 479-482) , Boston, Mosby year Book.
9. James H. Mayer. (1994). Modern Nutrition in health and disease. (pp 1029-1034). Eighth Edition, vol: 2, Lea &Febiger, London, pp 1029-1034.
10. Jim Mann and A. Stewart Truswell. (2008). Essentials of Human Nutrition. (pp 502-513). New York, Oxford University Press.
11. Marietjie G. Herselman, DemetreLabadariosetal., (2005). Clinical Nutrition. (pp 163-166). UK, Blackwell Publishing Company.
12. Mark A. Korsten and Charles S. Lieber. (1994). Modern Nutrition in Health and Disease. (pp- 1066-1077). Edited by Shills M E, Olson J A & Moshe Shike. USA, Publishers Wilhams& Wilkins.
13. Miguel A Gassull and Eduard cabre. (2005) Clinical Nutrition. Blackwell Publishing Company, UK pp 146-162.
14. Niraja Sharma. (2006). Nutrition and Nutrition Status. (pp-139-164), First Edition, New Delhi, Murali Lal & Sons.
15. Nutrient requirements and Recommended Dietary Allowances for Indians (1998), (pp1-83). A Report of the Expert Group of the Indian Council of Medical Research, Hyderabad, ICMR.
16. Rajya Lakshmi Muralidharan and Uma Benerji., 1969, National Council of Educational Research and Training, New Delhi, p-p 1-7.
17. Roger C. Andersen. (1997). Nutrition Support Theory and Therapeutics, Nutrition Support and Pregnancy. (pp508-517). New York, International Thomson Publishing
18. Sharon Rady Rolfesetal (1998). Life Span Nutrition. (pp 36-106). Conception through life, Belmont, An International Thomson Publishing Company.
19. Sheel Sharma. (2006). Human Nutrition and Meal Planning. (pp 390-400).New Delhi, JnanadaPrakasham (P&D).
20. Shubhangini A Joshi. (1994). Nutrition and Dietetics, (pp 301-307). New Delhi, Tata Mc Graw- Hill Publishing Company Limited.
21. Srilakshmi.B (2005). Dietetics. (pp 3-14). Fifth Edition. New Delhi. New Age International (P) Limited.
22. Sumati R. Mudambi, M.V. Rajagopal. (2001). Fundamentals of Foods and Nutrition. (pp195-232). New Delhi, New Age International (P) Ltd.
23. Williams, S.R. Nutrition and Diet Therapy, 6th Ed. Jones Mirror College Publishing

BSND 212-18 COMMUNITY NUTRITION

Total Marks: 100 L T P
3 1 0

UNIT I

Concept of community, health, malnutrition. Under nutrition – causes and effects

Assessment of Nutritional Status- overview of WHO Standards, Nutritional anthropometry. Analysis and Interpretation of Anthropometric data

Clinical Assessment of Nutritional Status: Introduction, Clinical changes in different parts of body: Face, Eyes, Tongue, Teeth, Glands, Skin, Nails, Subcutaneous Tissues, Muscular and Skeletal Systems, Muscular and Skeletal Systems., Guide to the interpretation of Groupings of clinical signs, Rapid clinical surveys, Interpretations of signs in relation to Nutrient deficiencies.

Biochemical Assessment of Nutritional Status: Introduction, Functional Biochemical Measurements, Collection of Blood samples, Assessment of protein status, Biochemical methods for assessing nutritional status of vitamins and minerals, Biophysical or Radiological Measurements.

UNIT II

Diet Survey: Introduction, Purpose of Diet Survey, Types of dietary Surveys, Methods of Diet Survey, Measuring food consumption of individuals.

Assessment of Nutritional Status Based on Vital Statistics: Introduction, Mortality rate, Morbidity rates, Vital statistics.

Major nutritional problems prevalent in India and Punjab - Protein Energy Malnutrition, Iodine Deficiency Disorders, Iron Deficiency Anemia (IDA), Vitamin A Deficiency (VAD) and fluorosis.

UNIT III

National and global nutrition programmes and policies. Role of National Agencies in Combating Malnutrition: Indian Council of Agricultural Research (ICAR), Indian Council of Medical Research (ICMR), National Institute of Nutrition (NIN), National Nutrition Monitoring Bureau (NNMB), Food and Nutrition Board (FNB), Nutrition Foundation of India (NFI).

Role of International Agencies in Combating Malnutrition: United Nations Children's Fund (UNICEF), World Health Organization (WHO), Food and Agricultural Organization (FAO), Cooperative American Relief Everywhere (CARE).

UNIT IV

Role of community kitchens in combating malnutrition.

Nutrition Education: Principles, methods and evaluation of nutrition education programmes. Nutrition surveillance.

Recommended Readings:

1. Annalynn Skipper. (2009). Medical Nutrition Therapy Practise .Jones&Barlett Publishers.
2. *Assessment* of IDD & monitoring their elimination. (2001) – *a guide for programme*

managers ICCIDD/UNICEF/WHO.

3. Bamji M. S, Prahlad Rao N. &Vinodinireddy (2003). *Text book of Human Nutrition* (p-p 197-201), New Delhi. Oxford & IBH Publishing Co. PVT. LTD
4. Derrick. B. Jelliffe (1966), *The assessment of the nutritional status of the community (With special reference to field surveys in developing regions of the World)*. World Health Organization, Geneva
5. FAO/ WHO Expert Committee on Medical *Assessment* of Nutritional Status. WHO Tech. Rep. ser . 8.
6. Jim Mann and StewantTruswell A. (2007). *Essentials of human nutrition*. Third edition; New York, Oxford University press.
7. Mahan, K. L., Stump E. S. (2012). Food and the Nutrition Care Process. (13thed) USA :Saundus Elsevier.
8. Mary, M. Mary K.R. &Scott .A. S. (2008).Clinical Nutrition for surgical patients.Jones&Barlett Publishers.
9. Michael C Latham, *Human Nutrition in the Developing World*. Ithaca, New york, USA
10. Srilakshmi.B (2005). *Nutrition Science* (pp 3-14), New Delhi. New Age International (P) Limited.
11. Swaminathan, M. 1997, Essentials of Food and Nutrition, vol I Second edition, BAPPCO, Bangalore p-p 107-111.
12. Tara Gopaldas and Subadra Seshadri (1987), *Nutrition: Monitoring and Assessment*. Oxford University Press.
13. Thomas, B. (Eds). (1994). Manual of Dietetics Practice .Oxford : Blackwell Scientific Publication.
14. Wardlaw, M. G. (1999) Perspectives In Nutrition. (4thed) .USA : WCB/ McGraw – Hill.
15. Zeman J. F. & Ney M. D. (1988). Application of Clinical Nutrition.London : Prentice – Hall International.

BSND 213-18 HEALTH, HYGIENE AND SANITATION

Total Marks: 100 L T P
3 1 0

UNIT I

Concept, Dimensions, significance and interrelationship of health, hygiene and sanitation. Characteristics of good health and factors affecting it. determinants of Health, Indicators of Health,

Concept of Disease and Disease Causation, Responsibility of Health, Concept of Control and Prevention of Diseases.

UNITII

Immunization to Prevent Communicable Disease, Host Defences

Hygiene, Personal Hygiene,Housing Standards: Criteria For Healthful Housing, Ventilation, Lighting and Noise- Need, Standards, Types, Effects on Health.

Vector Management, Rodent Control,

Food Hygiene, inculcating hygienic habits to promote health. Kitchen hygiene and sanitation.

UNIT III

Sources of water contamination and its purification at domestic level.

Causes of air pollution and its ill effects on health.

Soil impurities, their effect on health and its prevention and control.

Accidental and bacterial food poisoning. Symptoms and prevention of food poisoning.

Causes, symptoms and control of food borne diseases - diarrhoea, dysentery, cholera,typhoid, jaundice.

UNIT IV

Municipal health services and mobile units

Prevention and control of infectious diseases. Notification, quarantine, segregation, and disinfection.

Health services at fairs and festivals.

Removal and disposal of refuse and excreta. Sanitary drainage fittings.

Recommended Readings:

1. Biorklund A., Svensson T, and Read S. 2006, Holistic and biomedical concepts of health: a study of health notions among Swedish occupational therapists and a suggestion for developing an instrument for comparative studies. Scand. J. OccupTher 2006 Sep;13(3):141-50.
2. RodayS.(1998). Food Hygiene and Sanitation 10th Reprint. New Delhi:TataMcGraw-Hill Education.3. ChattopadayGhosh S and BasuN.(2015). UcchaMadhaymikKhadda O Pusti, Calcutta Book House
3. Okuno. T (1978). World Health Statistics, Quarterly Report, 31 (2) 120.

4. Park K. 2007, Park's text book of Preventive and Social Medicine, BanarsidasBhanot publishers, India.
5. SrilakshmiB.(2018). Food Science. New Delhi: New Age International.

BSND 214-18 NORMAL AND THERAPEUTIC NUTRITION (LAB)

Total Marks: 50

L T P
0 04

Course Content

1. Planning and preparation of balanced diet for adults.
2. Planning and preparation of balanced diet for preschool.
3. Planning and preparation of balanced diet for school going children.
4. Planning and preparation of balanced diet for adolescents.
5. Planning and preparation of balanced diet for old age.
6. Planning and preparation of diets for pregnant and lactating women.
7. Preparation of infant feed formula and complementary foods.
8. Planning and preparation of diets for special occasions - birthdays, festivals, packed lunches.
9. Planning and preparation of diets during selected disorders-typhoid, diarrhoea, constipation, hepatitis, hypertension, diabetes, over weight/obesity, under weight.
10. Demonstration of DietCal software.
11. Visit to hospital and anganwadi centres

BSND215-18 COMMUNITY NUTRITION (LAB)

Total Marks: 50

L T P
0 0 4

Course Content

1. Assessment of nutritional status of an individual/community using anthropometry.
2. Assessment of nutritional status of an individual/community using dietary survey.
3. Assessment of nutritional status of an individual/community using clinical signs and symptoms.
4. Visit to an Integrated Child Development Services block and Primary Health Centre.
5. Development of audio visual aids for imparting nutrition education.
6. Planning, implementation and evaluation of nutrition education for specific target groups.

BSND 216-18 HEALTH, HYGIENE AND SANITATION (LAB)

Total Marks: 50

L T P
0 0 2

Course Content

1.Personal and environmental hygiene.
2. Preparation of oral rehydration solution (ORS).
3. Chlorination of water.
4. Control of infestation - rodent control, proofing and destruction of rats, mice etc.
5. Swab testing for food preparation surfaces and utensils.
6. Personnel Hygiene Monitoring / Swab Testing
7. Quality analysis of drinking water.
8. Microbiological analysis of the air
9. Organization of health and hygiene camp.
10. Visit to primary health centre and civil hospital.

BSND217-18 NUTRACEUTICALS, FUNCTIONAL FOODS & NUTRIGENOMICS

Total Marks: 100 L T P
3 1 0

UNIT I

Nutraceuticals and functional foods: definition, types and scope, need, food applications and their health benefits, Nutraceutical compounds and their classification, Classification of functional foods, Nutraceuticals for specific situations such as cancer, heart disease, stress, osteoarthritis, hypertension etc.

UNIT II

Free radicals and Antioxidants; Phytochemical and their usefulness: polyphenols, Omega-3 Fatty Acids, Carotenoids, Dietary fibres, Phytoestrogens, Glucosinolates, Organosulphur Compounds, peptides, fatty acids. Cereal grains *viz.* oats, wheat bran, rice bran, fruits and vegetables, oil seeds, sea foods as functional foods. Coffee, tea and other beverages as functional drinks and their protective effect, Effects of processing, storage and interactions of various environmental factors on the potentials of such foods, health benefits.

UNIT III

Prebiotics and Probiotics: Usefulness of Probiotics & Prebiotics in gastrointestinal health and other benefits, Examples of useful microbes and their benefits, Prebiotic ingredients in foods, types of prebiotics and their effects on gut microbes, Probiotic foods and their functional role, Marketing and regulatory issues for functional foods and nutraceuticals.

UNIT IV

Concept of nutrigenomics and gene expression, nutrition in the omics era- elementary concepts on epigenetics, transcriptomics, proteomics, metabolomics; genetic variation and nutritional implications. Nutrient control of gene expression – amino acids, nucleotides, basic concepts of nutrigenomics and complex diseases – diabetes, cancer and obesity.

Recommended Readings:

1. Mine, Y and Fereidoon, S. (2006). Nutraceutical Proteins and Peptides in Health and Disease: TF, Bocaraton.
2. Bagchi, D. (2008). Nutraceutical and Functional Food Regulations in United States and Around the World: Elsevier, London.
3. Shi, J. (2007). Functional Food Ingredients and Nutraceuticals:Processing Technologies: CRC Press, London.
4. Guo, M. (2009). Functional Food: Principles and Technology: WP, New Delhi.
5. Mahtab, S, Bamji, Kamala Krishnasamy, G.N.V. Brahmam, Text Book of Human Nutrition, Third Edition, Oxford and IBH Publishing Co. P. Ltd., New Delhi, 2009.
6. Srilakshmi, B. Second Edition, Food Science, New Age International (P) Limited Publishers, New Delhi, 2010.
7. Simopoulus, A.P. and Ordovas, K.J.M., 2004, Nutrigenetics and Nutrigenomics,
Vol. 93, Karger, Switzerland.

8. Watson, David, H., 2003, Performance Functional Foods, CRC Press, Wood Head Publishing Ltd., England

9. Tamine, A., 2005, Probiotic Dairy Products, Blackwell Publishing Ltd., UK

10. Narasinga Rao, B.S., 2005, Nutrition Research in India – A Country Report, Published by INSA, New Delhi.

11. Webb, G.P., 2006, Dietary Supplementations and Functional Foods, Blackwell Publishing Ltd., New York.

12. Tai, E.S. and Gillies, P.J., 2007, Nutrigenomics – Opportunities in Asia, Karger, Singapor.

BSND218-18: MENTORING AND PROFESSIONAL DEVELOPMENT

Total Marks: 25	L	T	P
	1	0	0

Guidelines regarding Mentoring and Professional Development

The objective of mentoring will be development of:

- Overall Personality
- Aptitude (Technical and General)
- General Awareness (Current Affairs and GK)
- Communication Skills
- Presentation Skills

The course shall be split in two sections i.e. outdoor activities and class activities. For achieving the above, suggestive list of activities to be conducted are:

Part – A (Class Activities)

1. Expert and video lectures
2. Aptitude Test
3. Group Discussion
4. Quiz (General/Technical)
5. Presentations by the students
6. Team building Exercises

Part – B (Outdoor Activities)

1. Sports/NSS/NCC
2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE, CSI, Cultural Club, etc.

Evaluation shall be based on rubrics for Part– A & B. Mentors/Faculty in charges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.