

Syllabus and COs
for
B.Voc (Nutrition & Dietetics)

DEEN DAYAL UPADHYAY KAUSHAL KENDRA, DAVV, INDORE

B.Voc (Nutrition & Dietetics)

SEMESTER I

BVC-ND 11: Business Communication (English)

Course Outcomes:

CO 1: The student will be able to comprehend the importance of verbal and non-verbal communication and also apply the basic principles to communicate effectively.

Unit I : Understanding the basic structure used in English Language for formation and comparing it with that of our primary language, understanding and identifying 'Sense of Sentence', identifying and defining 'Subject' and 'Verb', Concept of Verbs and Verb Forms.

Unit II: Structures of Present, Past, Continuous and Future Sentence formation with First, Second and Third forms of Verbs, learning usage of Helping Verbs like Has, Have and Had, do, does, did, will, shall etc., knowing Subject-Verb Agreement principles, knowing 'Subject Modifiers' and their usage in sentence formation.

Unit III : Structures of Sense of Being (SoB) sentences, and for 'Sense of Possession (SoP)', knowing the type of sentences, usage of helping verbs like 'is/am/are/was/were' etc as Main Verbs for Present, Past, Continuous and Future times senses.

Unit IV: Sentence Structures using 'THERE' and 'IT', constructing sentences denoting the 'Location' of the subject with 'THERE', handling 'identified' and 'unidentified' Subjects, constructing sentences with 'IT' where 'Active Subject' is not available.

Unit V: Understanding 'Sense' of Grammar in special reference to Primary Language, usage of Pronoun, Articles and Prepositions.

Unit VI: Sentence constructions using 'Modals' like can, could, should, must, have to, will be able to, should have, must have etc.

Unit VII: Communication and English Lab Sessions to reinforce and enhance the effectiveness of Classroom Session.

Section A: These sessions to cover Verb and Verb Form vocabulary, Word vocabulary, 'Group of Words' vocabulary, Grammar aspects.

Section B: Elementary Reading, Listening and Writing skills practice and 'Trade Specific Vocabulary building.

Text & Reference Books:

1. Expressions, A language Lbas for English, C. Sumant, Publisher : 'iGrowth'.
2. SuperFast English and Instant English , Abdul Salam Chaus, Publisher : Salaam Chaus, Jafar Nagar, Masjid Complex, 110, Jafar Nagar, Nagpur.
3. How to Translate into English, Prof. Rajendra Prasad Sinha, Bharti Bhawan, 4271/3, Ansari Road, Dariya Ganj, New Delhi

BVC-ND 12: Basic Computer Application

Course Outcomes:

CO 1: To promote professional excellence in the area of Cargo Logistics Management towards National Prosperity through Sustainable Development.

Unit I: Fundamentals of Computers: Identification of various hardware components of a computer system, Architecture and types of Computers. Hardware- Input, Output, Processing, Storage and Networking devices with their working principals. Software - System and Application Software. Computer Languages - Generation of Languages and their Features. Introduction to Information Technology- Data, Information, role of Information System in organization, computer based Information System, latest trends and challenges of information Systems, Information System applications in Air cargo, water Cargo, road and railway cargo, use of RFID and GPS.

Unit II: Familiarization of various Operating Systems: WINDOWS: Basic Operations, Utilities and Features (Explorer to manage files). UNIX/LINUX: Introduction, Features and Basic Commands, introduction to mobile operating system – ANDROID and mobile applications. Fundamentals of Networking - types of networks (LAN, WAN, MAN), Network topologies, and Components of Computer Network -Server, Workstation, NIC, Hubs, Switchers, Cables etc. Internet and its use in business – e-commerce, business communication, sending documents, E-mail, www, Searching, Uploading and Downloading from Internet, Hardware and Software requirement of Internet, Search Engines, Browser, Video conferencing. Introduction to mobile communication and mobile computing, Computer Virus, Trojan horse and Worms and their Prevention.

Unit III: Application Software (Open Office Automation Software):

Word Processing Software- Word Processing Basics, spell check and grammar, Formatting Text and Documents, Headers, Footers, Tables, Working with Graphics, Templates, printing documents, advance report formatting, Introduction to Mail Merge
Presentation Software - Presentation software Basics, Creating Presentation, slide layouts, working with Text, Graphics, pictures, audio and video in presentation, Slide transition, Custom animation, managing slide shows.

Unit IV: Spreadsheet Software: Working with cell and cell Addresses, Inserting and Deleting Cells, rows and columns, cell ranges, Formatting and styles, entering formula, inbuilt simple Functions, Working with multiple sheets, Visual presentation of data using charts, adding Graphics, Table format, sorting and filtering data, Auto fill.

Unit V: Advance Features of Spreadsheet Software – logical and text functions, Validation, Conditional formatting, Editing charts, Using Worksheet as Databases, Subtotals, Goal Seek, Solver, Pivot tables, Protection of workbooks, managing large spreadsheets. Case Study: Role of Information Technology for Supply Chain Management. Case Study: Role of internet in logistics and Supply chain management.

Text & Reference Books:

1. Antony Thomas. Information Technology for Office. Pratibha Publications.
2. Gini Courter & Annette Marquis. Ms-Office 2007: BPB Publications.
3. Leon A & Leon M, Introduction to Computers, Vikas Publication.

4. Leon, Fundamentals of Information Technology, Vikas Publication.
5. Kakkar D.N., Goyal R, Computer Applications in Management, New Age.
6. Lucas, Henry C., Information Technology for Management, New Delhi, Tata McGraw-Hill.
7. P.K. Sinha, Computer Fundamentals, New Delhi, BPB Publications Christian Crumlish, ABCs of the Internet, New Delhi, BPB Publications.
8. Das, Sumitabha, Unix Concepts and Applications, New Delhi, Tata McGraw Hill Pub. Co. Ltd.

BVC- ND 13: Principles of Nutrition I

Course Outcomes:

CO 1: It will help to understand the basics of nutrition and dietetics.

CO 2: This subject will make students learn the concept of roots of nutrition in terms of micro and macro nutrients.

Unit I: Introduction to food, nutrition and dietetics- Scope of nutrition and dietetics, Basic concept of Food and Nutrition, Nutritional status, Health and Fitness, Importance of nutrition in all stages of life cycle, Job opportunities in food, nutrition and dietetics- Food industries and food service system, At Community kitchen, Instructor in ICDS integrated child development scheme, At NRC nutrition rehabilitation center, As a feeding demonstrator, As Infant and young child feeding demonstrator, As a junior research associate, At Pharm industries, In health clubs and fitness center, In school kitchen, As a content writer in nutrition journalism, Self-employed in small scale food industries.

Unit II: Carbohydrates- Introduction to nutrients, carbohydrates nutritional classification, function, digestion and absorption, deficiency and excess, sources and requirement. Fiber- definition, types, roles of fiber in prevention of disease.

Unit III: Protein- Nutritional classification, functions, digestion and absorption, sources and requirements, deficiency. Methods for the determination of protein quality- dc, bv, npu, npr, per and ndper. Classification of amino acids- essential and non-essential, functions and deficiency.

Unit IV: Lipids- Classification, functions, digestion and absorption, sources and requirements, deficiency, essential fatty acids- functions, sources, deficiency. Water - distribution, functions, sources, requirements, dehydration and intoxication.

Text & Reference Books:

1. B. Srilakshmi, Nutrition Science, Fifth Edition, New Age International (P) Ltd, New Delhi (2008).
2. Ambika Shanmugam, Fundamentals Of Biochemistry For Medical Students, Seventh Edition, New Age Publishing Pvt. Ltd., New Delhi (1986).
3. Joshi. A.S, "Nutrition & Dietetics", Third Edition, Tata Macgraw Hill Education Pvt. Ltd., New Delhi (2010).
4. R. Passmore and M. A. Eastwood, Human Nutrition and Dietetics, 8th language book society/ churchill livingstone, Hong Kong, (1986).

5. Neiman N. Catherine, Nutrition, WM. C. Brown Publishers. USA (1990).
6. U. Satyanarayana and U. Chakrapani, Biochemistry, Third edition, Uppala author-publisher interlinks, Vijayawada (2010).

PRACTICALS

- Practical demonstration of nutrients, Classification of macro and micronutrients, Identify the types of nutrients in food displayed, Visit to Anganwadi and hospital, for project.

BVC-ND 14: Food Science

Course Outcomes:

CO1: It enables students to understand the basic food groups, structure, chemical composition of all the food groups.

CO 2: Also, know about scientific approach towards various cooking techniques.

Unit I: Introduction to food science- Definition: Food, food science and balance diet, five food group. Functions of food – energy yielding, body building and protective foods. Cooking principles and methods- Principle of cooking, method of cooking- moist, dry and combination heat methods of cooking, merits and demerits. Microwave cooking: principle, merits & demerits. Solar cooking- solar cooker and solar oven- principle.

Unit II: Cereals, pulses, nuts & oil seeds- Cereals: wheat- structure, composition and nutritive value, milling process, by products. gluten formation. Rice- structure, composition and nutritive value, milling process, by products, parboiling methods, merits. Millet- types and nutritive value. Role of cereals in cookery. Pulses: composition and nutritive value, factors affecting cooking quality of pulses. Germination- process and its advantages. Role of pulses in cookery. Nuts and oil seeds: nuts- composition of specific nuts (almonds, coconut, groundnut, walnut) and their importance, role of nuts in cookery. Oil seeds- composition of specific oil seeds (flaxseed, pumpkin seed, gingelly seed) and their importance. Role of oil seeds in cookery.

Unit III: Vegetables, Fruits and Sugar- Vegetables: classification, composition and nutritive value. Pigments- classification, selection, effect of acid, alkali medium on the pigments, changes during cooking of vegetables, role of vegetables in cookery. Fruits: classification, composition and nutritive value, changes during ripening of fruits, browning reaction- types and its prevention. Sugar: types of sugar and related products, stages of sugar cookery, crystallization- meaning, types.

Unit IV: Milk, Egg and Fleshly foods- Milk and milk products: composition and nutritive value, types of milk and milk products. Pasteurization- definition and types. Egg: structure, composition and nutritive value, quality of egg, factors affecting foam formation, factors affecting the coagulation of egg. Uses of egg in cookery. Fleshly foods: meat- structure, composition and nutritive value of meat, post mortem changes, ageing and tenderness of meat. Poultry- classification, composition and nutritive value and poultry cooking. Fish- classification, composition and nutritive value, selection and methods of cooking.

Unit V: Fats, Beverages and Spices-Fats and oils: composition and nutritive value, smoking temperature. Rancidity- Types and prevention. Role of fats and oils in cookery.

Beverages: classification, nutritive value- coffee, tea, cocoa, milk based beverages, fruit juices and aerated beverages. Spices and condiments: classification, uses, roles of spices in cookery.

Text & Reference Books:

1. Shrilakshmi, B, “Food Science:, 5th edition, New Age International Pvt. Ltd. Publishers, New Delhi (2010)
2. Mudambi. S.R, Rao, S.M, & Rajagopal.M.V, “Food Science”, New Age International Pvt. Ltd. Publishers, New Delhi (2007).
3. Food and Agriculture Organization. (1980) Manual of Food Quality Control. Additive Contaminants Techniques. Rome.
4. Fuller, G.W. (1999) New Food Product Development. From concept to market place. CRC press, New York.
5. Graf E and Saguy I S, (1991) Principles and practices for the safe processing of foods. ButterwHeinemann Ltd., Oxford.
6. Mahindru, S N (2000) Food Additives- Characteristics Detection and Estimation. Tata Mc Graw Hill Publishing Co. Ltd

PRACTICALS

- Learning the uses of weights, measuring cups, measuring spoon weighing scales and standardization equipment in nutrition planning, Cooking demonstration on various cooking methods, Food group cooking with labelling of nutrients.

BVC-ND 15: Market Survey for Food Groups

The students are supposed to identify and categorize foods available according to different food groups. A detailed market survey and visits to different locations and departmental stores are to be covered.

SEMESTER II

BVC-ND 21: Introduction to Human Physiology

Course Outcomes:

- CO 1: It will help to understand the anatomy and physiology of each and every organ and tissue involved in the functioning of the body.
- CO 2: It help students to understand the etiology of diseases.

Unit I: General principles of physiology.

Unit II: Blood and circulatory system- blood and its composition, functions of each constituent of blood, blood groups, structure and functions of heart, blood pressure, heart rate, cardiac output and their regulation.

Unit III: Digestive system – structure and functions of alimentary tract. Functions of various secretions and juices – saliva, gastric, bile, intestinal, pancreatic. Functions of enzymes in digestion. Common problems of digestive tract – vomiting, constipation, diarrhea.

Unit IV: Excretory system – structure and functions of (a) kidney (b) ureter (c) bladder (d) skin. Urine -formation of urine, composition of normal and abnormal urine.

Unit V: Reproductive system – female reproductive system – organs, structure and functions male reproductive system – structure and functions, menstruation, menstrual cycle, puberty, menarche, menopause, fertilization of ovum, conception, implantation.

Unit VI: Glands and endocrine system: Liver- structure and function, Gall bladder - structure and function, Pancreas - structure and function, Endocrine system, Endocrine glands - structure and function. Hormone - types and functions, role in metabolism. Endocrine disorders, Regulation of hormone secretion.

Text & Reference Books:

1. K sembulingam, prem sembulingam. Essentials of Medical Physiology.
2. Human physiology – Introduction to Human Physiology, Ignou Textbook.
3. Garrows. Textbook of Physiology

PRACTICALS

- Understanding and reading biochemical parameters (nutrition related)
- Skeletal and organ study (with model skeleton)

BVC-ND 22: Concept and Scope of Community Nutrition

Course Outcomes:

- CO 1: To enable students to understand the schemes, policies run by various agencies and government,
CO 2: Understanding health and nutrition related problems in community and at national level.

Unit I: Food availability and factors affecting food availability and intake. Food security and adequacy of diets.

Unit II: Nutritional problems of communities and implications for public health. Common nutritional problems in India. Incidence – national, regional. Causes: nutritional and non-nutritional signs, symptoms, effect of deficiency and treatment, PEM, Micronutrient deficiencies, Fluorosis, Correction/improvements in diets.

Unit III: Schemes and programs in India to combat nutritional problems in India. Role of international, national and voluntary agencies and government departments.

Unit IV: Hazards to community health and nutritional status- Adulteration in food, Pollution of water, air, Waste management, Industrial effluents, sewage, Pesticide residue in food, Toxins present in food – mycotoxins etc.

Unit V: Nutrition policy of India and plan of action.

Text & Reference Books:

1. ICMR: growth and development of Indian infants and children, New Delhi, 1972.
2. Methodology of nutritional surveillance report of a joint FAO/UNICEF/WHO expert committee, tech. Report series.
3. Shukla, P. K.: Nutritional Problems of India, prentice hall of India (p) ltd. New Delhi, 1982.

PRACTICALS

- Assessment of nutritional status – meaning, need, objectives and importance. Use of clinical signs, anthropometry, biochemical tests, and biophysical methods.
- Assessment of food and nutrient intake through recall, record, weights
- Field visit to integrated child development service center, mid day meal program.

BVC-ND 23: Principles of Nutrition II

Course Outcomes:

CO 1: It will help to understand the basics of nutrition and dietetics.

CO 2: This subject will make students learn the concept of roots of nutrition in terms of micro and macro nutrients.

Unit I: Energy-units of energy- calorie, joule, determination of energy value of foods. BMR-definition of BMR, factors affecting metabolic rate.

Unit II: - Vitamins - Fat soluble vitamins (A, D, E, K): functions, sources, requirements, deficiency and excess. Water soluble vitamins (B1, B2, B3, B4, B6, B12 & C): Functions, sources, requirements, deficiency and excess.

Unit III :- Minerals- functions, sources, requirements, deficiency and excess of calcium, phosphorus, sodium, potassium, iron, iodine, fluorine, zinc and magnesium.

Unit IV:- Water and electrolyte balance – water intake and loss, composition of body fluids, regulation of water metabolism, effect of excess water intake, NaCl Depletion, Dehydration, electrolyte balance, active and passive transport, change in ICF and ECF volumes.

Unit V: - Role of dietary fiber and other carbohydrates in nutrition- Types of fiber, fiber content in food, role of fiber in regular diets, role of fiber in various diseases, fiber content of foods.

Text & Reference Books:

1. B. Srilakshmi, Nutrition Science, Fifth Edition, New Age International (P) Ltd, New Delhi (2008).
2. Ambika Shanmugam, Fundamentals Of Biochemistry For Medical Students, Seventh Edition, New Age Publishing Pvt. Ltd., New Delhi (1986).
3. Joshi. A.S, "Nutrition & Dietetics", Third Edition, Tata Macgraw Hill Education Pvt. Ltd., New Delhi (2010).

BVC-ND 24: Institutional Management

Course Outcomes:

CO 1: It is helpful for understanding industrial

CO 2: Catering industries working, like inventory, certifications, safety norms, equipment's and various ways to cater to these industries.

Unit I: Introduction to food services and catering industry, development of food service institutions in India, types of services as affected by changes in the environment.

Unit II: Hospital food service as a specialty- characteristics, rates and services of the food production, service and management in hospitals. Role of the food service manager/dietitians.

Unit III: Organizations - types of organizations and characteristics. Organizational charts. Management of resources - capital, space, equipment and furniture, materials, staff, time and energy, procedures physical facility design and planning. Equipment selection.

Unit IV: Financial management (in brief since there is a separate subject food cost and quality control) - elements of financial management, budget systems and accounting, budget preparation. Food production and service operations.

Unit V: General planning, Preliminary planning, Consideration of patients with specific nutritional and dietary needs, labour use and productivity. Flow pattern.

Text & Reference Books:

1. Livingston, G.E. (1979). Food service systems-analysis, design and implementation -academic press.
2. Powers, T. F. and powers, T. M. (1984). Food service operations planning and control. John Wiley & Sons.
3. Wood, C; kluge, E; annssem, P. (1978). The anatomy of food service design. C. B. I. Publishing Co Inc.
4. Boella, M. J. (1983). Personnel management in the hotel and catering industry. Hutchinson, London.
5. Drucker, P. S. (1975). Management. Allied publishers. New Delhi.
6. Hitchcock, M. J. (1980). Food service systems administration mac Millan. New York.
7. West, b. B. And wood, l. (1979). Food service in institutions. John wiley, New York.
8. Sethi, M; Malhan, S (1997). Catering management; an integrated approach. New Age international.

PRACTICALS

- Understanding industrial food packaging and nutritional labeling
- Visit- departmental stores, (understanding racking of food, reading labeling)
- Evaluation of packaging and shelf life
- Visit to professional kitchen/ food processing and preservation certification course by FSSAI, government of India

BVC-ND 25: Environmental Studies

Course Outcomes:

CO 1: The students should be aware of environmental factors and systems so as to understand and maintain eco friendly environment.

Unit I: Environment meaning, structure and type of environment, components of environment, society and resources. Man environment relationship: Approach to study man interaction with environment (historical to present day).

Unit II: Environmental degradation: Meaning of degradation, types of degradation, process of degradation, cause of degradation, Religious and philosophical factors, deforestation, agricultural development and degradation, population growth and degradation, urbanization and degradation, modern technology and degradation.

Unit III: Ecology: Definition of ecology and ecosystem. Types of ecosystem, components of ecosystem, functions of ecosystem, productivity and stability of ecosystem.

Environmental disasters: Meaning and concepts, types of hazards and disaster, man induced and natural hazards, global warming, ozone depletion, green house effect and other major environmental problems.

Unit IV: Environmental pollution: Air, water, solid, noise pollution. Meaning, definition, sources, types, adverse effects and methods of control.

Unit V: Environmental planning and management: Concepts, aspects and approaches, resources management, ecological management. Biosphere reserves, management of wild life. Environmental regulation and rules, Vision of Environment by govt. of India, Environmental policy, waste disposal rules and laws and legislation enacted by parliament for environmental protection.

Text Book(s):

1. Environmental Awareness : Dr. Dhananjay Verma, Published by : Madhya Pradesh Hindi Granth Academy.

BVC-ND 26 Community Nutrition & Institutional Food Services System

Project

SEMESTER III

BVC-ND 31: Life Skills Management

Course Outcomes:

- CO 1: Handle Stressful Situations
- CO 2: Understand their priorities
- CO 3: Cope with different Psychological Problems
- CO 4: Find Real Happiness

UNIT I: Basics of Life Skills Management: Understanding Self and Psychological Problems: Life Skills Management: Concepts and Applications, Basics of Brain-Structure, Hormones: Role of Hormones in changing mood and emotions, Role of genes, Understanding Memory. Normal Self: Concept of Normality. Characteristics of Healthy Personality, Levels of Personality Dysfunctions, Ways to offset depression. Anxiety: Symptoms and Dealing with anxiety. Managing Anger, and Right attitude towards competition. Understanding the reasons behind OCD and.

Unit II: Managing Habits: Neurology of Habits, Developing Discipline in creating new habits, will-power, Causes of Addictions, Changing destructive habits, Habits of highly effective people. Relaxation Techniques: Meditation, Effects of Meditation. Positive Attitude towards oneself, Equanimity in oneself, Happiness – a state of mind and related techniques.

Unit III: Relationship Management: Emotional Intelligence: Core Domain: Self Awareness, Self-Regulation, Social Awareness and Relationship Management. Relationship Management: Four Criteria for Effective Relationship Management, Competencies in the Relationship Management. Ability to size-up situations, Role of Empathy Basics of Interpersonal Communication: Understanding and Observing Non-Verbal Behavior, Listening skills. Profiling Personal Environments. Understanding the types of Personality & their Motivating-Factors. Concepts of healthy relationships.

Unit IV: Stress Management: Understanding the Physiology of Stress, Symptoms of Stress. Stress and Performance, effects of Stress on Learning, Oversensitivity, Focus and Concentration, Techniques of Stress Management. Concepts of Crisis Management, Dealing with Peer Pressure and Complexes, Assertiveness Training, Avoiding Groupthink, Dealing with distractions.

Unit V: Mental Health and Wellness: Concept of Wellness: Measures to improve Wellness. Sleeping and Mind, Yoga and Exercise, Concepts of Balanced Diet, Importance of Recreational Practice, Role of art in wellness, How imagination shapes our Mind-Set. Wellness Programs for Professionals.

BVC-ND 32: Nutritional Biochemistry

Course Outcomes:

- CO 1: Helps the students to understand all the biochemical process which takes place inside the body.
- CO 2: About, How food interacts and affects these processes.

Unit I: Carbohydrates – structure and properties of mono-saccharides, di-saccharides, poly-saccharides. Study of intermediary metabolism of carbohydrates, glycolysis, aerobic, anaerobic, tricarboxylic acid cycle, significance of TCA cycle integrating metabolism of carbohydrates, protein and lipid, gluconeogenesis, glycogenesis, glycogenolysis, hexose monophosphate shunt.

Unit II: Proteins – structure, composition, classification and function, structure of important proteins with special reference to insulin, myoglobin, and hemoglobin, binding proteins and their functions – nutritional implications, chemistry of amino acids, metabolism of proteins and amino acids – build up of amino acid pool. Urea cycle

Unit III: Lipids – definition, composition, classification, structure and properties, lipoproteins, metabolism of lipids, oxidation of fatty acids, unsaturated fatty acids, biosynthesis of cholesterol and regulation, bile acids and their metabolism, plasma lipoproteins – synthesis and metabolism

Unit IV: Enzymes – definition, classification, specificity of enzymes -intracellular distribution, kinetics, inhibition, factors affecting enzyme activity, enzymes in clinical diagnosis.

Unit V: Nucleic acids – composition, functions, classification, structure and properties of DNA and RNA, genetic code – protein biosynthesis, basics of purine and pyrimidine nucleotides.

Unit VI: Hormones – mode of action, regulation of metabolism, biochemical parameters. Endocrinological abnormalities and clinical diagnosis.

Text & Reference Books:

1. Dasgupta, S. K., Biochemistry Vol. I; N & Iii, Mc Millan Co. Of India Limited
2. Harper, H. A. Etal, A Review Of Physiological Chemistry, Los Altos, Lange Medical Publications, 1985.
3. Lehninger, a. L., principles of biochemistry

PRACTICALS

- Carbohydrates - qualitative tests for mono, di and polysaccharides and their identification in unknown mixtures
- Quantitative estimation of glucose, sucrose and lactose by titrimetric method
- Fats - properties of fats
- Proteins - qualitative tests for proteins
- Food adulteration

BVC-ND 33: Food Microbiology

Course Outcomes:

CO 1: Helps students understand about the micro- organisms that inhibit, create, or contaminate food, including study of food spoilage, pathogens which create diseases and infections.

CO 2: About sanitation and hygiene norms.

Unit I: Introduction to Microbiology – Mold, Yeast, Bacteria, Viruses, Protozoa, General Classification Family, Genus, Species. Study of their morphology, cultural characteristics and biochemical activities. Important microorganisms in foods, general.

Unit II: Growth curve of a typical bacterial cell – Effect of intrinsic and extrinsic factors on growth of organisms, pH, water activity, O₂ potential, nutritional requirements, temperature, relative humidity and gaseous environment.

Unit III: Primary sources of micro-organisms in foods – Physical and chemical methods used in the destruction of micro-organisms, pasteurization, sterilization.

Unit IV: Fundamentals of control of micro-organisms in foods – Extrinsic and intrinsic parameters affecting growth and survival of organisms. Use of high and low temperature, controlling moisture as water content, freezing, freezing-drying, irradiation, and use of preservatives in food. Storage of food-correct handling and techniques of correct storage, Temperatures at which growth is retarded and bacteria are killed, Storage temperatures for different commodities to prevent growth or contamination and spoilage.

Unit V: Food spoilage and contamination in different kinds of foods and their prevention – Cereal and cereal products, pulses and legumes, Vegetables and fruits, Meat and meat products, Eggs and poultry, Milk and milk products.

Unit VI: Public health hazards due to contaminated foods – Food poisoning and infections -Causative agents, symptoms, sources and mode of transmission, foods involved, Method of prevention, Fungal toxins, Investigation and detection of food-borne disease outbreak.

Unit VII: Indices of food, milk and water sanitary quality. Microbiological criteria of food, water and milk testing. Food standards, PFA, FPO, BNS, MPO, Agmark, Codex Alimentarius.

Text & Reference Books:

1. Razier. C. and Westhoff D. C. Food Microbiology, 4th ed., 1988 New York.
2. Pelezar, M. (1988) Microbiolgy V ed., McGraw Hill, N. Y.
3. James, M. Jay. Modern Food Microbiology 4th ed., CBS Publishers, New Delhi.

BVC-ND 34: Nutrition & Meal Planning

Course Outcomes:

- CO 1: Enables students to understand the nutrient and food requirement at daily basis.
- CO 2: Enables students to understand the nutrient and food requirement at every stage of the life cycle.

Unit I: Minimum nutritional requirements and rda. Formulation of rda and dietary guidelines – reference man and reference woman.

Unit II: Body composition and changes through the life cycle.

Unit III: Role of macronutrients and micronutrients in meal planning. Proteins – factors affecting protein bio-availability including anti nutritional factors. Requirements. Lipids – types of fatty acids, role and nutritional significance (sfa, mufa, pufa, omeg3 fatty acids). Carbohydrates –blood glucose and effects of different carbohydrates on blood glucose, glycemic index. Dietary fibre – classification, composition, properties and nutritional status significance. Vitamins, minerals and trace elements – physiological role, bioavailability and requirements. Water – functions, requirements.

Unit IV: Nutritional requirements for different age groups with rationale. Factors affecting these requirements.

Unit V: Effect of cooking and home processing on digestibility and nutritive value of foods.

Unit VI: Improving nutritional value through different methods – germination, fermentation, combination of foods.

Unit VII: Basic principles of meal planning.

Unit VIII: Nutritional considerations for planning meals for Adults – male and female, different levels of physical activity. Pregnancy and lactation. Feeding of young children 0 -3 years, Old age, Athletes.

Text & Reference Books:

1. Guthrie H.: Introductory Nutrition (6th Ed.) Times Mirror/Mostry College Publishing, 1986.
2. Robinson, Lawler: Normal & Therapeutic Nutrition (17th Ed.) Macmillan Publishing Co. 1986.
3. Swaminathan .: Advanced Textbook on Food & Nutrition Vol. 1 & N (2nd Ed. Revised _ Enlarged) Bapp Co. 1985.
4. Robinson. Basic Nutrition and Diet Therapy (8th Edition)
5. Shills and Young. Modern Nutrition in Health and Disease.

PRACTICALS

- Development of low cost nutritious recipes for population groups vulnerable to nutritional deficiencies
- Effect of germination, fermentation, steaming, on nutritional value of food
- Understanding denaturation, Millard reaction, dry roasting, moist cooking
- Basics of egg cooking , sugar cooking
- Baking practical
- Microwave cooking

BVC-ND 35 Industrial Internship

Project

The students are required to understand the concepts of meal planning for a variety of patients/ people in either hospitals or private clinics.

SEMESTER IV

BVC-ND 41: Basics of Accounting

Course Contents:

CO 1: The students should be able to understand the basic principles of accounting.

CO 2: Hands-on-training on TALLY will be helpful for implementation of these principles in real time applications.

UNIT I: Introduction: Introduction and Purpose of Accounting, uses of Accounting Information & Basic Accounting Concepts.

UNIT II: Accounting Structure: Process of Accounting, Journal, Ledger & Trial Balance based on double entry book keeping.

UNIT III: Practical System of Accounting: Cash Book, Sales & Purchase of goods. Bill of exchange, Bank Reconciliation Statements.

UNIT IV: Preparation of Financial Statements: Income Statements, (Profit and Loss A/C), Statement of Financial Position (Balance Sheet) and Adjustments (only Closing Stock, Prepaid, Outstanding, Unearned & Accrued), Valuation of Assests and Depreciation methods.

UNIT V: On the basis of Specialization: Case Study

PRACTICALS

- Exploration of features of TALLY software.
- To create & design various types of documents related to accounting such as Cash Book, Sales & Purchase of goods. Bill of exchange etc.

Reference Book:

1. T. S. Grewal, Introduction to accountancy, S. Chand & co. Ltd.

BVC-ND 42: Physiologic and Metabolic Changes

Course Outcomes:

CO 1: Students will be able to understand that affects the path physiology and anatomy.

CO 2: Also, the biochemical changes that occur due to changes occurring in diseased condition in every organ.

Unit I: Normal cellular processes, injury and response of cells to injurious agents, cellular adaptations.

Unit II: Regulation of food intake and pathogenesis of obesity and malnutrition and starvation.

Unit III: Pathophysiology of gi tract diseases – anatomic, physiologic and functional changes, impact on nutritional status and nutritional implications, post surgical complications and management, malabsorption syndrome.

Unit IV: Pathophysiology of liver diseases – progression of liver disease metabolic and nutritional implications, role of specific nutrients and alcohol.

Unit V: Diseases of the gall bladder and pancreas – pathophysiologic changes – metabolic and nutritional implications, dyslipidemias.

Unit VI: Cardio-vascular diseases – pathogenesis, role of nutrients in prevention – metabolic and nutritional implications, dyslipidemias.

Unit VII: Diseases of the renal system – etiology and pathogenesis – changes in function with progression of diseases, metabolic and nutritional implications, water and electrolyte balance.

Unit VIII: Cancer – carcinogenesis – pathogenesis and progression of cancer, role of nutrients, foodstuffs and food additives in cancer. Therapies and their clinical and metabolic implications.

Unit IX: Immunity and infection – diarrhea, aids, respiratory problems.

Unit X: Arthritis, osteoporosis – bone disorders.

Text & Reference Books:

1. Krause's Food and Nutrition Therapy, 14th Edition (2017) / Mahan and Raymon , Elseveir Publisher
2. Swaminathan .: Advanced Textbook on Food & Nutrition Vol. 1 & N (2nd Ed. Revised _ Enlarged) Bapp Co. 1985.
3. Robinson. Basic Nutrition and Diet Therapy (8th Edition)
4. Shills and Young. Modern Nutrition in Health and Disease.

PRACTICALS – Visit to hospital and learning to read files

BVC-ND 43: Diet Therapy

Unit I : Assessment of nutritional status: methods and application. Direct methods – anthropometry, biochemical and clinical examination. Indirect methods – dietary surveys, vital statistics.

Unit II: Common nutritional deficiencies. Etiology, prevalence, clinical features, prevention and management of nutritional deficiencies PEM. Micronutrient deficiencies such as vitamin a deficiency, nutritional anemias, iodine deficiency disorders

Unit III: Introduction to diet therapy. Basic concepts of diet therapy. Therapeutic modifications of the normal diet

Unit IV: Common diseases/ disorders , Etiology, clinical features and nutritional management of: Febrile disorders and HIV-AIDS, Diarrhoea, constipation , jaundice, peptic ulcer, Underweight, overweight and obesity, Diabetes Mellitus, Cardiovascular diseases Anemia, PEM, marasmus, osteoporosis

Text & Reference Books:

1. Antia F. P.: Clinical Dietetics and Nutrition, 3rd ed., Oxford University, Press, Delhi, Reprinted in 1989.
2. Robinson, C. H, M. R. Lawlwr, W. L. Chenoweth and A. E. Garwick: Normal and Therapeutic Nutrition, 17th ed; Mac Millan Pub. Co.
3. Willims, S. R.: Nutrition and DietTherapy, 4th ed., The C. V. Mosby Co., S1. Louis, 1981.
4. Krause's Food and Nutrition Therapy, 14th Edition (2017) / Mahan and Raymon , Elseveir Publisher
5. Willims S. R.: Essentials of Nutrition and Diet Therapy, 4th ed., Mosby College Pub. S. Louis, 1986.
6. Thomas, B.: Manual of Dietetic Practice, 1996,.
7. ASPEN; Nutrition Support, Dietetics

PRACTICALS - Menu planning

- Identification of 5 food group systems with foods available on daily basis
- Use of exchange list
- Food standardization and portion size
- Understanding recommended dietary allowances
- Execution of menu planning (reference man and reference woman)

BVC-ND 44: Nutrition Education and Diet Counselling

Course Outcomes:

- CO 1: Students will be able to grasp the counselling techniques to be able to reach out to individual clients, groups and society.
- CO 2: They will learn the hierarchy to counselling pattern right from taking history till follow ups.

Unit I: Dietician as part of the medical team and outreach services.

Unit II: Clinical information – medical history and patient profile techniques of obtaining relevant information, retrospective information, dietary diagnosis, assessing

food and nutrient intakes, lifestyles, physical activity, stress, nutritional status. Correlating relevant information and identifying areas of need.

Unit III: The care process – setting goals and objectives short term and long term, counselling and patient education, dietary prescription.

Unit IV: Motivating patients.

Unit V: Working with –Hospitalized patients (adults, paediatric, elderly, and handicapped), adjusting and adopting to individual needs. Outpatients (adults, paediatric, elderly, handicapped), patients' education, techniques and modes.

Unit VI: Follow up, monitoring and evaluation of outcome, home visits.

Unit VII: Maintaining records, reporting findings, applying findings, resources and aids for education and counselling, terminating counselling, education for individual patients, use of regional language, and linguistics in communication process, counselling and education.

Text & Reference Books:

1. Mahan, L. K. and Escott Stump. S. (2008) Krause's Food & Nutrition Therapy 12th ed. Saunders-Elsevier
2. Achaya, K.T. (Ed) (1984) Interface between Agriculture, Nutrition and Food Science, The United National University.
3. Beaton, G. H and Bengoa, J. M. (Eds) (1996) Nutrition in Preventive Medicine, WHO.
4. Gibney M. J., Margetts, B.M., Kearney, J. M. Arab, I., (Eds) (2004) Public Health Nutrition, NS Blackwell Publishing.
5. Gopalan, C. (Ed) (1987) Combating Under nutrition- Basic Issues and Practical Approaches, Nutrition Foundation of India.
6. Kaufman M. (2007) Nutrition in promoting the public health strategies, principles and practices. Jones and Barlett Publishers.
7. Park, K. (2009) Park's Textbook of Preventive and Social Medicine, 20th ed. Jabalpur M/s. Banarsidas Bhanot.

PRACTICALS

- Use of various audio visual aids in educating people
- Making power point presentation and presentation skills
- Learning to make print media

BVC-ND 45: Hospital Internship

Project

The students should be able to explore various activities, functions and procedures followed by nutritionists and dieticians.

SEMESTER V

BVC-ND 51: Basic Research Methodology

BVC-ND 52: Women and Child Nutrition

Course Outcomes:

CO 1: Nutrition requirement right from conception till adolescent, their problems and ways to solve it.

CO 2: Policies and programs for mother and child health and nutrition.

Unit I: Nutrition and food requirements for expectant mothers -: Physiological changes, Preconception Nutrition, Common Complication, Food, Nutritional Requirements, General dietary Problems.

Unit II: Nutritional and Food requirements of Lactating women -: Role of Hormones, Nutritional requirements, Food requirements.

Unit III: Nutritional and Food requirements for Infants -: Low birth weight, Preterm Baby, Breastfeed and Weaning, Malnutrition, Artificial Feedings, Nutritional and Food requirements.

Unit IV: Nutritional and Food requirements for pre school (1 to 6 years) and school children. Nutrition related problems of pre school kids, Feeding programs, School lunch programs, Nutritional and Food requirements.

Unit V: Policies and Programs for Women and child.

Text & Reference Books:

1. Antia F. P.: Clinical Dietetics and Nutrition, 3rd ed., Oxford University, Press, Delhi, Reprinted in 1989.
2. Krause's Food and Nutrition Therapy, 14th Edition (2017) / Mahan and Raymon , Elsevier Publisher
3. ASPEN; Nutrition Support, Dietetics (2012)

BVC-ND 53: Sports & Fitness Nutrition

Course Outcomes:

CO 1: Understanding the nutritional requirement of different sports, fat loss, and muscle gain.

CO 2: About various supplements, cryogenic aids and levels of fitness.

Unit I: Concept of sports nutrition

Unit II :- Knowing your clients and setting their goals –profiling our clients and their goals, changing body weight and composition, assessing your clients body composition and the role of metabolism

Unit III: - Carbohydrates in sports Nutrition

Unit IV: - Role of protein in athletes, muscle gain and fat loss

Unit V: - Fats in sports nutrition

Unit VI: - Micronutrients – Vitamins and Minerals

Unit VII: - Water and electrolyte

Text & Reference Books:

1. Mahan, L. K. and Escott Stump. S. (2008) Krause's Food & Nutrition Therapy 12th ed.Saunders-Elsevier
2. Geetanjai Bhide and Subhadra Mandalika (2018). Nutritional Guidelines for Sportspersons 1st Edition Jaypee Publications
3. Nancy Clarks (1990) Sports Nutrition Guidebook 5th Edition. Human Kinetics Publications
4. K11 Sports Nutrition and supplementation manual Index (2009) K11 Publication

BVC-ND 54 Exercise and Fitness Nutrition Project

The students should be able to explore various activities, functions and procedures followed by nutritionists and dieticians.

SEMESTER VI

BVC-ND 61: Dissertation

Students can select any one specialization out of the three and have to undergo 3 months internship in the respective fields and projects:

1. Infant and young child feeding,
2. Clinical and therapeutic nutrition,
3. Public and community nutrition.
4. Sports & Fitness Nutrition
5. Institutional Management