



**JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY,
JAIPUR**

**Faculty of Agriculture and Veterinary Science
Department of Food and Biotechnology**

SYLLABUS

**MASTER OF SCIENCE IN NUTRITION
AND DIETETICS
(M. Sc. N&D)**

SESSION – 2022-23

DURATION – 2 YEARS

**SYLLABUS FOR:
1-4 SEM**



PROGRAM DETAIL

Name of Program	-	Master of Science (M.Sc.)
Program Code	-	M.Sc. N&D
Mode of Program	-	Semester
Duration of Program	-	2yrs/ 4Semester
Total Credits of Program	-	87
Curriculum Type and Medium Choice	-	Hindi/English

Program Outcomes This program will prepare postgraduate for superwise practice programs and employment in foods and nutrition related position are registered dietician, nutritionists and support student timely program completions.

Specific Program Outcomes Prepare students for successful application to accredited supervised practice programs and to become competent, entry level registered dietician nutritionist.



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SYLLABUS DETAIL

I SEMESTER

S. No.	Credit	Name of Course
1	4	Pathophysiology & Metabolism in Disease
2	4	Nutritional Biochemistry
3	3	Medical Nutrition Management
4	1	Medical Nutrition Management Lab
5	3	Statistical Methods
6	1	Statistical Methods lab
7	4	Nutrition
Total	20	

II SEMESTER

S. No.	Credit	Name of Course
1	4	Research Methodology
2	3	Human Anatomy & Physiology
3	1	Human Anatomy & Physiology Lab
4	4	Advanced Nutrition
5	3	Applied Food Science & Product Modification
6	1	Applied Food Science & Product Modification Lab
7	3	Diet Therapy
8	1	Diet Therapy Lab
9	1	Industrial Visit
Total	21	



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III SEMESTER

S. No.	Credit	Name of Course
1	4	Pediatric and Geriatric Nutrition
2	4	Nutrition in Critical Care
3	4	Functional Foods and Nutraceuticals
4	3	Nutritional Management
5	1	Nutritional Management Lab
6	3	Food Service Management
7	2	Pre Dissertation Training (60 Days) (After II Sem during summer vacation)
Total	21	

IV SEMESTER

S. No.	Credit	Name of Course
1	25	Dissertation/ New Product Development(NPD)
Total	25	

Syllabus I Semester

Course Name: Pathophysiology & Metabolism In Disease:

Total Credits - 4

Course Outcome- To enable students to 1.Explain the basic knowledge of Pathophysiology and metabolism in various diseases 2.Describe and explain the normal function of the cells, tissues, organs and organ systems of the human body.

UNIT – I (Adaption & Endocrine system)

Theory (2 Credits)

Basic concepts of pathophysiology and metabolism of adaptation: Altered cellular and tissue biology, Fluid and electrolyte, acids and bases.Immunity. Inflammation Hypersensitivity, Infection and Immunodeficiency, Stress and Disease

Endocrine System: Mechanisms of hormone regulation, Alteration of hormonal regulation, Hypo and Hyperfunctions of Pituitary, Adrenal cortex and medulla, Hypo and Hyperthyroidism.

UNIT – II (Alterations in Haematologic& Musculoskeletal system)

Theory (1 Credits)

Alterations of Haematologic functions: Anemias and clinical manifestations, Cardiovascular, lymphatic and pulmonary system: Alteration of cardiovascular functions, atherosclerosis, Respiratory distress syndrome in adults and newborn, Obstructive pulmonary diseases, Asthma.

Musculoskeletal system-Biochemistry and Pathophysiology: Osteoporosis, Osteomalacia, Osteoarthritis.



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UNIT – III (Renal & Digestive System Pathophysiology)

Theory (1 Credits)

Renal and Urological Biochemistry and Pathophysiology: Alteration of renal and urinary tract function, kidney stones, Cystic pyelonephritis, glomerulonephritis, nephrotic syndrome, renal failure.

Digestive system: Biochemistry and Pathophysiology: Manifestations of gastrointestinal dysfunction, Acute and chronic gastritis, Ulcers, Liver dysfunction, Hepatitis, Cirrhosis, Ulcerative colitis.

Recommended Text Books:

1. Bodhankar SL & Vyabahare NS (2009), Pathophysiology, NiraliPrakashan
2. Sherwood L (2013), Human Physiology – From cells to system, 8th Edition, Cengage Learning

Reference Books:

1. Davies J (1994). Anemia: A Guide to Causes, Treatment and Prevention, HarperCollins Canada, Limited

References/Correlation with Ancient Indian Literature:

1. SushrutaSamhita, Page-1 <https://www.wisdomlib.org/hinduism/book/sushruta-samhita-volume-1-sutrasthana>
2. Charaksutrasthan(27-214) http://14.139.252.116/compendium/Compendium_2017.pdf
3. Rig Veda in its ninth Mantra of the 73rd Sukta in 10th Chapter (10-73-9) https://en.wikisource.org/wiki/The_Rig_Veda/Mandala_10

Course Name: Nutritional Biochemistry:

Total Credits - 4

Course Outcome- To enable students to 1. Describe the major metabolic pathways involved in the metabolism of nutrients in the human body. 2. Understand the principles of biochemical methods and be able to use them with appropriate instruction. 3. Understand the basis of reactivity of biologically relevant molecules and their interactions

UNIT – I (Membrane, Carbohydrate & Lipid Metabolism)

Theory (2 Credits)

Membrane structure, composition and Transport of metabolites across membranes. Acid base balance and its regulation

Carbohydrate Metabolism: Definition of carbohydrates, Types & functions, Sources, Glycolysis, Glycogenesis, Glycogenolysis, Gluconeogenesis, Disorders of carbohydrate metabolism – Lactose intolerance, Fructose intolerance, Galactosemia, Glycogen storage disease, Definition, classification, structure and properties of glycoproteins and proteoglycans.

Lipid metabolism: Definition of lipids, Types & functions, Sources Lipoprotein metabolism: VLDL and LDL ('Forward' Cholesterol transport) VLDL and LDL (Endogenous TAG transport) HDL ('Reverse' Cholesterol transport). Regulation of lipid metabolism at substrate level, enzyme level, hormonal level and organ level. Disorders of lipid metabolism, Dyslipidemias, Lipid storage diseases.

UNIT – II (Protein Metabolism, Biological Oxidation and Purine along with Pyrimidine)

Theory (1 Credits)

Protein Metabolism: Definition, Types & functions, Sources, Tricarboxylic acid cycle, Inborn errors of amino acid metabolism – Alkaptonuria, Maple syrup urine disease, Homocystinuria, Tyrosinemia.

Biological Oxidation: Anabolism, Catabolism, Electron transport chain and oxidative phosphorylation.

Biochemical aspects of purine and pyrimidine: Metabolism of purines, Metabolism of pyrimidines, Role of purine and pyrimidine nucleotides in metabolism.

UNIT – III (Biochemistry of nucleic acid & Enzymes)



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Theory (2.0 Credits)

Biochemistry of Nucleic Acids: Metabolism of DNA, Metabolism of RNAs, DNA replication, mutation, repair and recombination concepts, Disorders of nucleic acid metabolism

Enzymes: Kinetics of monosubstrate and bisubstrate catalysed reactions (including inhibition) Enzyme specificity, regulation of enzyme activity and synthesis, Enzymes in clinical diagnosis.

Recommended Text Books:

1. Satyanarayana U & Chakrapani U (2006), Textbook of Biochemistry, 3rd Edition
2. Talwar GP, Textbook of Human Biochemistry by G.P. Talwar

Reference Books:

1. Harcot (2001). Text book of Medical Physiology Gayton, 10th edition.
2. Murray and Granner. Harper's book of Biochemistry edited by, Appleton and Lange.

References/Correlation with Ancient Indian Literature:

1. (Mahabharatha Anu.65-46) <https://sanskritdocuments.org/mirrors/mahabharata/mbhK/mahabharata-k-01-sa.html>
2. Atharva Veda (2-13-1) <http://www.sacred-texts.com/hin/av/index.htm>
3. Maitrayani Upanishad (VI. 10) <https://www.yousigma.com/religionandphilosophy/maitrayani.html>

Course Name: Medical Nutrition Management:

Total- 4 (3T+1P)

Course Outcome- To enable the students to 1. Become a Registered dietitian 2. Individual counseling and defending a position on issues impacting the nutrition and dietetics profession 3. Recognize the disease and prevention of the disease.

UNIT – I (Nutritional care in health & weight management)

Theory (1 Credits)

Nutritional (and dietary) care Process A) in health: Depending on the state of growth & development of the Individual, at various activity levels and socioeconomic status.

The nutritional care process B) in disease: Nutritional screening/ assessment and identification of nutritional problem, Nutritional Intervention and Diet Modification based on Interpretation of Patient data-clinical, biochemical and other relevant data, Nutrition Education and Counseling, Evaluation of Nutritional care.

Nutrition for weight management: Disorders of energy balance: A. Obesity, Components of body weight, Adipose tissue- structure, regional distribution and storage. Regulation of body weight. Types of obesity Assessment of obesity, Health risks, Causes of obesity: neural, hormonal, and psychological. Management of obesity Dietary Modification, Psychology of weight reduction: psychotherapy and behavior modification Physical activity and exercise, Pharmacological treatment, Surgical treatment effect on satiety and other factors, Maintenance of Reduced weight.

B. Underweight/Excessive Leanness: Causes and assessment, Health risks, Dietary Management, Psychotherapy.

C. Eating disorders: Anorexia Nervosa and Bulimia Nervosa.



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Practical: (0.3 credits)

Sr. no.	Name of practical	Nature
1	Planning of diet for overweight person	Practical
2	Preparation of one day diet for overweight person	Practical
3	Planning of diet for obese person	Practical
4	Preparation of diet for obese person	Practical
5	Planning of diet for underweight & anemic person	Practical
6	Preparation of diet for underweight & anemic person	Practical

UNIT – II (Nutrition in Fever, infection & GIT diseases)

Theory (1.0 Credits)

Nutrition in Fever and Infectious Diseases: Pathophysiology of fever and infection, Effect of fever and infection on Nutritional status. Nutritional management: typhoid, tuberculosis and malaria, AIDS.

Medical Nutrition therapy for Upper Gastrointestinal tract Diseases /Disorders:

- a) Diagnostic Tests for the G.I. diseases
- b) Pathophysiology and diet therapy in
 - i) Diseases of oesophagus; oesophagitis, Hiatus hernia
 - ii) Disorders of stomach: Indigestion, Gastritis, Gastric and duodenal ulcers. Dietary management: traditional approach and liberal approach.
- c) Gastric Surgery: Nutritional care, dumping syndrome.

Medical Nutrition therapy for Lower gastrointestinal tract Diseases/Disorders: Common Symptoms of Intestinal dysfunction - Flatulence, constipation, haemorrhoids, diarrhoea, steatorrhoea,

- b) Diseases of the large intestine: Diverticular disease, Irritable bowel syndrome, inflammatory bowel disease
- c) Malabsorption Syndrome/Diseases of Small intestine - Celiac (Gluten –induced) sprue, tropical sprue, intestinal brush border enzyme deficiencies, Lactose intolerance, protein- losing enteropathy
- d) Principles of dietary Care: Fibre, residue Modified fibre diets
- e) Intestinal surgery: Short bowel syndrome, Ileostomy, Colostomy, Rectal surgery

Practical: (0.4 credits)

Sr. no.	Name of practical	Nature
1	Planning of diet for fever	Practical
2	Preparation of one day diet for fever	Practical
3	Planning of diet for upper GIT disease	Practical
4	Preparation of diet for upper GIT disease	Practical
5	Planning of diet for lower GIT disease & lactose intolerant patient	Practical
6	Preparation of diet for lower GIT disease & lactose intolerant patient	Practical

UNIT – III (Dietary management in Liver disease and Enteral & Parenteral Nutrition)

Theory (1 Credits)



JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

MNT for Diseases of the Hepato - Biliary Tract: a) Nutritional care in liver disease in context with results of specific liver function tests, Dietary care and management in viral hepatitis(different types) , cirrhosis of liver, hepatic encephalopathy, Wilson's disease

b) Dietary care and management in diseases of the gall bladder and pancreas i.e. biliary dyskinesia, cholelithiasis, cholecystitis, cholecystectomy, pancreatitis, Zollinger- Ellison syndrome.

Delivery of Nutritional Support – Meeting nutritional needs

a) Enteral tube feeding

b) Different Enteral feeding access

c) Practical Aspects

d) Parenteral nutrition

Practical: (0.3 credits)

Sr. no.	Name of practical	Nature
1	Planning of diet for hepatitis	Practical
2	Preparation of one day diet for hepatitis	Practical
3	Planning of diet for liver cirrhosis & encephalopathy	Practical
4	Preparation of diet for liver cirrhosis & encephalopathy	Practical
5	Planning of diet for cholelithiasis	Practical
6	Preparation of diet for cholelithiasis	Practical

Recommended Text Books:

1. Khanna K (2009). Text book of Nutrition & Dietetics, Elite Publishing House
2. Srilakshmi B (2007). Diet Therapy, New Age International
3. Mahan LK, Escott Stump S (2008). Krause's Food & Nutrition Therapy. W.B. Saunders Ltd.

Reference Books:

1. Garrow, JS, James, WPT and Ralph A (2000): Human Nutrition and Dietetics, 10th edition, Churchill Livingstone.
2. Gandy JW, Ladden A, Holdsworth M (2012). Oxford Handbook of Nutrition & Dietetics. Oxford University Press

Course Name: Statistical Methods

Total- 4 (3T+1P)

Course Outcome- To enable the students to 1. Understand the role of statistics and computer applications in research. 2. Apply statistical techniques to research data for analyzing 3. interpreting data meaningfully. . Differentiate between the qualitative and quantitative methods of analysis of data 2. Suitably apply data reduction strategies and illustrate data using various graphical methods 3. Use appropriate parametric and non-parametric statistical tests 4. Draw conclusions and interpretations from the analysis of data using various statistical software

UNIT I (Basics of Tabulation of Data & Central Tendency)



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Theory (1 Credits)

Classification and tabulation of data, Frequency distribution, Histogram, Frequency polygon and frequency curve, cumulative frequency curves, Measures of central tendency: mean, median, mode; Measures of dispersion: range, mean deviation, variance and standard deviation.

Practicals: (1 credits)

Sr. no.	Name of practical	Nature
1	To find out Mean	Practical/Practice
2	To find out Median	Practical/Practice
3	To find out Mode	Practical/Practice

UNIT II (Probability, Correlation, Regression & Sampling)

Theory (1.0 Credits)

Elementary Probability Distribution, Correlation: Positive and negative correlation and calculation of Karl Pearson's coefficient of correlation. Regression, Sampling: concept of population and sample, Sampling distribution and standard error.

UNIT III (Vital Statistics & ANOVA)

Theory (1.0 Credits)

Hypotheses testing: null and alternative hypothesis, T-test, Chi-square test, goodness of fit test and homogeneity of samples, F-test. ANOVA: one way and two way analysis of variance, Design of experiments. Use of statistical packages for data analysis (SPSS).

Text Books:

1. Elements of Mathematical Statistics; S.C. Gupta and V.K. Kapur; Sultan Chand & Sons, New Delhi
2. Elements of Biostatistics; S. Prasad; Rastogi Publications, Meerut

Suggested Readings:

1. Basic Statistics:-B.L.Agarwal
2. Principles and Procedure of Statistics:-A Biometrical Approach:-R.G.D. Steel and J.H.torrie
3. Fundamentals of Applied Statistics, S.C. Gupta and V.K. Kapur; Sultan Chand & Sons, New Delhi.

References/Correlation with Ancient Indian Literature:

1. Sankhyā: The Indian Journal of Statistics Published by: Indian Statistical Institute <https://www.springer.com/statistics/journal/13171>
2. The SulbaSutras http://www-history.mcs.st-and.ac.uk/Projects/Pearce/Chapters/Ch4_2.html
3. History of Hindu Mathematics, Asia Publishing House, Bombay, 1962 <https://link.springer.com/article/10.1007/BF02836134>

Course Name: Nutrition:

Total Credits 4

Course Outcome- To enable students to 1.Better understanding on the physiological and metabolic functions of nutrients. 2.Gain in-depth knowledge of the physiological and metabolic role of macronutrients, and their importance in human nutrition



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UNIT – I (Human Nutritional Requirements & Body composition)

Theory (2 Credits)

Human Nutritional Requirements – Development and Recent Concepts: Methods of determining human nutrient needs, Description of basic terms and concepts in relation to human nutritional requirements, Guidelines and Recommendations. Development of International and National Nutritional Requirements, Translation of nutritional requirements into Dietary Guidelines.

Body Composition: Significance of body composition and changes through the life cycle. Methods for assessing body composition (both classical and recent) and their applications.

Energy: Components of energy requirements: BMR, RMR, thermic effect of feeding, physical activity. Factors affecting energy requirements, methods of measuring energy expenditure. Estimating energy requirements of individuals and groups. Regulation of energy metabolism and body weight: Control of food intake – role of leptin and other hormones.

UNIT – II (Carbohydrates & Proteins)

Theory (1 Credits)

Carbohydrates

Review of nutritional significance of carbohydrates and changing trends in dietary intake of different types of carbohydrates and their implications. Dietary fibre: Types, sources, role and mechanism of action. Resistant starch, fructo-oligosaccharides, other oligosaccharides: Chemical composition and physiological significance. Glycemic Index and glycemic load.

Proteins

Overview of role of muscle, liver and G.I tract in protein metabolism. Amino acid and peptide transporters. Therapeutic applications of specific amino acids. Peptides of physiological significance. Proteins, amino acids and gene expression

UNIT – III (Lipids & Special condition Nutrition)

Theory (1.0 Credits)

Lipids

Nutritional significance of fatty acids – SFA, MUFA, PUFA: functions and deficiency, Role of n-3 and n-6 fatty acids, Prostaglandins, Trans Fatty Acids, Conjugated linoleic acid, Nutritional Requirements and dietary guidelines (International and National) for visible and invisible fats in diets. Lipids and gene expression

Nutrition in Special Conditions: Space, Travel, High Altitudes, Low Temperature, Submarines

Recommended Text Books:

1. Srilakshmi B (2006), Nutrition Science, New Age International
2. Swaminathan MS (1985), Essentials of Food & Nutrition, Bangalore Print & Publication Company
3. Mudambi SR (2001). Fundamentals of Food & Nutrition New Age International

Reference Books:



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Committee on Military Nutrition. Nutritional Needs in Cold and High-Altitude Environments, National Academies Press.

Fink HH, Lisa A. Burgoon AE. Mikesky. Practical Applications in Sports Nutrition

References/Correlation with Ancient Indian Literature:

1. Prasna Upanishad 1-5 <https://esamskriti.com/Prasnopanishad-TNS-Complete.pdf>
2. Brihadaranyaka Upanishad (V.12) <https://www.swami-krishnananda.org/brdup-audio.html>
3. Chhandogya Upanishad (VII. 26) http://sivanandaonline.org/public_html/?cmd=displaysection§ion_id=588

II Semester

Course Name: Research Methodology:

Total- 4

Course Outcome- To enable students to 1. Demonstrate knowledge of the scientific methods, purpose and approaches to research. 2. Compare and contrast quantitative and qualitative research. 3. Explain research design and the research cycle 4. Prepare a key elements of a research proposal.

UNIT – I (Introduction & Types of research)

Theory (1 Credit)

Research methodology: Introduction & meaning of research, Objectives of research, motivation in research. Types of research & research approaches. Research methods vs. methodology, Criteria for good research. Research problem: Statement of research problem, Statement of purpose and objectives of research problem, Necessity of defining the problem.

UNIT – II (Research design)

Theory (2 Credits)

Research design: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design.

Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification, important scaling techniques.

UNIT – III (Methods of data collection)

Theory (1 Credits)



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Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.

Report Writing

Recommended Text Books:

1. Kothari CR (2004). Research Methodology: Methods and Techniques, New Age International.
2. Bhattacharya DK (2009). Research Methodology, Excel Books.

Reference Text:

1. Annals of Food Science & Technology
2. Journal of Nutrition
3. Journal of Food Science & Technology

References/Correlation with Ancient Indian Literature:

1. Atharvaveda https://msrvvp.ac.in/vedvidya/26/27_Eng._Nimish_sharma_26.pdf
2. Charaka Samhita http://www.carakasamhitaonline.com/mediawiki-1.28.2/index.php?title=Charak_Samhita_New_Edition
3. Sushruta Samhita <https://www.wisdomlib.org/hinduism/book/sushruta-samhita-volume-1-sutrasthana>

Course Name: Human Anatomy & Physiology:

Total Credits :4 (3T +1P)

Course Outcome- To enable students to 1.Explain the basic knowledge of human anatomy and physiology
2.Describe and explain the normal function of the cells, tissues, organs and organ systems of the human body

UNIT – I (Physiology & Elementary tissues of human body)

Theory (1 Credits)

Practical (0.3 Credits)

Introduction: Scope of anatomy and physiology and basic terminology used these subjects. Structure of cell, its components and their functions

Elementary Tissues of the Human Body: Epithelial, connective, muscular and nervous tissues, their sub-types and their characteristics.

Practical: (0.3 credits)

Sr. no.	Name of practical	Nature
1	Study of human skeleton.	Practical
2	Study of different systems with the help of charts and models.	Practical
3	Microscopic study of connective tissues	Practical
4	Microscopic study of epithelial	Practical
5	Microscopic study of muscular & their sub types	Practical
6	Microscopic study of muscular & their sub types	Practical



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UNIT – II (Osseous, Haemopoietic & Cardiovascular system)

Theory (1 Credits)

Practical (0.4 Credits)

Osseous System: Structure, composition and functions of skeleton Classification of joints, types of movements of joints, Disorders of joints.

Haemopoietic System :Composition and functions of blood and its elements, their disorders, blood groups and their significance, mechanism of coagulation, disorders of platelets and coagulation.

Cardiovascular System: Basic anatomy of the heart, Physiology of heart, blood vessels and circulation. Basic understanding of Cardiac cycle. Heart sounds.

Practical: (0.4 credit)

Sr. no.	Name of practical	Nature
1	Study of calibration curve of cholestrol	Practical
2	Study of WBC	Practical
3	Study of RBC	Practical
4	Estimation of WBC	Practical
5	Estimation of RBC	Practical
6	Estimation of Haemoglobin	Practical
7	Estimation of blood cholesterol	Practical

UNIT – III (Renal & Endocrine system)

Theory (1 Credits)

Practical (0.3 Credits)

Renal system; Introduction – physiological anatomy, nephrons- cortical and juxtamedullary, juxtaglomerular. Functions of kidneys.

Endocrine system: Major endocrine glands, Hormones- classification, mechanism of action and function of hormones. Diabetes insipidus.

Pancreas – Physiological anatomy. Functions of pancreas. Endocrine pancreas – secretory cells, action.

Practical: (0.3 credits)

Sr. no.	Name of practical	Nature
1	Estimation of blood glucose.	Practical
2	Estimation of SGOT	Practical
3	Estimation of SGPT	Practical
4	Observation of Kidney slide	Practical
5	Observation of liver slide	Practical
6	Observation of pancreas slide	Practical



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7	Observation of nephron slide	Practical
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Recommended Text Books:

1. Gandhi TP. Elements for Human anatomy, physiology & health education, B. S Shah Prakashan.
2. Kale SR & Kale RR. Practice Human anatomy, Physiology, Nirali Prakashan.

Reference Books

1. Rizzo DC. Fundamentals Of Anatomy & Physiology, Delmar Cengage
2. Tortora GJ, Anagnostokos NP. Principles of Anatomy and Physiology, Harper & Row Publishers N. Y.

References/Correlation with Ancient Indian Literature:

1. Taittiriya Upanishad, III.vii.1 <https://www.hinduwebsite.com/taittiriya-upanishad.asp>
2. Chandogya Upanishad, VII.26.2 http://sivanandaonline.org/public_html/?cmd=displaysection§ion_id=588
3. The Mahabharata, Anusasana Parva, Section CXIV <https://sanskritdocuments.org/mirrors/mahabharata/mbhk/mahabharata-k-01-sa.html>

Course Name: Advanced Nutrition:

Total Credits 3

Course Outcome- To enable students to 1. Better understanding on the physiological and metabolic functions of nutrients. 2. Gain in-depth knowledge of the physiological and metabolic role of micronutrients, fat soluble and water soluble vitamins, electrolytes and their importance in human nutrition

UNIT – I (Water soluble & quasi vitamins)

Theory (1 Credits)

Historical background, Structure and chemistry, Food sources, Metabolism (digestion, absorption, transport, storage and elimination), Bioavailability and factors affecting bioavailability. Biochemical and physiological functions. Assessment of status, Interaction with other nutrients in

Water Soluble Vitamins: Ascorbic acid, Thiamin, Riboflavin, Niacin, Pyridoxine, Folic acid, Vitamin B₁₂, Biotin

Quasi vitamins (in brief): Choline/ Betaine, Myo Inositol, Carnitine, Bioflavinoids.

UNIT – II (Macro & micro minerals)

Theory (1 Credits)

Structure and chemistry, Food sources, Metabolism (digestion, absorption, transport, storage and elimination), Bioavailability and factors affecting bioavailability. Biochemical and physiological functions. Assessment of status in

Macrominerals: Calcium and phosphorus, Magnesium

Microminerals: Iron, Copper, Manganese, Iodine, Fluoride, Zinc, Selenium, Cobalt, Chromium, Molybdenum.

UNIT – III (Ultra trace elements)

Theory (1 Credits)

Structure and chemistry, Food sources, Metabolism (digestion, absorption, transport, storage and elimination), Bioavailability and factors affecting bioavailability. Biochemical and physiological functions. Assessment of status in

Ultra Trace Elements: Vanadium, Silicon, Boron, Nickel, Lithium, Lead, Cadmium, Sulphur, Sodium, Potassium and Chloride

Recommended Text Books:

1. Srilakshmi B (2006), Nutrition Science, New Age International
2. Swaminathan MS (1985), Essentials of Food & Nutrition, Bangalore Print & Publication Company



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Reference Books:

1. Bodwell CE, Erdman JW (1988). Nutrient Interactions. Marcel Dekker Inc. New York
2. Mudambi SR (2001). Fundamentals of Food & Nutrition, New Age International

References/Correlation with Ancient Indian Literature:

1. Taittiriya Upanishad, III.vii.1 <https://www.hinduwebsite.com/taittiriya-upanishad.asp>
2. Chandogya Upanishad, Vi.6.1 & 2 <https://www.wisdomlib.org/hinduism/book/chandogya-upanishad-english/d/doc239250.html>

Course Name: Applied Food Science and Product Modification: Total- 4 Credits (3T+1P)

Course Outcome- To enable students to 1.understanding of novel and innovative food sciences and emerging technologies 2.Understanding and ability to apply these novel technologies and the underpinning science to preserve and control the nutritional, microbiological and functional properties of foods. 3.Ability to apply and adapt novel technologies to real-life innovative products and processes

UNIT – I (Sensory Evaluation)

Theory (1.0 Credits)

Introduction to sensory analysis and uses of sensory tests, Recognition tests for 4 basic tastes, odour and aroma. Tests with other senses. Threshold tests

Analytical tests: (i) Difference, (ii) Ranking, (iii) Descriptive, (iv) Scoring and (v) Rating

Conducting the Test: Preparing samples, Presenting samples, Using reference samples, Reducing panel response error, Consumer oriented tests, Product oriented tests, Shelf life studies, Product matching, Product mapping, Taint Investigation and Prevention.

Practical: (0.3 credits)

Sr. no.	Name of practical	Nature
1	Study of subjective and objective tests	Practical
2	Preparation of Triangle test proforma	Practical
3	Performance of Triangle test	Practical
4	Preparation of 9 point hedonic test proforma	Practical
5	Performance of 9 point hedonic test	Practical
6	Preparation of Rating test proforma	Practical
7	Performance of Rating test	Practical



JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

UNIT – II (Development of health foods)

Theory (1.0 Credits)

Reducing viscosity and bulk in foods, Increasing energy density, Applications of fermentation, germination, malting, Use of different food ingredients for development of health foods – artificial sweeteners, modified starches, fat replacers, increasing fibre content, functional ingredients, low sodium food adjuncts, protein concentrates, whey.

Practical: (0.4 credits)

Sr. no.	Name of practical	Nature
1	Fermentation of food products	Practical
2	Germination of food products	Practical
3	Malting of food products	Practical
4	Development of fibre rich products	Practical
5	Development of products using artificial sweetener	Practical
6	Development of protein rich food products	Practical
7	Development of low fat food products	Practical

Theory (1.0 Credits)

New Food Products: Definition, Classification, Characterization Factors shaping new product development- Social concerns, health concerns impact of technology and market place influence. Planning, standardizing and testing the product, nutritional content. Tapping traditional foods and unconventional sources of foods. Modifying traditional foods, Planning, standardizing and testing the product, nutritional content.

Practical: (0.3 credits)

Sr. no.	Name of practical	Nature
1	Planning of development of innovative product	Practical
2	Standardization of innovative product	Practical
3	Organoleptic evaluation of developed food product	Practical
4	Modification of traditional food products	Practical
5	Development of food products using non conventional food stuffs as ingredients	Practical
6	Evaluation of nutritional content of developed food products	Practical

Recommended Text Books:



JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

1. Lyon DH, Francombe MA, Hasdell TA, Lawson K (eds) (1992). Guidelines for Sensory Analysis in Food Product Development and Quality Control. Chapman and Hall, London.
2. Amerine MA, Pangborn RM, Roessler EB (1965). Principles of Sensory Evaluation. Academic Press, New York.

Reference Books:

1. Kapsalis JG (1987) Objective Methods in Food Quality Assessment. CRC Press, Florida.
2. Gordon WF. New Food Product Development: From concept to market place, 3rd edition.
3. Martens M, Dalen GA, Russwurm H (eds) (1987). Flavour Science and Technology. John Wiley and Sons, Chichester
4. Guidelines for Sensory Analysis in Food Product Development and Quality Control edited by Roland P. Carpenter, David H. Lyon, Terry A. Hasdell

References/Correlation with Ancient Indian Literature:

1. Chandogya Upanishad
VI.6.5 https://www.chinfo.org/images/userupload/Reflections/14_Chandogya_Chap_6-Tat_Twam_Asi.pdf
2. Chandogya Upanishad, Vi.6.1 & 2 <https://www.wisdomlib.org/hinduism/book/chandogya-upanishad-english/d/doc239250.html>
3. Gita, 17.7 <https://www.holy-bhagavad-gita.org/chapter/17/verse/7>

Course Name: Diet Therapy:

Total- 4 Credits (3T+1P)

Course Outcome- 1. Know the metabolic condition of the life style related diseases. 2. Explain the risk factors for degenerative diseases and toward the management of the several disease conditions.

UNIT-I (Diet for Diabetes mellitus & Endocrine disorders)

Theory (1 Credits)

Nutrition for Diabetes Mellitus and hypoglycemia: A) Aetiology, classification, pathophysiology, symptoms and diagnosis, B) Management of DM: Home blood glucose monitoring, Glycosylated hemoglobin, Urine testing. C) Blood sugar lowering agents: Oral hypoglycemic agents, Insulin D) Exercise E) Nutritional management i) Diet planning for Type1, Type2 ii) For Special conditions Pregnancy, Elderly, Surgery, Illness, Physical activities F) Acute complications – pathophysiology, diagnosis, types, treatment- Hypoglycemia, Ketoacidosis.



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Nutrition in Diseases of Other Endocrine organs: Functions of the adrenal cortex, thyroid and parathyroid gland, their insufficiencies, clinical symptoms and metabolic implications.

- Dietary treatment as supportive to other form of therapy
- Hyper and Hypothyroidism (goiter)
- Hypocalcaemia

Practical: (0.3 credits)

Sr. no.	Name of practical	Nature
1	Planning of diet for DM patient	Practical
2	Preparation of planned diet for DM patient	Practical
3	Planning of diet for patient suffering from DM & pregnancy	Practical
4	Preparation of planned diet for patient suffering from DM & pregnancy	Practical
5	Planning of diet patient suffering from hyperthyroidism & goiter	Practical
6	Preparation of planned diet for patient suffering from hyperthyroidism & goiter	Practical

UNIT – II (Diet for Cardiovascular diseases & Hypertension)

Theory (1 Credits)

Nutrition in Cardiovascular Diseases and Hypertension:

A. The normal circulatory system (brief)

B. Blood pressure

i) Regulation, Short-term (sympathetic nervous system) and long-term (kidneys), ii) Hypertension – classification (secondary and essential), iii) Risk Factors for hypertension, iv) Dietary management-DASH approach, v) Use of various drugs (In brief)

C. Hyperlipidemia and Hyperlipoproteinemia

i) Classifications, ii) Dietary management, iii) Drug management – (in brief)

D. Atherosclerosis - Etiology and understanding the Pathogenesis

i) Coronary Heart Disease

- Angina Pectoris and Myocardial Infarction, Clinical manifestation and importance of cardiac enzymes to aid in the detection of CHD, Dietary management

E. Congestive Heart Failure

- Pathogenesis - Pathogenesis of sodium and water retention Risk factors, Clinical manifestation, Cardiac Cachexia, Treatment

- Nutritional Care

F. Cerebrovascular Disease and Peripheral Vascular Disease

- In brief etiology and dietary care

G. Rheumatic and Congenital Heart Disease

- Clinical manifestation, pathogenesis and nutritional care

Practical: (0.4 credit)

Sr. no.	Name of practical	Nature
1	Planning of diet for hypertension patient	Practical
2	Preparation of planned diet for hypertension patient	Practical



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3	Planning of diet for patient suffering from hyperlipidemia & hyperlipoproteinemia	Practical
4	Preparation of planned diet for patient suffering from hyperlipidemia & hyperlipoproteinemia	Practical
5	Planning of diet patient suffering from atherosclerosis	Practical
6	Preparation of planned diet for patient suffering from atherosclerosis	Practical

III SEMESTER

Course Name: Pediatric & Geriatric Nutrition

Total Credits 4

Course Outcome- To enable the students to 1. Thorough knowledge on the nutritional requirements at various stages of child growth and development. 2. Effective understanding of diet planning principles and nutritional facts for balanced and healthy diet during pregnancy, infancy and childhood stage. 3. Gain knowledge on the aspects of aging and the importance of the nutritional requirements and dietary modification during old age.

UNIT - I (Nutritional assessment & chronic disease prevention)

Theory (1.5 Credits)

Pediatric Nutritional Assessment:- Anthropometric measurements, biochemical parameters, clinical and dietary data.

Measuring, recording and plotting growth, Normal nutrition for infants:-requirements, importance of breast-feeding, bottle-feeding, commercial formulas, weaning foods, other family foods) Physiology and care of the preterm infant

Nutritional considerations for LBW children, and children with developmental disabilities, Nutrition in childhood; Growth and development; nutrient needs, Assessment of nutritional status of children. Providing an adequate diet: - Factors affecting food intake, Feeding the preschool child, the school-aged child, Preventing chronic disease.

UNIT - II (Obesity & Inborn errors of metabolism)

Theory (1.5 Credits)

Nutritional concerns: -

Childhood Obesity; Underweight and Undernutrition- shortterm and longterm consequences in brief, Failure to thrive; Growth faltering and detection. Mineral and vitamin deficiencies, Dental caries, Allergies Attention-deficit hyperactivity disorder

Inborn Errors of Metabolism: Disorders of amino acid metabolism e.g. PKU, Maple syrup urine disease, Homocystinemia, Disorders of CHO metabolism eg. Galactosemia, Glycogen storage disorder, Other disorders e.g. Wilson's disease, Nutritional Care Management of these conditions

Gastrointestinal diseases and disorder i.e. diarrhea, gluten enteropathy, inflammatory bowel disease, constipation and fat absorption test diet. (calculation of fluids & electrolytes both deficit and maintenance and management of caloric intake)

Neurological disease in children i.e. epilepsy (ketogenic diets)

UNIT - III (Geriatric Nutrition)

Theory (1.0 Credits)

The ageing process: physiological, metabolic, body composition changes and impact on health and nutritional status

Socio-psychological aspects of ageing-special problems of elderly women

Nutritional and health status of elderly. Factors influencing food and nutrient intake, health status including lifestyle pattern, medication, psychosocial aspects etc

Chronic degenerative diseases and nutritional problems of the elderly-their etiopathogenesis, management, prevention and control

Policies and programmes of the government and NGO sector pertaining to the elderly



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Promoting fitness and well being- use of various modern and traditional approaches

Recommended Text Books:

1. Mahan LK, Escott-Stump S (2000). Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.
2. Shils ME, Olson JA, Shike M, Ross AC (1999). Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
3. Escott-Stump S (1998). Nutrition and Diagnosis Related Care, 4th Edition, Williams and Wilkins.

Reference Books:

1. Chernoff R (ed) (1991). Geriatric Nutrition: The Health Professionals' Handbook, Gaithersburg, MD: Aspen
2. Sharma OP (Ed.) (1999). Geriatric Care in India – Geriatrics and Gerontology: A Textbook, M/s. ANB Publishers.

References/Correlation with Ancient Indian Literature:

- Atharva Veda (3-12-1 and 3-12-4) <http://www.dadf.gov.in/related-links/annex-v-ii-2-superiority-cow-milk-paper-sh-ik-narang>
- (Rigveda – 10-19-7) <http://www.gatewayforindia.com/vedas/rigveda/rigveda10.shtml>
- Rig Veda (1-71-9) <http://www.gatewayforindia.com/vedas/rigveda/rigveda10.shtml>

Course Name: Nutrition in Critical Care

Total Credits 4(T)

Course Outcome- To enable the students to 1. Thorough knowledge on the nutritional requirements at various stages of child growth and development. 2. Effective understanding of diet planning principles and nutritional facts for balanced and healthy diet during pregnancy, infancy and childhood stage. 3. Gain knowledge on the aspects of aging and the importance of the nutritional requirements and dietary modification during old age.

UNIT – I (Nutritional assessment & Special diet in critical care)

Theory (1 Credits)

Nutritional screening and nutritional status assessment of the critically ill: Introduction, Malnutrition, Medical Status, Nutritional status, Dietary & Fluid Intake, Clinical assessment, Anthropometry, Biochemical tests. Nutritional support systems and other life – saving measures for the critically ill. Enteral and parenteral nutrition support. Total parenteral nutrition, Role of immuno enhancers, conditionally essential nutrients, immunosuppressants, and special diets in critical care.

UNIT – II (Enteral Nutrition)

Theory (2 Credits)

Complications of Nutritional Support System including refeeding syndrome and rehabilitation diets. Diet related ethical issues in the terminally ill.

Enteral Nutrition:

- i). Various sites for Enteral nutrition
- ii). In brief, discussion on ryles tube and its care
- iii). Types of feeds, advantages and disadvantage of home-based feeds, Commercial formula feeds.
- iv). Incorporation of easily digestible foods.
- v). Requirements of nutrients according to problems eg. Renal, respiratory etc.

7. Total Parental Nutrition

- i). The importance of TPN, ii). Long term effect of its use, iii). Site of TPN and its care, iv). Composition

UNIT – III (Special Nutrition)

Theory (1 Credits)

Patho-physiological, clinical and metabolic aspects, understanding of the special nutritional requirements, nutritional goals and monitoring the therapy in critical illnesses like:

CV complications, stroke and surgery, Dialysis, Respiratory failure, Multi organ failure, Cancer, Hepatic failure GI tract- surgery and its complications, Neurosurgery, Stress, trauma, sepsis and burns, Ketoacidosis



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Recommended Text Books:

1. Zaloga GP (1994). Nutrition in Critical Care, Times Mirror/Mosby.
2. Shils ME, Olson JA, Shike M and Ross AC (Ed) (1999). Modern Nutrition in Health and Disease. 9th Edition, Williams and Wilkins.
3. Shikora SA and Blackburn GL (Ed) (1999). Nutritional Support – Theory and Therapeutics, Chapman and Hall, ITP (International Thomson Publishing).
4. Mahan LK and Escott – Stump S (2000). Krause's Food Nutrition and Diet Therapy, 10th Ed. W.B. Saunders Ltd.

Reference Books:

1. Phillips GD and Lodgers CL (1986). Parenteral and Enteral Nutrition. A Practical Guide. Churchill Livingstone.
2. Kinney JM and Borum PR (editors) (1989). Perspectives in Clinical Nutrition. Urban and Schwarzenberg.

References/Correlation with Ancient Indian Literature:

- Prasna Upanishad 1-5 <https://esamskriti.com/Prasnopanishad-TNS-Complete.pdf>
- Brihadaranyaka Upanishad (V.12) <https://www.swami-krishnananda.org/brdup-audio.html>
- Chhandogya Upanishad (VII. 26)
https://www.chinfo.org/images/userupload/Reflections/16_Bhumaiva_Sukham_Chand_7.pdf
- Chhandogya Upanishad (VII. 9)
https://www.chinfo.org/images/userupload/Reflections/16_Bhumaiva_Sukham_Chand_7.pdf

Course Name: Functional Foods & Nutraceuticals

Total Credits 4 (T)

Course Outcome- To enable the students to 1.To recognize the structure of the major bio-active food constituents that are being incorporated into functional foods 2.Physiological and functional basis of various phytochemical compounds of natural as well as synthetic compounds

UNIT – I (Probiotics)

Theory (1.0 Credits)

Introduction: Definition, history, classification – Type of classification (Probiotics, probiotics and synbiotics; Nutrient vs. Non-nutrient; according to target organ; according to source or origin).

Probiotics

Taxonomy and important features of probiotic micro- organisms., Health effects of probiotics including mechanism of action. Probiotics in various foods: fermented milk products, non-milk products etc.

Quality Assurance of probiotics and safety

UNIT – II (Prebiotics)

Theory (1 Credits)

Prebiotics

Definition, chemistry, sources, metabolism and bioavailability, effect of processing, physiological effects, effects on human health and potential applications in risk reduction of diseases, perspective for food applications for the following:

Non-digestible carbohydrates/oligosaccharides: Dietary fibre, Resistant starch, Gums

UNIT – III (Phytochemicals)

Theory (2 Credits)

Other Food Components with potential health benefits:

Definition, chemistry, sources, metabolism and bioavailability, effect of processing, physiological effects, effects on human health and potential

applications in risk reduction of diseases, perspective for food applications for the following:

- Polyphenols: Flavonoids, catechins, isoflavones, tannins. Phytoestrogens, Phytosterols, Glucosinolates
- Pigments: Lycopene, Curcumin etc, Organo sulphur compounds
- Other components – Phytates, Protease inhibitors, saponins, Amylase inhibitors, haemagglutinins
- Active biodynamic principles in spices, condiments and other plant materials

Non- nutrient effect of specific nutrients : Proteins, Peptides and nucleotides, Conjugated linoleic acid and n-3 fatty acids, Vitamins and Minerals.



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Recommended Text Books:

1. Wildman, R.E.C. ed. (2000) Handbook of Nutraceuticals and Functional Foods, CRC Press, Boca Raton.
4. Fuller, R. ed. (1992) Probiotics the scientific basis, London: Chapman and Hall, New York.

Reference Books:

1. Gibson, G, Williams C. eds (2000). Functional Foods. Woodhead Publishing Ltd. U.K.
2. Young J (1996). Functional Foods: Strategies for successful product development. FT Management Report Pearson Professional Publishers, London.
3. Frei B (1994). Natural antioxidants in human health and disease. Academic Press, San Diego.

References/Correlation with Ancient Indian Literature:

- (Rigveda – 10-19-7) <http://www.gatewayforindia.com/vedas/rigveda/rigveda10.shtml>
- Rigveda (10-179-3) <http://www.gatewayforindia.com/vedas/rigveda/rigveda10.shtml>
- Yajurveda Mantra 22-22) <http://www.sacred-texts.com/hin/av.htm>

Course Name: Nutritional Management

Total Credits 4 (3T +1P)

Course Outcome- To enable students to 1.Apply the principles of diet for the management of metabolic diseases. 2. Use the nutrition care process for special conditions like allergy and burns. 3.Develop the dietary models for cancer and HIV

UNIT – I (Nutritional Anemias & Food Allergy)

Theory (1 Credits)

Nutritional Anemias

A. Erythropoiesis and haemoglobin synthesis: Nutrients involved in Erythropoiesis

B. Classifications of Anemias and Nutritional Care

i) Normocytic anemia – aplastic anemia, ii) Megaloblastic anemia, iii) Microcytic anemia, iv) Sickle cell anemia and Thalassemia, v) Hemolytic anemia

Food Allergy

- i) Definition, Symptoms and mechanism of food allergy, ii) Diagnosis – Biochemical, immunotesting (brief), history and food record, iii) Elimination diets, iv) Food Selection, v) Medication (brief), vi) Food allergy in infancy (milk sensitive enteropathy, colic prevention of food allergy)

Practical: (0.4credits)

Sr. no.	Name of practical	Nature
1	Planning of diet for Normocytic anemia	Practical
2	Preparation of planned diet for Normocytic anemia	Practical
3	Planning of diet for patient suffering from Megaloblastic anemia	Practical
4	Preparation of planned diet for patient suffering from Megaloblastic anemia	Practical
5	Planning of diet patient suffering from milk sensitive enteropathy & other food allergy	Practical
6	Preparation of planned diet for patient suffering from from milk sensitive enteropathy & other food allergy	Practical

UNIT – II (Nutrition in Pulmonary Disease & Cancer)

Theory (1 Credits)

Nutrition in Pulmonary Disease

A. Effects of Malnutrition on Respiration

B. Chronic Obstructive Pulmonary Disease

i). Etiology and Pathogenesis, ii). Nutritional Management

C. Respiratory Failure

i). Nutritional Care

Nutrition and Cancer



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- i) Epidemiologic investigation of diet and cancer relationship, ii) Carcinogens in foods, iii) Chemoprevention of Cancer: nutrient and non-nutrient dietary components, iv) Etiology and Pathogenesis of carcinogenesis, v) Metabolic and Nutritional Alterations in Malignancy, vi) Interrelationships of nutritional status and systemic effects of cancer, vii) Nutritional impacts of cancer therapy, viii) Types of therapy, ix) Bone Marrow Transplant and its nutritional care, x) Nutritional support of the Cancer patient

Practical: (0.4credits)

Sr. no.	Name of practical	Nature
1	Planning of diet for malnutrition	Practical
2	Preparation of planned diet for malnutrition	Practical
3	Planning of diet for patient suffering from Pulmonary Disease	Practical
4	Preparation of planned diet for patient suffering from Pulmonary Disease	Practical
5	Planning of diet patient suffering from cancer & malnutrition	Practical
6	Preparation of planned diet for patient suffering from cancer & malnutrition	Practical

UNIT - III (Nutritional Care in Hyper metabolic Conditions & Drug- nutrient Interactions)

Theory (1 Credits)

Nutritional Care in Hyper metabolic Conditions

Burns, Sepsis, Surgery

Drug- nutrient Interactions

- Effects of diet and nutritional status on drug absorption, disposition metabolism and action
- Effects of drugs on food intake, body weight, nutrient requirements and growth.
- Drug induced mal-digestion and mal-absorption
- Effects of drugs on vitamin and mineral status, requirements and activity
- Demographics, disease state and risk of drug-nutrient and drug- nutritional status interactions.

Practical: (0.2 credits)

Sr. no.	Name of practical	Nature
1	Planning of diet for burn patient	Practical
2	Preparation of planned diet for burn patient	Practical
3	Planning of diet for surgery patient	Practical
4	Preparation of planned diet for surgery patient	Practical
5	Planning of diet for obese burn patient	Practical
6	Preparation of planned diet for obese burn patient	Practical

Recommended Text Books:

1. Mahan, L.K. and Escott-Stump, S. (2000): Krause's Food Nutrition and Diet Therapy, 10th Edition, W.B. Saunders Ltd.



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2. Shils, M.E., Olson, J.A., Shike, M. and Ross, A.C. (1999): Modern Nutrition in Health and Disease, 9th Edition, Williams and Wilkins.
3. Escott-Stump, S. (1998): Nutrition and Diagnosis Related Care, 4th Edition, Williams and Wilkins.
4. Garrow, J.S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics, 10th Edition, Churchill Livingstone.

Reference Books:

1. Williams, S.R. (1993): Nutrition and Diet Therapy, 7th Edition, Times Mirror/Mosby College Publishing.
2. Davis, J. and Sherer, K. (1994): Applied Nutrition and Diet Therapy for Nurses, 2nd Edition, W.B. Saunders Co.
3. Walker, W.A. and Watkins, J.B. (Ed) (1985): Nutrition in Pediatrics, Boston, Little, Brown & Co.
4. Guyton, A.C. and Hall, J.E. (1999): Textbook of Medical Physiology, 9th Edition, W.B. Saunders Co
5. World Cancer Research Fund (1997). Food, Nutrition and the Prevention of Cancer- A Global perspective, Washington E.D. WCRF

References/Correlation with Ancient Indian Literature:

- (Mahabharatha Anu.65-46)<https://sanskritdocuments.org/mirrors/mahabharata/mbhk/mahabharata-k-06-itx.html>
- Rig Veda (1-71-9)<http://xn--j2b3a4c.com/rigveda/1/71/9>
- 1. (Charak sutradhan 27-214)<http://www.dadf.gov.in/related-links/annex-v-ii-2-superiority-cow-milk-paper-sh-ik-narang>
- Mantra (4-21-6) of the Atharva veda<http://www.sacred-texts.com/hin/av.htm>

Course Name: Food Service Management

Total Credits 3

Course Outcome- To enable the students to 1.Implement safety and sanitation measures within the restaurant and food service industry. 2. The graduates are highly regarded by hospitals, food industries, food and pharmaceutical companies.

UNIT – I (Food Service Establishment & Management)

Theory (1 Credits)

Type of food service establishment: Commercial, Non Commercial, Street, mobile food unit Temporary food service establishment, vending machine, food court, High risk food Catering management- Principles of management (basic guidelines) Principle of Management (continued)Function of management: Managing, Planning, Organizing Directing, Coordinating, Controlling and Evaluating Tools of management Tangible. Tools of management, Intangible tools Management of resources Natural environment, Work environment

UNIT – II (Organization of Space & Equipment in Food Services establishment)

Theory (1 Credits)

Kitchen Space – Size and types, Developing kitchen plan, Work simplification, Features to be considered in kitchen designing Storage Space – Types of storage, Factors to be considered while planning storage spaces Service Area – Location, Structural designing and planning storage spacesEquipment – Classification of equipment Selection of equipment, Designing, installation and operation purchasing equipment Care and maintenance of equipment

UNIT – III (Food Management)

Theory (1 Credits)

Characteristic of food, Types of food, quality of food – quantity. Sensory quality and nutritional quality, Food purchasing – Importance Types – open market, formal, negotiated and wholesale. Receiving and Food storage – Delivery methods General guidelines for storing perishable and non perishable foods Menu Planning – Importance of menu planning Types of menus – Al a carte, table d'hôte and combination Food service Style of service, Waiter service, self service and vending

Recommended Text Books:

1. Catering Management – An Integrated Approach – Mohini Sethi, Surjeet Malhan, 2nd edition, New Age International Publishers.



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Reference Books:

1. Food Hygiene and Sanitation – S Roday, Tata Mc Graw Hill Publishing Co. Ltd., 3rd reprint
2. Institutional Food Management –Mohini Sethi

References/Correlation with Ancient Indian Literature:

- Mantra (4-21-6) of the Atharva veda <http://dahd.nic.in/hi/related-links/annex-v-ii-2-superiority-cow-milk-paper-sh-ik-narang>
- Atharva Veda's Mantra 18-4-16 <http://dahd.nic.in/hi/related-links/annex-v-ii-2-superiority-cow-milk-paper-sh-ik-narang>
- Atharva Veda's Mantra 18-4-19 <http://dahd.nic.in/hi/related-links/annex-v-ii-2-superiority-cow-milk-paper-sh-ik-narang>
- Rigveda (10-179-3) <http://www.gatewayforindia.com/vedas/rigveda/rigveda10.shtml>

Pre Dissertation Training (60 Days) (After II Sem during summer vacation) 2 Credits

Course Outcome- Student will be able to: 1. Demonstrate knowledge of scientific writing method and styles 2. Develop a research design on a topic relevant to their field 3. Prepare a systematic literature review on a select topic 4. Present a seminar of training

IV SEMESTER

Dissertation 25 Credits

Course Outcome- : Student will be able to 1. Know the practical aspects of, collecting data/ project work 2. Evaluate, select and use appropriate strategies for reduction, analysis and presentation of data collected during research process/ project work 3. Suitably illustrate data/ insights using various graphical and other methods. 4. Prepare a dissertation document/ project report based on research process/ project work done.

New Product Development (NPD) 25 Credits

Course Outcome- Student will be able to 1. Gain an understanding of the processes involved in the invention process, formulation, and development of new food products 2. Develop an appreciation of the food industry and how innovation is critical to the industry 3. Cultivate basic food science principles to problem solve during product development 4. Develop and enhance team cooperation and communication skills