SEMESTER -I

11001 – BASICS OF HUMAN PHYSIOLOGY

UNIT - I


UNIT - II

Respiratory System: Organs & functioning control of respiration. Gaseous exchange in lungs and tissues.

Cardiovascular System:


UNIT III


UNIT IV
Nervous System: Structure of a nerve cell-reflex action, nervous transmission- cerebrospinal nervous system and autonomous nervous system (only the parts and general functions), common test in neurological disorders- EEG, EMG, MRI, and NCV.

Renal system: Structure and functions of Kidney , re-absorption, structure of nephron , GFR, Regulation of re-absorption.

11005P-PRACTICAL

Section-A
1. Demonstration of measuring BP using sphygmomanometer.
2. Determination/Identification of blood group and Rh factor.
3. Determination of TC of RBC & WBC
4. Determination of DC of WBC
5. Determination of ESR
7. Measurement of clotting time of blood

REFERENCES


11002 – NUTRITIONAL BIOCHEMISTRY

UNIT –I

Chemistry of Bimolecules – Introduction & Carbohydrates:
Acids, bases, salts, buffers, Henderson – Hasselbach equation. Theory indicators principles of measurement of pH.

**Carbohydrates:** Enzymes of biological oxidation, redox potential, respiratory chain, Mitchell’s oxidative phosphorylation.

Classification, structure, properties, Overview of Metabolism (Glycolysis/EMP pathway, Citric acid/Krebs cycle)

**UNIT –II**

**Chemistry of Biomolecules-,Proteins and Lipids**

**Proteins:** Classification, structure, and properties of proteins (Primary, Secondary, Tertiary and Quaternary) Different types of bonds that stabilize the proteins, structure and biological functions of fibrous proteins (keratine, Collagen), and globular proteins (Hemoglobin, Methhemoglobin)

Overview of the Metabolism: Transamination, Deamination (oxidative and non-oxidative) and urea cycle and its regulations.

**Lipids:** Classification, structure and, properties of Lipids Overview of the Metabolism.

**UNIT – III**

**Chemistry of Biomolecules-Enzymes and Vitamins**

**Enzymes:** Enzymes as biological catalysts, IUB systems of classification, specific activity, Km & Vmax, evaluation. Line weaver Burk Plott. Effect of pH & temperature on enzyme catalyzed reactions, Enzyme inhibitors. Isoenzymes.

**Structure and functions of Co-enzymes –**flavin nucleotide, coenzyme A and biotin.

**Vitamins –**Water soluble and fat soluble vitamins, physiological functions, factors influencing bioavailability of vitamins.

**UNIT-IV**

**Chemistry of Biomolecules - DNA & RNA**

**DNA –**double helical structure, Watson-Crick model of DNA and base-pairing

A,B and Z types of DNA

Nucleic acid-Denaturation and annealing of DNA

**RNA –**A brief out line of structure and role of different types of RNA

**11005P-PRACTICAL**

**Section-B**

1. **Acid & Alkalis:** Preparation of Reagents and standard solutions-primary standards and secondary standards

2. **Buffers:** - Preparation of standard buffer solutions and determination of their pH

3. Estimation of glucose in blood.

4. Estimation of cholesterol in blood
5. Estimation of albumin in urine.
7. Fractionation of egg proteins and its quantification

Reference Books:
5. Todd and others, Clinical Diagnosis and Management, 17th Ed, W.B. Saunders, Philadelphia.
11003 - NUTRACEUTICALS & FUNCTIONAL FOODS
(Dr. K.V. Sucharitha, and Dr. Rajani,)

UNIT – I
Functional Foods and Nutraceuticals - Definition, introduction, importance of functional foods – Cereals and pulses and functional food Teleology of Nutraceuticals – Primary and secondary metabolites in plants. General Teleology of - a) Carotenoids b) Conjugated linolenic acid c) Flavonoids d) Sulphur containing Amino Acid Derivatives e) Omega 3 fatty acids f) PUFA g) Terpenoids

UNIT – II
Role of functional foods: - structure, properties, sources – Antioxidants, Non-Nutrients detoxifying agents.

Blocking and suppressing agents and some bioactive phytochemicals, pre and probiotics.

UNIT – III
Role of Nutraceuticals in disease management- Inborn errors of metabolism, Obesity, Neurological disorders, Diabetes mellitus,cancer, CVDs, Vitamin A Deficiency and PEM.

UNIT -IV
Nutraceuticals and the Future of Medical Science: Nutraceuticals of plant and animal origin, their uses. Formulas, development of designer foods for specific chronic diseases like diabetes, cardiovascular diseases, AIDS and degenerative diseases like Parkinson.

11006P – PRACTICAL
Section-A
1. Preparation of media and sterilization techniques :dry and wet methods.
2. Assessments of dietary intakes of antioxidants- Vitamin-A, C and Zinc
2. Estimation of antioxidants A, C, E.,
3. Estimation of dietary fibers and fruit fibers.
4. Isolation and identification of casein in milk.
5. Microbiological analysis of foods: processed & unprocessed like vegetables. & fruit, cereals, spices& canned foods.

REFERENCE
UNIT I
Microorganism of importance in food - Their classification, morphology, growth & reproduction, industrial importance.
Food as a substrate for microorganism - pH, moisture oxidation- reduction potential, nutrient content, inhibitory substance & biological structure.

UNIT II
Methods of isolation and detection of microorganism or their products in food.
  - Conventional methods
  - Chemical Methods
  - Molecular methods
  - Immunological Methods

UNIT III
**Food Spoilage** - General principles underlying spoilage: Causes of Spoilage Factors affecting food constituents.
Microbial spoilage: Chemical Changes caused by different Microorganisms – Factors affecting the growth of Microorganisms and Hazards.
Spoilage by enzymatic action: Different enzymes in foods, enzymes produced by Micro organisms nature of food spoilage
Contamination by Insects & Rodents: physical and chemical spoilage by insects and rodents.

UNIT IV: **Food Borne Diseases**:
**Viral** :-  Hepatitis,Poliomyelitis,
**Bacterial**: Botulism,,Salmonellosis,Gastroenteritis-Clostridium,vibrio cholera,,Enteropathogenic –Eschertia coli
**Nonbacterial**: Mycotoxins,Aflotoxin,Patulin,Ochratoxin
**Parasitic** : -  Tape worm, Ascaris

11006P – **PRACTICALS**

Section-B
  1. Preparation of media-broth, solid media
  2. Sterilization techniques: Dry and wet methods.
  3. Identification of microorganisms by staining techniques- Simple, Gram & negative
  4. Isolation of micro organisms
5. Microbiological analysis of water, milk, & air - Total count, MPN coliform (count) by Hemocytometric method & MBRT.

REFERENCE
SEMESTER II
21001 – ESSENTIALS OF MACRO & MICRO NUTRIENTS
(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I
Food groups
Classification, food composition, properties, Characteristics and nutritive values of different foods, Functions of foods and nutrients – (cereal grains, millets, pulses, nuts and oil seeds fruits and vegetables, milk and milk products, meat, egg, poultry and fish, spices and condiments).

UNIT II
Macro Nutrients –
Carbohydrates Classification, Functions, sources, effect of excess/low intake of Carbohydrates
Proteins and Aminoacids, sources, effects of protein deficiency,
Fats- Functions, sources, effects of deficiency and excess of fats

UNIT III
Micro Nutrients- Vitamins and minerals- Requirements, sources, biological functions and effects of deficiency.

UNIT IV
Major Nutrient Problems- PEM, Iron deficiency Anemia (IDA), Iodine deficiency disorders (IDD), Vitamin A deficiency-causes and consequences
Strategies to combat malnutrition with special reference to the above major nutritional problems.

21005P-PRACTICALS

Section -A
1. Assessment of dietary intakes of Macro Nutrients in different age groups.
2. Assessment of dietary intakes of Micro Nutrients in different age groups-Vitamins- (A & B-Complex) and Minerals- (Iron and Calcium)
3. Preparation of foods rich in macro & micronutrients.
4. Formulation of nutrients, supplementary foods for infants, children, aged and persons suffering from specific nutritional deficiencies and convalescing subjects.
REFERENCES

1. Mehtab S. Bamji, Text book of Human Nutrition
4. Gopalan, C (Editor) - Basic Issues in Combating Malnutrition - NFI Publication.
5. Gopalan, C (Editor) - Women Nutrition in India. NFI Publication.
7. Measuring change in nutritional status - WHO 1981 (NCHS Standards)
UNIT I

**Importance of pregnancy and lactation:** Importance of nutrients during pregnancy and lactation, Nutritional requirements during pregnancy, Complications of Pregnancy, importance of breast feeding, infant feeding trends, requirement RDAs, importance of nutrients in growth and development.

UNIT II

**Nutrition during infancy, childhood and adolescence**


**Growth and Development:** a) Growth and development during infancy, feeding of infants, Weaning and Dietary Management. Growth and development & dietary management in Childhood and Adolescence

UNIT – III

**Adult and Geriatric (Ageing) Nutrition:** Physiological needs – Nutrition as related to life styles (Sedentary, Moderate and Heavy work).

The process of Ageing – Nutrition implications of the Ageing Processes, nutritional implementation of ageing.

UNIT IV

**Nutrition during Special needs:**

Floods, Droughts and Famines.

Sports nutrition

Space travel and High altitudes.

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**21005P-PRACTICALS**

**Section -B**

1. Planning of diets to meet RDA of Pregnant and Lactation and calculating nutritive values of the diet

2. Planning of diets to meet RDA of different age groups and calculating nutritive values of the diet

3. Planning and calculating nutritive values of diets for different nutrient deficiencies.
REFERENCES

5. Modern Nutrition in Health & Disease, 9th Ed. by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999); Williams & Wilkins.
6. Human Nutrition and Dietetics by Davidson, S. Passmore, R. Brock. J.F. and Turswell A.S.
    Boon, New York, 1988
21003 - CLINICAL AND THERAPEUTIC NUTRITION
(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT I
Adaptation of normal diet, progressive diet-General & Modified Diets & Nutritional support-
special feeding methods
Incidence, etiology, pathology & metabolic aberrations, clinical manifestations, complications,
dietary management & counseling of following diseases.
Gastro-intestinal: - Peptic Ulcer, ulcerative colitis, Diarrhea and Dysentery
Pancreatic Disorders-.Pancreatitis,

UNIT II
Incidence, Etiology, Pathology, metabolic & clinical aberrations, complications. Prevention,
dietary management and Counseling of Following Diseases:
Gall Bladder and Liver Disorders: Hepatitis, Liver Cirrhosis, Hepatic Coma,
Over view of liver Transplant, Pre and post liver transplant Dietary Management
Renal Disorders- ARF, CRF, Nephritic Syndrome, Glomerulonephritis, Renal stones, ESRD
Dialysis
Overview of Kidney Transplant and Dietary Management

UNIT III
Metabolic Disorders:-
i) Gout

ii) Inborn errors: Alkaptonuria, Fructosuria, Tyrosinosis, Phenylketonuria, Galactosemia,
Maplesyrupurine Disease, Homocystinuria

iii) Etipathophysiology, metabolic & clinical aberrations, complications. Prevention and dietary
management of Neurological disorders – Parkinson ‘s Disease and Multiple Sclerosis

Food born illnesses and Food allergy
Viral :- Hepatitis,Poliomyelitis,
Bacterial:Botulism,,Salmonellosis,Gastroenteritis-
Clostridium,vibrio cholera,,Enteropathogenic –Eschertia coli
Nonbacterial:-Mycotoxins,Aflotoxin, Ochratoxin

UNIT IV
Diet, nutrient & drug interaction: - Effect of drugs of ingestion, digestion, absorption &
Metabolism of nutrients. Effect of drug dosage on food, nutrients & nutritional status
21006P-Practicals

Section-A

1. Planning and preparation of therapeutic modifications of normal diet.
2. Planning and preparation of diets for diabetes mellitus, liver disorders, gastrointestinal disorders and kidney disorders.
3. Visit to Hospitals- Dietary department.

REFERENCES

15. Joshi, Clinical nutrition
UNIT I - Biostatistics


Random variable, types of Random variables , Covariance, Skewness and Kurtosis.

Normal distribution and its applications.

Concepts of Population,sample,parameter , statistic, sampling.

Concepts of correlation and regression analysis.

UNIT II

Hypothesis - Statistical hypothesis, Null hypothesis, alternative hypothesis, critical region, level of significance, one and two tailed test.

Tests of significance based on large samples (Mean, SD,Proportion)

Small sample tests : t-test,F-test, Chi-square test - permutation and combination

ANOVA- A brief account of one Way Two way Analysis. Introduction to MANOVA- Introduction to Statistical Package for Social Sciences (SPSS) -use of statistical software such as COSTAT and STATISTICA.

UNIT III- Research methodology

Choosing the problem for research – stages in the execution of research -literature collection – Primary, secondary and tertiary sources – articles, reviews, abstract, current contents Bibliography – indexing and abstracting – Reporting the results of research in conferences – Oral and Poster presentation - Logical format for writing thesis and papers. Essential features of abstract, introduction, review of literature, materials and methods, and discussion.

UNIT IV-Research methodology


21006 P -PRACTICAL:

Section-B

1. Problem solving using statistical software

2. Construct a research tool- Questionnaire and schedule
3. Prepare a research paper
4. Present abstract of a research report.
5. Preparation of diagrams/ graphs

REFERENCES
10. Columns for Gas Chromatography -Barry & Grob
13. HPLC: Modern HPCL for Practicing Scientists-Michael W Dong
14. HPLC made to measures-Stavros Kromidas
15. HPLC: Practical HPLC-Veronika R Meyer
16. HPLC Quantitative Analysis of Pharmaceutical Formulations-Dr. P D Sethi
17. HPTLC(High Performance Thin Layer Chromatography)-Dr. P D Sethi
20. HPLC: A Practical handbook of Preparative HPLC-Donald A Welling
21. HPLC for Pharmaceutical Scientists-Yuri Kazakevich
22. HPLC: A Practical user's Guide-Marvin C. McMaster
23. Mass Spectrometry ( a Foundation Course)-K. Downard
24. Mass Spectrometry (Principle & Application)-E. Hoffmann & V. Stroobant
26. Spectroscopy for the Biological Science.-HAMMES.
SEMESTER -III
31001 - COMMUNITY NUTRITION (Dr. Rajani)

UNIT I
Assessment of Nutritional Status- Direct and Indirect methods- Nutritional Anthropometry, Biochemical methods, clinical examination, Dietary Survey- Age specific mortality and morbidity rates.

UNIT II

UNIT III
Nutrition Education : Meaning, nature and importance of nutrition education to the community, training the change Agents, training strategy, Training guidelines. Principals of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

UNIT IV

31005P-PRACTICALS
Section -A

1. One week community nutrition camp & report
2. Planning, conducting and evaluating nutrition education programmes.
3. Assessment of nutritional status through anthropometry and dietary survey
4. Critical appraisal of existing interventions and programmes in the voluntary sector and government and suggestions to improve the same vis-à-vis target groups in society and specific needs.
REFERENCES

31002 - FOOD PROCESSING AND SAFETY
(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT – I
Food Processing- Principles and Methods of processing :

UNIT-II
Meat and Flesh foods: Smoking, drying, canning.
Fruits and vegetables: Blanching, canning, bottling, sugar concentrates, drying and fumigation.

UNIT-III
Food Adulteration - Foods commonly adulterated Health hazards of adulterants Simple identification tests of adulterants.
Food Additives- emulsifiers, stabilizers, sweeteners, preservatives, colouring agents flavouring agents.

UNIT-IV
Food Standards and laws
National food Laws, acts and implementing agencies FSSA, PFA,ISI, AGMARK, FPO etc.,
Role of Govt.in setting standards and quality control - Food quality control Board, Technical Advisory committees, public health laboratories etc.,
International laws - ISO, CODEX.

31005P – PRACTICALS
Section - B
1. Visit to various food Industries.
2. Checking of food Adulterants in- Milk, Coffee, tea etc.,

REFERENCES :-
2. Rajesh Mehta and J. George-“ Food Safety Regulations concerns and Trade- The developing countryperspective, Mac millan India Ltd, 2005


UNIT I

Innovations in product development

Definition, Classification, Characterization Factors shaping new product development- Social concerns, health concerns impact of technology and market place influence. Brief introduction to phases in Food Product Development Idea generation, Screening (Feasibility, Consumer studies Financial Review), development, Production, Consumer trails and test Market.

UNIT II

New technologies in development of Nutraceuticals and functional foods: Supercritical food extraction technology-basics and application for extraction of nutraceuticals from various sources, application of bioprocess technology for production and enhancement of properties of nutraceuticals.

UNIT III

Packaging strategies for nutraceutical products: Introduction to packaging, plastic as packaging material- structure, optical and mechanical properties of plastic, paper and paper-based packaging material, glass packaging material, concept of aseptic packaging of foods.

UNIT IV

Labeling and claims for Nutraceuticals products

Overview of dietary supplements labeling, need for specific regulation governing dietary supplements, Nutritional content claims, health claims and exemption from FDA requirements, Dietary supplements labeling issues, regulatory agencies views on label claims.

The role of marketing Communication in the introduction of functional foods to the Consumer: Introduction to marketing and consumer buying behavior, food purchase habits of people, the basics of communication processes used to convey the message written and oral communication.

31006 P – PRACTICALS

Section-A

1. Estimation of protein quality using any one method.
2. Separation and identification of essential amino acids by TLC from given food sample (Demonstration experiment)
3. Fractionation of proteins from given sample (milk / Soya milk / Liver homogenate) using ammonium sulphate precipitation.
4. To study the gluten formation.
5. Market Survey, Consumer survey
6. To identify. Identify new products in terms of Innovation products Creative Products

REFERENCES
1. Food packaging principals and practice, Gordon L. Robertson, Marcel and Dekker Inc. New York. 1999. Chapters 1, 2, 3, 6, 7, 9, 13, 17, 18 & 19 for point 6.7.
31004 – Instrumental Techniques

UNIT- I

**Ultraviolet and Visible Spectroscopy:** Various electronic transitions (185-800 nm), effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic compounds.

**Infra red spectroscopy**

Instrumentation and sample handling. Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters, amides, acids, anhydrides, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, FT-IR.

UNIT- II

**Chromatography:**

General Principles involved in separations by paper, thin layer, column, and ion exchange Chromatography. Chromatographic behaviour of solutes, column efficiency and resolution, column processes and band broadening, time of analysis and resolution, quantitative determinations.

**High performance liquid chromatography:**

Theory and instrumentation- column performance, gradient elution, delivery system, sample introduction, separation columns, detectors.

UNIT- III

**NMR Spectroscopy:** Theory of NMR, chemical shift and its measurement, factors influencing chemical shift, solvents used in NMR, spin-spin coupling, spin-spin splitting, factors influencing the coupling constant, structural interpretations by NMR spectra.

**Mass Spectrometry:**

Principle, instrumentation, isotope abundance, metastable ions, fragmentation process, fragmentation associated with functional groups.

UNIT- IV

**Thermal Methods:**

Differential thermal analysis- principle, instrumentation, applications with special reference to the clays and minerals, coals (fuels).

Differential scanning calorimetry-principle, instrumentation, applications to inorganic materials like chlorates and perchlorates, ammonium nitrate.

Thermogravimetry- theory, instrumentation, applications with special reference to CuSO₄.5H₂O, CaC₂O₄.2H₂O. Difference between TG and DTA.
31006 P – PRACTICALS

Section-B

1. Identification of functional Groups by using UV Spectra
2. Identification of functional Groups by using IR Spectra
3. Structure determination of components by using NMR Spectra
4. Thermal analysis of coal or clay by Bomb Calorimeter

SEMESTER-IV

41001 – PROJECT WORK

It is proposed to included internship as a fieldwork for time duration of one month at near by hospitals as dietitian.
BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – I-Basics of Human physiology

TIME: 3hours Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

1. Cell theory 5. Thyroid secretions
2. Mitochondria. 6. Menstrual cycle
3. Blood functions 7. MRI
4. ECG 8. Nephron

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a) Explain About digestive juices and their functions.

OR

b). Give a detailed account on cell organelle

10. a) Explain about gaseous exchange in lungs and tissues.

OR

b) Describe about different types of circulation.

11. a) What are the Regulatory functions of endocrines.

OR

b) Describe about Male reproductive system.

12 a) Write in detail about structure of a nerve cell and its functions.

OR

b) Describe about autonomous nervous system.
M.Sc. DEGREE EXAMINATIONS

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – II - NUTRITIONAL BIOCHEMISTRY

TIME: 3 hours

Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 

1. Henderson-Hasselbach equation
2. Redox potential
3. Fibrous proteins
4. Deamination
5. Biological catalysts
6. Enzyme inhibitors
7. DNA
8. RNA

Section – II

Answer ALL questions. Each question carries 10 marks

9. a) Write about classification of carbohydrates.
   OR
   b) Write about chemistry of glycolysis.
10. a) Give a details about classification and properties of Lipids
    OR
    b) Write about urea cycle and its regulations.
11. a) Explain about structure and functions of co enzymes
    OR
    b) Write about water soluble vitamins and their physiological functions
12. a) What is the Chemistry of DNA.
    OR
    b) Write about the chemistry in RNA
M.Sc. DEGREE EXAMINATIONS 11003

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – III – Nutraceuticals and Functional foods

TIME: 3 hours

Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

1. Functional foods
2. Flavonoids
3. Antioxidants
4. Probiotics
5. Diabetes mellitus
6. Vitamin A deficiency
7. AIDS
8. FUPA

Section – II

Answer ALL questions. Each question carries 10 marks

9. a.) Describe about importance of Nutraceuticals

OR

b.) Explain about Primary and Secondary metabolites in plants

10. a.) What are various properties and sources of non nutrient detoxifying agents.

OR

b.) Explain about blocking and suppressing agents.

11. a.) Role of nutraceuticals in obesity management.

OR

b.) Write about PEM and role of nutraceuticals in its management

12. a.) Explain nutraceuticals of plant origin and their uses.

OR

b.) Write about designer foods for degenerative diseases.
M.Sc. DEGREE EXAMINATIONS  
BRANCH: Human nutrition and Nutraceutical Chemistry  
I SEMESTER  
PAPER IV – FOOD MICROBIOLOGY

TIME: 3 hours  
Max. Marks: 70

Section – I  
Answer any 6 questions. Each question carries 5 marks.  
6 x 5 = 30M

1. Reduction potential  
2. Food borne infections  
3. Streaking technique  
4. Detection of Microorganisms  
5. Food spoilage  
6. Hepatitis  
7. Hazards of Microorganisms  
8. Poliomyelitis

Section – II  
Answer ALL questions. Each question carries 10 marks  
4 x 10 = 40M.

9.a.) Write about microorganisms which are important in food microbiology  
(or)  
(b) Explain about isolation and importance of microorganisms

10.a) How the microorganisms are isolated from the food.  
(or)  
(b) Give a detailed account on molecular methods for identification of microorganisms in food

11.a) Describe about factors affecting microbial growth.  
(or)  
(b) Give details about the Physical and chemical spoilage of food by insects and rodents.

12.a) Write about food borne diseases with bacteria.  
(or)  
(b) Explain about food borne Vital diseases.
Section – I

Answer any 6 questions. Each question carries 5 marks.  
6 x 5 = 30M

1. Discuss about Clinical examination in assessment of nutritional status.
2. Explain the classification used to categorize the malnutrition.
3. Explain about FAO.
4. Write an detail about WHO.
5. Explain about training the change agents.
6. Give an account on principles of planning nutrition education programmed.
7. What is food fortification? Explain.
8. Explain about food diversification.

Section – II

Answer ALL questions. Each question carries 10 marks  
4 x 10 = 40M.

9.a). Classify direct and indirect methods of nutritional assessment and explain nutrition surveys in detail.

OR

B). Explain about classification used to categorize the malnutrition in children.

10. a) Write in detail about CARE.

OR

b) Explain in detail about ICDS.

11. a). Give an account training the change agents.

OR

b). Plan a nutrition education for community on malnourished children.

12. a) Elaborate on role of NGO agencies in improving food security.

OR

b). Explain in detail about food diversification and food fortification.
M.Sc. DEGREE EXAMINATIONS 31002
BRANCH: Human nutrition and Nutraceutical Chemistry
III SEMESTER
PAPER –II –FOOD PROCESING AND SAFETY

TIME: 3 hours
Max. Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks.
6 x 5 = 30M

1. What is fermentation? Explain.
2. Explain about germination
3. Smoking of flesh foods
4. Write about Blanching
5. Define food adulteration?
6. Flavoring agents
7. AGMARK
8. ISO

Section – II
Answer ALL questions. Each question carries 10 marks.
4 x 10 = 40M


OR

B) Describe in detail about process of making cheese.

10. a) Elaborate about processing of meat and flesh foods.

OR

b) Explain about drying and fumigation of fruits and vegetables.

11. a) Discuss about commonly adulterated foods and their health hazards.

OR

b) Explain about sweeteners and preservatives.

12. a) Describe about food laws.

OR

b) Write in detail about role of government in setting standards and food quality control.
Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1. Food product development
2. Explain Phases in food product development.
3. Write about nutraceuticals.
5. Write optical properties of paper packaging in detail.
6. Write about glass packaging material.
7. Dietary supplements.
8. Write in detail about food purchase habits of people.

Section – II

Answer ALL questions. Each question carries 10 marks. 4 x 10 = 40M.

9.a). Elaborate about social and health concern on new product development.
OR
   B). Explain in detail about screening of food product development.

10. a) Discuss the supercritical food extraction technology in development of functional foods.
OR
   b) Write a brief note on new technologies in development of nutraceuticals development.

11. a) Describe the structure and properties of glass packaging material.
OR
   b) Explain in detail about concept of aseptic packaging foods.

12. a) Write in detail about overview on labeling of dietary supplements.
OR
   b) Elaborate on role of government organisms agencies in improving food security.
M.Sc. DEGREE EXAMINATIONS 31004
BRANCH: Human nutrition and Nutraceutical Chemistry
III SEMESTER
PAPER – IV- INSTRUMENTAL TECHNIQUES

TIME: 3 hours Max. Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1a). CH4      (b). CH3CL
2. Give an account on
   (A). Fermi resonance  (B). Overtones
3. Discuss the principle of Thin layer Chromatography .
4. Define retention time and mention its importance in Chromatography .
5. Write is anisotropic effect .
7. Distinguish between TG AND DTA
8. Discuss the principle involved in DSC .

Section – II
Answer ALL questions. Each question carries 10 marks

9. A). Discuss the importance of HPLC in chemical analysis with suitable examples .

   OR


   OR

11. a) Explain the following . (A). Vicinal coupling   (B). Factors influencing chemical shift .

   OR

12. a Give an account on

Section – I
Answer any 6 questions. Each question carries 5 marks. \[6 \times 5 = 30\]
1. Properties of food
2. Low intake of Carbohydrates
3. Fat functions
4. Macro nutrients
5. Thiamin
6. Iron deficiency anemia
7. Brief explanation B12
8. Iodine deficiency disorders

Section – II
Answer ALL questions. Each question carries 10 marks \[4 \times 10 = 40\]
9. a) Describe the Characteristic features and nutritive valves of different foods .

OR

b). What are the main functions and classification of foods and nutrients .

10. a) Describe the levels of protein structure and effects of Protein deficiency .

OR

b). What are the Macro nutrients . Explain the carbohydrates functions sources and effects .

11. a). Illustrate the micronutrients and explain the requirements sources of vitamins .

OR

b) Classify the vitamins and its physiological functions and its deficiency .

12. a) . Describe the combat malnutrition with special reference to the major nutritional problem .

(OR)

b) What is the main sources of Vitamin A .
M.Sc.DEGREE EXAMINATIONS 21002
BRANCH: Human nutrition and Nutraceutical Chemistry
II SEMESTER
PAPER –II-HUMAN NUTRITION

TIME: 3 hours Max.Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30
1. Requirements of RDAS
2. Synthesis of Milk components
3. Feeding infants
4. Ageing process
5. Importance of nutrients
6. Dietary management in lactation
7. Nutrition during floods
8. Weaning management

Section – II
Answer ALL questions. Each question carries 10 marks 4 x 10 = 40
9.a). Give a detailed account on importance of nutrients during pregnancy
OR
B). Explain the importance of nutrients in growth development.
10. a). Explain the milk components and its effects and human milk composition.
OR
b). Discuss about dietary management in child hood.
11. a). Explain the Geriatrics nutrition and adult nutrition
b) Nutritional implications of ageing process.
12. a). Explain in detail about sports nutrition.
(OR)

b). Nutrition during space travel.
M.Sc. DEGREE EXAMINATIONS 21003

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER – III- CLINICAL AND THERAPEUTIC NUTRITION

TIME: 3 hours Max. Marks: 70

**Section – I**

Answer any 6 questions. Each question carries 5 marks.  
6 x 5 = 30

1. What is progressive diet. Explain.
2. Metabolic aberrations
3. Clinical aberrations
4. Homocystinuria
5. Effects of Drug dosage
6. ESRD
7. Liver cirrhosis
8. Mycotoxins

**Section – II**

Answer ALL questions. Each question carries 10 marks  
4 x 10 = 40

9. a). What are the Gastro intestinal disease. explain with examples.
   OR
   b). Explain progressive diet, Diet general, modified diets and nutritional support, special feeding methods.

10. a). Discuss about liver disorders.
    OR
    b). Describe about kidney transplant, & dietary management

    b). Explain bacterial disease with examples

12. a). Describe the effect of drug dosage on food, nutritionts & Nutritional status.
   (OR)
   b). Effect of drug on digestion and absorption of nutrients.
Section – I
Answer any 6 questions. Each question carries 5 marks.  6 x 5 = 30
1. Student t test and Chi-square test
2. Choosing the problem for research problem
3. ANOVA
4. Review of literature
5. Skewness of literature
6. Median
7. Impact factor
8. How to publish a full paper

Section – II
Answer ALL questions. Each question carries 10 marks  4 x 10 = 40
9.a Explain the statistical package for social sciences –use of statistical software such as COSTAT and STATISTICA
OR
B). What is Biostatistics? How collection and classification of data, tabulation and presentation of data.
10. a). Describe reporting results of research and oral and poster presentation in conferences – logical format for writing thesis and papers.
OR
b). Illustrate the logical format for writing thesis and papers.
11. a). Explain about the national and international, proof correction and full paper – short communication – review paper – books – plagiarism
b). Writer about effective illustration – tables and figures. references styles – Harvard and Vancouver systems in a thesis
12. a). Explain the intellectual property and intellectual property rights
(OR)
b). Describe the patenting procedures and applications for patent and granting of a patent and x compulsory licenses.
SEMESTER-I
11001-BASICS OF HUMAN PHYSIOLOGY

UNIT - I


UNIT - II

Respiratory System: Organs & functioning control of respiration. Gaseous exchange in lungs and tissues.

Cardiovascular System:


UNIT III


UNIT IVNervous System: Structure of a nerve cell-reflex action, nervous transmission- cerebrospinal nervous system and autonomous nervous system (only the parts and general functions), common test in neurological disorders- EEG, EMG, MRI, and NCV.

Renal system: Structure and functions of Kidney, re-absorption, structure of nephron, GFR,Regulation of re-absorption.

11005P-PRACTICAL

Section-A


10. Determination of TC of RBC & WBC
11. Determination of DC of WBC
12. Determination of ESR
14. Measurement of clotting time of blood

REFERENCES

11002 – NUTRITIONAL BIOCHEMISTRY

UNIT –I
Chemistry of Bimolecules – Introduction & Carbohydrates:
Acids, bases, salts, buffers, Henderson – Hasselbach equation. Theory indicators principles of measurement of pH.

Carbohydrates: Enzymes of biological oxidation, redox potential, respiratory chain, Mitchell’s oxidative phosphorylation.
Classification, structure, properties, Overview of Metabolism (Glycolysis/EMP pathway, Citric acid/Krebs cycle)

UNIT –II
Chemistry of Biomolecules-,Proteins and Lipids
Proteins: Classification, structure, and properties of proteins (Primary,Secondary, Tertiary and Quaternary) Different types of bonds that stabilize the proteins, structure and biological functions of fibrous proteins (keratine,Collagen), and globular proteins (Hemoglobin, Methhemoglobin)
Overview of the Metabolism: Transamination, Deamination (oxidative and non-oxidative) and urea cycle and its regulations.

Lipids: Classification, structure and, properties of Lipids Overview of the Metabolism.

UNIT – III
Chemistry of Biomolecules-Enzymes and Vitamins
Structure and functions of Co-enzymes –flavin nucleotide, coenzyme A and biotin.

UNIT-IV
Chemistry of Biomolecules - DNA & RNA
DNA – double helical structure, Watson-Crick model of DNA and base-pairing
A,B and Z types of DNA Nucleic acid-Denaturation and annealing of DNA
RNA-A brief outline of structure and role of different types of RNA

11005P-PRACTICAL

Section-B
1. Acid & Alkalis: Preparation of Reagents and standard solutions-primary standards and secondary standards
2. Buffers: Preparation of standard buffer solutions and determination of their pH
3. Estimation of glucose in blood.
4. Estimation of cholesterol in blood
5. Estimation of albumin in urine.
7. Fractionation of egg proteins and its quantification

Reference Books:
16. Todd and others, Clinical Diagnosis and Management, 17th Ed, W.B.Saunders, Philadelphia.
UNIT – I

Functional Foods and Nutraceuticals - Definition, introduction, importance of functional foods – Cereals and pulses and functional food Teleology of Nutraceuticals – Primary and secondary metabolites in plants. General Teleology of - a) Carotenoids b) Conjugated linolenic acid c) Flavonoids d) Sulphur containing Amino Acid Derivatives e) Omega 3 fatty acids f) PUFA g) Terpenoids

UNIT – II

Role of functional foods: - structure, properties, sources – Antioxidants, Non-Nutrients detoxifying agents.

Blocking and suppressing agents and some bioactive phytochemicals, pre and probiotics.

UNIT – III

Role of Nutraceuticals in disease management- Inborn errors of metabolism, Obesity, Neurological disorders, Diabetes mellitus,cancer, CVDs, Vitamin A Deficiency and PEM.

UNIT -IV

Nutraceuticals and the Future of Medical Science: Nutraceuticals of plant and animal origin, their uses. Formulas, development of designer foods for specific chronic diseases like diabetes, cardiovascular diseases, AIDS and degenerative diseases like Parkinson.

1006P – PRACTICAL

Section-A

1. Preparation of media and sterilization techniques :dry and wet methods.
2. Assessments of dietary intakes of antioxidants- Vitamin-A, C and Zinc
3. Estimation of antioxidants A, C, E,
4. Estimation of dietary fibers and fruit fibers.
5. Isolation and identification of casein in milk.
6. Microbiological analysis of foods: processed & unprocessed like vegetables. & fruit, cereals, spices& canned foods.

REFERENCE

UNIT I
Microorganism of importance in food - Their classification, morphology, growth & reproduction, industrial importance.
Food as a substrate for microorganism - pH, moisture oxidation- reduction potential, nutrient content, inhibitory substance & biological structure.

UNIT II
Methods of isolation and detection of microorganism or their products in food.
- Conventional methods
- Chemical Methods
- Molecular methods
- Immunological Methods

UNIT III
Food Spoilage-General principles underlying spoilage: Causes of Spoilage Factors affecting food constituents.
Microbial spoilage: Chemical Changes caused by different Microorganisms – Factors affecting the growth of Microorganisms and Hazards.
Spoilage by enzymatic action: Different enzymes in foods, enzymes produced by Micro organisms nature of food spoilage
Contamination by Insects & Rodents: physical and chemical spoilage by insects and rodents.

UNIT IV: Food Borne Diseases:
Viral - Hepatitis, Poliomyelitis,
Bacterial: Botulism, Salmonellosis, Gastroenteritis-Clostridium, vibrio cholera, Enteropathogenic - Eschertia coli
Nonbacterial: Mycotoxins, Aflotoxin, Patulin, Ochratoxin
Parasitic: Tape worm, Ascaris
11006P – PRACTICALS

Section-B

6. Preparation of media-broth, solid media
7. Sterilization techniques: Dry and wet methods.
8. Identification of microorganisms by staining techniques- Simple, Gram & negative
9. Isolation of microorganisms
10. Microbiological analysis of water, milk, & air - Total count, MPN coliform (count) by Hemocytometric method & MBRT.

REFERENCE

UNIT I
Food groups
Classification, food composition, properties, Characteristics and nutritive values of different foods, Functions of foods and nutrients – (cereal grains, millets, pulses, nuts and oil seeds fruits and vegetables, milk and milk products, meat, egg, poultry and fish, spices and condiments).

UNIT II
Macro Nutrients –
Carbohydrates Classification, Functions, sources, effect of excess/low intake of Carbohydrates
Proteins and Aminoacids, sources, effects of protein deficiency,
Fats- Functions, sources, effects of deficiency and excess of fats

UNIT III
Micro Nutrients- Vitamins and minerals- Requirements, sources, biological functions and effects of deficiency.

UNIT IV
Major Nutrient Problems- PEM, Iron deficiency Anemia (IDA), Iodine deficiency disorders (IDD), Vitamin A deficiency-causes and consequences
Strategies to combat malnutrition with special reference to the above major nutritional problems.

21005P- PRACTICALS
Section -A
1. Assessment of dietary intakes of Macro Nutrients in different age groups.
2. Assessment of dietary intakes of Micro Nutrients in different age groups-Vitamins- (A& B-Complex) and Minerals- (Iron and Calcium)
3. Preparation of foods rich in macro & micronutrients.
4. Formulation of nutrients, supplementary foods for infants, children, aged and persons suffering from specific nutritional deficiencies and convalescing subjects.
REFERENCES

1. Mehtab S. Bamji, Text book of Human Nutrition
4. Gopalan, C (Editor) - Basic Issues in Combating Malnutrition - NFI Publication.
5. Gopalan, C (Editor) - Women Nutrition in India. NFI Publication.
7. Measuring change in nutritional status - WHO 1981 (NCHS Standards)

21002 - HUMAN NUTRITION
(Dr. K. V. Sucharitha)

UNIT I

Importance of pregnancy and lactation: Importance of nutrients during pregnancy and lactation, Nutritional requirements during pregnancy, Complications of Pregnancy, importance of breast feeding, infant feeding trends, requirement RDAs, importance of nutrients in growth and development.

UNIT II

Nutrition during infancy, childhood and adolescence


Growth and Development: a) Growth and development during infancy, feeding of infants, Weaning and Dietary Management) Growth and development &dietary management in Childhood and Adolescence
UNIT – III

**Adult and Geriatric (Ageing) Nutrition:** Physiological needs – Nutrition as related to life styles (Sedentary, Moderate and Heavy work).

The process of Ageing – Nutrition implications of the Ageing Processes, nutritional implementation of ageing.

UNIT IV

Nutrition during Special needs:

Floods, Droughts and Famines.

Sports nutrition

Space travel and High altitudes.

21005P-PRACTICALS

Section -B

1. Planning of diets to meet RDA of Pregnant and Lactation and calculating nutritive values of the diet

2. Planning of diets to meet RDA of different age groups and calculating nutritive values of the diet

3. Planning and calculating nutritive values of diets for different nutrient deficiencies.

REFERENCES


19. Human Nutrition and dietetics by Davidson, S. Passmore, R. Brock. J.F. and Turswell A.S.


21003 - CLINICAL AND THERAPEUTIC NUTRITION

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT I

Adaptation of normal diet, progressive diet-General & Modified Diets & Nutritional support-special feeding methods
Incidence, etiology, pathology & metabolic aberrations, clinical manifestations, complications, dietary management & counseling of following diseases.
Gastro-intestinal: - Peptic Ulcer, ulcerative colitis, Diarrhea and Dysentery
Pancreatic Disorders-.Pancreatitis,

UNIT II

Incidence, Etiology, Pathology, metabolic & clinical aberrations, complications. Prevention, dietary management and Counseling of Following Diseases:
Gall Bladder and Liver Disorders: Hepatitis, Liver Cirrhosis, Hepatic Coma,
Renal Disorders- ARF, CRF, Nephritic Syndrome, Glomerulonephritis, Renal stones, ESRD
Dialysis
Overview of Kidney Transplant and Dietary Management

UNIT III

Metabolic Disorders:-
i) Gout
ii) Inborn errors: Alkaptonuria, Fructosuria, Tyrosinosis, Phenylketonuria, Galactosemia, Maplesyrupurine Disease, Homocystinuria
iii) Etiopathophysiology, metabolic & clinical aberrations, complications. Prevention and dietary management of Neurological disorders – Parkinson’s Disease and Multiple Sclerosis

Food born illnesses and Food allergy

Viral :-  Hepatitis,Poliomyelitis,
Bacterial:Botulism,,Salmonellosis,Gastroenteritis-
     Clostridium,vibrio cholera,,Enteropathogenic –Eschertia coli
Nonbacterial:-Mycotoxins,Aflotoxin, Ochratoxin

UNIT IV
Diet, nutrient & drug interaction: - Effect of drugs of ingestion, digestion, absorption &
Metabolism of nutrients. Effect of drug dosage on food, nutrients & nutritional status

21006P-Practicals

Section-A

1.Planning and preparation of therapeutic modifications of normal diet.
2.Planning and preparation of diets for diabetis mellitus, liver disorders,gastrointestinal
   disorders and kidney disorders.
3. Visit to Hospitals- Dietary department.

REFERENCES
15. Antia FP, Clinical Dietetics and Nutrition, Oxford University Press, New Delhi, 4th edition,
   1997.
16. Davidson, Pasmore P and Break LP, Human Nutrition and Dietetics, English language book
17. Robinson, normal and Therapeutic Nutrition, Oxford & LBM Publishing, Calcutta, Bombay,
19. Mahan,L.K and Stump SE, Krause’s Food, Nutrition and Diet Therapy, WB Saunders
20. The Management of Nutrition in Major Emergencies, A.I.T.D.S. Publishers and Distributors
21. LoryA. Smolin and Mary B.Grosvenor, Nutrition Science and Application, Saunders College
23. Gopal, C. Kamalakrishnaswamy, Nutrition in Major Metabolic Disease, Oxford India Paper
    saunders Co, 2004
    Livingeston, 1986.
26. Shills, E.M and Olson, S.J and SMC, Modern nutrition in Health and Diseases, Volume II,
27. Passmore, D.P and Break, J.P, Human Nutrition& Dietetics, English Language Book Society,
    Livingeston, 1986.
28. Cataldo, C.B., Rolfe, S.R and whitney, E.N, Understanding clinical nutrition, west
15.Joshi,Clinical nutrition
21004 - BIOSTATISTICS AND RESEARCH METHODOLOGY

(Prof. Dr. Raman, University of Madras)

UNIT I - Biostatistics


Random variable, types of Random variables , Covariance, Skewness and Kurtosis.

Normal distribution and its applications.

Concepts of Population, sample, parameter, statistic, sampling.

Concepts of correlation and regression analysis.

UNIT II

Hypothesis- Statistical hypothesis, Null hypothesis, alternative hypothesis, critical region, level of significance, one and two tailed test.

Tests of significance based on large samples (Mean, SD, Proportion)

Small sample tests: t-test, F-test, Chi-square test- permutation and combination

ANOVA- A brief account of one Way Two way Analysis. Introduction to MANOVA- Introduction to Statistical Package for Social Sciences (SPSS) - use of statistical software such as COSTAT and STATISTICA.

UNIT III- Research methodology

Choosing the problem for research – stages in the execution of research - literature collection – Primary, secondary and tertiary sources – articles, reviews, abstract, current contents Bibliography – indexing and abstracting – Reporting the results of research in conferences – Oral and Poster presentation - Logical format for writing thesis and papers. Essential features of abstract, introduction, review of literature, materials and methods, and discussion.

UNIT IV- Research methodology

21006 P -PRACTICAL:

Section-B

1. Problem solving using statistical software
2. Construct a research tool- Questionnaire and schedule
3. Prepare a research paper
4. Present abstract of a research report.
5. Preparation of diagrams/ graph

REFERENCES

32. Columns for Gas Chromatography -Barry & Grob
35. HPLC: Modern HPCL for Practicing Scientists-Michael W Dong
36. HPLC made to measures-Stavros Kromidas
37. HPLC: Practical HPLC-Veronika R Meyer
38. HPLC Quantitative Analysis of Pharmaceutical Formulations-Dr. P D Sethi
39. HPTLC(High Performance Thin Layer Chromatography)-Dr. P D Sethi
40. Herbal Medicines PDR 3rd ed. -Thomson
41. Herbal Medicine: Pharmacodynamic basis of Herbal Medicine 2nd ed-Manuchair Ebadi
42. HPLC: A Practical handbook of Preparative HPLC-Donald A Welling
43. HPLC for Pharmaceutical Scientists-Yuri Kazakevich
44. HPLC: A Practical user's Guide-Marvin C. McMaster
45. Mass Spectrometry ( a Foundation Course)-K. Downard
46. Mass Spectrometry (Principle & Application)-E. Hoffmann & V. Stroobant
47. Solvent Extraction (Principles & Practices)-Jan Rydberg, Claude Musikas
48. Spectroscopy for the Biological Science.-HAMMES.
SEMESTER III
31001 - COMMUNITY NUTRITION (Dr. Rajani)

UNIT I
Assessment of Nutritional Status: Direct and Indirect methods- Nutritional Anthropometry, Biochemical methods, clinical examination, Dietary Survey- Age specific mortality and morbidity rates.

UNIT II

UNIT III
Nutrition Education: Meaning, nature and importance of nutrition education to the community, training the change Agents, training strategy, Training guidelines. Principals of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

UNIT IV

31005P-PRACTICALS
Section -A

5. One week community nutrition camp & report
6. Planning, conducting and evaluating nutrition education programmes.
7. Assessment of nutritional status through anthropometry and dietary survey
8. Critical appraisal of existing interventions and programmes in the voluntary sector and government and suggestions to improve the same vis-à-vis target groups in society and specific needs.
REFERENCES

31002 - FOOD PROCESSING AND SAFETY
(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT – I
Food Processing- Principles and Methods of processing :
Cereals, pulses and grains - Drying, husking, parboiling, fermentation, germination and Flouring.
Milk and milk products: Pasteurization, sterilization, Homogenation, drying, cheese making & defatting.

UNIT-II
Meat and Flesh foods: Smoking, drying, canning.
Fruits and vegetables: Blanching, canning, bottling, sugar concentrates, drying and fumigation.

UNIT-III
Food Adulteration - Foods commonly adulterated Health hazards of adulterants Simple identification tests of adulterants.
Food Additives- emulsifiers, stabilizers, sweeteners, preservatives, colouring agents flavouring agents.

UNIT-IV
Food Standards and laws
National food Laws, acts and implementing agencies FSSA, PFA, ISI, AGMARK, FPO etc.,
Role of Govt.in setting standards and quality control - Food quality control
Board, Technical Advisory committees, public health laboratories etc.,
International laws - ISO, CODEX.

31005P – PRACTICALS
Section - B

3. Visit to various food Industries.
4. Checking of food Adulterants in- Milk, Coffee, tea etc.,
REFERENCES :
2. Rajesh Mehta and J. George-“ Food Safety Regulations concerns and Trade- The developing country perspective, Mac millan India Ltd, 2005
   CBS Publishers & Distributors, New Delhi.
UNIT I

Innovations in product development

Definition, Classification, Characterization Factors shaping new product development- Social concerns, health concerns impact of technology and market place influence. Brief introduction to phases in Food Product Development Idea generation, Screening (Feasibility, Consumer studies Financial Review), development, Production, Consumer trails and test Market.

UNIT II

New technologies in development of Nutraceuticals and functional foods: Supercritical food extraction technology-basics and application for extraction of nutraceuticals from various sources, application of bioprocess technology for production and enhancement of properties of nutraceuticals.

UNIT III

Packaging strategies for nutraceutical products: Introduction to packaging, plastic as packaging material- structure, optical and mechanical properties of plastic, paper and paper-based packaging material, glass packaging material, concept of aseptic packaging of foods.

UNIT IV

Labeling and claims for Nutraceuticals products

Overview of dietary supplements labeling, need for specific regulation governing dietary supplements, Nutritional content claims, health claims and exemption from FDA requirements, Dietary supplements labeling issues, regulatory agencies views on label claims.

The role of marketing Communication in the introduction of functional foods to the Consumer: Introduction to marketing and consumer buying behavior, food purchase habits of people, the basics of communication processes used to convey the message written and oral communication.

31006 P – PRACTICALS

Section-A

8. Separation and identification of essential amino acids by TLC from given food sample (Demonstration experiment)
9. Fractionation of proteins from given sample (milk / Soya milk / Liver homogenate) using ammonium sulphate precipitation.
10. To study the gluten formation.
5. Market Survey, Consumer survey
6. To identify. Identify new products in terms of Innovation products Creative Products
REFERENCES

UNIT- I

**Ultraviolet and Visible Spectroscopy:** Various electronic transitions (185-800 nm), effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic compounds.

**Infra red spectroscopy**

Instrumentation and sample handling. Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters, amides, acids, anhydrides, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, FT-IR.

UNIT- II

**Chromatography:**

General Principles involved in separations by paper, thin layer, column, and ion exchange Chromatography. Chromatographic behaviour of solutes, column efficiency and resolution, column processes and band broadening, time of analysis and resolution, quantitative determinations.

**High performance liquid chromatography:**

Theory and instrumentation- column performance, gradient elution, delivery system, sample introduction, separation columns, detectors.

UNIT- III

**NMR Spectroscopy:** Theory of NMR, chemical shift and its measurement, factors influencing chemical shift, solvents used in NMR, spin-spin coupling, spin-spin splitting, factors influencing the coupling constant, structural interpretations of simple molecules by NMR spectra. structural interpretation of simple molecules by NMR spectra.

**Mass Spectrometry:**

Principle, instrumentation, isotope abundance, met stable ions, Mc lafferty rearrangement, nitrogen rule, fragmentation associated with functional groups; Carbonyl compounds, alcohols, amines, olefins, α, β-Unsaturated systems

UNIT-IV

**Thermal Methods:**

Differential thermal analysis- principle, instrumentation, applications with special reference to the clays and minerals, coals (fuels).

Differential scanning calorimetry-principle, instrumentation, applications to inorganic materials like chlorates and perchlorates, ammonium nitrate.

Thermogravimetry- theory, instrumentation, applications with special reference to CuSO₄.5H₂O, CaC₂O₄.2H₂O. Difference between TG and DTA.
3106 P – PRACTICALS

Section-B

1. Identification of functional Groups by using UV Spectra
2. Identification of functional Groups by using IR Spectra
3. Structure determination of components by using NMR Spectra
4. Separation of the compounds by Thin layer Chromatography, Paper Chromatography
5. Thermal analysis of coal or clay by Bomb Calorimeter

SEMESTER-IV
41001 – PROJECT WORK

PROJECT:
The thesis work shall be written & submitted in four copies. Only such candidates shall be permitted to offer Dissertation (if provided in the scheme of the examination) in lieu of the paper as have secured at least 55% or more marks in the aggregate of all the papers prescribed for the previous examination.

In 41001 Project Work – Scheme of Evaluation of the project Work for 600 Marks is specified as given below—

For internal assessment by the internal guide (on the basis of the report given by External guide considering attendance, regularity, interest and performance of the student.) 200 M

For Project dissertation submission 200M
(Average is to be taken from External and Internal Examiners Marks)
For project presentation and Viva-voce 200M
M.Sc.DEGREE EXAMINATIONS 11001
BRANCH: Human nutrition and Nutraceutical Chemistry
I SEMESTER
PAPER – I-Basics of Human physiology

TIME: 3hours
Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.
6 x 5 = 30

1. Functions of cell
2. Golgi apparatus
3. Erythroblast sis foetalisis
4. Angiogram
5. Pituitary hormones
6. Menstrual cycle
7. EEG
8. Renal reabsorption

Section – II

Answer ALL questions. Each question carries 10 marks
4 x 10 = 40

9. a) Write about composition and functions of gastric, intestinal and pancreatic secretions
   OR
   b) Give a detailed account on cell organelle
10. a) Write about cardiac cycle with all events
    OR
    b) Describe about different types of circulation
11. a) What are the Regulatory functions of endocrines
    OR
    b) Describe about Female reproductive system.
12. a) Give a detailed structure about kidney including its functions
    OR
    b) Describe about autonomous nervous system.
Section – I
Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M
1. Respiratory chain
2. principles measurement of ph
3. Deamination
4. Structure of proteins
5. Biological catalysts
6. Enzyme inhibitors
7. Globular proteins
8. Oxidative phosphorylation

Section – II
Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.
9. a) Write about classification of carbohydrates.
   OR
   b) Give a detailed account on lipid metabolism
10. a) Give a details about classification and properties of proteins
    OR
    b) Give a detailed account on lipid metabolism
11. a) How the vitamins are classified and write about any two fat soluble vitamin intes
    OR
    b) Give an account on water soluble vitamins
12. a) Explain about structure and role of different types of RNA
    OR
    b). Give a detailed description about A,B and Z TYPES OF DNA
Section – I
Answer any 6 questions. Each question carries 5 marks.  
1. Nutraceuticals  
2. Flavonoids  
3. Carotenoids  
4. Phytochemicals  
5. PEM  
6. CVD  
7. Parkinson's disease  
8. FUPA

Section – II
Answer ALL questions. Each question carries 10 marks.

9.a.) Write about importance of Functional foods  
OR  
   b) Explain about cereal technology  
10. a) Give information about structure and properties of antioxidants  
OR  
   b) Explain about blocking and suppressing agents.  
11. a) Role of nutraceuticals in obesity management  
OR  
   b) Explain about effects of nutraceuticals in neurological disorders  
12. a) Explain nutraceuticals of plant origin and their uses  
OR  
   b) Write about designer foods for diabetes.
M.Sc.DEGREE EXAMINATIONS 11004

BRANCH: Human nutrition and Nutraceutical Chemistry
I SEMESTER

PAPER IV – FOOD MICROBIOLOGY

TIME: 3hours
Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1. Moisture oxidation
2. Useful microorganisms
3. Isolation of microorganisms
4. Detection of Microorganisms
5. Food contamination
6. Hepatitis
7. Hazards of Microorganisms
8. Gastroenteritis

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M

9.a.) Write about microorganisms which are important in food microbiology
(or)
(b) Give a detailed account on growth and reproduction of microorganisms

10a). How the microorganisms are isolated from the food.
(or)

(b). Give a detailed account on molecular methods for identification of microorganisms in food

11.a). What are various immunological methods for finding microorganisms in food
(or)
b). Explain in detailed about microbial spoilage of food

12.a) Write about food borne Parasitic diseases
(b) Write about food borne diseases of non bacterial ori
M.Sc. DEGREE EXAMINATIONS 31001
BRANCH: Human nutrition and Nutraceutical Chemistry
III SEMESTER
PAPER – I COMMUNITY NUTRITION

TIME: 3 hours
Max. Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1. Write short notes on food frequency questionnaire
2. Elaborate on family diet surveys
3. Describe national nutrition anaemia program me
4. Write an detail about WHO.
5. Write about guidelines for training nutrition education
6. How do you evaluate the nutrition education program me
7. Write about strategies to overcome food security
8. Explain about food diversification

Section – II
Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M

9.a). Elaborate on clinical assessment for various nutritional disorders
OR
B). Write in detail about age and cause specific mortality and morbidity
10. a). Write in detail about Vitamin A Prophylaxis program me
OR
b) Explain in detail about national nutritional anaemia control program me .
11. a). Write in detail about planning, executing and evaluating nutrition education .
OR
b). Plan a nutrition education for community on malnourished children.
12. a) Write in detail about food security programmes
OR
b). Elaborate on role of Government organizations agencies in improving food security
M.Sc. DEGREE EXAMINATIONS                                  31002
BRANCH:  Human nutrition and Nutraceutical Chemistry
III SEMESTER
PAPER –II –FOOD PROCESSING AND SAFETY

TIME: 3 hours                                              Max. Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks.  6 x 5 = 30M

1. Write about homogenation                                  5. Explain about emulsifiers
2. Explain about Pasteurization                              6. Flavoring agents
3. Fleshfoods                                                7. AGMARK
4. Write about Blanching                                     8. CODEX

Section – II
Answer ALL questions. Each question carries 10 marks         4 x 10 = 40M.

9.a). Explain in detail about flour milling of cereals

OR

B). Discuss about processing of milk.

10. a) Elaborate about processing of meat and flesh foods.

OR

b) Explain about drying and fumigation of fruits and vegetables.

11. a) Discuss about Food additives.

OR

b) Explain in detail about food adulteration

12. a) Describe about technical advisory committee in food quality control

OR

b) Elaborate in detail about international laws
M.Sc. DEGREE EXAMINATIONS

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER – III- Development and Marketing of Nutraceuticals and functional foods

TIME: 3 hours
Max. Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks.
6 x 5 = 30 M

1. Write about characterization factors in shaping new product development
2. Describe consumer trails and test market
3. Write about supercritical food extraction technology.
4. Explain bioprocessing technology for production of nutraceuticals
5. Write optical properties of paper packaging in detail
6. Write about glass packaging material.
7. Dietary supplements.
8. What are the basics of oral communication used to convey the message written

Section – II
Answer ALL questions. Each question carries 10 marks
4 x 10 = 40 M.

9.a) Elaborate about social and health concern on new product development.

OR

B). Explain in detail about screening of food product development.

10. a) Write in detail about application of bio process technology for production of nutraceuticals.

OR

b). Write a brief note on new technologies in development of nutraceuticals development.

11. a) Describe the structure and properties of glass packaging material.

OR

b) Explain in detail about concept of aseptic packaging foods.

12. a). Describe regulatory agencies views on label claims

OR

b). Elaborate on role of government organisms agencies in improving food security
Section – I

Answer any 6 questions. Each question carries 5 marks.
6 x 5 = 30M

1a). Explain the following (A). Bath chromic shift  B). Hyper chromic effect
2. How can you distinguish the ketenes , aldehydes , esters , amides and acids by IR Spectroscopy.
4. Define retention time and mention its importance in Chromatography.
5. Discuss the principles and application of paper chromatography.
6. What is nuclear overhauled effect? Explain with an example.
7. Discuss the basic principle involved in DTA.
8. Give an account on factors affecting thermal data.

Section – II

Answer ALL questions. Each question carries 10 marks

9. A). Explain the following (A). Steric effect in biphenyls  (B). Factors influencing vibration frequencies

OR

10). Write a short note on (a). Paper Chromatography  (B). Column Chromatography

OR

11. Explain the principle involved in HPLC and how this technique is superior than gas chromatography.

OR

12. Discuss the following (a). Contact shift reagents  (B). Karplus-curve variation of coupling constant

13. Explain the factors affecting fragmentation in Mass spectrometry.

14. Discuss the instrumentation of DTA and how this technique is useful in chemical analysis.
M.Sc.DEGREE EXAMINATIONS
BRANCH: Human nutrition and Nutraceutical Chemistry
II SEMESTER
PAPER –I-ESSENTIALS OF MACRO MICRO NUTRIENTS

TIME: 3hours Max.Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30
1. Properties of food 5. Thiamin
3. Fatty acids 7. PERNICIOUS ANEMIA
4. Carbohydrates 8. Iodine deficiency disorders

Section – II
Answer ALL questions. Each question carries 10 marks 4 x 10 = 40
9.a) Write about properties and nutritive values of fruits and vegetables
OR
b). Describe the characteristics and nutritive value of millets and pulses
10. a) Explain about carbohydrates sources, functions and effects of carbohydrates deficiency.
OR
b). Write an account on functions and effects poly unsaturated fatty acids
11. a). Describe the biochemical functions, sources and dietary requirements of zinc
OR
b) Explain the dietary requirements, biochemical functions and sources of vitamin D
(OR)

b) What is the main sources of Vitamin A.
Section – I

Answer any 6 questions. Each question carries 5 marks.  
6 x 5 = 30

1. Role of Hormones during pregnancy
2. Importance of nutrients in growth
3. Factors affecting breastfeeding
4. Feeding of infants
5. Nutritional requirement during ageing
6. Nutrient requirement for adult women with heavy work
7. BMR
8. Space nutrition

Section – II

Answer ALL questions. Each question carries 10 marks  
4 x 10 = 40

9.a). Give a detailed account on importance of nutrients during pregnancy

OR

B). Explain the importance of breastfeeding

10. a). Explain about growth development during infancy

OR

b). Write about factors affecting breastfeeding and fertility

11. a). Give a detailed account on nutrition an related to moderate life style

b) Nutritional implications of ageing process

12. a). Explain in detail about nutrition at high altitudes

(OR)

b). Give a detailed account on nutrition during special needs like famines
M.Sc.DEGREE EXAMINATIONS

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER –III-CLINICAL AND THERAPEUTIC NUTRITION

TIME: 3hours
Max.Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks. 
6 x 5 = 30

1. Modified diets
2. Ulcerative colitis
3. Chronic renal failure
4. Glomerulonephritis
5. GOUT
6. Multiple sclerosis
7. Drug dosage
8. Nutrient and drug interaction

Section – II
Answer ALL questions. Each question carries 10 marks
4 x 10 = 40

9.a). Discuss about Diarrhea and dysentery in detail including signs, symptoms and diet control

OR

B). Give a detailed account on pancreatic disorders.

10. a). Discuss about liver disorders.

OR

b). Describe about kidney transplant & dietary management.

11. a). Explain food borne bacterial infections in detail.

b). Describe about inborn errors metabolism

12. a). Discuss about effect of drugs on metabolism of nutrients.

(OR)

b). Describe the effect of drug dosage on nutritional status
M.Sc. DEGREE EXAMINATIONS

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER – IV – Biostatistics and Research methodology

TIME: 3 hours

Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

1. Questionnaire
2. Mean, median and mode
3. Alternative hypothesis
4. T-TEST
5. Literature collection
6. Writing papers
7. Impact factor
8. Citation index

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9. Describe the scope of biostatistics collection and classification of data.

OR

B). Explain random variable.

10. a). Write about the Chi-square test

OR

b). Give a brief account of one way and Two way analysis

11. a). Explain the choosing the problem for research

b). Write short notes on (A) Logical format for writing (B) Essential features of abstract

12. a). Write about reference styles

(OR)

b). What is trade mark? Explain the various types of trade mark in India
2017-2018
REVISED SYLLABUS
SEMESTER-I
11001-BASICS OF HUMAN PHYSIOLOGY

UNIT - I


UNIT - II

Respiratory System: Organs & functioning control of respiration. Gaseous exchange in lungs and tissues.

Cardiovascular System:


UNIT III


UNIT IVNervous System: Structure of a nerve cell-reflex action, nervous transmission-cerebrospinal nervous system and autonomous nervous system (only the parts and general functions), common test in neurological disorders- EEG, EMG, MRI, and NCV.

Renal system: Structure and functions of Kidney , re-absorption, structure of nephron , GFR,Regulation of re-absorption.
11005P-PRACTICAL

Section-A

15. Demonstration of measuring BP using sphygmomanometer.
17. Determination of TC of RBC & WBC
18. Determination of DC of WBC
19. Determination of ESR
21. Measurement of clotting time of blood

REFERENCES

27. Modern Nutrition in Health & Disease, 9th Edition by Shils, M.E., Olson, J.A., Shike, N. and Ross, A.C. (Ed) (1999); Williams & Wilkin
11002 – NUTRITIONAL BIOCHEMISTRY

UNIT –I

Chemistry of Bimolecules – Introduction & Carbohydrates:
Acids, bases, salts, buffers, Henderson – Hasselbach equation. Theory indicators principles of measurement of pH.

Carbohydrates: Enzymes of biological oxidation, redox potential, respiratory chain, Mitchell’s oxidative phosphorylation.
Classification, structure, properties, Overview of Metabolism (Glycolysis/EMP pathway, Citric acid/Krebs cycle)

UNIT –II

Chemistry of Biomolecules-Proteins and Lipids

Proteins: Classification, structure, and properties of proteins (Primary, Secondary, Tertiary and Quaternary) Different types of bonds that stabilize the proteins, structure and biological functions of fibrous proteins (keratine, Collagen), and globular proteins (Hemoglobin, Methhemoglobin)
Overview of the Metabolism: Transamination, Deamination (oxidative and non-oxidative) and urea cycle and its regulations.

Lipids: Classification, structure and, properties of Lipids Overview of the Metabolism.

UNIT – III

Chemistry of Biomolecules-Enzymes and Vitamins


Structure and functions of Co-enzymes –flavin nucleotide, coenzyme A and biotin.


UNIT-IV

Chemistry of Biomolecules - DNA & RNA

DNA – double helical structure, Watson-Crick model of DNA and base-pairing
A, B and Z types of DNA
Nucleic acid-Denaturation and annealing of DNA
RNA-A brief out line of structure and role of different types of RNA
11005P-PRACTICAL

Section-B

1. Acid & Alkalis: Preparation of Reagents and standard solutions-primary standards and secondary standards

2. Buffers: Preparation of standard buffer solutions and determination of their pH

3. Estimation of glucose in blood.

4. Estimation of cholesterol in blood

5. Estimation of albumin in urine.


7. Fractionation of egg proteins and its quantification

Reference Books:

27. Todd and others, Clinical Diagnosis and Management, 17th Ed, W.B.Saunders, Philadelphia.
11003 - NUTRACEUTICALS & FUNCTIONAL FOODS
(Dr. K.V. Sucharitha, and Dr. Rajani,)

UNIT – I
Functional Foods and Nutraceuticals - Definition, introduction, importance of functional foods – Cereals and pulses and functional food Teleology of Nutraceuticals – Primary and secondary metabolites in plants. General Teleology of - a) Carotenoids b) Conjugated linolenic acid c) Flavonoids d) Sulphur containing Amino Acid Derivatives e) Omega 3 fatty acids f) PUFA g) Terpenoids

UNIT – II
Role of functional foods: - structure, properties, sources – Antioxidants, Non-Nutrients detoxifying agents.
Blocking and suppressing agents and some bioactive phytochemicals, pre and probiotics.

UNIT – III
Role of Nutraceuticals in disease management- Inborn errors of metabolism, Obesity, Neurological disorders, Diabetes mellitus, cancer, CVDs, Vitamin A Deficiency and PEM.

UNIT - IV
Nutraceuticals and the Future of Medical Science: Nutraceuticals of plant and animal origin, their uses. Formulas, development of designer foods for specific chronic diseases like diabetes, cardiovascular diseases, AIDS and degenerative diseases like Parkinson.

11006P – PRACTICAL

Section-A
1. Preparation of media and sterilization techniques : dry and wet methods.
2. Assessments of dietary intakes of antioxidants- Vitamin-A, C and Zinc
2. Estimation of antioxidants A, C, E,
3. Estimation of dietary fibers and fruit fibers.
4. Isolation and identification of casein in milk.
5. Microbiological analysis of foods: processed & unprocessed like vegetables. & fruit, cereals, spices & canned foods.
REFERENCE

11004 - FOOD MICROBIOLOGY
(Prof. Dr. Sai Gopal)

UNIT I
Microorganism of importance in food - Their classification, morphology, growth & reproduction, industrial importance.
Food as a substrate for microorganism - pH, moisture oxidation- reduction potential, nutrient content, inhibitory substance & biological structure.

UNIT II
Methods of isolation and detection of microorganism or their products in food.
- Conventional methods
- Chemical Methods
- Molecular methods
- Immunological Methods

UNIT III
**Food Spoilage**-General principles underlying spoilage: Causes of Spoilage Factors affecting food constituents.
Microbial spoilage: Chemical Changes caused by different Microorganisms – Factors affecting the growth of Microorganisms and Hazards.
Spoilage by enzymatic action: Different enzymes in foods, enzymes produced by Micro organisms nature of food spoilage
Contamination by Insects & Rodents: physical and chemical spoilage by insects and rodents.

UNIT IV: Food Borne Diseases:

Viral  -  Hepatitis, Poliomyelitis,

Bacterial: - Botulism, Salmonellosis, Gastroenteritis-Clostridium, vibrio cholera, Enteropathogenic - Eschettia coli

Non bacterial: - Mycotoxins, Aflotoxin, Patulin, Ochratoxin

Parasitic  -  Tape worm, Ascaris

11006P – PRACTICALS

Section-B

11. Preparation of media-broth, solid media
12. Sterilization techniques: Dry and wet methods.
13. Identification of microorganisms by staining techniques- Simple, Gram & negative
14. Isolation of microorganisms
15. Microbiological analysis of water, milk, & air - Total count, MPN coliform (count) by Hemocytometric method & MBRT.

REFERENCE

UNIT I
Food groups
Classification, food composition, properties, Characteristics and nutritive values of different foods, Functions of foods and nutrients – (cereal grains, millets, pulses, nuts and oil seeds fruits and vegetables, milk and milk products, meat, egg, poultry and fish, spices and condiments).

UNIT II
Macro Nutrients –
Carbohydrates Classification, Functions, sources, effect of excess/low intake of Carbohydrates
Proteins and Aminoacids, sources, effects of protein deficiency,
Fats-Functions, sources, effects of deficiency and excess of fats

UNIT III
Micro Nutrients- Vitamins and minerals-Requirements, sources, biological functions and effects of deficiency.

UNIT IV
Major Nutrient Problems- PEM, Iron deficiency Anemia (IDA), Iodine deficiency disorders (IDD), Vitamin A deficiency-causes and consequences
Strategies to combat malnutrition with special reference to the above major nutritional problems.

21005P-PRACTICALS
Section -A
1. Assessment of dietary intakes of Macro Nutrients in different age groups.
2. Assessment of dietary intakes of Micro Nutrients in different age groups-Vitamins- (A & B-Complex) and Minerals- (Iron and Calcium)
3. Preparation of foods rich in macro & micronutrients.
4. Formulation of nutrients, supplementary foods for infants, children, aged and persons suffering from specific nutritional deficiencies and convalescing subjects.
REFERENCES

1. Mehtab S. Bamji, Text book of Human Nutrition
4. Gopalan, C (Editor) - Basic Issues in Combating Malnutrition - NFI Publication.
5. Gopalan, C (Editor) - Women Nutrition in India. NFI Publication.
7. Measuring change in nutritional status - WHO 1981 (NCHS Standards)

21002 - HUMAN NUTRITION

(Dr. K. V. Sucharitha)

UNIT I

Importance of pregnancy and lactation: Importance of nutrients during pregnancy and lactation, Nutritional requirements during pregnancy, Complications of Pregnancy, importance of breast feeding, infant feeding trends, requirement RDAs, importance of nutrients in growth and development.

UNIT II

Nutrition during infancy, childhood and adolescence


Growth and Development: a) Growth and development during infancy, feeding of infants, Weaning and Dietary Management) Growth and development &dietary management in Childhood and Adolescence

UNIT – III

Adult and Geriatric (Ageing) Nutrition: Physiological needs – Nutrition as related to life styles (Sedentary, Moderate and Heavy work).
The process of Ageing – Nutrition implications of the Ageing Processes, nutritional implementation of ageing.

UNIT IV
Nutrition during Special needs:
Floods, Droughts and Famines.
Sports nutrition
Space travel and High altitudes.

21005P-PRACTICALS

Section -B

1. Planning of diets to meet RDA of Pregnant and Lactation and calculating nutritive values of the diet
2. Planning of diets to meet RDA of different age groups and calculating nutritive values of the diet
3. Planning and calculating nutritive values of diets for different nutrient deficiencies.

REFERENCES
32. Human Nutrition and dietetics by Davidson, S. Passmore, R. Brock. J.F. and Turswell A.S.
UNIT I
Adaptation of normal diet, progressive diet-General & Modified Diets & Nutritional support- special feeding methods
Incidence, etiology, pathology & metabolic aberrations, clinical manifestations, complications, dietary management & counseling of following diseases.
Gastro-intestinal: - Peptic Ulcer, ulcerative colitis, Diarrhea and Dysentery
Pancreatic Disorders-. Pancreatitisis,

UNIT II
Incidence, Etiology, Pathology, metabolic & clinical aberrations, complications. Prevention, dietary management and Counseling of Following Diseases:
Gall Bladder and Liver Disorders: Hepatitis, Liver Cirrhosis, Hepatic Coma,
Over view of liver Transplant, Pre and post liver transplant Dietary Management
Renal Disorders- ARF, CRF, Nephritic Syndrome, Glomerulonephritis, Renal stones, ESRD
Dialysis
Overview of Kidney Transplant and Dietary Management

UNIT III
Metabolic Disorders:-
   i) Gout
   ii) Inborn errors: Alkaptonuria, Fructosuria, Tyrosinosis, Phenylktonuria, Galactosemia, Maplesyrupurine Disease, Homocystinuria
   iii) Etipathophysiology, metabolic & clinical aberrations, complications. Prevention and dietary management of Neurological disorders – Parkinson’s Disease and Multiple Sclerosis

Food born illnesses and Food allergy
Viral :- Hepatitis, Poliomyelitis,
Bacterial: Botulism, Salmonellosis, Gastroenteritis-
   Clostridium, vibriocholera, Enteropathogenic – Eschertia coli
Nonbacterial: - Mycotoxins, Aflotoxin, Ochratoxin

UNIT IV
Diet, nutrient & drug interaction: - Effect of drugs of ingestion, digestion, absorption & Metabolism of nutrients. Effect of drug dosage on food, nutrients & nutritional status
21006P-Practicals

Section-A

1. Planning and preparation of therapeutic modifications of normal diet.
2. Planning and preparation of diets for diabetes mellitus, liver disorders, gastrointestinal disorders and kidney disorders.
3. Visit to Hospitals- Dietary department.

REFERENCES

Robinson, normal and Therapeutic Nutrition, Oxford & LBM Publishing, Calcutta,
SEMESTER II
21001 – ESSENTIALS OF MACRO & MICRO NUTRIENTS
(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I
Food groups
Classification, food composition, properties, Characteristics and nutritive values of different foods, Functions of foods and nutrients – (cereal grains, millets, pulses, nuts and oil seeds fruits and vegetables, milk and milk products, meat, egg, poultry and fish, spices and condiments).

UNIT II
Macro Nutrients –
Carbohydrates Classification, Functions, sources, effect of excess/low intake of Carbohydrates
Proteins and Aminoacids, sources, effects of protein deficiency,
Fats-Functions, sources, effects of deficiency and excess of fats

UNIT III
Micro Nutrients- Vitamins and minerals-Requirements, sources, biological functions and effects of deficiency.

UNIT IV
Major Nutrient Problems- PEM, Iron deficiency Anemia (IDA), Iodine deficiency disorders (IDD), Vitamin A deficiency-causes and consequences
Strategies to combat malnutrition with special reference to the above major nutritional problems.

21005P-PRACTICALS
Section -A
1. Assessment of dietary intakes of Macro Nutrients in different age groups.
2. Assessment of dietary intakes of Micro Nutrients in different age groups-Vitamins- (A & B-Complex) and Minerals- (Iron and Calcium)
3. Preparation of foods rich in macro & micronutrients.
4. Formulation of nutrients, supplementary foods for infants, children, aged and persons suffering from specific nutritional deficiencies and convalescing subjects.
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1. Mehtab S. Bamji, Text book of Human Nutrition
4. Gopalan, C (Editor) - Basic Issues in Combating Malnutrition - NFI Publication.
5. Gopalan, C (Editor) - Women Nutrition in India. NFI Publication.
7. Measuring change in nutritional status - WHO 1981 (NCHS Standards)

21002 - HUMAN NUTRITION
(Dr. K. V. Sucharitha)

UNIT I
Importance of pregnancy and lactation: Importance of nutrients during pregnancy and lactation, Nutritional requirements during pregnancy, Complications of Pregnancy, importance of breast feeding, infant feeding trends, requirement RDAs, importance of nutrients in growth and development.

UNIT II
Nutrition during infancy, childhood and adolescence


Growth and Development: a) Growth and development during infancy, feeding of infants, Weaning and Dietary Management) Growth and development &dietary management in Childhood and Adolescence
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**Adult and Geriatric (Ageing) Nutrition:** Physiological needs – Nutrition as related to life styles (Sedentary, Moderate and Heavy work).

The process of Ageing – Nutrition implications of the Ageing Processes, nutritional implementation of ageing.

UNIT IV

Nutrition during Special needs:

Floods, Droughts and Famines.

Sports nutrition

Space travel and High altitudes.

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**21005P-PRACTICALS**

**Section -B**

1. Planning of diets to meet RDA of Pregnant and Lactation and calculating nutritive values of the diet

2. Planning of diets to meet RDA of different age groups and calculating nutritive values of the diet

3. Planning and calculating nutritive values of diets for different nutrient deficiencies.

**REFERENCES**


45. Human Nutrition and dietetics by Davidson, S. Passmore, R. Brock. J.F. and Turswell A.S.


21003 - CLINICAL AND THERAPEUTIC NUTRITION

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT I
Adaptation of normal diet, progressive diet-General & Modified Diets & Nutritional support-special feeding methods
Incidence, etiology, pathology & metabolic aberrations, clinical manifestations, complications, dietary management & counseling of following diseases.
Gastro-intestinal: - Peptic Ulcer, ulcerative colitis, Diarrhea and Dysentery
Pancreatic Disorders-.Pancreatitiss,

UNIT II
Incidence, Etiology, Pathology, metabolic & clinical aberrations, complications. Prevention, dietary management and Counseling of Following Diseases:
Gall Bladder and Liver Disorders: Hepatitis, Liver Cirrhosis, Hepatic Coma,
Over view of liver Transplant, Pre and post liver transplant Dietary Management
Renal Disorders- ARF, CRF, Nephritic Syndrome, Glomerulonephritis, Renal stones, ESRD
Dialysis
Overview of Kidney Transplant and Dietary Management

UNIT III
Metabolic Disorders:-
i) Gout
ii) Inborn errors: Alkaptonuria, Fructosuria, Tyrosinosis, Phenylketonuria, Galactosemia, Maplesyrupurine Disease, Homocystinuria
iii) Etipathophysiology, metabolic & clinical aberrations, complications. Prevention and dietary management of Neurological disorders – Parkinson ‘s Disease and Multiple Sclerosis

Food born illnesses and Food allergy
Viral :- Hepatitis,Poliomyelitis,
Bacterial:Botulism,,Salmonellosis,Gastroenteritis-
          Clostridium,vibrio cholera,,Enteropathogenic –Eschertia coli
Nonbacterial:-Mycotoxins, Aflotoxin, Ochratoxin

UNIT IV
Diet, nutrient & drug interaction: - Effect of drugs of ingestion, digestion, absorption &
Metabolism of nutrients. Effect of drug dosage on food, nutrients & nutritional status

21006P-Practicals

Section-A

1. Planning and preparation of therapeutic modifications of normal diet.
2. Planning and preparation of diets for diabetes mellitus, liver disorders, gastrointestinal disorders and kidney disorders.
3. Visit to Hospitals- Dietary department.

REFERENCES


SEMESTER III

31001 - COMMUNITY NUTRITION (Dr. Rajani)

UNIT I

Assessment of Nutritional Status- Direct and Indirect methods- Nutritional Anthropometry, Biochemical methods, clinical examination, Dietary Survey- Age specific mortality and morbidity rates.

UNIT II

UNIT III

Nutrition Education: Meaning, nature and importance of nutrition education to the community, training the change Agents, training strategy, Training guidelines. Principals of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

UNIT IV


31005P-PRACTICALS

Section -A

9. One week community nutrition camp & report
11. Assessment of nutritional status through anthropometry and dietary survey
12. Critical appraisal of existing interventions and programmes in the voluntary sector and government and suggestions to improve the same vis-à-vis target groups in society and specific needs.

REFERENCES


31002 - FOOD PROCESSING AND SAFETY

(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT – I

Food Processing - Principles and Methods of processing:
Cereals, pulses and grains - Drying, husking, parboiling, fermentation, germination and Flouring.
Milk and milk products: Pasteurization, sterilization, Homogenation, drying, cheese making & defatting.

UNIT-II

Meat and Flesh foods: Smoking, drying, canning.
Fruits and vegetables: Blanching, canning, bottling, sugar concentrates, drying and fumigation.

UNIT-III

Food Adulteration - Foods commonly adulterated Health hazards of adulterants Simple identification tests of adulterants.
Food Additives- emulsifiers, stabilizers, sweeteners, preservatives, colouring agents flavouring agents.

UNIT-IV

Food Standards and laws
National food Laws, acts and implementing agencies FSSA, PFA, ISI, AGMARK, FPO etc.,
Role of Govt.in setting standards and quality control - Food quality control
Board, Technical Advisory committees, public health laboratories etc.,
International laws - ISO, CODEX.

31005P – PRACTICALS

Section - B

5. Visit to various food Industries.
6. Checking of food Adulterants in- Milk, Coffee, tea etc.,
REFERENCES :-


2. Rajesh Mehta and J. George-“Food Safety Regulations concerns and Trade- The developing countryperspective, Mac millan India Ltd, 2005


31003 - DEVELOPMENT & MARKETING OF NUTRACEUTICALS/FUNCTIONAL FOODS

(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I

Innovations in product development

Definition, Classification, Characterization Factors shaping new product development- Social concerns, health concerns impact of technology and market place influence. Brief introduction to phases in Food Product Development Idea generation, Screening (Feasibility, Consumer studies Financial Review), development, Production, Consumer trails and test Market.
UNIT II
New technologies in development of Nutraceuticals and functional foods: Supercritical food extraction technology-basics and application for extraction of nutraceuticals from various sources, application of bioprocess technology for production and enhancement of properties of nutraceuticals.

UNIT III
Packaging strategies for nutraceutical products: Introduction to packaging, plastic as packaging material- structure, optical and mechanical properties of plastic, paper and paper-based packaging material, glass packaging material, concept of aseptic packaging of foods.

UNIT IV
Labeling and claims for Nutraceuticals products
Overview of dietary supplements labeling, need for specific regulation governing dietary supplements, Nutritional content claims, health claims and exemption from FDA requirements, Dietary supplements labeling issues, regulatory agencies views on label claims.
The role of marketing Communication in the introduction of functional foods to the Consumer: Introduction to marketing and consumer buying behavior, food purchase habits of people, the basics of communication processes used to convey the message written and oral communication.

31006 P – PRACTICALS
Section-A
12. Separation and identification of essential amino acids by TLC from given food sample (Demonstration experiment)
13. Fractionation of proteins from given sample (milk / Soya milk / Liver homogenate) using ammonium sulphate precipitation.
14. To study the gluten formation.
5. Market Survey, Consumer survey
6. To identify. Identify new products in terms of Innovation products Creative Products

REFERENCES
21. Food packaging principals and practice, Gordon L. Robertson, Marcel and Dekker Inc. New York. 19993. Chapters 1,2,3,6, 7, 9,13,17,18 & 19 for point 6.7.
**31004 – Instrumental Techniques**

**UNIT- I**

**Ultraviolet and Visible Spectroscopy:** Various electronic transitions (185-800 nm), effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic compounds.

**Infra red spectroscopy**

Instrumentation and sample handling. Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters, amides, acids, anhydrides, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, FT-IR.

**UNIT- II**

**Chromatography:**

General Principles involved in separations by paper, thin layer, column, and ion exchange Chromatography. Chromatographic behaviour of solutes, column efficiency and resolution, column processes and band broadening, time of analysis and resolution, quantitative determinations.

**High performance liquid chromatography:**

Theory and instrumentation- column performance, gradient elution, delivery system, sample introduction, separation columns, detectors.

**UNIT- III**

**NMR Spectroscopy:** Theory of NMR, chemical shift and its measurement, factors influencing chemical shift, solvents used in NMR, spin-spin coupling, spin-spin splitting, factors influencing the coupling constant, structural interpretations by NMR spectra.

**Mass Spectrometry:**
Principle, instrumentation, isotope abundance, metastable ions, fragmentation process, fragmentation associated with functional groups.

UNIT-IV

Thermal Methods:

Differential thermal analysis- principle, instrumentation, applications with special reference to the clays and minerals, coals (fuels).

Differential scanning calorimetry-principle, instrumentation, applications to inorganic materials like chlorates and perchlorates, ammonium nitrate.

Thermogravimetry- theory, instrumentation, applications with special reference to CuSO$_4$.5H$_2$O, CaC$_2$O$_4$.2H$_2$O. Difference between TG and DTA.

31006 P – PRACTICALS

Section-B

1. Identification of functional Groups by using UV Spectra
2. Identification of functional Groups by using IR Spectra
3. Structure determination of components by using NMR Spectra
4. Thermal analysis of coal or clay by Bomb Calorimeter

SEMMESTER-IV

41001 – PROJECT WORK

PROJECT:

The thesis work shall be written & submitted in four copies. Only such candidates shall be permitted to offer Dissertation (if provided in the scheme of the examination) in lieu of the paper as have secured at least 55% or more marks in the aggregate of all the papers prescribed for the previous examination.

In 41001 Project Work –Scheme of Evaluation of the project Work for 600 Marks is specified as given below—

For internal assessment by the internal guide (on the basis of the report given by External guide considering attendance, regularity, interest and performance of the student.) 200 M

For Project dissertation submission 200M
(Average is to be taken from External and Internal Examiners Marks)

For project presentation and Viva-voce 200M
MODEL PAPERS-2017-2018
M.Sc.DEGREE EXAMINATIONS
BRANCH: Human nutrition and Nutraceutical Chemistry
I SEMESTER
PAPER – I-Basics of Human physiology

TIME: 3hours  Max.Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks.  6 x 5 = 30

1. Functions of cell Membrane
2. Bile and its salt
3. Respiratory organs
4. Functions of blood
5. Role of Thyroid secretions in Carbohydrate metabolism
6. What is Menstrual cycle
7. Describe about MRI and its interpretations
8. Structure of Nephron

Section – II
Answer ALL questions. Each question carries 10 marks  4 x 10 = 40

9. Explain about structure as well as functions of cell
   OR
   b). Give a detailed account on Liver anatomy and physiology

10. a) Write about respiratory system and control of respiration
    OR
    b) Discuss in detail about cardiac cycle and its events

11. a) What are the Regulatory functions of endocrines.
    OR
    b) Explain about structure and functions of male reproductive organs

12. a) Write in detail about structure and functions of nerve cell
    OR
    b) Discuss about renal reabsorption and its regulation
M.Sc.DEGREE EXAMINATIONS

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – II-NUTRITIONAL BIOCHEMISTRY

TIME: 3 hours
Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1. Buffers
5. IUB classification of enzymes

2. What are the principles measurement of pH
6. Structure and functions of co enzyme A

3. Properties of proteins
7. Watson –crick model of DNA

4. Globular proteins
8. Structure of RNA

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.

9. a) Write In detail about respiratory chain

OR

b) Describe about EMP pathway

10. a) Discuss about deamination

OR

b) Explain about overview metabolism of lipids


OR

b) Give an account on water soluble vitamins

12. a). Describe about the DNA structure and chemistry

OR

b). Write in detail about role of different types of RNA
Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1. Functional foods
2. Carotenoids
3. Blocking and suppressing agents
4. Vitamin A Deficiency
5. PEM
6. Diabetes mellitus
7. Parkinson's disease
8. Designer foods

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.

9.a.) Define functional foods? Explain the functional food technology of nutraceuticals

OR

b) Explain the following (A). Omega three fatty acids (B). Sulfur contain amino acids

10. a) Write in detail about structure, properties and non nutrients detoxifying agents

OR

b). Give a detailed account on bioactive phytochemicals.

11. a) Role of nutraceuticals in disease management with examples.

OR

b) Explain about effects of nutraceuticals in neurological disorders.

12. a) (A) Designer foods (B). Cardiovascular diseases

OR

b) Write about types and uses of nutraceuticals/
M.Sc.DEGREE EXAMINATIONS

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER IV   –FOOD MICROBIOLOGY

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1. Classify Micro organisms
2. Nutrient content
3. Convensional methods
4. Immunological methods
5. Food spoilage
6. Enzymes in foods
7. Botulism
8. Mycotoxins

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M

9.a) Write about food as a substrate for microorganisms .
   (or)
   (b) Explain about morphology growth and reproduction of microorganisms

10a).Discuss in detail about about chemical methods .
   (or)
   (b).Give a detailed about molecular methods

11.a). Give about chemical changes caused by different micro organisms
   (or)
   b). Explain in detailed about microbial spoilage of food

12.a) Discussthe food borne bacterial disease
   (or)
   b) Write in detail about food borne parasitic disease
M.Sc. DEGREEx EXAMINATIONS

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER – I-COMMUNITY NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

1. write about Biochemical methods of assessment
2. Give about age specific mortality and morbidity
3. describe national nutrition anemia program me
4. Write an detail about WHO.
5. write about guidelines for training nutrition education
6. How do you evaluate the nutrition education program me
7. what is food fortification? explain.
8. Write about strategies to overcome food insecurity

Section – II

Answer ALL questions. Each question carries 10 marks

9.a). Describe about direct methods of nutritional assessment

 OR

B). Explain about classification used to categorize malnutrition in children.

10. a). Write in detail about Vitamin A Prophylaxis program me

 OR

b) Explain in detail about national nutritional anemia control program me.

11. a). Give an account training the change agents.

 OR

b) . Plan a nutrition education for community on malnourished children.

12. Describe the role non governmental agencies in improving food security.

 OR

b). Write in detail about food diversification.
M.Sc. DEGREE EXAMINATIONS

31002

BRANCH: Human nutrition and Nutraceutical Chemistry

III SEMESTER

PAPER –II –FOOD PROCESSING AND SAFETY

TIME: 3 hours
Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1. What are the principles of food processing 5. How the adulteration for fats and oils is carried out.
2. Explain about germination 6. Write about stabilizers and emulsifiers
3. Fleshfoods 7. FSSA
4. Write about Blanching 8. Public health laberties

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M

9. a). How to process rice? Describe

OR

B). Explain in detail about pasteurization and methods pasteurization

10. a). Discuss about processing of meat

OR

b). Explain about drying and fumigation of fruits and vegetables.

11. a) Discuss about Food adulteration? Discuss about simple identification tests of food adulteration

OR

b). Explain about preservatives in detail.

12. a). Describe about national laws

OR

b). Discuss about public health laboratories.
Answer any 6 questions. Each question carries 5 marks.  

1. Write the classification of product development with examples.
2. Explain about external sources of idea generation.
3. Write about sources and role of nutraceuticals with examples.
4. Explain bioprocessing technology for production of nutraceuticals.
5. Write optical properties of paper packaging in detail.
6. Write about glass packaging material.
7. Dietary supplements.
8. Briefly write about food purchase habits of customers.

Section – II

Answer ALL questions. Each question carries 10 marks.

9. a). Enumerate the different phases of food product development.  
   OR
   B). Explain in detail about screening of new product development.
10. a). Write in detail about application of bio process technology for production of nutraceuticals.  
    OR
    b). Discuss the application of bioprocess technology for the production of nutraceuticals.
11. a) Define food packaging? Explain its role in food preservation.
    OR
12. a). Give an overview on issues of dietary supplements labeling.
    OR
    b). Write about FDA requirements and regulatory agencies views on labeling of disarray supplements.
Answer any 6 questions. Each question carries 5 marks.

1. Write a note on effect of solvents on electronic transitions
2. Discuss the instrumentation of FT-IR
3. Describe different types of HPLC detections
4. Write briefly on Chromatographic behavior of solutes and column process
5. Explain the factors influencing the coupling constant
6. Discuss (A) Isotopic abundance  (B) Met stable ions’.
7. Discuss the basic principle involved in DTA
8. Discuss the factors affecting TG

Answer ALL questions. Each question carries 10 marks

9. A). Write fisher wood ward rules for conjugated dices

OR


10. A). Explain column chromatography and its applications

OR

11. A). Explain the principle involved in HPLC and how this technique is superior than gas chromatography.

OR

B). Write the principle and applications of differential scanning calorimetric

12a). Describe the principles and instrumentation of differential scanning

B). Write the difference between TG and DTA
M.Sc.DEGREE EXAMINATIONS 21001

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER – I-ESSENTIALS OF MACRO AND MICRO NUTRIENTS

TIME: 3hours                      Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

1. Properties of food
2. Essential fatty acids
3. Effect of excess intake of Carbohydrates
4. Riboflavin
5. Vitamin-E
6. Functions of nutrients
7. Iron deficiency Anemia
8. Goiter

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a) Describe the characteristics features and Nutritive values of different foods?

OR

b) Explain the Nutritive importance of Cereals, grains, Pulses and nuts?

10. a) Explain about Carbohydrate, sources, functions and effects of Carbohydrate deficiency?

OR

b) Write an account on the Effects of protein and amino acid Deficiency disorders?

11. a) Discuss the biochemical function, dietary requirements, sources of Calcium and phosphorous?

OR

b) explain the dietary requirement, biochemical functions and sources of Vitamin-D?

OR

12. a) Describe Iodine Deficiency Disorders (IDD) causes and Consequences

OR

b) Explain the prevalence and Control strategies of Vitamin-A Deficiency?
TIME: 3hours

Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

1. Requirements of RDA
2. Importance of nutrients in growth and development
3. Synthesis of milk components
4. Weaning management
5. Dietary management in lactation
6. Ageing process
7. Space nutrition
8. Brief explanation on nutritional during special need

Section – II

Answer ALL questions. Each question carries 10 marks

9 a) Give a detailed account on importance of nutrients during pregnancy.

OR

b). Write in detailed about importance of breast feeding.

10). a). Explain the growth and development and dietary management in childhood and Adolescence

OR

b) Write down the physiology of lactation and the factors influencing the lactation

11. a) Explain the Geriatrics Nutrition and adult Nutrition.

OR

b) Explain about the process of ageing and nutrition in same process.

12. a) Explain about the sport nutrition.

OR

b). Give a detailed account on nutrition during special needs like floods and famines.

b). Describe the effect of drug dosage on nutritional status
M.Sc., DEGREE EXAMINATIONS 21003
BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER – III-CLINICAL AND THERAPEUTIC NUTRITION

TIME: 3 hours                        Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

1. Differences between Normal and Progressive diet.
2. Ulcerative colitis.
3. Hepatic coma.
4. Clinical aberrations
5. Fructosuria
6. ESRD
7. Liver cirrhosis
8. Botulism

Section – II

Answer ALL questions. Each question carries 10 marks


OR

b) Explain Progressive Diet – general, Modified diets and Nutritional support special feeding methods

10. a) Describe about Liver disorders.

OR

b) Describe about Kidney transplant & dietary management.

11. a) Explain Metabolic & clinical aberrations, complications, prevention and dietary management of Neurological disorders

OR

b) Explain bacterial diseases with examples.

OR

12. a) Describe the effect of drug dosage on food, nutrients & nutritional status.

OR

b) Explain the effect of drugs of ingestion, digestion, absorption & metabolism of nutrients.
21004 - BIOSTATISTICS AND RESEARCH MET

M.Sc. DEGREE EXAMINATIONS

BRANCH: Human nutrition and Nutraceutical Chemistry

II SEMESTER

PAPER – IV – Biostatistics and Research methodology

TIME: 3 hours

Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30

1. Questionnaire
2. Mean, median and mode
3. Alternative hypothesis
4. T-TEST
5. Literature collection
6. Writing papers
7. Impact factor
8. Citation index

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40

9. Describe the scope of biostatistics collection and classification of data.

OR

B). Explain random variable.

10. a) Write about the Chi-squire test

OR

b). Give a brief account of one way and Two way analysis

11. a). Explain the choosing the problem for research

b). Write short notes on (A) Logical format for writing (B). Essential features of abstract

12. a) Write about reference styles

(OR)

b). What is trade mark? Explain the various types of trade mark in India
2018-2019

SEMESTER-I

11001-BASICS OF HUMAN PHYSIOLOGY

UNIT - I


UNIT - II

Respiratory System: Organs & functioning control of respiration. Gaseous exchange in lungs and tissues.

Cardiovascular System:


UNIT III


UNIT IV

Nervous System: Structure of a nerve cell-reflex action, nervous transmission- cerebrospinal nervous system and autonomous nervous system (only the parts and general functions), common test in neurological disorders- EEG, EMG, MRI, and NCV.

Renal system: Structure and functions of Kidney, re-absorption, structure of nephron, GFR, Regulation of re-absorption.
11005P-PRACTICAL

Section-A

22. Demonstration of measuring BP using sphygmomanometer.
23. Determination/Identification of blood group and Rh factor.
24. Determination of TC of RBC & WBC
25. Determination of DC of WBC
26. Determination of ESR
27. Estimation of Hb by Sahlis Method.
28. Measurement of clotting time of blood

REFERENCES

UNIT –I
Chemistry of Biomolecules – Introduction & Carbohydrates:
Acids, bases, salts, buffers, Henderson – Hasselbach equation. Theory indicators principles of measurement of pH.

Carbohydrates:
Classification, structure, properties, Overview of Metabolism (Glycol sis/EMP pathway, Citric acid/Krebs cycle, Respiratory chain ,Glucoseogenesis, HMP pathway ).

UNIT –II
Chemistry of Biomolecules-Proteins and Lipids
Amino acids : Classification ,Structure of Amino acids .
Proteins : Classification ,structure, and properties of proteins (Primary, Secondary, Tertiary and Quaternary). Structure and biological functions of Fibrous proteins (keratine,Collagen), and Globular proteins(Hemoglobin, Meth hemoglobin).
Overview of the Metabolism: Transamination, Deamination (oxidative and non-oxidative) and urea cycle and its regulations.

Lipids : Classification, structure and, properties of Lipids Overview of the Metabolism(β – Oxidation ).

UNIT – III
Chemistry of Biomolecules-Enzymes and Vitamins
Structure and functions of Co-enzymes –flavin nucleotide, coenzyme A and biotin.
Vitamins –Water soluble and fat soluble vitamins and their physiological functions.

UNIT-IV
Chemistry of Biomolecules - DNA & RNA
DNA – double helical structure, Watson-Crick model of DNA .
A,B and Z types of DNA Nucleic acid-Denaturation and Renaturation of DNA.
RNA-A brief out line of structure Functions of different types of RNA
11005P-PRACTICAL

Section-B

1. Acid & Alkalis: Preparation of Reagents and standard solutions-primary standards and secondary standards

2. Buffers: Preparation of standard buffer solutions and determination of their pH

3. Estimation of glucose in blood.

4. Estimation of cholesterol in blood

5. Estimation of albumin in urine.


Reference Books:

38. Todd and others, Clinical Diagnosis and Management, 17th Ed, W.B.Saunders, Philadelphia.
44. Vote and Voet, Fundamentals in Biochemistry.
**11003 - NUTRACEUTICALS & FUNCTIONAL FOODS**  
(Dr. K.V. Sucharitha, and Dr. Rajani,)

**UNIT – I**

Functional Foods and Nutraceuticals - Definition, introduction, importance of functional foods – Cereals and pulses and functional food Teleology of Nutraceuticals – Primary and secondary metabolites in plants. General Teleology of - a) Carotenoids b) Conjugated linolenic acid c) Flavonoids d) Sulphur containing Amino Acid Derivatives e) Omega 3 fatty acids f) PUFA g) Terpenoids

**UNIT – II**

**Role of functional foods:** - structure, properties, sources – Antioxidants, Non-Nutrients detoxifying agents.

Blocking and suppressing agents and some bioactive phytochemicals, pre and probiotics.

**UNIT – III**

**Role of Nutraceuticals in disease management**- Inborn errors of metabolism, Obesity, Neurological disorders, Diabetes mellitus, cancer, CVDs, Vitamin A Deficiency and PEM.

**UNIT -IV**

**Nutraceuticals and the Future of Medical Science:** Nutraceuticals of plant and animal origin, their uses. Formulas, development of designer foods for specific chronic diseases like diabetes, cardiovascular diseases, AIDS and degenerative diseases like Parkinson.

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**11006P – PRACTICAL**

**Section-A**

1. Isolation of probotic microorganisms.

2. Assessments of dietary intakes of antioxidants- Vitamin-A, C and Zinc

3. Estimation of antioxidants A, C, E.,

4. Isolation and identification of casein in milk.

5. Microbiological analysis of foods: processed & unprocessed like vegetables, & fruit, cereals, spices & canned foods.
11004 - FOOD MICROBIOLOGY
(Prof. Dr. Sai Gopal)

UNIT I
Microorganism of importance in food - Their classification, morphology, growth, Reproduction, industrial importance.

Food as a substrate for microorganism - pH, moisture oxidation- reduction potential, nutrient content, inhibitory substance & biological structure.

UNIT II
Methods for isolation and detection of microorganisms and their products in food.

- Conventional methods
- Chemical Methods
- Molecular methods
- Immunological Methods

UNIT III
Food Spoilage-General principles underlying spoilage: Causes of Spoilage .Factors affecting food spoilage .

Microbial spoilage: Chemical Changes caused by different Microorganisms –
Spoilage by enzymatic action: Different enzymes in foods, enzymes produced by
Contamination by Insects & Rodents: physical and chemical spoilage by insects and rodents.

Food preservation ;Principles of Food preservation ,methods of food preservation .
UNIT IV: Food Borne Diseases:

**Viral:** - Hepatitis, Poliomyelitis,

**Bacterial:** - Botulism, Salmonellosis,

**Nonbacterial:** - Mycotoxins, Aflotoxin, Patulin, Ochratoxin

**Parasitic:** - Tape worm, Ascaris

11006P – PRACTICALS

**Section-B**

16. Preparation of media-broth, solid media
17. Sterilization techniques: Dry and wet methods.
18. Identification of microorganisms by staining techniques - Simple, Gram & negative
19. Microbiological analysis of water, milk, & air - Total count, MPN coliform (count) by Hemocytometric method & MBRT.

REFERENCE

SEMESTER III
31001 - COMMUNITY NUTRITION
(Dr. Rajani)

UNIT I
Assessment of Nutritional Status- Direct and Indirect methods- Nutritional Anthropometry, Biochemical methods, clinical examination, Dietary Survey- Age specific mortality and morbidity rates.

UNIT II

UNIT III
Nutrition Education : Meaning, nature and importance of nutrition education to the community, training the change Agents, training strategy, Training guidelines. Principals of planning, executing and evaluating nutrition education programmes, problems of nutrition education programmes.

UNIT IV

31005P-PRACTICALS
Section -A

13. One week community nutrition camp & report
15. Assessment of nutritional status through anthropometry and dietary survey
16. Critical appraisal of existing interventions and programmes in the voluntary sector and government and suggestions to improve the same vis-à-vis target groups in society and specific needs.
REFERENCES


31002 - FOOD PROCESSING AND SAFETY
(Dr. K.V. Sucharitha and Dr. Rajani)

UNIT – I
Food Processing- Principles and Methods of processing :
Cereals, pulses and grains - Drying, husking, parboiling, fermentation, germination and Flouring.
Milk and milk products: Pasteurization, sterilization, Homogenation, drying, cheese making & defatting.

UNIT-II
Meat and Flesh foods: Smoking, drying, canning.
Fruits and vegetables: Blanching, canning, bottling, sugar concentrates, drying and fumigation.

UNIT-III
Food Adulteration - Foods commonly adulterated health hazards of adulterants ,simple identification tests of adulterants.

Food Additives- Emulsifiers, stabilizers, sweeteners, preservatives, colouring agents flavouring agents.

UNIT-IV
Food Standards and laws
National food Laws, acts and implementing agencies FSSA, PFA,ISI, AGMARK, FPO etc.,
Role of Govt.in setting standards and quality control - Food quality control
Board, Technical Advisory committees, public health laboratories etc.,
International laws - ISO, CODEX.

31005P – PRACTICALS
Section - B

7. Visit to various food Industries.
8. Checking of food Adulterants in- Milk, Coffee, tea etc.,

REFERENCES :-
2. Rajesh Mehta and J. George-“ Food Safety Regulations concerns and Trade- The developing countryperspective, Mac millan India Ltd, 2005

31003 - DEVELOPMENT & MARKETING OF NUTRACEUTICALS/FUNCTIONAL FOODS
(Dr. K. V. Sucharitha and Dr. Rajani)

UNIT I
Innovations in product development
Definition, Classification, Characterization Factors shaping new product development- Social concerns, health concerns impact of technology and market place influence. Brief introduction to phases in Food Product Development Idea generation, Screening (Feasibility, Consumer studies Financial Review), development, Production, Consumer trails and test Market.

UNIT II
New technologies in development of Nutraceuticals and functional foods: Supercritical food extraction technology-basics and application for extraction of nutraceuticals from various sources, application of bioprocess technology for production and enhancement of properties of nutraceuticals.

UNIT III
Packaging strategies for nutraceutical products: Introduction to packaging, plastic as packaging material- structure, optical and mechanical properties of plastic, paper and paper-based packaging material, glass packaging material, concept of aseptic packaging of foods.

UNIT IV
Labeling and claims for Nutraceuticals products
Overview of dietary supplements labeling, need for specific regulation governing dietary supplements, Nutritional content claims, health claims and exemption from FDA requirements, Dietary supplements labeling issues, regulatory agencies views on label claims.

The role of marketing Communication in the introduction of functional foods to the Consumer: Introduction to marketing and consumer buying behavior, food purchase habits of people, the basics of communication processes used to convey the message written and oral communication.
31006 P – PRACTICALS

Section-A

15. Separation and identification of essential amino acids by TLC from given food sample (Demonstration experiment)
16. To study the gluten formation.
17. Market Survey, Consumer survey
18. Quality analysis of packaged foods
5. To identify. Identify new products in terms of Innovation products Creative Products

REFERENCES

31. Food packaging principals and practice, Gordon L. Robertson, Marcel and Dekker Inc. New York, 19993. Chapters 1,2,3,6, 7, 9,13,17,18 & 19 for point 6.7.
40. Consumer’s guide to Dietary supplements and alternative medicines servings of Hope, W. Marvin Davis, Pharmaceutical Products Press, 2006
UNIT- I

Ultraviolet and Visible Spectroscopy: Various electronic transitions (185-800 nm), effect of solvent on electronic transitions, ultraviolet bands for carbonyl compounds, unsaturated carbonyl compounds, dienes, conjugated polyenes. Fieser-Woodward rules for conjugated dienes and carbonyl compounds, ultraviolet spectra of aromatic compounds.

Infra red spectroscopy:
Instrumentation and sample handling. Characteristic vibrational frequencies of alkanes, alkenes, alkynes, aromatic compounds, alcohols, ethers, phenols and amines. Detailed study of vibrational frequencies of carbonyl compounds (ketones, aldehydes, esters, amides, acids, anhydrides, lactones, lactams and conjugated carbonyl compounds). Effect of hydrogen bonding and solvent effect on vibrational frequencies, FT-IR.

UNIT- II

Chromatography:
General Principles involved in separations by paper, thin layer, column, and ion exchange Chromatography. Chromatographic behaviour of solutes, column efficiency and resolution, column processes and band broadening, time of analysis and resolution, quantitative determinations.

High performance liquid chromatography:
Theory and instrumentation- column performance, gradient elution, delivery system, sample introduction, separation columns, detectors.

UNIT- III

Electrophoresis: Migration of ions in electric fields of factors affecting electrofophoretic mobility. Types of gels. Agarose gel electrophoresis and SDS-PAGE. Electrophoris’ and applications’.

PCR – Principle, components in PCR and PCR conditions. Reverse transcription PCR.

UNIT-IV:

Microscopy: Compound Microscopy: Numerical aperture and its importance, Resolving power, oil immersion objectives’ and their significance principles and applications’ of dark field, phase contrast and fluorescent Microscopy

Electron microscopy - Principle, ray diagram me and applications. TEM, SEM. Compression between optical and Electron microscope, limitations of Electron microscopy.
31006 P – PRACTICALS
Section-B

1. Estimation of Protein by UV Spectra.
2. Paper Chromatography.
3. Thin layer Chromatography.
4. Agarose Gel Electrophoreses.
5. Estimation of Protein by Biureat method.
6. Poly acryl amide Gel Electrophoresis.
7. Differential staining – (Gram staining)

SEMESTER-IV
41001 – PROJECT WORK

Instead of project work extended period of internship and also included. Three theory papers to train up students to words professional aspects.

1. Paper -I - Nutritional assessment
2. Paper – ii – Geatric nutrition
3. Paper-iii- Nutrition emergences in disaster
MODEL PAPERS -2018-2019
M.Sc.DEGREE EXAMINATIONS - 11001
BRANCH: Human nutrition and Nutraceutical Chemistry
I SEMESTER
PAPER – I-Basics of Human physiology

TIME: 3hours
Max.Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30
1. Functions of cell membrane
2. Mitochondria.
3. Blood functions
4. ECG
5. Thyroid secretions
6. Female reproductive system
7. MRI
8. Nephron

Section – II
Answer ALL questions. Each question carries 10 marks 4 x 10 = 40
9. a) Explain about Structure as well as Functions of cell
   OR
   b). Give a detailed account on liver Anatomy and physiology.
10. a) Explain about gaseous exchange in lungs and tissues.
    OR
    b) Discuss on the blood groups, blood coagulation, blood transfusion and erythroblastsis foetals.
11. a) What are the Regulatory functions of endocrines.
    OR
    b) Describe about Female reproductive system.
12. a) Give a detailed structure about Kidney including its functions.
    OR
    b) Write in detail about structure of a nerve cell and its functions.
Answer any 6 questions. Each question carries 5 marks. \(6 \times 5 = 30\text{M}\)

1. Hendersen-Hasselbath equation
2. Structure of Homopolysaccharides
3. Fibrous proteins
4. Deamination
5. Isoenzymes
6. Vitamin D and E
7. Denaturation and renaturation of DNA
8. Structure of tRNA

Answer ALL questions. Each question carries 10 marks \(4 \times 10 = 40\text{M}\).

9. a) Draw the cycle of HMP pathway and explain all the reactions
OR
b) Draw the cycle of Citric acid cycle and explain all the reactions

10. a) Give a details about classification and properties of Lipids
OR
b) Write about urea cycle and its regulations.

11. a) Write about Specific activity of Enzymes
OR
b) Write about water soluble vitamins and their physiological functions

12. a) Draw the Structure of Watson and Crick model of DNA and explain it
OR
b) Write about different types of DNA with their structures
M.Sc. DEGREE EXAMINATIONS 11003

BRANCH: Human nutrition and Nutraceutical Chemistry

I SEMESTER

PAPER – III – Nutraceuticals and Functional foods

TIME: 3 hours  Max. Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30 M

1. Functional foods  5. Diabetes mellitus
2. Carotenoids  6. Vitamin A deficiency
3. Antioxidants.  7. Diabetes Mellitus
4. Probiotics  8. Designer foods

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40 M.

9.a.) Write about importance of Nutraceuticals

OR

b) Explain about cereal technology

10. a) Give information about structure and properties of antioxidants.

OR

b) Explain about pre and probiotics

11. a) Role of nutraceuticals in obesity management.

OR

b) Write in detail about structure, Properties and non nutrients detoxifying agents of functional foods

12. a) Explain nutraceuticals of plant origin and their uses.

OR

b). Write about designer foods for degenerative diseases.
Section – I

Answer any 6 questions. Each question carries 5 marks.

1. Inhibitory substances
2. Industrial importance of fungi
3. ELISA
4. RFLP
5. Contamination of food by insects
6. Food spoilage
7. Botulism
8. Aflatoxins

Section – II

Answer ALL questions. Each question carries 10 marks.

9.a) Write about microorganisms which are important in food microbiology

(or)

(b) Explain the industrial importance of microorganisms

10a) How the microorganisms are isolated from the food.

(or)

(b) Give a detailed account on molecular methods for identification of microorganisms in food

11.a) Describe about factors affecting microbial growth.

(or)

b) Give details about the physical and chemical spoilage of food by insects and rodents.

12.a) Write about Hepatitis and poliomyelites.

(or)

b) Write about the non bacterial food borne disease.
Section – I
Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M
1. Write about biochemical methods of assessment.
2. Give about age specific mortality and morbidity rates
3. Explain about FAO.
4. Write an detail about WHO.
5. Explain about training the change agents.
6. Give an account on principles of planning nutrition education programmed.
7. What is food fortification? Explain.
8. Explain about food diversification

Section – II
Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.
9. a). Elaborate on clinical assessment for various nutritional disorders

OR

B). Explain about classification used to categorize the malnutrition in children
10. a) Discuss about nutritional surveillance.

OR

b) Write national iodine deficiency disorders control program me
11. a). Give an account training the change agents

OR

b) Plan a nutrition education for community on malnourished children.
12. a) Write in detail about food security programmers.

OR

b). Elaborate on role of Government organizations agencies in improving food
1. What are the principles of food processing?
2. Explain about germination.
3. What is Smoking of flesh foods?
4. Write about Blanching.
5. Define food adulteration?
6. Flavoring agents.
7. AGMARK.
8. CODEX.


OR

B). Explain in detail about pasteurization and methods of pasteurization.

10. a). Elaborate about processing of meat and flesh foods.

OR

b). Explain about drying and fumigation of fruits and vegetables.

11. a) Discuss about commonly adulterer foods and their health hazards.

OR

b) Explain about sweeteners and preservatives.

12. a) Describe about food laws.

OR

b). Write in detail about role of government in setting standers and food quality control.
M.Sc .DEGREE EXAMINATIONS
BRANCH: Human nutrition and Nutraceutical Chemistry
III SEMESTER
PAPER –III-Development and Marketing of Nutraceuticals and functional foods
TIME: 3hours
Max.Marks: 70

Section – I
Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30M

1. Food product development
2. Explain Phases in food product development.
3. Write about nutraceuticals.
4. Define functional foods
5. Write optical properties of paper packaging indetail
6. Write about glass packaging material.
7. Dietary supplements.
8. Write in detail about food purchase habits of people

Section – II
Answer ALL questions. Each question carries 10 marks 4 x 10 = 40M.

9.a). Elaborate about social and health concern on new product development.

OR

B). Explain in detail about screening of food product development.
10. a). Discuss the supercritical food extraction technology in development of functional foods.

OR

b). Write a brief note on new technologies in development of nutraceuticals development.
11. a) Describe the structure and properties of glass packaging material..

OR

b) Explain in detail about concept of aseptic packaging foods.
12. a) Write in detail about food security programmers.

OR

b). Elaborate on role of government organisms agencies in improving food security
M.Sc. DEGREE EXAMINATIONS 31004
BRANCH: Human nutrition and Nutraceutical Chemistry
III SEMESTER
PAPER –IV-INSTRUMENTAL TECHNIQUES

TIME: 3hours
Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks.

6 x 5 = 30M

1. Explain the following. (a). Bath chromic shift, (b). Hyper chromic effect
2. How can you distinguish ketones, aldehydes, esters, amides, and acids by IR spectroscopy?
3. Write about TLC plate preparation
4. Write briefly about principle and applications of paper chromatography
5. Write about different types of Gels using in Electrophoresis technique
6. Write about factors affecting Electrophoretic mobility
7. Explain about Numerical aperture with diagram and write it’s importance
8. Explain briefly about phase contrast microscopy and it’s importance

Section – II

Answer ALL questions. Each question carries 10 marks

9. A). Write down woodward–fisher rules for conjugated dines and carbonyl compounds in UV Spectrum
   OR
   B). Explain the importance of Finger print region in I.R Spectroscopy

10. a). Discuss about Column Chromatography
    OR
    B). Draw the diagram of HPLC, write the performance and advantages

11. a) Write the principle, procedure and applications of SDS - PAGE
    OR
    b). Write the principle, procedure and applications of PCR

12. a) Draw the ray diagram and explain about Fluorescent Microscopy
    OR
    b) Draw the ray diagram, sample preparation and applications of SEM
Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

1. Cereal grains
2. Essential amino acids
3. Write about sources of fats
4. Classification of foods
5. Deficiency of sodium
6. Niacin
7. IDA
8. IDD

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9. a) write about characterization features and nutritive composition of pulses and nuts oil seeds

OR

b) Explain about the functions and nutritive value of foods

10. a) Describe the biological functions carbohydrates and effects of low intake.

OR

b) Write an account on functions carbohydrates and effects of low intake

11. a) Discuss the biochemical function, dietary requirements, sources of Calcium and phosphorous?

OR

b) explain the dietary requirement, biochemical functions and sources of Vitamin-D?

OR

12. a) Describe PEM and strategies to combat malnutrition with special reference to proteins.

OR

b) Explain the prevalence and control strategies of Vitamin-A Deficiency?
Answer any 6 questions. Each question carries 5 marks.

1. Requirements of RDA
2. Importance of nutrients in growth and development
3. Endocrinology of lactation
4. Feeding of infants
5. Nutritional requirements of adult hood
6. Ageing process
7. FAMINES
8. Complications during space travel

Answer ALL questions. Each question carries 10 marks

9 a) Give a detailed account on importance of nutrients during Lactation
OR

b) Write in detailed about importance of breast feeding.

10). a). Explain the growth and development and dietary management in childhood and Adolescence
OR

b) Write about human milk composition

11. a) Give a detailed account on nutritional related to heavy work
OR

b). Physical ,physiological and biological needs during old age

12. a) Explain in detail about nutrition during high attitudes
OR

b). Give a detailed account on nutrition during special needs like floods and famines.
Section – I

Answer any 6 questions. Each question carries 5 marks.  

6 x 5 = 30M.

1. What is nutritional support? explain
2. Complications and dietary management during dysentery
3. Renal stones
4. Liver transplant
5. Fructosuria
6. Phenyl ketonuria
7. Effect of drug dosage food
8. Botulism

Section – II

Answer ALL questions. Each question carries 10 marks

4 x 10 = 40M.

9.a) what are the Gastro –intestinal disease. Explain with examples 

OR

b) Explain Progressive Diet –general. Modified diets and Nutritional support special feeding methods

10). A). Describe about nephritic syndrome

OR

b) Describe about Kidney transplant & dietary management.

11. a) Explain Metabolic & clinical aberrations, complications, prevention and dietary management of Neurological disorders

OR

b) Explain bacterial diseases with examples.

OR

12. a) Explain in detail about nutrient and drug interaction

OR

b) Effect of drug on metabolism of nutrients.
Section – I

Answer any 6 questions. Each question carries 5 marks.  
6 x 5 = 30

1. Standard deviation  
2. Types of random variables  
3. Alternative hypothesis  
4. STATISTICA  
5. Stages of execution of research  
6. Poster presentation

Section – II

Answer ALL questions. Each question carries 10 marks  
4 x 10 = 40

9. How can you tabulate and present a data  
   B). Explain random variable .

10. a) Write about the Chi –squire test

OR

b). Give a brief account on small sample tests

11. a). Explain the choosing the problem for research
   b). Write short notes on (A) Logical format for writing (B). Essential features of abstract

12. a). Write in detail about effective illustration of tables and figures

   (OR)

b). Explain in detail world intellectual property rights organization
M.Sc. DEGREE EXAMINATIONS  
BRANCH: Human nutrition and Nutraceutical Chemistry  
IV SEMESTER  
PAPER – I - NUTRITIONAL ASSESSMENT  

TIME: 3 hours  
Max. Marks: 70  

Section – I  
Answer any 6 questions. Each question carries 5 marks.  
6 x 5 = 30  

1. Anthropometric assessment  
2. Types of dietary surveys  
3. Protein quality  
5. Growth studies  
6. PER  
7. Case study  
8. Nitrogen balance studies  

Section – II  
Answer ALL questions. Each question carries 10 marks  
4 x 10 = 40  

9. a) Classify direct methods of nutritional assessment and explain in nutritional surveys.  

OR  

b) Briefly explain the clinical assessment and clinical signs in various disorders.  

10. a) Discuss the methods of estimation of protein quality & protein efficiency ratio (NPR)  

OR  

b) 1. Net protein ratio  
2. Net dietary protein calories percent (NDPCP)  

11. a) Role of different protein levels briefly explain.  

OR  

b) Explain in detail infants on feeding methods.  

12. a) Children’s, adolescents and adults procedure briefly explain.  

(OR)  

b) 1. Maintain of animal laboratory  
2. Calculations of endogenous nitrogen
M.Sc.DEGREE EXAMINATIONS

BRANCH: Human nutrition and Nutraceutical Chemistry

IV SEMESTER

PAPER –II-GERIATRIC NUTRITION

TIME: 3hours

Max.Marks: 70

Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

1. Ageing
2. Physiological changes
3. Dietary management
4. Menopausal
5. Chronic degenerative disease
6. NGO
7. Nutrition health problems

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9.a) Briefly explain the process of ageing and classify the types.

OR

b). Definition of Geriatric nutrition and explain.

10. a). food and nutrition needs of elderly and dietary management.

OR

b). Special problems of women menopausal, post menopausal problems

11. a). Briefly explain chronic degenerative disease and nutrition health problems

OR

b). Definition of Geriatric nutrition and explain.

12. a). Genesis life style and living conditions, management prevention control.

(OR).

b) OLD AGE HOMES – day care and recreation centres their need and scope
Section – I

Answer any 6 questions. Each question carries 5 marks. 6 x 5 = 30

1. Disasters 5. Rehabilitation
2. Sanitation 6. Food distribution
3. Malnutrition 7. Therapeutic feeding
4. Anthropometry 8. Types of epidemiology

Section – II

Answer ALL questions. Each question carries 10 marks 4 x 10 = 40

9. a) Write about natural and manmade disasters.

OR

b). Discuss about vitamin-d deficiency disasters

10. a). How to assess nutritional status

OR

b). Write about communicate disease

11. a). Explain assessment of food needs in emergency situations.

OR

b). Briefly explain mass and supplementary feeding


(OR).

b) Explain about public nutrition approach to tackle nutritional problems in emergencies
The Board of Studies members was suggested to replace project work with three theory and practical papers, those which are applicable for survey and nutritional assessment.
Here the time period of internship was prolonged up to 3 months, which is a very useful for students in getting employability in hospitals as Nutritionist.

Semester –iv
41001   Nutritional assessment

UNIT-I
Assessments of Nutritional status:
Direct methods- Anthropometric, Biochemical, Clinical, Dietary assessments.
Anthropometric assessment: Introduction, Definition, Methods of measurements,
Standardizations Classification of Nutritional status.
Biochemical assessment: Need for Biochemical test, Interpretation of biochemical test, Types of test.
Clinical assessments: Assessment of clinical signs in various disorders.
Dietary Assessments: Types of Diet surveys, methods of Diet surveys, analysis and interpretation,
problems in Diet surveys and solutions.
Indirect method: Vital statistics and other Records

UNIT II
Methods of estimation of protein quality:
Protein efficiency ratio (PER), Digestibility coefficient, Biological value (BV), Net Protein Utilization (NPU), Net protein Ratio (NPR), Chemical score, protein Digestibility corrected Amino Acid Score (PDCAAS), Net Dietary Protein Calories Percent (NDPCP).

UNIT III
Growth studies: animal models:
Role of animal models in nutrition research; need for extrapolation of animal research results to human populations; Maintenance of animal laboratory; maintenance of records; Principles of formulation of diets- classification and composition.
Growth and development of rats- role of different protein levels of the diet protein sources of the diet- body weight changes- feeding techniques- calculation of PER.
Biological Assays with animal models: metabolic and balance studies: (for protein quality): Biological value- formulation of objectives, composition of diets- collections of urine and fecal, food intake assessment, determination of food and urine and fecal nitrogen – calculations of endogenous nitrogen – digestibility coefficient (DC) and Biological value
UNIT IV

Growth and metabolic studies with Human subjects:
Principles, objectives.
Growth studies with infants on feeding different protein sources. (case study experiences and report of research studies)
Growth studies with preschool children, school children and adolescents: Effect of supplementation
Nitrogen balance studies, in growing children, adolescents and adults- Procedure for conducting metabolic and balance studies and interpretation of results.

Practicals **41005P**: Survey on Nutritional status : Analysis, Report writing. ----50M

**REFERENCE BOOKS AND TEXT BOOKS:**

41002- GERIATRIC NUTRITION

UNIT-I:
The process of Ageing – Physiological biochemical and body compositional changes – Theories of ageing. Socio-cultural and psychological aspects of ageing – Health seeking behavior of the elderly.

UNIT-II:
Food and Nutritional needs of the elderly – Dietary management – Special problem of women – menopausal, post-menopausal. Problems; Early nutrition and nutrition and health in later years.

UNIT-III:
Chronic degenerative diseases and nutrition and health problems of the elderly – their etiology – genesis life style and living condition, management, prevention and control.

UNIT-IV
Policies and programmes of the government and NGO sectors pertaining to the elderly – old age homes – Day care and recreation centers – their need and scope.

Practicals 41005P: Case study : Analysis, Report writing.------------------------ 50M

REFERENCE:
Kumar, V. (1996): Aging – Indian Perspective and Global Scenario, Proceedings of International symposium of Gerontology and Seventh Conference of the Association Gerontology (India)
Bergmann, Klaus (1972): Aged: Their Understanding and Care, London Wolfe Pub.
41003- NUTRITION IN EMERGENCIES AND DISASTERS

UNIT-I
Natural/Manmade disasters resulting in emergency situations:
- Famine, drought, flood, earthquake, cyclone, war, civil and political emergencies.
- Factors giving rise to emergency situation in these disasters.
- Illustration using case studies from Indian subcontinent
Nutritional problems in emergencies in vulnerable groups
Causes of malnutrition in emergency situations
Major deficiency diseases in emergencies
Specific Nutrient deficiencies - Energy, Vitamins, Minerals
Control of communicable diseases in emergencies – Role of immunization and sanitation.

UNIT-II
Assessment and surveillance of Nutritional status in emergency affected populations.
Scope of assessment of malnutrition in emergencies
Indicators of malnutrition. Clinical signs for screening acute malnutrition
Anthropometric assessment of nutritional status. Indicators and cut-offs indicating seriously abnormal nutrition situation: Weight for height based indices, MUAC, social indicators.
Organization of nutritional surveillance and individual screening.

UNIT-III
Nutritional Relief and Rehabilitation
Assessment of food needs in emergency situations
Food distribution strategy – Identifying and reaching the vulnerable group – Targeting Food Aid.
Mass and Supplementary Feeding
Therapeutic Feeding
Special foods/ rations for nutritional relief
Local production of special foods
Local foods in rehabilitation
Organization of mass feeding/general food distribution
Feeding centers
Transportation and food storage
Sanitation and hygiene,
Evaluation of feeding programmes
Household food security and nutrition in emergencies
Public nutrition approach to tackle nutritional problems in emergencies
UNIT-IV

Introduction to Epidemiology – types of epidemiology, collection of epidemiological data, secondary routine date, Descriptive epidemiology, Cross sectional Analysis, prevalence and incidence, risk factors, risks and odds, relative and attributable risks
Principles of Nutritional Epidemiology, Measurement issues, Measurement of disease, Occurrence and Measurements of association, Exposure and outcome, Socio demographic and Psycho social variables.
Design and Planning of Nutritional Epidemiological studies – assessing and supplyingAndEvaluating Epidemiological studies – Discussion of selected case studies

Practicals 41006P: Seminars -------------------------- 10X5 = 50M

REFERENCE:

World Disasters Report – Focus on Public Health, International Federation of Red Cross and Red Crescent Societies.

41004 Internship --------- 150M

It is proposed to include internship as field work for time duration of one month at near by hospitals as dietitian.