

**SRI VENKATESWARA UNIVERSITY**  
**B.Sc. DEGREE COURSE IN Clinical Nutrition**  
**SEMESTER SYSTEM WITH CBCS**  
**SEMESTER IV**  
**W.E.F. 2021-2022**

**CN-400 – HUMAN PHYSIOLOGY AND MICROBIOLOGY**

**Outcomes of the course**

The students will be able to:

**A) Remembers and explain in a systematic way**

- Studying different structures and systems, Classification and functions

**B) Understanding and Uses**

- Obtain a better understanding of nutrition and dietetics through the study of physiology and microbiology
- Gain knowledge of about the role of microorganisms in health and disease

**C) Critically explains, judges & Solves**

- Types, causes and symptoms of Food borne, water borne and Air borne infectious diseases

**D) Working in out of prescribed areas**

- Preparation of charts/thermocolor, posters on topics like structures and systems, Organization of Seminars.

**E) Practical skills**

- Estimation of Blood Groups, Haemoglobin levels and preparation of culture media

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**CN-400 – HUMAN PHYSIOLOGY AND MICROBIOLOGY**

Theory: 4hrs/week  
Practicals: 2hrs/week

**UNIT – 1 Digestive and Skeletal systems**

- Tissues- Classification of tissues, structure and functions of epithelial, muscular, connective and nervous tissue.
- Digestive System- Structure of digestive system, digestion and absorption of carbohydrates, proteins and fats.
- Musculo Skeletal System-classification of Bone and Muscle – Structure and functions.

**UNIT – II Circulatory, Cardiovascular and Excretory systems**

- Blood- Composition, functions and coagulation of blood - process and factors regulating clotting of blood, blood groups; Aneamia.
- Heart - Anatomy of heart and blood vessels; Blood pressure- definition and factors Affecting blood pressure; Heart rate and cardiac cycle.
- Excretory system- Structure and functions of kidneys; Composition, volume, formation and micturition of urine.
- Skin and its role in excretion and regulation of temperature.

**UNIT – III Physiology of Reproductive, Endocrine and Respiratory systems**

- Reproductive System- Structure of male and female reproductive organs, puberty, menstrual cycle, meaning of menopause and structure of mammary glands.
- Endocrine System- Pituitary, thyroid, parathyroid and adrenal glands – Structure, functions of hormones secreted and their abnormality.
- Respiratory system – structure and mechanism of respiration; abnormal types of respiration-anoxia or hypoxia, asphyxia and artificial respiration.

#### **UNIT – IV Introduction to Microbiology**

- Classification of Microorganisms
- Bacteria- Structure, types, growth, reproduction, and nutrition.
- Virus - Characteristics – size, shape, structure, replication and classification
- Yeast - Structure, reproduction and economic importance.
- Protozoa – Structure, classification, reproduction and life cycle of Entamoebahistolytica.
- Moulds–General characteristics, types, structure, reproduction and economic importance

#### **UNIT – V Food, Water and Air borne diseases**

- Infection – Sources and transmission of infectious diseases
- Immunity – Innate and Acquired – active and passive immunity
- Infectious Diseases- Causes and pathogenesis – symptoms, prevention and control of the following:
  - Food Borne Diseases- Salmonellosis, Botulism, Cholera and Typhoid.
  - Water Borne Diseases- Gastro enteritis, Diarrhoea and Viral hepatitis
  - Air Borne Diseases- Tuberculosis and Pneumonia.
  - Parasitic Infections- Amoebiasis and Malaria.

#### **PRACTICALS**

1. Estimation of Haemoglobin
2. Estimation of Blood Groups
3. Examination of Yeast, Mould, Protozoa and Pathogenic Bacteria.
4. Study of Sterilizing Equipment
5. Common Culture Media

#### **REFERENCES**

1. Gary.AThibodeau and Kelvin. T.Patlon, Anthony's Text Book of Anatomy and Physiology, Seventeenth edition, Mosby Publications, Indiana Print, 2004.
2. Anne Waugh and Allison Grant Ross and Wilson Anatomy and Physiology in Health and Illness Elsevier Publication, Ninth Edition, 2005.
3. Guyton, A.C, Text Book of Medical Physiology, 4<sup>th</sup> Edition, W.B. Saunders Co. Philadelphia, 1996.
4. Frazier, W.C, Food Microbiology, McGraw Hill Publications, New York, 4<sup>th</sup> Edition, 1998.
5. Pelczar, H.J. And Rober. D, Microbiology, McGraw Hill Publication, New York, 10<sup>th</sup> Edition, 1998.

## CO-CURRICULAR ACTIVITIES

- Charts and poster presentation
- Drawing photographs of different structures and systems
- Debates/seminars/group discussions/quiz
- Organizing exhibitions
- Album making of different microorganisms
- Model making-clay,cardboard etc.

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**CN-400-HUMAN PHYSIOLOGY AND MICROBIOLOGY**  
**MODEL QUESTION PAPER**

**Time : 3 Hours**

**Maximum :75 marks**

**PART-A**

**Answer any 5 Questions**

(5X5 = 25 marks)

1. List different types of connective tissues.
2. What are the functions of liver?
3. What are the factors affecting blood pressure?
4. Explain the process of coagulation of blood?
5. Draw the structure of nephron and explain its parts.
6. Write about artificial respiration.
7. Economic importance of moulds.
8. Methods of transmission of infections.

**PART – B**

**Answer all Questions**

(5X10 = 50 marks)

9. (a) Give the structure of muscular tissues.  
(OR)  
(b) Explain the digestion of carbohydrates.
10. (a) Write about the composition and the functions of blood.  
(OR)  
(b) Describe the structure of heart.
11. (a) Explain the phases of menstrual cycle.  
(OR)  
(b) List out the hormones of anterior pituitary gland. Discuss the functions and disorders of growth hormone.
12. (a) Describe the structure of a bacterial cell.  
(OR)  
(b) Explain life cycle of *Entamoeba histolytica*.
13. (a) Write in detail about *Clostridium botulinum* food poisoning.  
(OR)  
(b) Discuss the causes, symptoms, prevention and control of pneumonia

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**CN-401 - THERAPEUTIC NUTRITION**

**Outcomes of the course**

The students will be able to

**A) Remember and explain in a systematic way**

- Understands the meaning, objectives and purpose of therapeutic nutrition.
- Understanding about modification of normal diets to therapeutic diets.

**B) Understands and Uses**

- Planning and preparation of diets for different diseases like Obesity, Cardiovascular, Renal, Diabetes mellitus etc,

**C) Critically explains, judges**

- Calculation of Nutrient Requirements and modification of the diets for complications in different disease conditions.

**D) Working in out of prescribed areas under co-curricular activity**

- Preparation of diets for the patients in acceptable manner by applying their own choice of foods through observing the family members, elderly, friends, neighbours and patients.

**E) Practical skills**

- Planning and preparation of diets for different disease conditions.
- Diet counselling and patient education.

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**CN-401 - THERAPEUTIC NUTRITION**

Theory: 4hrs/week  
Practicals: 2hrs/week

**THEORY**

**Unit -I Introduction to Therapeutic Nutrition**

- Therapeutic Nutrition – Purpose of Diet Therapy, Therapeutic adaptation of normal diets - liquid, soft and special feeding methods, pre- and post operative diets.
- Dietitian – Roles and responsibilities, Diet counselling, follow up and patient education.
- Indian Dietetic Association

**Unit -II Malnutrition and Fevers**

- Fevers – Acute and Chronic fevers – Typhoid, T.B. – Causes, symptoms and dietary management
- Under weight, Overweight and Obesity – Causes, assessment, symptoms and dietary management and complications.

**Unit -III Gastrointestinal and Liver Diseases**

- Gastrointestinal Diseases - Dyspepsia, Peptic ulcer, Diarrhoea, Constipation and Malabsorption Syndrome – Steatorrhea, Celiac disease and Tropical Sprue – Causes, symptoms and dietary management
- Liver diseases – Hepatitis, Cirrhosis of liver - Causes, symptoms and dietary management

**Unit -IV Cardio-vascular and Renal Diseases**

- Cardio-Vascular Diseases – Role of fat in the development of Atherosclerosis, Hypertension - Causes, symptoms and dietary management
- Kidney disease – Nephritis, Nephrosis, Renal Failure, and Renal calculi - Causes, symptoms and dietary management

**Unit -V Diabetes and Cancer**

- Diabetes Mellitus - Classification, causes, symptoms, Tests for detection of Diabetes Mellitus, Dietary management and complications
- Cancer – Classification, risk factors, symptoms, general systemic reactions, nutritional requirements; Role of food and dietary guidelines for prevention of cancer

## PRACTICALS

1. Planning and preparation of the following diets
2. Preparation of modified diets-Liquid and Soft diets.
3. Planning and preparation of diet in fevers – Typhoid and T.B.
4. Planning and preparation of diets for Underweight and Obesity.
5. Planning and preparation of diet in diseases of Gastrointestinal System – Peptic Ulcer, Viral Hepatitis
6. Planning and preparation of diet in Cardio-Vascular diseases – Atherosclerosis and Hypertension
7. Planning and preparation of diet in Kidney diseases – Nephritis
8. Planning and preparation of diet for Diabetes Mellitus

## REFERENCES

1. Bamji MS, Krishnaswamy K, Brahman GNV. (2016). Textbook of Human Nutrition, 4th edition, Oxford and IBH Publishing Co. Pvt. Ltd.
2. Khanna K, Gupta S, Seth R, Mahna R, Rekhi T (2004). “The Art and Science of Cooking: A Practical Manual, Revised Edition. Elite Publishing House Pvt. Ltd.
3. NIN. (2017). Food Composition Tables, National Institute of Nutrition, Hyderabad.
4. Srilakshmi, B. (2019).Dietetics , 8<sup>th</sup> edition, New Age International Publishers.
5. Srilakshmi, B. (2018). Nutrition Science, 6<sup>th</sup> edition, New Age International Publishers.
6. Sumati R. Mudambi, Rajagopal, M.V.(2012). Fundamentals of Foods, Nutrition and Diet Therapy, 6<sup>th</sup> edition, New Age International Publishers.
7. Swaminadhan, M., (1988). Essentials of Food and Nutrition, Volume I and II, The Bangalore Printing and Publishing Co. Ltd., Bangalore.
8. WardlawMG&Insel PM. (2004). Perspectives in Nutrition, Sixth Edition,

## CO-CURRICULAR ACTIVITIES

1. Academic based: -
  - Visit to dietetics Dept. and diet counselling centre
  - Exhibition on therapeutic diets
  - Diet plans and laboratory reports
2. Research based: -
  - Case studies
  - Project work on assessment of obesity among staff members and students of the college
3. Value based: -
  - Clean and green, nutrition games
  - Drama, dance, and music to propagate and promote nutrition education
4. Celebration of Important Days (National and International): -
  - World Diabetes day -November 14<sup>th</sup>
  - World Cancer day -February 4<sup>th</sup>
  - World Health day -April 7<sup>th</sup>
  - National Cancer Awareness Day-Nov 7<sup>th</sup>



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**CN-401 Therapeutic Nutrition**

**Model Question Paper**

**Time: 3 hrs.**

**Max. Marks: 75**

**Part – A**

**Answer any five Questions. Each question carries 5 Marks**

**(5x5 = 25 marks)**

1. Write the purpose of diet therapy?
2. Classify fevers and explain the symptoms.
3. What is meant by hypertension? Elucidate the causes for it.
4. Define liver cirrhosis. Write the principles of dietary management?
5. What is type II diabetes? Explain the causative factors.
6. Elucidate the points to be considered for planning a diet to prevent constipation?
7. Define Diet counselling. Explain its importance in today's life.
8. What is 'Peptic ulcer'? Write the causative factors.

**Part – B**

**Answer five Questions. Each Question carries 10 marks**

**(5x10 = 50 marks)**

9. a) Write in detail about the therapeutic adaptation of normal diet.  
(OR)  
b) Who is a Dietitian? Explain the Roles and responsibilities of a Dietitian?
10. a) What are complications of obesity?  
(OR)  
b) Elucidate the causative factors for Typhoid? Write the dietary management for Typhoid.
11. a) Describe the symptoms, and dietary management of Celiac disease  
(OR)  
b) What are the functions of liver and discuss about the agents responsible for liver damage.
12. a) What is meant by Atherosclerosis. Explain the symptoms and plan a diet for an Atherosclerosis patient.  
(OR)  
b) Elucidate the reasons for Renal Failure. Give an account of dietary restrictions during this condition.
13. a) Describe the principles of dietary management of a person with Diabetes Mellitus  
(OR)  
b) Discuss the dietary guidelines to be followed for prevention of cancer.