

**PITHAPUR RAJAH'S GOVERNMENT COLLEGE
(AUTONOMOUS)
KAKINADA
(Affiliated to Adikavi Nannaya University)**



2021-2022

BOARD OF STUDIES

**DEPARTMENT OF
FOOD SCIENCE**

(CHOICE BASED CREDIT SYSTEM)

P.R.GOV.T. COLLEGE (A) KAKINADA FOOD SCIENCE – SYLLABUS
(FOOD BIOCHEMISTRY)
CHOICE BASED CREDIT SYSTEM
SEMESTER – II (PAPER-II)
ACADEMIC BATCH 2022

Hrs.: 4

Credits : 2

OBJECTIVES:

To enable the students to:

- a. Acquire knowledge on the macro and micro constituents of the food.
- b. Know the structure and chemical & biological characteristics of constituents of food.

Module – I

CARBOHYDRATES

Classification with examples, nomenclature briefly, study of important properties of Glucose, Fructose, Sucrose, Lactose & Galactose – sources, functions, deficiency, and toxicity. Inversion of sucrose. Structure of starch, cellulose, glycogen, pectin. Gelatinization of starch.

Module – II

PROTEINS

Amino acids, peptides and proteins classification of amino acids, structure, zwitter ion, isoelectric point, amphoteric property. Classification of proteins according to shape, composition and solubility structure with examples. General properties of proteins, sources, biological functions, deficiency and toxicity. Estimation of protein by paper electrophoresis and paper chromatography.

Module – III

LIPIDS

Definition, classification with examples, composition, fatty acids; saturated and unsaturated & essential fatty acids, hydrolytic and oxidative rancidity; mechanism of auto oxidation of fat; reversion, antioxidants – natural and synthetic, technology of edible fats and oils – hardening of fat, hydrogenation and inter – esterification, structure – phospholipids, glycolipids, cholesterol. Emulsion and emulsifiers.

Module – IV

VITAMINS, MINERALS AND WATER

Vitamins – Fat soluble – A, D, E, K; Water soluble – thiamine, riboflavin, niacin, B12, pyridoxine, Vitamin – C: sources, functions, deficiency diseases and hypervitaminosis. Minerals – Ca, Fe, K, Na, P, I, F – sources, functions, deficiency diseases and excess. (Absorption of calcium and Iron).

P.R.GOV.T. COLLEGE (A) KAKINADA
FOOD SCIENCE – SYLLABUS
(FOOD BIOCHEMISTRY)
CHOICE BASED CREDIT SYSTEM
SEMESTER – II (PAPER-II)
MODEL QUESTION PAPER
ACADEMIC BATCH 2022-23

Time : 2 ½ Hours.

Marks:50M

PART – I

Answer any **THREE** questions choosing at least ONE question from each section.
10x3=30M

SECTION – A

1. Write the important properties of glucose and fructose.
2. What are Amino acids? Give the classification of amino acids.
3. Explain biological functions, deficiency and excess of proteins.

SECTION – B

4. Explain composition and classification of fatty acids.
5. Mention about water soluble vitamins.
6. Discuss the sources, functions, diseases of calcium, iron and phosphorous.

PART – II

Answer any FOUR questions. (Short answer questions)

4x5=20M

7. Write the sources of glucose.
8. Explain inversion of sugar.
9. Write a note on zwitter ion.
10. Write a note on paper chromatography?
11. Write about saturated, unsaturated and essential fatty acids.
12. Write about antioxidants – natural and synthetic
13. Mention fat soluble vitamins and write their functions.

P.R.GOV.T. COLLEGE (A) KAKINADA
FOOD SCIENCE – SYLLABUS
(FOOD BIOCHEMISTRY)
CHOICE BASED CREDIT SYSTEM
SEMESTER – II (PAPER-II)
BLUE PRINT FOR QUESTION PAPER SETTER

Time : 2 Hours.

Marks:50M

MODULE NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 5 MARKS	MARKS ALLOTTED TO THE UNIT
MODULE – I	01	02	30
MODULE – II	02	02	30
MODULE – III	01	02	20
MODULE – IV	02	01	25
Total no. of questions	06	07	
	Total marks including choice		95

Note : The question paper setters are requested to kindly adhere to the format given in the above table.

P.R.GOVT. COLLEGE (A) KAKINADA
FOOD SCIENCE – SYLLABUS
(FOOD BIOCHEMISTRY)
CHOICE BASED CREDIT SYSTEM
SEMESTER – II (PAPER-II)
(Qualitative and Quantitative Analysis)
PRACTICAL SYLLABUS
THE END OF II SEMESTER

Hrs.: 3

Credits : 1

1. Qualitative tests for carbohydrates
2. Qualitative tests for proteins
3. Moisture assay by oven drying method
4. Estimation of starch
5. Estimation of Crude fibre

P.R.GOV. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
II SEMESTER (PAPER-II)
FOOD BIOCHEMISTRY
Question Bank

Essay Questions (10M)

Module - I

1. Write the important properties of glucose and fructose?
2. Write about the structure of any three polysaccharides?
3. Write the classification of carbohydrates with examples?
4. Write the important properties of sucrose and lactose?

Module - II

1. What are amino acids? Give the classification of amino acids?
2. Write a note on structure of proteins?
3. Explain the biological functions, deficiency, and excess of proteins?
4. Write a note on classification of proteins based on shape and solubility?
5. Write about the structure and properties of amino acids?

Module - III

1. Explain the composition and classification of Fatty acids?
2. Explain the structure of phospholipids and glycolipids?
3. Write about mechanism of auto oxidation of fat?

Module - IV

1. Mention about water soluble vitamins?
2. Write a brief note on fat soluble vitamins?
3. Discuss the sources, functions, diseases of calcium and phosphorous?

Short Answer Questions (5M)

Module - I

1. Write the sources of glucose?
2. Explain the inversion of sugar?
3. Write a note on gelatinization of starch?
4. Write about the structure of glycogen?
5. Write about the structure of starch?
6. Write about functions of lactose?

Module - II

1. Write a note on zwitter ion?
2. Write a note on paper chromatography?
3. Write about the estimation of protein by paper electrophoresis?
4. Explain the properties of proteins?
5. Write about essential and non essential amino acids?

Module - III

1. Write a note on saturated and unsaturated fatty acids?
2. Write about antioxidants – natural and synthetic?
3. Write about natural and synthetic antioxidants?
4. Write a note on structure of cholesterol?
5. Write a note on structure of inter esterification and Hydrogenation?

Module - IV

1. Write about the functions of fat soluble vitamins?
2. Write about the functions of water soluble vitamins?
3. Write a note on sources, functions and deficiency diseases of vitamin C?
4. Write a note on minerals?

P.R.GOV'T. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
FOOD SCIENCE SYLLABUS (FOOD MICROBIOLOGY)

SEMESTER – IV (PAPER-IV)
ACADEMIC BATCH 2022

Hrs.: 4

CREDITS :4

OBJECTIVES :

To help the students to acquire an elementary knowledge about micro organisms, develop an understanding of industry and in maintenance of health, to acquire knowledge about the adulterants of food, food born diseases and health hazards.

Module – I

Basic concepts of microbiology: Introduction to microbiology. Microbiology in daily life. Classification of prokaryotic and eukaryotic microorganisms. Characteristics and morphology of bacteria, fungi, virus.

Module – II

Control of microorganisms: Bacterial growth curve and kinetics of growth, effect of i) P ii) Water activity iii) O₂ availability iv) temperature on the growth of microorganisms. Micro-organisms importance in food – factors affecting the growth of micro organisms in food , Intrinsic and Extrinsic parameters that affect microbial growth.

Module – III

Cultures & Media: Methods of sterilization. Types of media. Preparation of culture media, isolation and cultivation of microorganisms, methods of preservation of microbes, gram staining.

Module – IV

Food spoilage : Contamination and spoilage of different foods, spoilage of different groups of foods: Cereal and cereal products, vegetables and fruits, meat and meat products, eggs and poultry, fish and other sea foods, milk and milk products. Food poisoning, food infection.

P.R.GOV. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM FOOD SCIENCE
(FOODMICROBIOLOGY)
IV SEMESTER (PAPER-IV)
ACADEMIC BATCH 2022
MODEL QUESTION PAPER

Time : 3 Hours.

Marks:60M

PART – I

Answer any **THREE** questions choosing at least ONE question from each section.
10x3=30M

SECTION – A

1. How bacteria are classified on the basis of morphology?
2. Write about growth curve and explain the phases of growth curve?
3. What are the Intrinsic and extrinsic parameters of microbial growth?

SECTION – B

4. What are the different types of culture media?
5. Write the contamination and microbial spoilage of vegetables?
6. Write the contamination and microbial spoilage of milk and milk products?

PART – II

Answer any FOUR questions. (Short answer questions)

Marks : 4x5=20M

7. Write the morphology of TMV?
8. Briefly describe the structure of bacterial cell?
9. Write the effect of ph and temperature on growth?
10. Write about culture techniques?
11. Write the methods of isolation of micro organisms?
12. Write the contamination and spoilage of fish?
13. Write a note on food poisoning?

PART – III

Answer any FIVE questions. (Very short answer questions)

Marks : 5x2=10M

14. Yeast
15. Microbiology
16. Bacteriophage
17. O₂ availability
18. Water activity
19. Sterilization

P.R.GOV.T. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
SEMESTER – IV (PAPER-IV)
ACADEMIC BATCH 2022
BLUE PRINT FOR QUESTIONPAPER SETTER

Time : 3 Hours.

Marks:60M

MODULENO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 5 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTTED TO THE UNIT
MODULE – I	01	02	02	24
MODULE – II	02	01	02	29
MODULE – III	01	02	01	22
MODULE – IV	02	02	01	32
Total no. of questions	06	07	06	
	Total marks including choice			107

Note : The question paper setters are requested to kindly adhere to the format given in the above table.

P.R.GOV'T. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
FOOD SCIENCE (FOOD MICROBIOLOGY)
PRACTICAL SYLLABUS
AT THE END OF SEMESTER – IV (PAPER-IV)
ACADEMIC BATCH 2022

Hrs.: 3

Credits : 1

1. Study of compound microscope
2. Working and handling of common microbiological laboratory equipments and materials; preparation of microscopic examination.
3. Monochrome staining
4. Differential staining
5. Capsule staining
6. Microscopic examination of living organisms – Hanging Drop Mount method for the demonstration of bacterial motility
7. Negative staining of bacteria
Composition, preparation and sterilization of media nutrient agar, potato dextrose agar.
8. Microbiology of air and surface isolation of microorganisms.

P.R.GOV'T. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
IV SEMESTER (PAPER-IV)
Food Microbiology
Question Bank
Essay Questions (10M)

Module - I

1. How bacteria are classified on the bases of morphology?
2. Discuss the classification of prokaryotic and eukaryotic microorganisms.
3. Discuss the role of microbiology in daily life with reference to foods?

Module - II

1. Write about growth curve and explain the phases of growth curve?
2. Discuss the factors affecting the growth of microorganisms in food?
3. What are intrinsic and extrinsic parameters of microbial growth?

Module - III

1. What are different types of culture media?
2. Explain the preparation of different culture media?
3. Write a note on different methods of sterilization?

Module - IV

1. Write a note on contamination and microbial spoilage of vegetables?
2. Write a note on contamination and microbial spoilage of milk and milk products?
3. Describe the spoilage of meat and meat products?
4. What is the role of mycotoxins in causing food poisoning?

Short Answer Questions (5M)

Module - I

1. Explain the morphology of fungi
2. Explain the morphology of virus.
3. Difference between prokaryotic and eukaryotic cell.
4. What are characteristics of bacteria?

Module - II

1. What is the effect of pH on bacterial growth curve?
2. microorganisms Importance in food.
3. What is the effect of temperature on bacterial growth curve?
4. Write about kinetics of growth curve?

Module - III

1. Write a note on isolation and cultivation of microorganisms?
2. Write a note on gram staining?
3. Write a note on preparation of culture media.
4. Explain any two methods of sterilization?

Module - IV

1. Write a note on food poisoning?
2. Write a note on spoilage of fruits?
3. Write a note on spoilage of poultry?
4. Write a note on spoilage of fish?

Very Short Answer Questions (2M)

Module - I

1. Yeast
2. Microbiology
3. Bacteriophage
4. Prokaryotic microorganism
5. Morphology
6. Virus

Module - II

1. Water activity
2. O₂ availability
3. Intrinsic factors
4. Extrinsic factors

Module - III

1. Isolation
2. Culture media
3. Staining
4. Sterilization.

Module - IV

1. Spoilage of cereals
2. Food poisoning
3. Food infection
4. Irradiation
5. Ropiness of bread
6. Contamination of sea foods

P.R.GOV.T. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
FOOD SCIENCE SYLLABUS (Principles of human nutrition)
SEMESTER – IV (PAPER-V)
ACADEMIC BATCH 2022-23

Hrs: 3

Credits: 4

Module – I

Nutrition through life cycle: Basic five food groups, balanced diet, food guide pyramid.

Nutrition in infancy: Growth and development, nutritional requirements, breast feeding, weaning and supplementary foods.

Module – II

Nutrition in preschool age: Physiology development and food intake, development of food habits, diet plan.

Nutrition in adolescence: Growth and development, nutritional requirement.

Module – III

Nutrition in pregnancy: Physiological changes during pregnancy, importance of nutrition in pregnancy, diet for the pregnant mother, complications in pregnancy – gestational diabetes, toxemia, infections and effect of maternal malnutrition on fetus.

Module – IV

Nutrition in lactations: Nutrition requirements, human milk composition and importance, lactogogues, diet planning.

Nutrition in old age: Changes during old age, nutritional requirements, diet planning.

P.R.GOV. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
FOOD SCIENCE SYLLABUS (Principles of human nutrition)
SEMESTER – IV (PAPER V)
ACADEMIC BATCH 2022

MODEL QUESTION PAPER

Time : 3 Hours.

Marks:60M

PART – I

Answer any **THREE** questions choosing at least ONE question from each section.

3x10=30M

SECTION – A

1. Explain the nutrition in infancy of growth development and nutritional requirements
2. Explain the development of food habits, diet plan in preschool age
3. Explain growth and development during adolescence and nutritional requirements of an adolescent.

SECTION – B

4. Write about importance of nutrition in pregnancy
5. Explain the human milk composition and importance lactogogues
6. Write the nutritional requirements of old age

PART – II

Answer any **FOUR** questions. (Short answer questions)

4x5=20M

7. Write about supplementary foods.
8. Explain the food guide pyramid
9. Explain the physiological development and food intake of preschool age
10. Nutritional requirement of adolescence
11. Physiological changes in pregnancy
12. Plan and prepare a diet for old age.
13. Nutritional requirement of lactating women.

PART – III

Answer any **FIVE** questions. (Very short answer questions)

Marks : 5x2=10M

14. Balance diet
15. Weaning
16. Breast feeding
17. Food intake
18. Adolescence
19. Nutritional requirements.

P.R.GOV.T. COLLEGE (A), KAKINADA
 CHOICE BASED CREDIT SYSTEM
 FOOD SCIENCE SYLLABUS (Principles of human
 nutrition) SEMESTER – IV (PAPER V)
 ACADEMIC BATCH 2022

BLUE PRINT FOR QUESTION PAPER SETTERS

Time : 3 hours

Max.marks:60

MODULE NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 5 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTTED TO THE UNIT
MODULE – I	01	02	01	22
MODULE – II	02	02	02	34
MODULE – III	01	01	02	19
MODULE – IV	02	02	01	32
Total no. of questions	06	07	06	
	Total marks including choice			107

Note: The question paper setters are requested to kindly adhere to the format given in the above table.

P.R.GOV.T. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
FOOD SCIENCE SYLLABUS (Principles of
human nutrition)
SEMESTER – IV (PAPER-V)
ACADEMIC BATCH 2022

PRACTICAL SYLLABUS

Hrs: 3

credits: 2

Planning, preparing and serving normal diets for

- Infants
- Preschool age
- Adolescence
- Adult
- Pregnancy
- Lactation
- Old age

P.R.GOV.T. COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
IV SEMESTER (PAPER-V)
Principles of Human nutrition
Question Bank
Essay Questions (10M)

Module - I

1. Explain the nutrition, growth, development, and nutritional requirements in infants?
2. Write about weaning and supplementary foods?

Module - II

1. Explain the development of food habits, diet plan in preschool age
2. Explain growth and development during adolescence and nutritional requirements of an adolescent.

Module - III

1. Write a note on importance of nutrition in pregnancy.
2. What are the complications during pregnancy?
3. Write a note on physiological changes during pregnancy?

Module - IV

1. Write a note on human milk composition and importance of lactogogues.
2. Explain the nutritional requirements during old age.

Short Answer Questions (5M)

Module - I

1. Write a note on five basic food groups?
2. Explain food guide pyramid?
3. Write about breast feeding.
4. Write about supplementary foods.

Module - II

1. Write briefly about the physiological development during preschool age.
2. Nutritional requirement in adolescence
4. Write a diet plan for preschool age.

Module - III

1. Physiological changes during pregnancy.
2. Maternal malnutrition in fetus.

3. Write a note on diet for pregnant woman.
4. Gestational diabetes.

Module - IV

1. Plan and prepare a diet for old age.
2. Nutritional requirement of lactating women.
3. Write a diet plan for lactating women.

Very Short Answer Questions (2M)

Module - I

1. Balanced diet
2. Weaning
3. Supplementary foods.

Module - II

1. Food intake
2. Adolescence
3. Development in adolescence

Module - III

1. Toxemia
2. Infections
3. Malnutrition

Module - IV

1. Human milk
2. Changes during old age
3. Lactogogues
4. Lactation
5. Fetus
6. Protein content