

**P.R. Government College
(Autonomous)**

Kakinada

(Affiliated to Adikavi Nannaya University)



Department of Chemistry

B. Voc (Food Technology)

Under NSQF Scheme

Board of studies

2021-22

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Note: BOS is to provide final soft copy in PDF and word formats and four copies of hard copies in bounded form to the office of Dean Academic affairs.

P.R. Government College (Autonomous), Kakinada
Recommended Composition of the Board of Studies of
B. Voc (Food Technology)
And it's Functions of an Autonomous College
2021-22

I Composition

1. Chairman, Board of Studies:

Sri T.V.V. Satya Narayana, M.Sc., Lecturer in Chemistry Nodal Officer
for B. Voc Courses

2. The entire faculty of each specialization.

1. Sri Dr.D.Chenna Raa

2. V.Sanjeev Kumar

3. V.RamBabu

4. K. Vijaya Kumar

3. One expert nominated by the Vice-Chancellor from a panel of six recommended by the College Principal

Sri S. Sasikanth M. Tech (Food Technology) University Nominee
Asst. Professor (Contract), School Of Food Technology, JNTUK, Kakinada.

4. One Subject expert nominated by the Principal.

P.Mounika, Subject Expert Asst. Professor department of food technology ideal college of arts and science, Kakinada

5. One postgraduate meritorious alumnus to be nominated by the Principal.

Sri V. Mallikharjuna Sharma, Lecturer in Chemistry, ASD women Govt. College (A), Kakinada

The chairman, Board of Studies, may with the approval of the Principal of the College, Co-opt.

II. Term.

The term of the nominated members shall be two years.

III. Meeting

The Principal of the College shall draw the schedule for meeting of the Board of Studies for different Departments. The meeting may be scheduled as and when necessary but at least once a year.

IV. Functions

The Board of Studies of a Department in the College shall:

- a) Prepare syllabus and various courses keeping in view the objectives of the College interest of the stakeholders and national requirement for consideration and approval of the Academic Council.
- b) Suggest methodologies for innovative teaching and evaluation techniques.
- c) Suggest panel of names to the Academic Council for appointment of examiners.
- d) Coordinate research, Teaching, Extension and other academic activities in the Department/College.

**Signatures of the members who attended the
Board of studies in B. Voc (Food Technology)**

Date:09/02/2022

Time: 2pm

Mode of conduct of meeting: Offline

S. No.	Name of the member	Designation	Signature
1	T.V.V,Satya narayana	Chairman, Board of Studies,Nodal Officer for B. Voc Courses. Lecturer In Chemistry, 9490876913 tvvsatyan@gmail.com	
2	Sri S. Sasikanth M. Tech (Food Technology)	University Nominee Asst. Professor (Contract), School Of Food Technology, JNTUK, Kakinada. sarangamsasikanth@gmail.com 8008175975	
3	P.Mounika	Subject Expert Asst. Professor department of food technology ideal college of arts and science ,Kakinada	
4	V. Mallikarjuna Sarma	Subject Expert Lecturer In Chemistry,ASD Womens Government Degree College,kkd, East Godavari District. 9676822550, 8341546804 v.mallikarjunasarma@gmail.com	
5	Sri D.Chenna roa	Member Lecturer in Charge Department of Chemistry	
6	Sri.V.Sanjay kumar	Member Lecturer in Charge Department of Chemistry	
7	Sri.V. Rama babu	Member Lecturer in Charge Department of Chemistry	
8	Sri.K. Vijaya Kumar	Member Lecturer in Charge Department of Chemistry	
9	P. Pavan Kumar Regd no: 5215726	Student Member II B.Voc Food Tech	
10	V. Ashok Kumar Regd no: 5215703	Student Member II B.Voc Food Tech	

ACTION PLAN BOS MEETING -CHEMISTRY HELD ON 09-02-2022

Department activities for the academic year 2021-2022.

Annexure I

1. Organizing National/ State level seminars/Workshops/ Conferences/ Training Programmes etc., with topics and other details.

(Mandatory for each Department)

- i) Staff development programme
- ii) Training in the food industry
- iii) Awareness on FOOD ADULTRATION
- iv) World food day Third week of October
- v) Food. fest
- vi) National Science Day – Last week of February
- vii) Guest lectures
- viii) National seminar in food technology.
- ix) World food week- First week of September
- x) Training in water analysis

2. Change of modules in the syllabus content.

Syllabus designed for first and second and final years as per university regulations. CBCS introduced for final year w.e.f. 2020-21.

3. Plan for utilization of funds for Autonomous/UGC/other grants available for arranging guest lectures, faculty improvement programmes, study tours, equipping laboratories, reference books& other necessary teaching-learning material with ICT enabled teaching.

I. Study visits to:

Rs, 50,000

1. Gemini Oils Pvt. Ltd, Kakinada
2. Santhoshi Matha Oil Packaging Industries, Kakinada.

II.

- | | |
|--------------------------------------------------------|------------|
| 1. Sophisticated version UV-Visible spectrophotometer- | 5.0 lakhs |
| 2. Other equipment | 1.50 lakhs |
| 3. Consumables | 1.98 lakhs |

4. Plan for organizing subject oriented community outreach programmes & allocation of necessary funds. (Mandatory for each Department)

- | | |
|----------------------------------|------------|
| i) Adoption of village | Rs. 20,000 |
| ii) Food adulteration programmes | Rs. 10,000 |

5. Institution of new medals/incentives/prizes etc., from alumni, philanthropists, parents, faculty etc., - Strategies to be recommended

6. Introduction of new Online programmes –PG/UG/Diploma and certificate courses.

Swayam online course

1. Food Nutrition
2. Food Preservation technology
3. Food Microbiology
4. Food Chemistry

7. Any other programme that enhances the learning capacity of students and their employable & knowledge skills.

Market and literature survey to identify the concepts of new products ,functional foods , convenience foods , existing Indian traditional foods.

8. Change in internal assessment exams for conducting I mid Semester by way of Project work/Assignment.

9. Suggest panel of examiners/paper setters & other experts/nominees for BOS deliberations.

Chemistry

- i) Dr. Srirangam, Lecturer in Food Technology, Layola college, Vijayawada.
- ii) Sri S. Sasikanth, JNTUK, Kakinada.
- iii) Dr. M. Srijaya, Associate Professor, Sai Institute of Higher learning, Puttaparti.

Department of B. Voc (Food Technology)

Board Of Studies Meeting

Dt. 09/02/2022 At 2:00 pm

Resolutions:

The meeting of Board of studies in B. Voc (Food Technology) is convened on 09/02/2022 at 2:00 pm in offline mode through The Principal Dr. B.V.Tirupayanam, Sri T. V. V. Satyanarayana, University Nominee Sri S. Sasikanth, Asst. Professor, School of Food Technology, JNTUK, Kakinada , P.Mounika Asst. Professor department of food technology ideal college of arts and science ,Kakinada Sri Ch. Venkata Rao, Director, Surendra Oils Pvt Ltd., Mandapat, Dr. K. Viswanatha Chaitanya, Professor, School of Food Science and Technology, GITAM University, Visakhapatnam and all members of the faculty of Chemistry and student representatives attended the meeting. Agenda items are discussed and resolutions are made.

1. It is resolved to follow the revised Choice Based Credit System for B. Voc courses scrupulously as per the directions of Andhra Pradesh State Council of Higher Education (APSCHE), Vijayawada and also as per the directions of Adikavi Nannaya University, Rajamahendravaram with effect from the academic year 2020-21.
2. It is resolved to follow the revised curricular framework for B. Voc courses scrupulously as per the directions of Andhra Pradesh State Council of Higher Education (APSCHE), Vijayawada and also as per the directions of Adikavi Nannaya University, Rajamahendravaram with effect from the academic year 2020-21.
3. It is resolved to choose Life Skill courses and Skill Development Courses in concurrence with the vocational course.
4. It is resolved to conduct industrial visits for B. Voc students to make them acquainted with the industrial environment.
5. It is resolved to admit both Intermediate (MPC) stream and Intermediate (BiPC) stream students in to B. Voc courses and design the curriculum accordingly.

6. It is resolved to run B. Voc (Food Technology) in two streams namely
 - i. B. Voc (Food Technology) Maths stream and
 - ii. B. Voc (Food Technology) Biology stream
7. It is resolved to organize Guest lectures by eminent professors and Industrial Experts.
8. Resolved to implement pass minimum for internal assessment for CBSE pattern students as the pattern is learner oriented.
9. Resolved to submit proposals to conduct a faculty development programme in instrumentation techniques/ advanced topics with the assistance of industry representatives and university representatives.
10. Resolved to conduct Industrial Internship for a period of two months during the summer after completion of semester end examinations.
11. It is resolved to make it mandatory for the students in the entire V semester to undergo industrial internship for a period of 6 months in a Food Industry.
12. It is resolved to get the students of B. Voc (Food Technology) registered in NAPS (National Apprenticeship Promotion Scheme).
13. It is resolved that the B. Voc (Food Technology) course is restructured in B. Sc (Professional) (Food Technology). The proposal is put forward to Academic Council and General Body Meeting.
14. It is resolved to follow strictly the guidelines of UGC under NSQF scheme for the recruitment and engagement of faculty and non-teaching staff.
15. It is resolved to follow the same syllabi for English, Second Language, Life Skill Courses and Skill Development Courses as those prescribed for UG Courses by APSICHE, Vijayawada.
16. It is resolved to follow the same syllabi for main subjects namely Mathematics, Botany and Chemistry as those prescribed for UG Courses by APSICHE, Vijayawada.
17. It is resolved to implement 50% external & 50% internal marks for both theory & practicals from the academic year 2020-2021 for first year students only.
18. It is resolved to implement 60% external & 40% internal marks for both theory & practicals from the academic year 2020-2021 for second & third year students.
19. Resolved to reduce 40 marks of Theory internal to 20 marks for mid exams and 20 marks for co-curricular activities (Seminar / Assignment / Quiz / Group Discussion) and reduce 50 marks of theory internal to 25 marks for mid exams and 25 marks for co-curricular activities (Seminar / Assignment / Quiz / Group Discussion).
20. Resolve to conduct practical examinations semester wise.

The following paper setters are recommended

 - i) Dr. Srirangam, Lecturer in Food Technology, Layola college, Vijayawada.
 - ii) Sri S. Sasikanth, JNTUK, Kakinada.
 - iii) Dr. M. Srijaya, Associate Professor, Sai Institute of Higher learning, Puttaparti.

About B. Voc (Food Technology)

The University Grants Commission (UGC) had launched a scheme on 27 February, 2014 for skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) degree with multiple entry and exit points. Considering the implementation modalities, the guidelines of the scheme have been revised in the year 2015. The B.Voc. Programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles and their NOSs along with broad based general education. This would enable the graduates completing B.Voc to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

Objectives

1. To provide judicious mix of skills relating to a profession and appropriate content of general education.
2. To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.
3. To provide flexibility to students by means of pre-defined entry and multiple exit points.
4. To integrate NSQF within the undergraduate level of higher education in order to enhance employability of the graduates and meet industry requirements. Such graduates apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.
5. To provide vertical mobility to students coming out of (a) 10+2 with vocational subjects; and (b) Community Colleges.

Course Objectives:

To make student

1. Understand the basic concepts of Food Technology
2. Understand different types of food products
3. Acquire knowledge on qualitative and quantitative chemical analysis
4. Develop skills in the usage and application of laboratory instruments
5. Understand the technologies of various food products
6. Acquire knowledge on various types of packaging materials.
7. Understand various forms of dairy products.
8. Acquire knowledge on different types of instrumentation techniques in food analysis.
9. Understands the importance of food science and technology.
10. Acquire knowledge on the basic concepts of computers
11. Develop skills in MS word, MS Excel and MS PowerPoint applications.
12. Develop communication and soft skills.

13. Undergo industrial training and acquire skills in various instrumentation techniques.
14. Visit Food industries and understand the functioning of plant,

Course Outcomes:

At the end of the course, the student will be able to

1. Acquire competence and skills in various techniques in Food analysis and technology of various foods and food products.
2. Ready to get a suitable position or job role such as packaging expert, food analyst in food Industries.
3. Choose for an academic progression under vertical mobility for higher studies.
4. Eligible for various competitive examinations in various posts recruited by State and Central Governments.

QUESTION PAPER SETTERS FOR B. VOC (FOOD TECHNOLOGY)

The following paper setters for Vocational (Food Technology) papers are recommended.

S. NO.	NAME OF THE SUBJECT EXPERT	QUALIFICATION	DESIGNATION	ADDRESS	E- MAIL & MOBILE NO.
1	V.MALLIKARJUNA SHARMA	M.SC (CHEMISTRY & ANALYSIS OF FOODS, DRUGS AND WATER)	LECTURER IN CHEMISTRY	WOMENS ASD GOVERNMENT DEGREE COLLEGE, KKD, EAST GODAVARI DISTRICT	v.mallikarjunasarma@gmail.com 9676822550,8341546804
2	S. SASIKANTH	M. TECH (FOOD TECHNOLOGY)	ASST. PROFESSOR (CONTRACT)	SCHOOL OF FOOD TECHNOLOGY, JNTUK, KAKINADA	sarangamsasikanth@gmail.com 8008175975
3	DR. M. SRIJAYA	M. SC., PH.D	ASSOCIATE PROFESSOR	DEPARTMENT OF FOOD AND NUTRITIONAL SCIENCES, SRI SATHYA SAI INSTITUTE OF HIGHER LEARNING, PUTTAPARTI, ANANTHAPUR DIST	msrijaya@sssihl.edu.in 9247242399
4	PROF. K. VISWANATHA CHAITANYA	M. SC., PH.D	HEAD - FOOD SCIENCE & TECHNOLOGY	INSTITUTE OF SCIENCE, GITAM UNIVERSITY, VISAKHAPATNAM	ckolluru@gitam.edu 9493117720

P. R. GOVERNMENT COLLEGE (AUTONOMOUS) KAKINADA
CURRICULAR FRAMEWORK FOR B. VOC COURSES UNDER NSQF FOR THE YEAR 2020-21

B.Voc Food Technology (Maths stream/Biology stream)

SUBJECT/ SEMESTER		I		II		III		IV		V		VI		
		H/W	C	H/W	C	H/W	C	H/W	C	H/W	C			
English		4	3	4	3	4	3						Third Phase of Apprenticeship for the entire V/VI Semester	
Second Language (Telugu/ Hindi/ Sanskrit)		4	3	4	3	4	3							
Life Skill Courses		2	2	2	2	2+2	2+2							
Skill Development Courses		2	2	2+2	2+2	2	2							
Core Subjects														
Major Subject -1	C1 to C5 Maths/ Botany (Theory & Practicals)	6/ 4+2	4+1	6/ 4+2	4+1	6/ 4+2	4+1	4+2 4+2	4+1 4+1					
Major Subject -2	C1 to C5 Chemistry (Theory & Practicals)	4+2	4+1	4+2	4+1	4+2	4+1	4+2 4+2	4+1 4+1					
Vocational	C1 to C14 including SEC Food Technology(Theory &Practicals)	4+2	4+1	4+2	4+1	4+2	4+1			4 +2 4 +2	4 +1 4 +1			
	C2, C4, C6 (Theory and Lab/Institutional/Industrial Training) Food Technology	2+2	2+1	2+2	2+1	2+2	2+1	4 +2 4 +2	4 +1 4 +1	4 +2 4 +2 4 +2	4 +1 4 +1 4 +1			
Total Hrs/Week(Academic Credits)		34	28	36	30	36	30	36	30	36	30	12	4	4
Extension Activities														
NCC/ NSS/ Sports/ Extra Curricular								2						
Yoga						1		1						
Extra Credits														
Hrs/ W(Total Credits)		34	28	36	30	36	31	36	33	36	30	12	4	4

Marks and Credits distribution (Maths Stream*/ Biology Stream)**

S.No.	Course Type	No. of Courses	Course wise Teaching Hrs/Week	Credits for each Course	Total Credits	Each Course Evaluation				Total(Theory +Practical)	Total Marks (Maths Stream*/ Biology Stream**)
						Theory			Practical (Maths Stream/ Biology)		
						Continuous Assessment	End Semester	Total			
1	English	3	4	3	9	40	60	100		100	300
2	Second Language	3	4	3	9	40	60	100		100	300
3	Life Skill Courses	4	2	2	8	0	50	50		50	200
4	Skill Development Courses	4	2	2	8	0	50	50		50	200
5	Core/ SE –I Maths/ Botany	5	6/ 4+2	4+1	25	40	60	100	0/ 50	100/ 150	500*/ 750**
6	Core/ SE –II Chemistry	5	4+2	4+1	25	40	60	100	0/ 50	100/ 150	750
7	Vocational Courses(C1 to C14) Food Technology	11	4+2	4+1	55	40	60	100	50	150	1650
	VocationalCourses C2, C4, C6 Food Technology										
8	Summer Vacation Internship	2		4	8					100	200
9	Industrial Internship for one full Semester	1		12	12					200	200
10	Extension Activities(Non Academic Credits)										
	NCC/ NSS/ Sports/ Extra Curricular			2	2						
	Yoga	2		1	2						
	Extra Credits										
	Hrs/ W(Total Credits)&Marks	43			172						4600*/ 4850**

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (MATHS STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
SEMESTER -I

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
First language	ENGLISH PRAXIS COURSE - I		Theory	4	3	40	60	100
Second Language	Telugu/ Sanskrit/ Hindi		Theory	4	3	40	60	100
Life Skill Courses	Computer Applications		Theory	2	2		50	50
Skill Development Course	Electrical Appliances		Theory	2	2		50	50
Major Subject - 1	Mathematics	C1	Theory	6	5	40	60	100
Major Subject - 2	Chemistry	C1	Theory	4	4	40	60	100
	Chemistry		Practical	2	1		50	50
Vocational	Food chemistry- I	C1	Theory	4	4	50	50	100
	Food chemistry- I		Practical	2	1	-	50	50
	Fundamentals of Food Technology	C2	Theory	2	2	-	50	50
	Fundamentals of Food Technology		Practical	2	1	-	50	50
			TOTAL	34	28	210	590	800

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (MATHS STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
SEMESTER –II

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
First language	ENGLISH PRAXIS COURSE - II		Theory	4	3	40	60	100
Second Language	Telugu/ Sanskrit/ Hindi		Theory	4	3	40	60	100
Life Skill Courses	Information and Communication Technology		Theory	2	2	-	50	50
Skill Development Course - 1	Food Adulteration		Theory	2	2	-	50	50
Skill Development Course - 1	Solar Energy		Theory	2	2	-	50	50
Major Subject - 1	Mathematics	C2	Theory	6	5	40	60	100
Major Subject - 2	Chemistry	C2	Theory	4	4	50	50	100
	Chemistry		Practical	2	1	-	50	50
Vocational	Food Packaging - I	C3	Theory	4	4	50	50	100
	Food Packaging - I		Practical	2	1	-	50	50
	Cereals and Grain Science Technology	C4	Theory	2	2	-	50	50
	Cereals and Grain Science Technology		Project	2	1	-	50	50
			TOTAL	36	30	220	630	850

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (MATHS STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
Semester –III

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
First language	ENGLISH PRAXIS COURSE - III		Theory	4	3	40	60	100
Second Language	Telugu/ Sanskrit/ Hindi		Theory	4	3	40	60	100
Life Skill Course - I	Environment Education		Theory	2	2	-	50	50
Life Skill Course - II	Personality Development and Leadership		Theory	2	2	-	50	50
Skill Development Course	Environment Audit		Theory	2	2	-	50	50
Major Subject - 1	Mathematics	C3	Theory	6	5	40	60	100
Major Subject - 2	Chemistry	C3	Theory	4	4	40	60	100
	Chemistry		Practical	2	1	-	50	50
Vocational	Food Chemistry - II	C5	Theory	4	4	40	60	100
	Food Chemistry - II		Practical	2	1	-	50	50
	Bakery and Confectionary	C6	Theory	2	2	-	50	50
	Bakery and Confectionary		Project	2	1	-	50	50
			TOTAL	36	30	200	650	850

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (MATHS STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
Semester –IV

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
Major Subject - 1	Mathematics	C4	Theory	6	5	40	60	100
	Mathematics	C5	Theory	6	5	40	60	100
Major Subject - 2	Chemistry	C4	Theory	4	4	40	60	100
	Chemistry		Practical	2	1	-	50	50
	Chemistry	C5	Theory	4	4	40	60	100
	Chemistry		Practical	2	1	-	50	50
Vocational	Food packaging - II	C7	Theory	4	4	40	60	100
	Food packaging - II		Practical	2	1	-	50	50
	Dairy Technology	C8	Theory	4	4	40	60	100
	Dairy Technology		Practical	2	1	-	50	50
			TOTAL	36	30	240	560	800

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (MATHS STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)

Semester -V

Subject / Paper	Theory / Practical	No of credits	Evaluation
First Phase of Apprenticeship between 1st and 2nd year (Summer Vacation)		04	100
Second Phase of Apprenticeship between 2nd and 3rd year (Summer Vacation)		04	100
INDUSTRIAL INTERNSHIP		12	200
TOTAL		20	400

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (MATHS STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
Semester –VI

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
Vocational	Food Microbiology	C9	Theory	4	4	40	60	100
	Food Microbiology		Practical	2	1	-	50	50
	Pulses and Oil Seed Technology	C10	Theory	4	4	40	60	100
	Pulses and Oil Seed Technology		Practical	2	1	-	50	50
	Post harvest management of fruits and vegetables	C11	Theory	4	4	40	60	100
	Post harvest management of fruits and vegetables		Practical	2	1	-	50	50
	Food quality and Sensory evaluation	C12	Theory	4	4	40	60	100
	Food quality and Sensory evaluation		Practical	2	1	-	50	50
	Food preservation Technology	C13	Theory	4	4	40	60	100
	Food preservation Technology		Practical	2	1	-	50	50
	Technology of meat , fish and poultry	C14	Theory	4	4	40	60	100
	Technology of meat , fish and poultry		Practical	2	1	-	50	50
			TOTAL	36	30	240	660	900

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (BIOLOGY STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
SEMESTER -I

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
First language	ENGLISH PRAXIS COURSE - I		Theory	4	3	40	60	100
Second Language	Telugu/ Sanskrit/ Hindi		Theory	4	3	40	60	100
Life Skill Courses	Computer Applications		Theory	2	2		50	50
Skill Development Course	Plant nursery		Theory	2	2		50	50
Major Subject - 1	Botany	C1	Theory	4	4	40	60	100
	Botany		Practical	2	1	-	50	50
Major Subject - 2	Chemistry	C1	Theory	4	4	40	60	100
	Chemistry		Practical	2	1		50	50
Vocational	Food Chemistry- I	C1	Theory	4	4	40	60	100
	Food Chemistry- I		Practical	2	1	-	50	50
	Fundamentals of Food Technology	C2	Theory	2	2	-	50	50
	Fundamentals of Food Technology		Practical	2	1	-	50	50
			TOTAL	34	28	200	650	850

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (BIOLOGY STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
SEMESTER –II

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
First language	ENGLISH PRAXIS COURSE - II		Theory	4	3	40	60	100
Second Language	Telugu/ Sanskrit/ Hindi		Theory	4	3	40	60	100
Life Skill Courses	Information and Communication Technology		Theory	2	2	-	50	50
Skill Development Course - 1	Food Adulteration		Theory	2	2	-	50	50
Skill Development Course - 1	Fruits and vegetables preservation		Theory	2	2	-	50	50
Major Subject - 1	Botany	C2	Theory	4	4	40	60	100
	Botany		Practical	2	1	-	50	50
Major Subject - 2	Chemistry	C2	Theory	4	4	40	60	100
	Chemistry		Practical	2	1	-	50	50
Vocational	Food Packaging - I	C3	Theory	4	4	40	60	100
	Food Packaging - I		Practical	2	1	-	50	50
	Cereals and Grain Science Technology	C4	Theory	2	2	-	50	50
	Cereals and Grain Science Technology		Project	2	1	-	50	50
			TOTAL	36	30	200	700	900

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (BIOLOGY STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
Semester –III

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
First language	ENGLISH PRAXIS COURSE - III		Theory	4	3	40	60	100
Second Language	Telugu/ Sanskrit/ Hindi		Theory	4	3	40	60	100
Life Skill Course - I	Environment Education		Theory	2	2	-	50	50
Life Skill Course - II	Personality Development and Leadership		Theory	2	2	-	50	50
Skill Development Course	Environment Audit		Theory	2	2	-	50	50
Major Subject - 1	Botany	C3	Theory	4	4	40	60	100
	Botany		practical	2	1	-	50	50
Major Subject - 2	Chemistry	C3	Theory	4	4	40	60	100
	Chemistry		Practical	2	1	-	50	50
Vocational	Food Chemistry - II	C5	Theory	4	4	40	60	100
	Food Chemistry- II		Practical	2	1	-	50	50
	Bakery and Confectionary	C6	Theory	2	2	-	50	50
	Bakery and Confectionary		Project	2	1	-	50	50
			TOTAL	36	30	200	700	900

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (BIOLOGY STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
Semester –IV

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation		
						Internal	External	TOTAL
Major Subject - 1	Botany	C4	Theory	4	4	40	60	100
	Botany		Practical	2	1	-	50	50
	Botany	C5	Theory	4	4	40	60	100
	Botany		Practical	2	1	-	50	50
Major Subject - 2	Chemistry	C4	Theory	4	4	40	60	100
	Chemistry		Practical	2	1	-	50	50
	Chemistry	C5	Theory	4	4	40	60	100
	Chemistry		Practical	2	1	-	50	50
Vocational	Food Packaging - II	C7	Theory	4	4	40	60	100
	Food Packaging - II		Practical	2	1	-	50	50
	Dairy Technology	C8	Theory	4	4	40	60	100
	Dairy Technology		Practical	2	1	-	50	50
			TOTAL	36	30	240	660	900

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (BIOLOGY STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)

Semester -V

Subject / Paper	Theory / Practical	No of credits	Evaluation
First Phase of Apprenticeship between 1 st and 2 nd year (Summer Vacation)		04	100
Second Phase of Apprenticeship between 2 nd and 3 rd year (Summer Vacation)		04	100
INDUSTRIAL INTERNSHIP		12	200
TOTAL		20	400

P.R. GOVERNMENT COLLEGE (A), KAKINADA
DEPARTMENT OF CHEMISTRY
B. VOC (FOOD TECHNOLOGY) (BIOLOGY STREAM)
CURRICULAR FRAMEWORK (CREDITS TABLE)
Semester –VI

Category	Subject / Paper	Course	Theory / Practical	No. of Hrs./ Week	No of credits	Evaluation			
						Internal	External	TOTAL	
Vocational	Food Microbiology	C9	Theory	4	4	40	60	100	
	Food Microbiology		Practical	2	1	-	50	50	
	Pulses and Oil Seed Technology	C10	Theory	4	4	40	60	100	
	Pulses and Oil Seed Technology		Practical	2	1	-	50	50	
	Post Harvest Management Of Fruits And Vegetables	C11	Theory	4	4	40	60	100	
	Post Harvest Management Of Fruits And Vegetables		Practical	2	1	-	50	50	
	Food Quality And Sensory Evaluation	C12	Theory	4	4	40	60	100	
	Food Quality And Sensory Evaluation		Practical	2	1	-	50	50	
	Food Preservation Technology	C13	Theory	4	4	40	60	100	
	Food Preservation Technology		Practical	2	1	-	50	50	
	Technology Of Meat , Fish And Poultry	C14	Theory	4	4	40	60	100	
	Technology Of Meat , Fish And Poultry		Practical	2	1	-	50	50	
				TOTAL	36	30	240	660	900

PITHAPUR RAJAH'S GOVERNMENT COLLEGE(AUTONOMOUS), KAKINADA

B.VOC COURSES UNDER NSQF SCHEME

STUDENTS ELIGIBILITY AND FACULTY ELIGIBILITY

S.NO	NAME OF THE COURSE	STUDENTS ELIGIBILITY (10+2 OR EQUIVALENT WITH SPECIFIC GROUP IF ANY)	FACULTY ELIGIBILITY WITH SPECIALIZATION
1	B.VOC(COMMERCIAL AQUACULTURE)	Intermediate/10+2 or equivalent with Bi.P.C/Biology	M. Sc Aquaculture/MarineBiology/Zoologywithfisherybiologyspe
2	B.VOC(HORTICULTURE)	Intermediate/10+2 or equivalent with Bi.P.C/Biology	M.Sc Horticulture/Biology/Botany with Horticulture Specialization
3	B.VOC(PHARMACEUTICAL CHEMISTRY)	Intermediate or 10+2 with MPC/BIPC group	M. Pharm /M.Sc (Pharmaceutical Chemistry)/ M.Sc(Chemistry)
4	B.VOC(FOOD TECHNOLOGY)	Intermediate or 10+2 with MPC/BIPC group	M.Sc(Food Technology)/ M.Sc(Food Processing)/ M.Sc(Food and Nutrition)/ M. Sc (Foods, Drugs & Water)
5	B.VOC(JOURNALISM AND MASS COMMUNICATION)	Intermediate or 10+2 or equivalent	M.A(Journalism)
6	B.VOC(HOTEL MANAGEMENT)	Intermediate/10+2 or equivalent	MBA(Hotel Management/M.Com Hotel Management/M.Com or MBA with Diploma in Hotel Management

P. R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
B. VOC (PHARMACEUTICAL CHEMISTRY) & B. VOC (FOOD TECHNOLOGY)
INTRODUCTION OF REVISED CBCS FROM THE YEAR 2020-21
SELECTION OF LIFE SKILL COURSES AND SKILL DEVELOPMENT COURSES FOR
B. VOC (PHARMACEUTICAL CHEMISTRY) & B. VOC (FOOD TECHNOLOGY)

The Departments of B. Voc (Pharmaceutical Chemistry) & B. Voc (Food Technology) resolved to adopt the revised CBCS from the academic year 2020-21 by introducing Life Skill Courses and Skill Development Courses as per APSCHE & Adikavi Nannaya University guidelines.

Courses	Sem-I	Sem-II	Sem-III	Sem-IV	Sem-V
Life Skills	1 (02)	1 (02)	2 (04)		
Skill Development	1 (02)	2 (04)	1 (02)		

The following courses are selected for B. Voc (Pharmaceutical Chemistry) & B. Voc (Food Technology)

Sem	Life Skill Courses	Preferred Teaching Dept.	Skill Development Courses	Preferred Teaching Dept.
I	1. Computer Applications	Computers	Electrical Appliances (B. Voc Maths Stream)	Physics
			Plant Nursery (B. Voc Biology Stream)	Botany
II	1. Information and Communication Technology	Computers	1. Food Adulteration	Chemistry
			2. Solar Energy (B. Voc Maths Stream)	Physics
			2. Fruit & Vegetable Preservation (B. Voc Biology Stream)	Botany
III	1. Environment Education	Botany/Zoology/ Environmental Sciences/Any Dept.	1. Environment Audit	Chemistry
	2. Personality Development and Leadership	English/ Any Dept		

SEMESTER - I

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – I
COURSE – 1: FOOD CHEMISTRY- I

Hrs. 4

CREDITS: 4

OBJECTIVES :

- To acquaint various functional chemical constituents of food.
- To build a relationship between the dynamic forces of food and the dynamic forces of digestion and growth.

Unit – I

Introduction and Water in foods: Introduction to chemistry of foods; composition and factors affecting food composition;

Chemistry of water: Review of structure and properties of water; Concept of water activity and shelf of foods; Moisture sorption isotherms; Phase transition of foods containing water; WLF reaction

Unit – II

Carbohydrates: Overview, Properties and classification; Monosaccharides, disaccharides and sweeteners; Sugars – types and properties; Polysaccharides: starch, cellulose, pectic substances, enzymes and its use in foods; Properties (gel formation and starch degradation, dextrinization, Browning reactions – Enzymatic & Non- enzymatic browning);

Unit – III

Proteins : Classification; Physical, chemical and functional properties of proteins and amino acids; Hydrolysis of proteins; Physical, chemical and nutritional changes of proteins during processing. Protein denaturation; Texturised proteins; Protein isolates; Protein hydrolysates;

Unit – IV

Oils and Fats : Classification, composition, Sources, physical and chemical properties, hydrolysis, hydrogenation, rancidity and flavor reversion, winterization, refining of oils, rendering, emulsions; Fat crystallization and application in foods; Quality determination of fats and fatty acids;

References :

1. Campbell, M K and Farrell, S O-Biochemistry 5th edition-international student, 2006
2. Damodaran,S., Parkin , K L.,Fennema, O R., Fennema's Food Chemistry- 4th edition, CRC press Taylor and Francis Group, New York 2008.
3. Fennema, O R. -Food Chemistry 3rd edition, Marcel Dekker Inc, New York., 1996.
4. Manay, N.S, Shadaksharaswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
5. Meyer, L H-Food Chemistry. CBS publishers & distributors, New Delhi. 2002

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – I
COURSE – 1: (FOOD CHEMISTRY-1)**

WEIGHTAGE TO CONTENT

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	1	2	20
2.	UNIT -II	2	2	30
3.	UNIT -III	1	2	20
4.	UNIT -IV	2	1	25
	Total	6	7	95

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – I
COURSE – 1: FOOD CHEMISTRY- I**

Time 2hrs.

Max marks-50M

PART-I

SECTION-A

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

3x10=30M

1. One question is to be set from unit-I
2. One question is to be set from unit-II
3. One question is to be set from unit-II

SECTION-B

4. One question is to be set from unit-III
5. One question is to be set from unit-IV
6. One question is to be set from unit-IV

PART-II

Answer any FOUR questions

4x5=20M

1. One question is to be set from unit-I
2. One question is to be set from unit-I
3. One question is to be set from unit-II
4. One question is to be set from unit-II
5. One question is to be set from unit-III
6. One question is to be set from unit-III
7. One question is to be set from unit-IV

**B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – I
COURSE – 1: FOOD CHEMISTRY- I
QUESTION BANK**

**SECTION – A
ESSAY QUESTIONS (10M)**

UNIT – I

1. Write about food composition and factors effecting food composition
2. Write about moisture sorption isomerism
3. Write about phase transition of food containing water

UNIT – II

1. Explain enzymatic and non enzymatic browning reaction
2. Define enzymes and uses in foods

UNIT III

1. Explain physical, chemical and nutritional changes of proteins during processing
2. Explain physical, chemical and functional properties of proteins and amino acids

UNIT IV

1. Explain the following
 - 1) Rancidity in oils and fats
 - 2) Hydrogenation
2. Explain quality determination of fats and fatty acids

SECTION –B

SHORT QUESTIONS (5M)

UNIT I

1. Write a short note on concept of water activity
2. Write about WLS reaction

UNIT II

1. Write a note on technique substances
2. Write a short note on dextrinization
3. write a note on gel formation

UNIT III

1. Write a note on protein denaturation
2. Write a note on protein hydroxylation
3. Write a short note on texturized proteins

UNIT IV

1. Define and classify oils and fats
2. Write a note on hydrolysis of oils and fats
3. Write a short note on flavor reversion
4. Write about the applications of oils and fats in food

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – I
COURSE – 1: FOOD CHEMISTRY- I**

PRACTICALS:

1. Qualitative tests for sugars - glucose, fructose, lactose, maltose and glucose.
2. Qualitative tests for proteins.
3. Qualitative tests for minerals
4. Demonstration Experiments.
 - a. Estimation of total nitrogen in foods (Micro or Macro Kjeldahl methods)
 - b. Lipid extraction
5. Standardization of Sodium Hydroxide by Oxalic acid.

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – I
COURSE – 2: FUNDAMENTALS OF FOOD TECHNOLOGY

Hrs.: 2

CREDITS – 2

Objectives:

- To deliver a sequence of steps to produce an acceptable and quality food product from raw materials.
- Study of scientific and technological advancements in food processing.

Unit – I

Classification of Food : Definition of food, classification of foods- based on origin, pH, nutritive value, functions of food, Health food, ethnic food;

Emerging trends in food technology: Organic food – Advantages and limitations; Functional foods and Nutraceuticals; Fabricated foods, Convenience foods, Processed foods; Food fortification;

Unit – II

Unit operations in food processing technology:

Raw material handling : Cleaning; Sorting based on shape, size, color and weight; Grading; Various types of peeling; Size reduction of solids foods and liquid foods (emulsification and homogenization) and its effect on foods; Mixing and forming of foods- efficiency, principles and its applications;

Unit - III

Thermal operations: Blanching, pasteurization, Heat sterilization, Evaporation and distillation, Extrusion, Dehydration, Baking and roasting, Cooling and Freezing;

Post –processing operations: Coating or enrobing, Packaging, filling and sealing of containers

Unit – IV

Fermentation and enzyme technology – Theory, types of fermentations, effect on foods, Applications of enzymes in food processing; Theory of irradiation , Detection of irradiated foods – physical, chemical and biological methods; benefits of irradiation;

References:

1. Brian E. Grimwood, Coconut Palm Products: Their Processing in Developing Countries, 1979.

2. Hui, Y H and Associate Editors; Hand Book of Food Products Manufacturing Vol I, Wiley- Interscience, New Jersey 2007.
3. Hui, Y H and Associate Editors; Hand Book of Food Products Manufacturing Vol II, Wiley- Interscience, New Jersey 2007.
4. Manay, N.S, Shadakshara swamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
5. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi. 2000.

WEIGHTAGE TO CONTENT

S.NO	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	1	2	20
2.	UNIT -II	2	2	30
3.	UNIT -III	1	2	20
4.	UNIT -IV	2	1	20
	Total	6	7	95

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – I
COURSE – 2: FUNDAMENTALS OF FOOD TECHNOLOGY**

Time 2hrs.

Max. Marks-50M

PART-I

SECTION-A

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

3x10=30M

1. One question is to be set from unit-I
2. One question is to be set from unit-II
3. One question is to be set from unit-II

SECTION-B

4. One question is to be set from unit-III
5. One question is to be set from unit-IV
6. One question is to be set from unit-IV

PART-II

Answer any FOUR questions. Each Question carries 5 Marks. 4x5=20M

1. One question is to be set from unit-I
2. One question is to be set from unit-I
3. One question is to be set from unit-II
4. One question is to be set from unit-II
5. One question is to be set from unit-III
6. One question is to be set from unit-III
7. One question is to be set from unit-IV

P.R.GOV.T.COLLEGE (A), KAKINADACHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – I
COURSE – 2: FUNDAMENTALS OF FOOD TECHNOLOGY
QUESTION BANK
SECTION I
ESSAY QUESTIONS (10M)

1. Define food and classification of food based on origin, pH and nutritional values
2. Explain the following
 - i) organic food along with advantages and limitations
 - ii) Functional food and Nutraceuticals

UNIT II

1. Explain about raw material handling and cleaning, softing based on shape size, colour and weight
2. Explain about mixing ,forming of food efficiency, principles and applications

UNIT III

1. Explain the following
 - i) Sterilization
 - ii) Evaporation and distillation
2. Explain about packing, filling and sealing of containers

UNIT IV

1. Define fermentation and types of fermentation and its effects on food
2. Define irradiated foods – physical, chemical and biological methods and benefits of irradiation.

SECTION B
SHORT QUESTIONS (5M)

UNIT I

1. Write a short note on health food and ethnic food
2. Write a short note on fabricated foods
3. Write a short note on food fortification

UNIT II

1. Write about size reduction of solid food and its effects on food
2. Write about size reduction of liquid food and its effects on food

3. Write a short note on types of peeling

UNIT III

1. Write a short note on pasteurization
2. Write a short note on baking and roasting
3. Write a short note on cooling and freezing
4. Write a short note on coating or enrobing

UNIT IV

1. Write about applications of enzymes in food processing.
2. Write a short note on detection of irradiation foods
3. Write a short note on benefits of irradiation foods

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – I**

COURSE – 2: FUNDAMENTALS OF FOOD TECHNOLOGY

Practicals

1. Physical characteristics of Wheat.
2. Estimation of Gluten Content of flour.
3. Fermenting power of yeast.
4. Physical Characteristics of Rice and paddy.
5. Determination of sedimentation power of flour.

SEMESTER - II

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 3: FOOD PACKAGING - I

Hrs : 4

Credits : 4

Objectives :

- To know various kinds of packaging materials used in food processing.
- To bring awareness about the modern concepts of food packaging techniques.

Unit – I

Introduction to food packaging : Definition, importance and scope of packaging, functions and requirements for effective packaging, packaging criteria, Classification of packaging- Primary, secondary and tertiary packaging, Flexible, rigid and Semi- rigid packaging.

Unit – II

Materials for food packaging : Paper, Glass, Tin, Aluminium: TFS, Polymer coated tin free steel cans, cellophane, plastics-LDPE, HDPE, LLDPE, HMHDPE, Polypropylene, polystyrene, polyamide, polyester, polyvinyl chloride, Metal and other packaging materials;

Advantages and Disadvantages of different packaging materials; Effect of packaging materials on food commodities; Role of ideal packaging materials; Selection criteria of packaging material for raw and processed foods;

Unit – III

Modern concepts of packaging technology - Aseptic packaging of foods : Carton system, Can, Bottle, Sachet and Pouch System, Cup systems, Vacuum, Gas and Shrink Packaging; Integrity testing of aseptic packages; Active and intelligent packaging system; Modified Atmosphere Packaging (MAP);

Unit – IV

Packaging testing: Determination of parameters of different packaging materials; Identification of different packaging materials;

Quality testing of packaging materials: Paper & paper boards-thickness, bursting strength, grammage, puncture resistance, Cobbs test, tearing resistance. Flexible packaging materials (plastics)-yield, density, tensile strength, elongation, impact of resistance, WVTR, GTR, Overall Migration Rate, seal strength.

References :

1. Robertson, G, L., Food packaging Principles and practice, 3rd edition, CRC Press, 2013.
2. Sharma, H., Food packaging technology. Agrimoon.com
3. Cruess, W.V. Commercial Fruit & Vegetable Products. Allied Scientific Publishers, New Delhi. 2003
4. Davis, E.G. Evaluation of tin & plastic containers for foods. CBS Publishers, New Delhi. 2004
5. Sacharow, S., Griffin, R.C. Food Packaging. AVI Publishing Company, West Port, Connecticut. 2000

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 3: FOOD PACKAGING –I**

WEIGHTAGE TO CONTENT

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT –I	1	2	20
2.	UNIT –II	2	2	30
3.	UNIT –III	1	1	15
4.	UNIT –IV	2	2	30
	Total	6	7	95

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 3: FOOD PACKAGING - I**

Time :2hrs

Max marks-50M

PART-I

SECTION-A

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

3x10=30M

1. One question is to be set from unit-I
2. One question is to be set from unit-II
3. One question is to be set from unit-II

SECTION-B

4. One question is to be set from unit-III
5. One question is to be set from unit-IV
6. One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

1. One question is to be set from unit-I
2. One question is to be set from unit-I
3. One question is to be set from unit-II
4. One question is to be set from unit-II
5. One question is to be set from unit-III
6. One question is to be set from unit-IV
7. One question is to be set from unit-IV

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 3: FOOD PACKAGING –I
QUESTION BANK
SECTION A
EASSY QUESTIONS (10M)

UNIT I

1. Write about packaging criteria and classification of packaging
2. Define packaging and write about functions and requirements of effective packaging

UNIT II

1. Write about following materials of food packaging
 - i) Glass
 - ii) Paper
 - iii) Tin
2. Write about following materials of food packaging
 - i) Cellophane
 - ii) HDPE
 - iii) LLDPE
3. Write about following materials of food packaging
 - i) Polypropylene
 - ii) Polystyrene
 - iii) Polyamide

UNIT III

1. Define aseptic packaging of foods and write any 4 types of aseptic packaging.2. Define packaging and write about active and intelligent packaging system

UNIT IV

1. Write about determination of parameters of different packaging materials
2. Write about the following quality testing of packaging materials i) paper and paper boards thickness ii) bursting strength

SECTION B

SHORT QUESTIONS (5M)

UNIT I

1. Write a short note on semi rigid packaging
- . 2. Write a short note on importance and scope of packaging

UNIT II

1. Write about advantages and disadvantages of different packaging materials
- . 2. Write about role of ideal packaging materials
- . 3. Write a note on selection criteria of packaging material for raw and processed foods

UNIT III

1. Write a note on sachet and pouch system
- . 2. Write a short note on modified atmosphere packaging (MAP)
- . 3. Write about integrity testing of aseptic packages

UNIT IV

1. Write a short note on tearing resistance and impact of resistance
- . 2. Write a short note on overall migration rate
- . 3. Write a note on tensile strength and seal strength.

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 3: FOOD PACKAGING –I**

Practicals

- 1 Preparation of Bread
- 2 Preparation of Biscuit
- 3 Preparation of Cake
- 4 Determination of Physical parameters of wheat and rice.
- 5 Estimation of protein by Biuret and Lowry method.

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 4: CEREAL AND GRAIN SCIENCE TECHNOLOGY

Hrs: 2

Credits: 2

Objectives :

- To explain the milling processes of various cereal group foods.
- To know about various by-products of cereals during processing.
- To bring awareness regarding the ready-to-serve cereal based breakfast and snack foods.

Unit - I

Rice : Cereal grain structure, composition of rice, Processing- Milling, parboiling– Avorio process, conversion process, Malek process and Fernandez process and its advantages.

Unit - II

By products of cereals

starch, gluten, dextrose, dextrin, bran, broken grains, parched rice, puffed rice, flaked rice, popped rice, hulls, rice pollards, bran oil, germ and germ oil, husk, straw.

Unit - III

Wheat: Classification of wheat, structure and composition, Harvesting and storage: Harvesting the grain, cleaning the grain and storage, wheat milling, wheat products: whole wheat flour, maida, semolina, macaroni products and its method of preparation: macaroni, spaghetti and vermicelli.

Unit - IV

Breakfast cereals: Definition, Nutritive value of breakfast cereals, and classification of breakfast cereals: uncooked breakfast cereals and ready to eat cereals: processing of ready –to-eat cereals (Batch cooking, continuous cooking and extrusion cookers) and products (flaked cereals, puffed cereals, shredded products, granular products).

References:

1. David Dendy A.V, etal; Cereals and Cereal Products: Technology and Chemistry, - 2000
2. Manay, N.S, Shadakshara swamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
3. Potter, N.N. and Hotchkiss J. H. Food Science. CBS publishers and distributors. 1996.
4. Sri Lakshmi, B. Food Science. New Age International Publishers, New Delhi, 2003.
5. Subbalakshmi, G and Udipi, S.A. Food processing and preservation. New Age International Publishers, New Delhi, 2001.

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 4: CEREAL AND GRAIN SCIENCE TECHNOLOGY**

WEIGHTAGE TO CONTENT

C	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	1	2	20
2.	UNIT -II	1	2	20
3.	UNIT -III	2	2	30
4.	UNIT -IV	2	1	25
	Total	6	7	95

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 4: CEREAL AND GRAIN SCIENCE TECHNOLOGY

Time 2hrs.

Max. Marks-50M

PART-I

SECTION-A

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

3x10=30M

1. One question is to be set from unit-I
2. One question is to be set from unit-II
3. One question is to be set from unit-III

SECTION-B

4. One question is to be set from unit-III
5. One question is to be set from unit-IV
6. One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions. Each Question carries 5 Marks. 4x5=20M

1. One question is to be set from unit-I
2. One question is to be set from unit-I
3. One question is to be set from unit-II
4. One question is to be set from unit-II
5. One question is to be set from unit-III
6. One question is to be set from unit-III
7. One question is to be set from unit-IV

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 4: CEREAL AND GRAIN SCIENCE TECHNOLOGY
QUESTION BANK
SECTION A
ESSAY QUESTIONS (10M)

UNIT I

1. Explain the following
 1. Avorio process
 2. Parboiling
2. Explain the following
 1. Malek process
 2. Fernandez process

UNIT II

1. Explain the following byproducts of cereals
 1. Parched rice
 2. puffed rice
 3. Flaked rice
 4. popped rice
2. Explain the following byproducts of cereals
 1. Bran oil
 2. germ oil
 3. broken rice
 4. husk

UNIT III

1. Explain harvesting, cleaning and storage of wheat
2. Explain the classification, composition and structure of wheat

UNIT IV

1. Define breakfast cereals explain the classification of breakfast cereals
2. Explain the processing of ready to eat cereals
3. Explain different breakfast cereal products

SECTION B
SHORT QUESTIONS (5M)

UNIT I

1. Write about the advantages of Fernandez process
2. Write about the advantages of milling process
3. Write a short note on composition of rice

UNIT II

1. Write a short note on starch and gluten
2. Write a short note on dextrose and dextrin

UNIT III

1. Explain any 2 wheat products
2. Explain the preparation of gels
3. Explain the preparation of macaroni

UNIT IV

1. Explain the nutritive values of cereals
2. Write a note on uncooked breakfast cereals

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
FIRST YEAR SEMESTER – II
COURSE – 4: CEREAL AND GRAIN SCIENCE TECHNOLOGY

Projects on:

1. Market and literature survey to identify the concepts of new products based on special dietary requirements, functionality, convenience and improvisation of existing traditional Indian foods.
2. Screening of product concept on the basis of techno-economic feasibility.
3. Visit to any confectionary and learn the manufacture of cake, biscuits, breads etc.

SEMESTER - III

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – III
COURSE – 5: FOOD CHEMISTRY-2

Hrs.: 4

Credits :4

Objectives :

- To acquaint various functional chemical constituents of food.
- To know the different applications of food compounds involved in food processing.

Unit – I

Natural Food Pigments- Introduction, Chemistry, Properties, classification ; Food pigments(chlorophyll, carotenoids, anthocyanins and flavonoids, beet pigments, caramel; Changes during processing of pigments; Food colorants – Natural and synthetic;

Unit – II

Flavor chemistry: Chemistry of taste and aroma compounds; Natural flavors; Process flavors; Artificial flavors; Flavor enhancers; Flavor deterioration in foods;

Food additives: Food additives, definition, objectives, functional classification, natural and synthetic additives, health and safety aspects of food additives;

Unit – III

Enzymes in Foods : introduction, Classification, Factors influencing enzyme activity; Enzyme inhibitors in foods; Enzyme inactivation and control in foods; Enzymes in food processing; Enzymes in waste management;

Unit – IV

Colloids in foods : Types, Surface properties of foods –Surface tension, surface activity, and interfacial tension; Colloidal systems in Food – Sols, gels, emulsions and foams. Emulsifying agents – their uses in foods;

References :

1. Campbell, M K and Farrell, S O-Biochemistry 5th edition-international student, 2006
2. Damodaran,S., Parkin , K L.,Fennema, O R., Fennema's Food Chemistry- 4th edition, CRC press Taylor and Francis Group, New York 2008.
3. Fennema, O R. -Food Chemistry 3rd edition, Marcel Dekker Inc, New York., 1996.
4. Manay, N.S, Shadaksharaswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
5. Meyer, L H-Food Chemistry. CBS publishers & distributors, New Delhi. 2002

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – III
COURSE – 5: FOOD CHEMISTRY-2**

WEIGHTAGE TO CONTENT

S.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	2	2	30
2.	UNIT -II	2	2	30
3.	UNIT -III	2	2	30
4.	UNIT -IV	2	2	30
	Total	8	8	120

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – III
COURSE – 5: FOOD CHEMISTRY-2

Time 2hrs.30min

Maxmarks-60

SECTION-A

4x10=40 M

Answer the following questions

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-II
3. One question is to be set from unit-III
Or
One question is to be set from unit-III
4. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

5. One question is to be set from unit-I
6. One question is to be set from unit-I
7. One question is to be set from unit-II
8. One question is to be set from unit-II
9. One question is to be set from unit-III
10. One question is to be set from unit-III
11. One question is to be set from unit-IV
12. One question is to be set from unit-IV

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – III
COURSE – 5: FOOD CHEMISTRY-2
QUESTION BANK
SECTION A
EASSY QUESTIONS (10M)**

UNIT I

1. Explain different types of natural food pigments
2. Explain the changes during the processing of food pigments

UNIT II

1. Write an essay on natural flavors
2. Define food additives and explain the health and safety aspects of food additives
3. Write about the following
 - 1) Artificial flavors
 - 2) Flavor enhances

UNIT III

1. Define enzymes and explain the factors influencing enzyme activity
2. Explain the role of enzymes in food processing and waste management

UNIT IV

1. Explain different colloidal systems in food
2. Explain surface properties of food

**SECTION B
SHORT QUESTIONS (5M)**

UNIT 1

1. Write a short note on natural food colorants
2. Write a short note on synthetic food colorants
3. Write the properties of the natural food pigments

UNIT II

1. Write a short note on flavored deterioration in foods
2. Write the classification of food additives
3. Write a short note on chemistry of taste

UNIT III

1. Write a note on enzyme inhibitors in foods

2. Write about classification of enzymes

3. Write a note on enzyme inactivation and its control on foods

UNIT IV

1. What are emulsifying agents and their uses in foods

2. Write about different types of colloids in foods.

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – III
COURSE – 5: FOOD CHEMISTRY-2**

Practicals

- | | |
|--------------------------------------------------------|---|
| 1. Estimation of Hardness in water by EDTA | 6 |
| 2. Determination of viscosity of a polymer | 6 |
| 3. Estimation of reducing sugars by dns method. | |
| 4. Estimation of reducing sugars by Fehling method | |
| 5. Estimation of starch content by Iodine Colorimetry. | 6 |

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
SECOND YEAR SEMESTER – III
COURSE- 6: BAKERY AND CONFECTIONERY

Hrs: 2

Credits: 2

Objectives :

- To enable students to develop skill in Bakery & Confectionery Course
- To know the principles of behind various bakery food products

Unit – I

Introduction to bakery and confectionery industry: Importance of bakery and confectionery in food industry - Important cereals used in bakery and confectionery - Flour for the bakery products - Types of flours - Qualities of flour for the production of bakery items - Availability of starch in different grains;

Unit – II

Primary processing equipments used in Bakery and Confectionery – Chakki, Flour Mill, mixer, moulding machine, balance, packing machines, measuring glass, moulds, knives, extruder, oven ; Dough development, Rheological testing of dough-principles of Farinograph, Mixograph, Extensograph, Amylograph / Rapid Visco Analyzer, Falling number, Hosney's dough stickiness tester;

Unit – III

Bread and cake - Principle involved in production of Bread - Principle involved in production of Cake - Different types of Bread and cakes and their applications - Ingredients used in its production of Bread ; Ingredients used in its production of Cake.

Biscuits and Cookies - Principle involved in biscuits production - Principle involved in cookies production. Different types of biscuits and cookies and their uses. Ingredients used in biscuits production and Ingredients used in cookies production

Unit – IV

Principles of confectionary production - Characteristics of confectionary products-Types of confectionary products - Ingredients used in confectionary products ; Chocolate Processing - Boiled Sweets - Gelatin Sweets - Crystallized confectionery

References:

- 1) W.P. Edwards: Science of Bakery Products.
- 2) John Kingslee: A professional text to bakery and confectionary, New Age International Publication.
- 3) NIIR Board: The complete technology book on bakery products
- 4) Emmanuel Obene : Chocolate science and Technology

**P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
SECOND YEAR SEMESTER – III
COURSE- 6: BAKERY AND CONFECTIONERY**

WEIGHTAGE TO CONTENT

C	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	2	1	25
2.	UNIT -II	1	2	20
3.	UNIT -III	1	2	20
4.	UNIT -IV	2	1	25
	Total	6	6	90

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
SECOND YEAR SEMESTER – III
COURSE- 6: BAKERY AND CONFECTIONERY

Time 2hrs.

Max. Marks-50M

SECTION-A

Answer the following questions. Each Question carries 10 Marks 3x10=30 M

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-III
3. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions. Each Question carries 5 Marks. 4x5=20M

4. One question is to be set from unit-I
5. One question is to be set from unit-II
6. One question is to be set from unit-II
7. One question is to be set from unit-III
8. One question is to be set from unit-III
9. One question is to be set from unit-IV

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
SECOND YEAR SEMESTER – III
COURSE- 6: BAKERY AND CONFECTIONERY
QUESTION BANK
SECTION A
ESSAY QUESTIONS (10M)

UNIT I

1. Explain the importance of bakery and confectionary in food industry
2. Explain the different types of flours and quality of flours for the production of bakery item

UNIT II

1. Explain the following principles
 - 1) Farinograph 2) Mixograph 3) Extensograph 4) Amylograph
2. Explain different types of primary processing equipments in bakery and confectionary

UNIT III

1. Explain different types of breads and cakes and their uses
2. Explain different types of biscuits and cookies and their uses
3. Write different types of ingredients used in production of bread and cake
4. Write different types of ingredients used in production of biscuits and cookies

UNIT IV

1. Write briefly about different types of ingredients used in confectionary products
2. Explain the processing of chocolate

SECTION B
SHORT QUESTIONS (5M)

UNIT I

1. Explain the important cereals used in bakery and confectionary
2. Write a note on the availability of starch in different grains

UNIT II

1. Write a short note on Rheological testing of dough
2. Write a note on falling number and Hosney's dough stickiness tester

UNIT III

1. Explain the principal involved in production of bread and cake
2. Explain the principal involved in production of biscuits and cookies

UNIT IV

1. Write the characteristics of confectionary products
2. Write a note on different types of confectionary products
3. Write a note on gelatin sweets

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
SECOND YEAR SEMESTER – III
COURSE- 6: BAKERY AND CONFECTIONERY

Project on

1. Packaging, labeling and shelf-life studies.
2. Texture evaluation of various food samples- cookies/ biscuits/ snack foods

SEMESTER - IV

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
SECOND YEAR SEMESTER – IV
Course - 7: FOOD PACKAGING – II

Hrs. 4/ Week

Credits: 4

Objectives:

- To know the effect of packaging on different processed foods.
- To know the usage of the sustainable treatment of packaging.

Unit – I

Need of Packaging food: Logistics - Merchandising Outlets - Handling - Transportation - Packaging machinery - Technology upgradation - Public distribution - Cost effective packaging - Packaging requirements - Levels of Packaging - Packaging functions - Attractiveness - Protection - Convenience - Printability – Differentiability.

Unit – II

Packaging of horticultural products such as fresh and minimally processed, frozen, canned, dehydrated, vegetable oils;

Packaging of microwavable foods – Transparent materials, absorbent materials, shielding and field modification, and doneness indicators, testing methods and safety;

Unit – III

Packaging of flesh foods and sea foods – Vacuum and MAP packaging; Packaging of dairy products : packaging requirements, materials and packaging techniques; Packages of beverages – water, carbonated soft drinks, coffee, tea, juices, beer and wine;

Unit – IV

Food packaging and sustainability – hierarchy of waste management, source reduction, disposal and recycling, composting, thermal treatment, landfill;

References:

1. Robertson, G, L., Food packaging Principles and practice, 3rd edition, CRC Press, 2013.

2. Sharma, H., Food packaging technology. Agrimoon.com
3. Cruess, W.V. Commercial Fruit & Vegetable Products. Allied Scientific Publishers, New Delhi. 2003
4. Davis, E.G. Evaluation of tin & plastic containers for foods. CBS Publishers, New Delhi. 2004
5. Gopal T.K.S. Seafood packaging, CIFT, Matsyapuri Cochin,2007
6. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi. 2000.
7. Sacharow, S., Griffin, R.C. Food Packaging. AVI Publishing Company, West Port, Connecticut. 2000

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
SECOND YEAR SEMESTER – IV
Course - 7: FOOD PACKAGING – II

WEIGHTAGE TO CONTENT

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	2	2	30
2.	UNIT -II	2	2	30
3.	UNIT -III	2	2	30
4.	UNIT -IV	2	2	30
	Total	8	8	120

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
SECOND YEAR SEMESTER – IV
Course - 7: FOOD PACKAGING – II

Time 2hrs.30min

Maxmarks-60

SECTION-A

Answer the following questions

4x10=40 M

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-II
3. One question is to be set from unit-III
Or
One question is to be set from unit-III
4. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

5. One question is to be set from unit-I
6. One question is to be set from unit-I
7. One question is to be set from unit-II
8. One question is to be set from unit-II
9. One question is to be set from unit-III
10. One question is to be set from unit-III
11. One question is to be set from unit-IV
12. One question is to be set from unit-IV

P.R.GOVERNMENT COLLEGE (A), KAKINADA

CHOICE BASED CREDIT SYSTEM

B.Voc (Food Technology)

SECOND YEAR SEMESTER – IV

Course - 7: FOOD PACKAGING – II

QUESTION BANK

SECTION A

ESSAY QUESTIONS (10M)

UNIT 1

1. Explain the following in food packaging
 - 1) Handling
 - 2) Transportation
2. Explain different levels of packaging
3. Write an essay on
 - 1) Packaging requirements
 - 2) Packaging function

UNIT II

1. Write an essay on packaging of dehydrated products and vegetable oils
2. Write an essay on microbial foods

UNIT III

1. Explain the following
 - 1) Vacuum packaging
 - 2) MAP packaging
2. Explain the packaging of water and carbonated soft drinks
3. Explain the packaging of coffee and tea

UNIT IV

1. Explain briefly about disposal and recycling of food packaging
2. Explain composting, thermal treatment in food packaging

SECTION B

SHORT QUESTIONS (5M)

UNIT I

1. Write a note on Printability and Differentiability
2. Write a note on Logistics in food packaging

UNIT II

1. Write about the safety of microwavable foods

2. Write a note on doneness indicators
3. Write a note on packaging of canned products

UNIT III

1. What are the packaging requirements for packaging of dairy products
 2. Write a note on packaging materials for packaging of dairy products
 3. Write a note on packaging of beer and wine

UNIT IV

1. Write a note on source reduction
 - 2.. Write a note on landfill

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
SECOND YEAR SEMESTER – IV
Course - 7: FOOD PACKAGING – II

PRACTICALS

Chemical and Microbiological Analysis of Milk and Milk Products

1. Hydrogen Peroxide
2. Hypochlorites
3. Formaldehyde (Honnies Test)
4. Boric Acid and Borates
5. Maltodextrins
6. Urea
7. Neutralizers
8. Starch
9. Sugar
10. Salt Mineral Oil

Other Tests:

1. Determination of milk fat (Gerber Method)
2. Testing Fat in Homogenized milk
3. Microscopic observation of fat globules size
4. Determination of SNF (Volumetric Method)
5. Determination of Total Solids
6. Phosphatase Test
7. Determination of Ash content in milk
8. Determination of Protein in milk

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – IV
COURSE – 8: DAIRY TECHNOLOGY

Hrs.: 4

Credits : 4

Objectives :

- To know the importance of milk as an agricultural commodity
- To be innovative in exploring various traditional and nontraditional milk products

Unit – I

Introduction : Definition, different sources of milk and their composition, factors affecting composition of milk. Physico-chemical properties of milk constituents. Microbiology of milk, Collection and transportation of milk. Grading of milk.

Unit – II

Types of processed milk : Pasteurized milk, Sterilized milk, Homogenized milk, Flavored milk, frozen concentrated milk, Fermented milk, Reconstituted milk, Recombined milk, Toned and double toned milk, Vitaminised/ Irradiated milk, milk powder.

Unit – III

Butter, cream, cheese, Ice cream and condensed milk : Definition, classification, composition and nutritive value, method of manufacture, packaging and storage, defects-causes & prevention, and its uses;

Unit – IV

Indigenous Dairy Products : Fat rich products- Ghee, Makkan and Malai. Concentrated Products- Khoa, Rabri and Basundi. Coagulated Products- Chhana and Paneer. Fermented Products- Dahi , Chakka, Shrikhand and Lassi. Frozen Products- Kulfi and Kulfa. Sweet dairy products - Gulab Jamun and Rasagulla.

References :

1. Godbole, N.N; Milk – The Most Perfect Food ; Biotechnology books, 2007
2. Manay, N.S, Shadaksharaswamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
3. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi. 2000.
4. Spreer E and Mixa, A; Milk and Dairy Product Technology; Marcel Dekker, 2005
5. Srilakshmi, B. Food Science (3rd edition), New Age International (P) Limited Publishers, New Delhi, 2003.
6. Sukumar De; Outlines of dairy technology; Oxford University Press; 2001
7. Walstra A, Geurts T.J and Noomen, A; Dairy Technology – Principles of milk and Properties and Processes; Marcel Dekker, 2005

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – IV
COURSE – 8: DAIRY TECHNOLOGY**

WEIGHTAGE TO CONTENT

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	2	2	30
2.	UNIT -II	2	2	30
3.	UNIT -III	2	2	30
4.	UNIT -IV	2	2	30
	Total	8	8	120

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – IV
COURSE – 8: DAIRY TECHNOLOGY**

Time 2hrs.30min

Maxmarks-60

SECTION-A

4x10=40 M

Answer the following questions

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-II
3. One question is to be set from unit-III
Or
One question is to be set from unit-III
4. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

5. One question is to be set from unit-I
6. One question is to be set from unit-I
7. One question is to be set from unit-II
8. One question is to be set from unit-II
9. One question is to be set from unit-III
10. One question is to be set from unit-III
11. One question is to be set from unit-IV
12. One question is to be set from unit-IV

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – IV
COURSE – 8: DAIRY TECHNOLOGY
QUESTION BANK
SECTION A
ESSAY QUESTIONS (10M)**

UNIT I

1. Define milk and write different sources of milk along with their composition
2. Explain Physico and chemical properties of milk constituents

UNIT II

1. Explain the following
 - 1) pasteurized milk
 - 2) flavored milk
 - 3) homogenized milk
2. Explain the following
 - 1) irradiated milk
 - 2) toned and double toned milk
 - 3) recombined milk

UNIT III

1. Write an essay on classification and composition of milk products
2. Explain the method of manufacture of milk products

UNIT IV

1. Write an essay on fat rich products
2. Write an essay on fermented products

**SECTION B
SHORT QUESTIONS (5M)**

UNIT I

1. Write about factors affecting composition of milk
2. Write a short note on microbiology of milk
3. Write a short note on grading of milk
4. Write a short note on collection and transportation of milk

UNIT II

1. Write a short note on milk powder
2. Write a short note on fermented milk
3. Write a short note on reconstituted milk

UNIT III

1. Write a short note on packaging and storage of milk products
2. Write about defects and causes of milk products
3. Write a short note on nutritional value of milk products

UNIT IV

1. Write a short note on sweet diary products
2. Write a short note on concentrated diary products
3. Write a short note on frozen diary products
4. Write a short note on coagulated diary products

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
SECOND YEAR SEMESTER – IV
COURSE – 8: DAIRY TECHNOLOGY**

PRACTICALS:

Testing of Milk Powder

Moisture Content by IMA

Moisture Content by drying method

Titration Acidity

Rosalic Acid Test

Scorched Particles

Ash Content

Insolubility Index Fat Percent (WMP)

Fat percent (SMP)

Bulk Density

Testing of Paneer:

Determination of Moisture

Determination of Fat

Determination of Acidity

SEMESTER - V

**INDUSTRIAL
INTERNSHIP FOR THE
ENTIRE V SEMESTER**

SEMESTER - VI

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 9: FOOD MICROBIOLOGY**

Hrs.: 4

Credits :4

Objectives :

- Acquire an elementary knowledge about micro organisms.
- To know the effects of microbial spoilage of foods and its prevention methods.

Unit – I

Introduction : Historical development of food microbiology. Scope of food microbiology; Morphology, general characteristics and classification of bacteria, fungi and algae. Viruses: structure and replication with particular reference to food borne viruses. Primary sources of microorganisms in food.

Unit – II

Factors affecting the growth and survival of micro-organisms in foods: Microbial growth; Intrinsic factors (Nutrient content, pH and buffering activity, Redox potential, Antimicrobial barriers and constituents, Water activity); Extrinsic factors (Relative humidity, Temperature, Gaseous atmosphere); Implicit factors; Predictive food microbiology;

Heat resistance of micro-organisms: Determination of heat resistance (Thermal Death Time), TDT curve, 12Dconcept;

Unit – III

Microbial spoilage of food : Causes of food spoilage; Microbial contamination of water; Spoilage of different group of foods - Milk and milk products; Cereals and cereal products; Fruits, vegetables and their products; Meat and meat products; Fish and fish products; Poultry and eggs; Canned foods.

Unit – IV

Methods and principles of food preservation: Physical: Low temperature; High temperature (pasteurization, canning); Irradiation (UV, microwave, ionization); Drying; High pressure processing;

Chemical preservatives and natural antimicrobial compounds; Biobased preservation systems: LAB and bacteriocins;

References :

1. Frazier, W.C. Food Microbiology. 4th edition. Mc Graw Hill. New York, 2008
2. Khetarpaul, N. Food microbiology, Daya publishing house, New Delhi, 2009
3. Narayanan, L.M. and Mani,L. Microbiology.Saras Publications, Nagercoil.
4. Pelzar, H.J. and Rober, D. Microbiology 5th edition Mc Graw Hill. NewYork, 2009
5. Prescott, L.M., Harley, J.P. and Klein, D.A. Microbiology. 4th edition McGraw-Hill, NewYork. 1999

**P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 9: FOOD MICROBIOLOGY**

WEIGHTAGE TO CONTENT

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	2	2	30
2.	UNIT -II	2	2	30
3.	UNIT -III	2	2	30
4.	UNIT -IV	2	2	30
	Total	8	8	120

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B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 9: FOOD MICROBIOLOGY**

Time 2hrs.30min

Maxmarks-60

SECTION-A

4x10=40 M

Answer the following questions

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-II
3. One question is to be set from unit-III
Or
One question is to be set from unit-III
4. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

One question is to be set from unit-I

5. One question is to be set from unit-I
6. One question is to be set from unit-II
7. One question is to be set from unit-II
8. One question is to be set from unit-III
9. One question is to be set from unit-III
10. One question is to be set from unit-IV
11. One question is to be set from unit-IV

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 9: FOOD MICROBIOLOGY
SECTION A
ESSAY QUESTIONS (10M)

UNIT I

1. Define food microbiology and write the scope of food microbiology
2. Write an essay on general characteristics and classification of bacteria , fungi and algae

UNIT II

1. Write an essay on intrinsic factors of microbial growth
2. Write an essay on extrinsic factors of microbial growth

UNIT III

1. Write an essay on causes and microbial spoilage of milk and milk products
2. Write an essay on microbial spoilage of meat , fish and poultry

UNIT IV

- 1 Write the following physical methods of food preservation
 - 1) High temperature
 - 2) irradiation
- 2 Write the following chemical methods of food preservation
 - 1) Anti microbial compounds
 - 2) biobased preservations

SECTION B
SHORT QUESTIONS (5M)

UNIT I

1. Write a short note on primary sources of microorganisms in food
2. Write a short note on morphology of fungi and algae
3. Write structure and replication of food born virus

UNIT II

1. Write a short note on microbial growth
2. Write a short note on predictive food microbiology
3. Write a note on determination of heat resistance

UNIT III

1. Write a short note on microbial contamination of water
2. Write a short note on spoilage of cereals
3. Write a short note on spoilage of canned foods

UNIT IV

1. Write a short note on high pressure processing
2. Write a short note on low temperature preservations
3. Write a short note on LAB and bacteriocins

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B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 9: FOOD MICROBIOLOGY**

Practicals

- | | |
|--------------------------------------------------------------------|---|
| 1. Laboratory safety and sterilization techniques | 4 |
| 2. Microscopic methods in the identification of microorganisms | 4 |
| 3. Preparation of culture media – nutrient broth and nutrient agar | 4 |
| 4. Staining techniques – grams' and differential. | |
| 5. Isolation of yeast from starchy food sample. | |
| 6. Quantitative analysis of milk by standard plate count method | |

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 10: PULSES & OIL SEED TECHNOLOGY

Hrs.: 4

Credits :4

Objectives :

- To acquire the knowledge about various pulses and oil seed processing methods.
- To know the processing involved in packing and storage of oil seeds and pulses.

Unit – I

Pulse-based food products : Composition and nutritional value of Pulses - Common forms -Green beans, Dry pulses, Canned pulses; Sprouted pulses, traditional fermented products; Developments in pulse products : Quick-cook dehydrated pulses, Extruded pulse products, Snack based products; Value-added pulse based products – roasted pulses, gluten-free products, pulse noodles;

Emerging technologies for pulse processing : Dielectric heating, Pulse electric field treatment, High-pressure processing; Applications;

Unit – II

Production and Processing of oil : Crops of oil seeds - Steps involved in oil processing-pressing, methods of oil extraction from oil seeds, degumming, oil refining, hydrogenation, winterization, deodorizing, bleaching, tempering; Major and minor oil seeds, sources, examples, hydrogenated vegetable oils.

Unit – III

Fat Characterization : Functional properties of fats; Importance of fat analysis, refractive index, melting point, solid fat index, cold test, smoke, flash and fire points, iodine value, saponification number, acid value and free fatty acids, polar components in frying fats, lipid oxidation, peroxide value, Thiobarbituric acid test, Schaal Oven test, active oxygen method.

Unit – IV

Products made from fats and oils: Butter, Margarine, Shortenings and Frying oils, Mayonaisse and salad dressings; Fat substitutes;

Packing and storage of oils and Fats: Packing, packaging materials, factors to be considered during packing, antioxidants, storage.

References :

1. Manay, N.S, Shadakshara swamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
2. Meyer, L H-Food Chemistry. CBS publishers & distributors, New Delhi. 2002
4. Nielsen, S.S. Introduction to the chemical analysis of foods. Jones and Bartlett Publishers, Boston, London. 2003
6. Fereidoon Shahidi, Functional properties of proteins and lipids 7. Clyde, E. Stauffer, Fats and oils
7. Tiwari, B, K., et al., Pulse foods processing, quality and Nutraceuticals applications, Elsevier publications, (2011).

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CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 10: PULSES & OIL SEED TECHNOLOGY**

WEIGHTAGE TO CONTENT

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT –I	2	2	30
2.	UNIT –II	2	2	30
3.	UNIT –III	2	2	30
4.	UNIT –IV	2	2	30
	Total	8	8	120

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 10: PULSES & OIL SEED TECHNOLOGY

Time 2hrs.30min

Maxmarks-60

SECTION-A

4x10=40 M

Answer the following questions

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-II
3. One question is to be set from unit-III
Or
One question is to be set from unit-III
4. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

5. One question is to be set from unit-I
6. One question is to be set from unit-I
7. One question is to be set from unit-II
8. One question is to be set from unit-II
9. One question is to be set from unit-III
10. One question is to be set from unit-III
11. One question is to be set from unit-IV
12. One question is to be set from unit-IV

P.R.GOV.T.COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 10: PULSES & OIL SEED TECHNOLOGY
QUESTION BANK
SECTION A
ESSAY QUESTIONS (10M)

UNIT I

1. Write about the following pulse based food products
 - 1) Dry pulses
 - 2) sprouted pulses
 - 3) green beans
2. Write about the following
 - 1) roasted pulses
 - 2) pulse noodles
 - 3) gluten free products

UNIT II

1. Write an essay on steps involved in oil processing
2. Write an essay on oil extraction from oil seeds

UNIT III

1. Write the following
 - 1) Schaal oven test
 - 2) Thiobarbituric acid test
2. Write an essay on functional properties and importance of fat

UNIT IV

1. Write an essay on packaging and storage of oils and fats
2. Write an essay on any 3 products made from oils and fats

SECTION B
SHORT QUESTIONS (5M)

UNIT I

1. Write a short note on dielectric heating
2. Write a short note on pulse electric field treatment
3. Write a short note on quick cook dehydrated pulses

UNIT II

1. Write a short note on winterization
2. Write a short note on major and minor oil seeds
3. Write a short note on margarine

UNIT III

1. Write a short note on active oxygen method
2. Write a short note on saponification number
3. Write a short note on iodine value

UNIT IV

1. Write a short note on mayonnaise and salad dressing
2. Write a short note on fat substituent..
3. Write a short note on anti oxidants

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CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 10: PULSES & OIL SEED TECHNOLOGY

Practicals

- | | |
|-----------------------------------------------|---|
| 1. Saponification value of oil | 6 |
| 2. Acid value of oil | 6 |
| 3. Iodine value of oil | 6 |
| 4. Estimation of total fat content in oil | 6 |
| 5. Estimation of glycerides in the given oil. | 6 |

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CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 11: POST HARVEST MANAGEMENT OF FRUIT & VEGETABLES

Hrs.: 4

Credits :4

Objectives :

- To know about the processing methods of fruits from the time of harvesting to occurrence of a by-product.
- To know the preparation of various processed foods made with fruits and vegetables.

Unit – I

Introduction : Ripening and quality of fruits, harvesting and transportation, Chemical composition, post harvest changes, cold storage of fruits, selection and preparation of fruits for processing, deskinning, enzyme inactivation, Packaging.

Unit – II

Quality Storage of Fruits and Vegetables: Natural, Ventilated and controlled atmosphere storage, Low temperature storage, Fruit & Vegetable processing plant layout and processing line, Fruit & Vegetable product quality standards & quality control measures.

Unit – III

Canning of fruits and vegetables: basic requirements, process, machinery, operation. Effect on food. Drying/Dehydration of fruits and vegetables: types, process, machinery, operation, Problems related to storage of dehydrated products

Unit – IV

Definitions, formulation and preparation of fruit juices, Jams, jelly, pickles, tomato products (sauce), potato chips: principle, processing techniques.

Processing of vegetables: Processing of okra (ladies finger), potatoes, onions, carrots, green peas, procuring, transportation, storage, processing, packaging and warehousing.

References :

1. Siddappa and Bhatia, Fruits and Vegetable Processing Technology
2. Lea, R. A. W, Fruit juice processing and packaging
3. Hui, Y. H. Processing of fruits
4. Cash J. N. Processing of vegetables
5. Jongen, W. Fruit and vegetable processing

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CHOICE BASED CREDIT SYSTEM
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THIRD YEAR SEMESTER – VI
COURSE – 11: POST HARVEST MANAGEMENT OF FRUIT & VEGETABLES**

WEIGHTAGE TO CONTENT

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	2	2	30
2.	UNIT -II	2	2	30
3.	UNIT -III	2	2	30
4.	UNIT -IV	2	2	30
	Total	8	8	120

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THIRD YEAR SEMESTER – VI
COURSE – 11:POST HARVEST MANAGEMENT OF FRUIT & VEGETABLES

Time 2hrs.30min

Maxmarks-60

SECTION-A

4x10=40 M

Answer the following questions

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-II
3. One question is to be set from unit-III
Or
One question is to be set from unit-III
4. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

5. One question is to be set from unit-I
6. One question is to be set from unit-I
7. One question is to be set from unit-II
8. One question is to be set from unit-II
9. One question is to be set from unit-III
10. One question is to be set from unit-III
11. One question is to be set from unit-IV
12. One question is to be set from unit-IV

P.R.GOV.T.COLLEGE (A), KAKINADA
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THIRD YEAR SEMESTER – VI
COURSE – 11:POST HARVEST MANAGEMENT OF FRUIT & VEGETABLES
QUESTION BANK
SECTION A
ESSAY QUESTIONS (10M)

UNIT I

1. Write an essay on harvesting and transportation of foods
2. Write an essay on selection and preparation of fruits for processing and packaging

UNIT II

1. Write about the following
1) ventilated and control atmosphere storage
2) Low temperature storage
2. Write about the product quality standards of fruits and vegetables and its quality control measures

UNIT III

1. Write an essay on process , machinery , operation of fruits and vegetables
2. Write an essay on types ,process , machinery of dehydration fruits and vegetables

UNIT IV

1. Write an essay on formulation and preparation of fruit juices , jams, pickles
2. Write about processing and storage of okra, green peas and onions

SECTION B

SHORT QUESTIONS (5M)

UNIT I

1. Write a short note on post harvest changes
2. Write a short note on enzyme inactivation
3. Write a short note on cold storage of fruits

UNIT II

1. Write a short note on natural storage
2. Write a short note on plant layout
3. Write a short note on processing lane

UNIT III

1. Write a short note on canning of fruits and vegetables
2. Write about problems related to storage of dehydrated products

UNIT IV

1. Write a short note on ware housing
2. Write a short note on transportation of vegetables
3. Write a short note on procuring

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CHOICE BASED CREDIT SYSTEM
B. VOC (FOOD TECHNOLOGY)
THIRD YEAR SEMESTER – VI
COURSE – 11: POST HARVEST MANAGEMENT OF FRUIT & VEGETABLES**

Practicals

- | | |
|----------------------------------------------------|--------------|
| 1. Processing of mango squash and mango pickle. | 4Hrs |
| 2. Processing of pineapple jam. | 6 Hrs |
| 3. Manufacture of tomato puree. | 4 Hrs |
| 4. Manufacture of lemon pickle and lemon juice. | 5 Hrs |
| 5. Manufacture of tomato ketchup and tomato sauce. | 5 Hrs |
| 6. Manufacture of tuti fruity. | 6 Hrs |

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
FINAL YEAR - VI SEMESTER
COURSE- 12: FOOD QUALITY AND SENSORY EVALUATION

Hrs.: 4

CREDITS:4

OBJECTIVES :

Unit – I

Food quality – definition and its need in food industry - Quality attributes - Classification of quality attributes.

Quality assessment of Food materials i.e, meat, poultry, egg and processed food products - Sensory evaluation – introduction, panel screening, selection methods, Interaction and thresholds, Statistical quality control.

Unit – II

Food quality objectives, importance and functions of quality control - Methods of Quality control - concepts of Rheology - Quality assessment of food materials i.e, fruits, Vegetables, cereals and dairy products/milk and milk products

Sensory and instrumental analysis in quality control. Consumer measurements: Factors influencing acceptance and preference, objectives of consumer preference studies, information obtained from consumer study.

Unit – III

Odour : Introduction, definition and importance of odour and flavor - Odour classification, chemical specificity of odour - Odour measurement using different techniques – primitive to recent techniques. Merits and demerits of each method. Olfactory abnormalities;

Texture- classification; Texture measurement – basic rheological models, forces involved in texture measurement;

Unit – IV

Introduction and importance of colour: Dimensions of colour and attributes of colour, appearance factors, gloss etc.; Perception of colour;

Colour abnormalities; Measurement of colour; Munsell colour system, CIE colour system, Hunter colour system, UV – Visible Spectrophotometry and Colorimetry etc.

Sensation of Taste: Chemical dimensions of basic tastes- sweet, salt, sour, bitter and umami; Factors affecting taste quality, reaction time, taste modification, absolute and recognition threshold Taste abnormalities; Taste measurement;

References :

1. Fellows, P. J., Food processing Technology principles and practice, 2nd edition, Wood head publishing, England, 2000.
2. Dincer, I. Heat Transfer Food Cooling Applications. Taylor and Francis Publishers, USA. 1997
3. Heldman, D. R. and Lund, D.B. Handbook of Food Engineering 2nd edition. CRC press, Newyork. 2007.
4. Singh, R.P. Introduction to Food Engineering 3rd edition. Academic Press, London. 2004.
5. Saravacos,G D and Kostaropoulos A E.Handbook of Food Processing Equipment.2006.Brijbasi Art Press Ltd,New Delhi.

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B.Voc (Food Technology)
FINAL YEAR - VI SEMESTER
COURSE- 12: FOOD QUALITY AND SENSORY EVALUATION
WEIGHTAGE TO CONTENT**

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	2	2	30
2.	UNIT -II	2	2	30
3.	UNIT -III	2	2	30
4.	UNIT -IV	2	2	30
	Total	8	8	120

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
FINAL YEAR - VI SEMESTER
COURSE- 12: FOOD QUALITY AND SENSORY EVALUATION

Time 2hrs.30min

Maxmarks-60

SECTION-A

Answer the following questions

4x10=40 M

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-II
3. One question is to be set from unit-III
Or
One question is to be set from unit-III
4. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

5. One question is to be set from unit-I
6. One question is to be set from unit-I
7. One question is to be set from unit-II
8. One question is to be set from unit-II
9. One question is to be set from unit-III
10. One question is to be set from unit-III
11. One question is to be set from unit-IV
12. One question is to be set from unit-IV

P.R.GOVERNMENT COLLEGE (A), KAKINADA
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B.Voc (Food Technology)
FINAL YEAR - VI SEMESTER
COURSE- 12: FOOD QUALITY AND SENSORY EVALUATION
QUESTION BANK
SECTION A
ESSAY QUESTIONS (10M)

UNIT I

1. Write an essay on quality assessment of meat
2. Write an essay on quality assessment of egg
3. Write about classification of quality attributes in food quality control

UNIT II

1. Write an essay on importance and functions of quality control
2. Write an essay on quality assessment of fruits and vegetables
3. Write an essay on quality assessment of milk and milk products

UNIT III

1. Definition and importance of odour and flavor
2. Write an essay on measurement of odour and measurement in different techniques
3. Write about texture classification and forces involved in texture measurement

UNIT IV

1. Explain Munsell colour system and CIE colour system
2. Explain factors effecting quality of taste

SECTION B
SHORT QUESTIONS (5M)

UNIT I

1. Define food quality and need in food industry
2. Write about the role of food quality in food industry
3. Write a short note on panel screening

UNIT II

1. Write a note on food quality objectives
2. Write a note on concept of Rheology
3. Write a note on objectives of consumer

UNIT III

1. Write a note on chemical specificity of odour
2. Write a note on olfactory abnormalities
3. Write a note on odour classification

UNIT IV

1. Write a note on factors effecting appearance of colours
2. Write a note on hunter colour system
3. Write a note on taste abnormalities
4. Write a note on colour abnormalities

P.R.GOVERNMENT COLLEGE (A), KAKINADA
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B.Voc (Food Technology)
FINAL YEAR - VI SEMESTER
COURSE- 12: FOOD QUALITY AND SENSORY EVALUATION

Practicals

1. Triangle test
2. Single sample test
3. Paired comparison test
4. Duo- trio test
5. Numerical scoring test
6. Ranking test
7. Descriptive test

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
FINAL YEAR - VI SEMESTER
COURSE – 13: FOOD PRESERVATION TECHNOLOGY

Hrs.: 4

Credits : 4

Objectives:

- To enable the students to acquire knowledge on different preservation techniques used to enhance the shelf span of food product.
- To study the different mode of spoilage in foods and minimize the contamination by different preservation technology.

Unit – I

Introduction to Food Processing and Preservation: Definition, Objectives, scope of food processing industries, Introduction to Different processes employed in food processing viz. Milling, Cooking, Boiling, Steaming, Braising, Stewing, Roasting, Frying, Grilling, Baking, Fermentation, Pickling, Refining;

Unit – II

Thermal Preservation Technology of foods : Introduction, historical perspectives, principles, classification – cooking, blanching, pasteurization, sterilization;

Food Preservation by Moisture control: Drying and Dehydration - Definition, drying as a means of preservation, differences between solar drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying, normal drying curve, names and types of driers used in the food industry;

Unit – III

Preservation of foods by high-temperature technology: Evaporation, extrusion cooking, infrared, microwave, ohmic heating, dehydration and drying; effect of thermal processing on foods.

Preservation of foods by low-temperature technology: Introduction, methods of freezing – air, plate, liquid-immersion and cryogenic freezing; quality and stability of frozen foods – defects, common storage temperatures, prediction of storage life of frozen foods;

Unit – IV

Food Preservation by Irradiation technology: Introduction, units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry, concept of cold sterilization.

Fermentation technology: Curing and Pickling; Smoking Chemical preservatives- (Objectives, principles, types of preservatives, Different types of chemical preservatives, Safety in use and certification levels, adverse affects. Preservation by high osmotic pressure (Pickling, salting, curing – principles)

References :

1. Subalakshmi, G and Udipi, S.A. Food processing and preservation. New Age International Publishers, New Delhi, 2001.
2. Potter, N.N. and Hotchkiss J. H. Food Science. CBS publishers and distributors. 1996.
3. Srivastava, R.PO and Kumar, S. Fruit and vegetable preservation, International Book distribution Company, Lucknow, 1994.
4. MC.Williams, M and Paine, H. Modern Food preservation. Surjeet Publications, Delhi, 1984.
5. Cruess, W.V. Commercial fruits and vegetable products, Anees Offset press, New Delhi.
6. Sahay K.M. & Singh K.K, Unit Operations of Agricultural Processing, Vikas Publication House, New Delhi.

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FINAL YEAR - VI SEMESTER
COURSE – 13: FOOD PRESERVATION TECHNOLOGY**

WEIGHTAGE TO CONTENT

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	2	2	30
2.	UNIT -II	2	2	30
3.	UNIT -III	2	2	30
4.	UNIT -IV	2	2	30
	Total	8	8	120

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FINAL YEAR - VI SEMESTER
COURSE – 13: FOOD PRESERVATION TECHNOLOGY

Time 2hrs.30min

Maxmarks-60

SECTION-A

4x10=40 M

Answer the following questions

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-II
3. One question is to be set from unit-III
Or
One question is to be set from unit-III
4. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

5. One question is to be set from unit-I
6. One question is to be set from unit-I
7. One question is to be set from unit-II
8. One question is to be set from unit-II
9. One question is to be set from unit-III
10. One question is to be set from unit-III
11. One question is to be set from unit-IV
12. One question is to be set from unit-IV

P.R.GOVERNMENT COLLEGE (A), KAKINADA
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FINAL YEAR - VI SEMESTER
COURSE – 13: FOOD PRESERVATION TECHNOLOGY
QUESTION BANK
SECTION A
ESSAY MARKS (10M)

UNIT I

1. Define food processing and preservation and write scope and objectives of food processing and preservation
2. Explain the following
 - 1) steaming
 - 2) braising
 - 3) stewing
 - 4) frying
3. Explain the following
 - 1) cooking
 - 2) milling
 - 3) boiling
 - 4) roasting

UNIT II

1. Explain principles of thermal preservation technology
2. Explain different types of thermal preservation of food technology
3. Explain drying , dehydration as a means of preservation

UNIT III

1. Explain evaporation, extrusion ,cooking in preservation of foods
2. Explain different types of preservations of foods by low temperature

UNIT IV

1. Write different types of ionizing radiations used in food irradiation
2. Write different types of chemical preservations

SECTION B
SHORT QUESTIONS (5M)

UNIT I

1. Write a short note on pickling
2. Write a short note on refining

3. Write a short note on fermentation

UNIT II

1. Write the difference between sun drying and dehydration
2. Write factors affecting the rate of drying
3. Write different driers in food industry

UNIT III

1. Write defects in quality and stability of frozen foods
2. Write the effects of thermal processing of food

UNIT IV

1. Write a short note on concept of cold sterilization
2. Write the uses of radiation processing in food industry
3. Write a short note on curing and pickling
4. Explain principles in salting and curing

P.R.GOVERNMENT COLLEGE (A), KAKINADA
CHOICE BASED CREDIT SYSTEM
B.Voc (Food Technology)
FINAL YEAR - VI SEMESTER
COURSE – 13: FOOD PRESERVATION TECHNOLOGY

Practicals

1. Determination of adulterants in spices
2. Total soluble solids in fruits by physical method
3. pH and acidity of juices
4. Preparation of orange squash.
5. Preparation of guava jelly.
6. Preparation of mango pickle.
7. Qualitative tests for adulterants in milk.

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FINAL YEAR - VI SEMESTER
COURSE- 14: TECHNOLOGY OF MEAT, FISH & POULTRY

Hrs.: 4

Credits :4

Objectives :

Objectives

- To provide an extensive description of meat, fish and poultry processing
- To introduce the latest technologies, manufacturing processes and tools for effective control of safety and quality during processing.

Unit – I

Meat Processing: Chemical composition & structure of meat, Post-mortem changes in meat, tenderizing, curing; Dry heat and moist heat cooking methods of meat; quality Classification, Meat preservation- chilling, freezing, curing, salting, pickling, smoking and canning; storage of meat;

Unit – II

Fish Processing :Classification, Composition of fish, Preservation methods of fish during processing - Drying, salting and smoking, Chilling and freezing of fish, application of freezing system in fish processing- IQF method, Canning of fish and fish products, Packaging.

Unit – III

Egg Processing: Egg formation and structure, composition, Microbes in eggs. egg processing methods- Freezing, refrigeration, drying. Egg quality parameters: interior and exterior. Effect of thermal process on eggs; Egg foams; various egg products;

Unit – IV

Poultry Processing: Poultry composition, classification, slaughtering techniques, various cooking methods of poultry and its preservation;

References :

1. Manay, N.S, Shadakshara swamy, M., Foods- Facts and Principles, New Age International Publishers, New Delhi, 2004.
2. Potter, N. N, Hotchkiss, J. H. Food Science. CBS Publishers, New Delhi. 2000.

3. Subalakshmi, G and Udipi, S.A. Food processing and preservation. New Age International Publishers, New Delhi, 2001.
4. Srilakshmi, B. Food Science. New Age International Publishers, New Delhi, 2003
5. Warriss P. D, Meat Science: An Introductory Text, Cambridge university press – 2010

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COURSE- 14: TECHNOLOGY OF MEAT, FISH & POULTRY
WEIGHTAGE TO CONTENT

Sl.No.	Course Content	Essay (10M)	Short (5M)	Total marks
1.	UNIT -I	2	2	30
2.	UNIT -II	2	2	30
3.	UNIT -III	2	2	30
4.	UNIT -IV	2	2	30
	Total	8	8	120

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COURSE- 14: TECHNOLOGY OF MEAT, FISH & POULTRY

Time 2hrs.30min

Maxmarks-60

SECTION-A

4x10=40 M

Answer the following questions

1. One question is to be set from unit-I
Or
One question is to be set from unit-I
2. One question is to be set from unit-II
Or
One question is to be set from unit-II
3. One question is to be set from unit-III
Or
One question is to be set from unit-III
4. One question is to be set from unit-IV
Or
One question is to be set from unit-IV

SECTION-B

Answer any FOUR questions

4x5=20M

5. One question is to be set from unit-I
6. One question is to be set from unit-I
7. One question is to be set from unit-II
8. One question is to be set from unit-II
9. One question is to be set from unit-III
10. One question is to be set from unit-III
11. One question is to be set from unit-IV
12. One question is to be set from unit-IV

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COURSE- 14: TECHNOLOGY OF MEAT, FISH & POULTRY
SECTION A
ESSAY QUESTIONS (10M)

UNIT I

1. Explain different types of preservations of meat
2. Explain post mortem changes in meat

UNIT II

1. Explain different types of preservation of fish
2. Explain different classification , composition of fish

UNIT III

1. Explain different types of egg processing methods
2. Explain quality parameters of egg

UNIT IV

1. Explain cooking methods of poultry
2. Explain slaughtering techniques in poultry

SECTION B
SHORT QUESTIONS (5M)

UNIT I

1. Write a short note on dry heat cooking method of meat
2. Write a short note on moist heat cooking method of meat
3. Write a short note on storage of meat

UNIT II

1. Write a short note on packaging of fish products
2. Write a short note on IQF method

UNIT III

1. Write about effects of thermal process on egg
2. Write a short note on composition of eggs

UNIT IV

1. Write a short note on composition of poultry
2. Write a short note on classification of poultry

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FINAL YEAR - VI SEMESTER
COURSE- 14: TECHNOLOGY OF MEAT, FISH & POULTRY

Practicals

1. Evaluation of eggs for quality parameters(market eggs, branded eggs)
2. To prepare casein and calculate its yield.
3. Internal & External quality of egg
4. Proximate composition of Meat & Fish.
5. Determination of Nitrite
6. Alternate method for Determination of Nitrite
7. Determination of Nitrite in Processed meat and meat products / fish and fish products like Ready to eat / ready to cooked products
8. Determination of Ascorbic acid
9. Alternate method for Determination of Ascorbic acid
10. Determination of Total Phosphorous
11. Test for presence of Polyphosphates
12. Determination of Glucono-delta-lactone
13. Additional tests
14. Total Fat
15. Total Protein