

Estd. 1962

'A++" Accredited by NAAC (2021)

With CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR - 416004, MAHARASHTRA

PHONE: EPABX-2609000, www.unishivaji.ac.in, bos@unishivaji.ac.in

शिवाजी विद्यापीठ, कोल्हापूर -४१६००४,महाराष्ट्र

दूरध्वनी-ईपीएबीएक्स -२६०९०००, अभ्यासमंडळे विभाग दुरध्वनी ०२३१—२६०९०९४ ०२३१—२६०९४८७



Ref.No.SU/BOS/Science/271

To,

The Principal, All Concerned Affiliated Colleges/Institutions Shivaji University, Kolhapur.

Subject: Regarding revised syllabi of B.Sc. Part-II (Sem.III & IV) degree programme under the Faculty of Science and Technology as per NEP-2020 (2.0).

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabi, nature of question paper B.Sc. Part-II (Sem. III & IV) degree programme under the Faculty of Science and Technology as per NEP-2020 (2.0).

	B.Sc.Part-II (Sem. III & IV) as per NEP-2020 (2.0)								
1.	Pollution	8.	Food Science (Entire)						
2.	Biochemistry	9.	Biotechnology (Entire)						
3.	Food Science and Quality Control	10.	Environmental Science (Entire)						
4.	Computer Science (Optional)	11.	Information Technology (Entire)						
5.	Biotechnology (Optional/Vocational)	12.	Food Science and Technology (Entire)						
6.	Animation (Entire)	13.	Food Technology & Management (Entire)						
7.	Computer Science (Entire)	14.	All Faculty UG Part II Environmental Studies (VEC)						

This syllabus, nature of question and equivalence shall be implemented from the academic year 2025-2026 onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website <u>www.unishivaji.ac.in NEP-2020@suk(Online Syllabus)</u>

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2025 & March/April 2026. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully, Dy Registrar Dr. S. M. Kubal

Encl: As above

for Information and necessary action

Copy to:

Copy				
1	Dean, Faculty of Science & Technology	6	Appointment Section A & B	
2	Director, Board of Examinations and Evaluation	7	I.T.Cell /Computer Centre	
3	Chairman, Respective Board of Studies	8	Eligibility Section	
4	B.ScM.Sc. Exam Section	9	Affiliation Section (T.1) (T.2)	
5	Internal Quality Assurance Cell (IQAC Cell)	10	P.G. Seminar Section	

Date: 03/05/2025

SHIVAJI UNIVERSITY, KOLHAPUR



Established: 1962 "A++ Grade" Accredited by NAAC (2021) with CGPA 3.52 Structure and Syllabus in Accordance with National Education Policy – 2020 With Multiple Entry and Multiple Exit

> Syllabus for B. Sc. Part – II Food Technology & Management (Faculty of Science and Technology) Semester III and IV

(To be implemented from Academic Year 2025-26

SYLLABUS OF B.Sc. (FOOD TECHNOLOGY AND MANAGEMENT) II

(NEP 2020)

Vear of Implementation: To be implemented from June 2024 onwards

- Guidelines shall be as per B. Sc. Regular Program.
- Rules and Regulations in accordance with National Education Policy with effect from Academic Year 2024-25.

***** Preamble:

The Bachelor of Science in Food Technology and Management program combines food science with essential management skills, preparing students for leadership roles in the growing food industry. The curriculum covers food safety, processing, product development, and business management, addressing challenges like sustainability, nutrition, and food security. Students gain hands-on experience in food processing, quality assurance, supply chain management, and marketing, while also developing critical business skills. Emphasizing ethical practices, regulatory standards, and sustainability, the program equips graduates to make informed decisions and excel in diverse roles across the food sector.

Program Outcomes:

1. Understanding of Food Science Principles: A comprehensive understanding of the scientific principles underlying food production, processing, preservation, and safety.

2. Food Product Development Skills: Design, develop, and innovate new food products that meet consumer needs and regulatory standards.

3. Knowledge of Food Safety and Quality Control: Knowledge and skills required to implement food safety and quality assurance practices throughout the food supply chain.

4. Food Processing and Engineering Expertise: Understanding of food processing techniques, including thermal and non-thermal methods, and the ability to apply engineering principles to optimize these processes.

5. Sustainability in Food Production: Importance of sustainability in food production, focusing on resource management, waste reduction, and environmentally friendly practices in food manufacturing.

6. Food Business Management: Skills to manage food-related businesses, including planning, marketing, budgeting, and financial management within the food industry.

7. Regulatory and Ethical Standards in Food: National and international food laws, regulations, and ethical standards that govern the food industry.

8. Supply Chain Management in the Food Industry: Manage and optimize food supply chains, from raw material sourcing to distribution, ensuring efficiency and compliance with food safety standards.

9. Analytical and Laboratory Skills: Proficiency in using laboratory techniques and tools to analyse food products, assess their nutritional content, and test for quality and safety.

10. Consumer Behaviour and Market Trends: Analyse consumer behaviour and market trends to make informed decisions about food product development and marketing strategies.

11. Innovation and Problem-Solving in Food Technology: Ability to critically analyse challenges in the food industry and develop innovative solutions to improve processes, products, and consumer experiences.

12. Communication and Teamwork Skills: Strong communication, collaboration, and leadership skills, enabling them to work effectively in interdisciplinary teams within the food industry.

***** Objectives of Programme:

1. Understanding Food Science and Processing:

• To provide a strong foundation with the principles of food science, including food chemistry, microbiology, and processing & preservation techniques for development of food products.

2. Ensuring Food Safety and Quality:

• To train students in food safety regulations, quality control measures, and hygiene practices to ensure the production of safe and high-quality food products by implementing food safety management systems.

3. Developing Management and Entrepreneurial Skills:

• To impart knowledge of food industry management, including production planning, marketing, and distribution including fostering an entrepreneurial mindset to encourage innovation and the development of new food products and businesses.

4. Promoting Nutritional Awareness:

• To educate students on the nutritional value of foods and the impact of processing on nutrient content.

5. Fostering Industry Relevance and Practical Skills:

• To provide students with practical experience through laboratory work, industrial training, and projects helping them to bridge the gap between theoretical knowledge and industry practices and preparing them for successful careers in the food sector.

***** Duration of Programme:

3 years B. Sc. Programme or

4 years B.Sc. Programme (Honours Degree) or

4 years B. Sc. Programme (Honours with Research Degree)

Medium of instruction: English

***** Eligibility for admission:

The eligibility of students taking admission at B. Sc. Part-I [Level 4.5] (initial entry) and the eligibility of students making lateral entry (Multiple entry-ME) admission at Level 5.0/ Level 5.5/ Level 6.0 are required to be scrutinized (with stipulated procedure) on the basis of following criteria:

(A) Eligibility requirements for admission to B. Sc. Part-I (Level 4.5):

 The students passing the Higher Secondary School Certificate Examination with Science stream or Vocational subjects with science stream conducted by the Maharashtra State Board of Higher Secondary Education shall be allowed to enter upon the B. Sc. Part-I (or Undergraduate Certificate in Science).

OR

ii) An Examination of any other Statutory Board or an examining

Body recognized as equivalent thereto.

OR

iii) Completed 2nd year of the 3-year diploma after 10th

(B) Eligibility requirements for admission to B. Sc. Part-II (Level 5.0):

i) The students passing or ATKT the B. Sc. Part-I (or Undergraduate Certificate in Science) shall be allowed to enter upon the B. Sc. Part-II (or Undergraduate Diploma in Science).

OR

ii) An Examination of any other Statutory University or an examining Body recognized as equivalent there to.

OR

iii) Completed 3-year diploma course with subjects allied / related to the subject at B.Sc. Part I

OR

iv) Completed first year of B.E./B. Tech. with subjects allied / related to the subject at B.Sc. Part I

(C) Eligibility requirements for admission to B. Sc. Part-III (Level 5.5):

 The students passing (pass/ ATKT) the B. Sc. Part-II (or Undergraduate Diploma in Science) and successfully completed level 5 shall be allowed to enter upon the B.Sc. Part-III (or Three Year Undergraduate Degree in Science).

OR

ii) An Examination of any other Statutory University or an examining Body recognized as equivalent thereto.

OR

iii) Completed second year of B.E./B. Tech. with subjects allied / related to the subject at B.Sc. Part II

(D) Eligibility requirements for admission to B. Sc. Part-IV (Level 6.0):

 The students passing the B. Sc. Part-III (or Three-Year Undergraduate Degree in Science) with 7.5 CGPA or 75% marks in Three-Year Undergraduate Degree in Science shall be allowed to enter upon the B. Sc. Part-IV (or Four-Year Undergraduate Degree in Science with Honours/ Honours with Research).

OR

ii) An Examination of any other Statutory University or an examining Body recognized as equivalent thereto.

Eligibility Application requirement:

- (a) Students who are seeking admission for Level 4.5 need to apply for eligibility.
- (b) Students who are not taking any exit from the programme at any level and students re-entering after taking exit, need not apply for eligibility at Level 5.0, 5.5 and 6.0.
- (c) However, students from other university who wish to seek admission for any level of undergraduate degree need to apply for eligibility.

Rules for Multiple Exits:

- a) If a student wishes to exit after completion of Level 4.5, he/she has to complete additional four credit skill course/ internship.
- b) If a student wishes to exit after completion of Level 5.0, he/she has to complete additional four credit skill course/ internship.
- c) If a student wishes to exit after completion of Level 5.5, he/she need not require completing any additional skill course/ internship.

Pattern of B.Sc. Programme:

The pattern of program will be of semester type. (A) Weightage: There shall be Undergraduate certificate in science program credits. There shall be Undergraduate diploma in science with 92 credits. There shall be Three Year B.Sc. Programme with 132 credits. The with 48 candidate wishes to attempt for Four-Year B.Sc.(Hon./Research) may opt for 4thyear which will have additional 44 credits, hence, Four Year B.Sc. Programme will require 176 credits.(Please refer the university regulations and structure of the programme for details).

Credit distribution chart for B. Sc. Programme:a) For 3 year B. Sc. Programme:

Course Name		Total Credits	% of total
Major			
Major Mandatory(MM)	MM	52	
Major Elective(ME)	ME	08	-
Vocational Skill Courses(VSC)	VSC	06	-
On Job Training(OJT)	OJT	04	57.58
Field Project(FP)	FP	02	-
Indian Knowledge System	IKS	02	-
Community Engagement Programme	CEP	02	-
Major Total Credits		76	
Minor	MIN	24	18.18
Open Elective (OE)/ Generic Elective(GE)Courses	OE	10	7.58
Ability Enhancement Courses	AEC	08	
			10.60
Indian Knowledge System(Generic)	IKS	02	
Value Education Courses	VEC	04	
Skill Enhancement Courses	SEC	06	6.06%
Co-Curricular Courses(NSS/NCC/Sports/Cultural Activities)	CC	02	
TOTAL		132	100%

b) For 4year B.Sc. Programme (Honours Degree)

Course Name		Total Credits	% of total credits
Major			
Major Mandatory	MM	80	
Major Elective	ME	16	
Vocational Skill Courses	VSC	06	
On Job Training	OJT	08	65.01
Field Project	FP	02	05.91
Research Projects*	RP	00	-
Indian Knowledge System	IKS	02	
Community Engagement Programme	CEP	02	
Major Total Credits		116	-
Minor	MIN	24	15.01
Research Methodology	RM	04	15.91
Open Elective/Generic Elective	OF	10	5.68
Courses	OL	10	5.00
Ability Enhancement Courses	AEC	08	7.95
Indian Knowledge System(Generic)	IKS	02	
Value Education Courses	VEC	04	•
Skill Enhancement Courses	SEC	06	
Co-Curricular			1 55
Courses(NSS/NCC/Sports/Cultural	CC	02	4.55
Activities)			
TOTAL	1	176	100%

c) For 4 year B. Sc. Programme (Honours with Research Degree):

Course Name		Total Credits	% of total credits
Major			
Major Mandatory	MM	72	
Major Elective	ME	16	

Vocational Skill Courses	VSC	06	
On Job Training	OJT	04	
Field Project	FP	02	65.91
Research Projects*	RP	12	
Indian Knowledge System	IKS	02	
Community Engagement Programme	CEP	02	
Major Total Credits		116	
Minor	MIN	24	15.91
Research Methodology	RM	04	
Open Elective/Generic Elective	OF/GE	10	5.68
Courses		10	5.00
Ability Enhancement Courses	AEC	08	
Indian Knowledge System(Generic)	IKS	02	7.95
Value Education Courses	VEC	04	
Skill Enhancement Courses	SEC	06	
Co-Curricular			1 55
Courses(NSS/NCC/Sports/Cultural	CC	02	4.55
Activities)			
TOTAL		176	100%

*For honours degree with research, research project is applicable and for honours degree, courses related to major are incorporated.

Scheme of Teaching and Examination pattern (Theory/Practical/Internal):

Structure in Accordance with National Education Policy - 2020 With Multiple Entry and Multiple Exit Options

٠	B.Sc. Part –	- I (Level-4.5) Semester	r I
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	Teaching Scheme			Examination Scheme						
Course Code	Theory and Practical			Univ	ersity Assessment (UA)	Internal Assessment (IA)			
	Lectures + Tutorial/ (Hours/ week)	Practical (Hours/ week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours	
FP I	2	0	2	40	14	1.5	10	4	1	
FC I	2	0	2	40	14	1.5	10	4	1	
Lab Course I	0	4	2	50	18	4				
FM I	2	0	2	40	14	1.5	10	4	1	
HP I	2	0	2	40	14	1.5	10	4	1	
Lab Course II	0	4	2	50	18	4				
DT I	2	0	2	40	14	1.5	10	4	1	
HN I	2	0	2	40	14	1.5	10	4	1	
Lab Course III	0	4	2	50	18	4				
OE-1 Sewing Technology (T)/ (P)	2	0	2	40	14	1.5	10	4	1	
IKS-1	2	0	2	40	14	1.5	10	4	1	
TOTAL			22	470			80			

B.Sc. Part – I (Level-4.5) Semester II

		Teaching Scheme		Examination Scheme							
Course Code	Theory and Practical			University Assessment (UA)			Internal Assessment (IA)				
	Lectures (Hours /	Practical (Hours/ week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours		
	week)										
FP II	2	0	2	40	14	1.5	10	4	1		
FC II	2	0	2	40	14	1.5	10	4	1		
Lab Course IV	0	4	2	50	18	4					
FM II	2	0	2	40	14	1.5	10	4	1		
HP II	2	0	2	40	14	1.5	10	4	1		
Lab Course V	0	4	2	50	18	4					
DT II	2	0	2	40	14	1.5	10	4	1		
HN II	2	0	2	40	14	1.5	10	4	1		
Lab Course VI	0	4	2	50	18	4					
OE-2 Financial Literacy (T)	2	0	2	40	14	1.5	10	4	1		
VEC-1	2	0	2	40	14	1.5	10	4	1		
TOTAL			22	470			80				
Cum. Total Sem I &II			44	940			160				

• S#T#– Subject number Theory paper number	• Total Marks for B.ScI : 1100
• S#P#– Subject number Practical paper number	• Total Credits for B.ScI (Semester I & II): 44
• OE # (T) - Open Elective Theory Paper number	• Separate passing is mandatory for University and Internal Examinations
• OE # (P) - Open Elective Practical Paper number	
• IKS-1–Indian Knowledge System Theory Paper 1	
(Generic)	
• VEC-1 –Value Education Course (Democracy)	
Theory	
• Requirement for Exit after Level 4.5:	
Award of UG Certificate with 44 Credits and an add	litional 4 credits core NSQF course/Internship.

	Т	eaching Schem	ie	Examination Scheme							
Course Code	Theory and Practical			Uni	iversity Assessme	ent (UA)	Internal Assessment (IA)				
Course Cour	Lectures + Tutorial/ (Hours/ week)	Practical (Hours/week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours		
CLOT I	2	-	2	40	14	1.5	10	4	1		
FVPT I	2	0	2	40	14	1.5	10	4	1		
Lab Course VII	-	4	2	50	18	4					
FPK I	2	-	2	40	14	1.5	10	4	1		
FB I	2	-	2	40	14	1.5	10	4	1		
Lab Course VIII	-	4	2	50	18	4					
OE-3 (T)/	2/	_/	2/	40/	14/	1.5/	10	4	1		
(P) will be selected	-	4	2	50	18	4					
from Basket											
VSC I Vocational	-	4	2	50	18	4					
Skill Course in Jam,											
Jelly & Ketchup											
Processing (P)											
SEC I FQS I (T)	2	-	2	40	14	1.5	10	4	1		
AEC I English	2	2	2	40	14	1.5	10	4	1		
CC - I	-	-	2								

B.Sc. Part – II (Level-5.0) Semester III

*Note: The marking scheme of CC and CEP will be as per B. Sc. Regular structure of Shivaji University, Kolhapur.

B.Sc. Part – II (Level-5.0) Semester IV

	Teaching Scheme Theory and Practical			Examination Scheme							
Course Code				Uni	versity Assessment	t (UA)	Internal Assessment (IA)				
	Lectures + Tutorial/ (Hours/week)	Practical (Hours/ week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours		
CLOT II	2	-	2	40	14	1.5	10	4	1		
FVPT II	2	-	2	40	14	1.5	10	4	1		
Lab Course X	-	4	2	50	18	4					
FPK II	2	-	2	40	14	1.5	10	4	1		
FB II	2	-	2	40	14	1.5	10	4	1		
Lab Course XI	-	4	2	50	18	4					
OE-4 (T)/	2/	_/	2/	40/	14/	1.5/	10	4	1		
(P) will be selected from Basket	-	4	2	50	18	4					
SEC II FQS II (T)	2	-	2	40	14	1.5	10	4	1		
AEC II English	2	-	2	40	14	1.5	10	4	1		
VEC II Environmental Studies	2	-	2	40	14	1.5	10	4	1		
CEP-I	-	-	2								

*Note: The marking scheme of CC and CEP will be as per B. Sc. Regular structure of Shivaji University, Kolhapur.

Examination Scheme: Total marks shall be 50 for 2 credit courses.

1. The question paper in each semester end examination for each theory course (paper) for B.Sc. (all Semesters) shall be of 40 marks for 2 credits.

Total marks for each course shall be based on continuous assessments and semesterend examination. The division of internal assessment and semester–end examination for B. Sc. will be as follows:

Particulars	2 Credit Course	Duration
Semester-end Examination	40 Marks	1.5 Hrs
Internal Assessment	10 Marks	1 Hr
Total marks for each course	50 Marks	

2. The Examination for practical course will be of 50 marks at end of each semester. The rule for practical examination shall be as per the circular/ letter issued by respective board of studies.

3. The examination pattern for Co-Curricular Activities (CC), Field Project (FP), On Job Training (OJT), Community Engagement Program (CEP) and Research Project (RP) as per the University guidelines.

Internal Assessment Process shall be as follows:

(a) The internal assessment should be conducted after completing 50% of syllabus of the course/s.

(b) In case a student has failed to attend internal assessment on scheduled date, it shall be deemed that the student has dropped the test. However, in case of student who could not take the test on scheduled date due to genuine reasons, such a candidate may appeal to the Programme coordinator /Principal /Head of the Department. The Programme coordinator /Principal /Head of the Department in consultation with the concerned teacher shall decide about the genuineness of the case and decide to conduct special test to such candidate on the date fixed by the concerned teacher but before commencement of the concerned semester-end examination. The outline for continuous internal assessment activities shall be as under: Outline for continuous internal assessment activities

Level	Semester	Activities Per Semester	Marks
4.5	Semester-I	Assignment	10 marks
	Semester-II	Unit test	10 marks
5.0	Semester-III	Unit test	10 marks
	Semester-IV	Oral examination/Group discussion	10 marks
5.5	Semester–V	Seminar/ Group discussion/Field Work/ Project Work	10 marks
	Semester–VI	Study tour / Field Work /Project Work / Seminar	10 marks
6.0	Semester–VII	Case Study /Field Work/Project Work	10 marks

♦ Ordinances regarding the examination: O. B.Sc.2,3 and 4 shall prevail.

***** Equivalence of papers and chances for the students in previous-Semester pattern: Two additional chances in subsequent semesters shall be provided for the repeater students of old three-year B.Sc. program. In such case the scores obtained by the students in NEP 1.0/CBCS scheme should be converted into equivalent credits in NEP

2.0. After that the students concerned shall have to appear for the examination as per this revised pattern.

If a student fails in two consecutive chances, she has to take admission for the respective course in NEP 2.0. In such cases his previous performance of incomplete academic years (B. Sc. I, B. Sc. II or B. Sc. III) will be cancelled.

	Old Course	Equivalent Course	
Sem No.	Title of Old Course & Credits	Title of New Course & Credits	Remark/s
Ι	Human Nutrition-I (02)	-	Course shifted to First year
I	Food Biochemistry-I (02)	Food Biochemistry-I (02)	Slight modification in syllabus

Solution Equivalence of papers: (Old B. Sc. FTM II & New B. B. Sc. FTM II)

I	Post-Harvest Technology- I (02)	_	Contents merged with other courses
I	Processing of Fruits and Vegetables-I (02)	Fruits and Vegetables Processing Technology- I (02)	Title of course changed; Syllabus reformulated
I	Grain Science and Technology-I (02)	Cereals, Legumes and Oilseeds Technology-I (02)	Title of course changed; Syllabus reformulated
I	Food Packaging-I (02)	Food Packaging-I (02)	Slight modification in syllabus
I	Laboratory Course III (04)	Laboratory Course VII (04)	Change in syllabus as per theory courses
Ι	-	Laboratory Course VIII (04)	Newly added practical & syllabus as per theory courses
п	Human Nutrition-II (02)	-	Course shifted to First year
II	Food Biochemistry-II (02)	Food Biochemistry-II (02)	Slight modification in syllabus
II	Post-Harvest Technology-II (02)	-	Contents merged with other courses
Π	Processing of Fruits and Vegetables-II (02)	Fruits and Vegetables Processing Technology- II (02)	Title of course changed; Syllabus reformulated
II	Grain Science and Technology-II (02)	Cereals, Legumes and Oilseeds Technology-II (02)	Title of course changed; Syllabus reformulated
II	Food Packaging-II (02)	Food Packaging-II (02)	Slight modification in syllabus
Π	Laboratory Course IV (04)	Laboratory Course IX (04)	Change in syllabus as per theory courses
II	-	Laboratory Course X (04)	Newly added practical & syllabus as per theory courses

College of Non-Conventional Vocational Courses for Women, Kolhapur Bachelor of Food Technology and Management-Course Structure (As per NEP 2020) Credit Framework

Second Year

SEM Level	COURSES			OE	VSC/SEC	AEC/ VEC/ IKS	OJT/ FP/ CEP/ CC/ RP	Total Credits	Degree/ Cum. Cr. MEME
	Major		Minor						
SEM III (5.0)	Major-V Cereals, Legumes & Oilseeds Technology I (2) Major-VI Fruits and Vegetables Processing Technology I (2) Major P-III Lab Course VII (2)	-	Minor-V Food Packaging I (2) Minor-VI Food Biochemistry I(2) Minor P-III - Lab Course VIII (2)	OE-3 Will be selected from OE Basket (T) (2)	VSC I (P) Vocational Skill Course in Jam, Jelly & Ketchup Processing Lab Course IX (2) SEC I (T) Food Quality and Safety I (2)	AEC I English (2)	CC- I (2)	22	UG Diploma
SEM IV (5.0)	Major- VII Cereals, Legumes & Oilseeds Technology II (2) (2) Major-VIII Fruits and Vegetables Technology Processing II (2) Major P-IV Lab Course X (2)	-	Minor-III Food Packaging II (2) Minor-IV Food Biochemistry II (2) Minor P-IV Lab Course XI (2)	OE-4 Will be selected from OE Basket (T) (2)	SEC II (T) Food Quality and Safety II (2)	AEC II English (2) VEC II Environment Studies (2)	CEP- I (2)	22	88
Credits	8 (T)+4 (P)=12	-	8 (T) +4 (P) =12	2 +2=4(T)	4 (T) + 2 (P) =6	2+4=6	2+2=4	44	Exit Option: 4 credits NSQF/Intern ship/ Skill Courses

Standard of Passing: The standard of passing shall be as per shown in the following table:

	Semester End Exam	Internal Assessment	Course Exam (Total)
Maximum Marks	40	10	50
Minimum Marks required for passing	14	4	18

- 1. There shall be a separate head of passing for semester end examination and internal examination.
- 2. Minimum 18 marks out of 50 are required for passing of practical examination of each course.
- 3. Passing criteria for Co-Curricular Activities (CC), Field Project (FP), On Job Training (OJT), Community Engagement Program (CEP) and Research Project (RP) as per the University guidelines.

Gradation Chart:

% of Marks Obtained	Numeric al Grade (Grade Point)	CGPA	Letter Grade
Absent		-	-
0-34	0	0.0-4.99	F (Fail)
35 - 44	5	5.00 – 5.49	С
45 - 54	6	5.50 - 6.49	В
55 - 64	7	6.50 – 7.49	B+
65 – 74	8	7.50 – 8.49	А
75 - 84	9	8.50 – 9.49	A+
85 - 100	10	9.50 – 10.0 –	O (Outstanding)

Note:

1. Marks obtained ≥ 0.5 shall be rounded off to next higher natural number.

2. The SGPA &CGPA shall be rounded off to 2 decimal points.

Calculation of SGPA& CGPA:

1. Semester Grade Point Average (SGPA)

 $SGPA = \sum (Course credits \times Grade points obtained) of a semester$

 \sum (Course credits) of respective semester

 Result - The result of each semester shall be declared as Pass or Fail with grade/grade points. However, ATKT rules will be followed as per University guidelines.

Nature of question paper and scheme of marking: a) Theory (Semester exam) for each Theory paper: Maximum marks – 40

Modality of Assessment

Students appearing for the NEP B.Sc. I will be evaluated as per the 80:20 scheme wherein the term end exam will be of 40 marks each paper while 10 marks will be through internal evaluation for each paper.

A. Theory Examination

- \checkmark Equal weightage shall be given to all units of the theory paper
- ✓ Total number of questions -03
- ✓ Question one will carry-08Marks,
- ✓ Question No. 1 will be of an objective type eight objective will carry-08Marks.
- Question 2 will be descriptive two questions are to be attempted out of three and will carry 16 Marks, 08 Marks each)
- ✓ Question 3 will be short answer type four questions are to be attempted out of six and will carry 16 Marks, 04 Marks each)
- ✓ **Nature of questions** multiple choice, Descriptive and short answer type.
- \checkmark All These questions will be answered in the same answer book

Semester End Theory Assessment 40 marks

- The duration of this exam will be of 1.5 Hrs (90 minutes)
- For each unit there will be at least one question
- All questions shall be compulsory with internal choice within the questions

* Nature of Question Paper and Marking Scheme

University Assessment for 40 Marks

B. Sc. (Part) (Semester) Examination Food Technology and Management Course Name (Course Code)
Day & Date:	Total Marks: 40
Time:	
Instructions: 1) An the questions	s are compulsory.
2) Figures to the right	indicate full marks.
Q.1 Multiple choice questions (0	8-Questions)08 marks
Q.2 Attempt any two of the follo	owing:
(Essay type/Broad answer q	uestions) 16marks
А.	
В.	
С.	
Q.3 Write short notes (any four)	16marks
a)	
b)	
c)	
d)	
e)	
f)	

B. Internal assessment 20%

Sr No	Evaluation type (Any one of the following)	Marks
	Evaluation modalities:	10
	1. Assignments that can include	
	a. Essay Writing	
	b. Solving Subjective Questions	
	c. Problem Solving	
	d. Report on lab/industry visit	
	e. Any other subject/content specific assignments	
	2. Project based learning activities	
	a. Group Discussion	
	b. Research/Case studies	
	c. Seminar Presentations	
	d. Skits	
	e. Poster Presentation	
	f. Debate	
	3. Self-study/Class test	
	4. MCQ test	

PRACTICAL EXAMINATION

- There will be semester wise practical examination to be conducted at the end of each semester. The question paper along with marking scheme and skeleton / Question paper will be given by BOS before practical examination.
- Total marks -50 for each semester -I and II (Will be evaluated by Internal examiner.)
- Total-50 Marks for each Sem-III and IV (Will be evaluated by one Internal examiner and one external examiner)
- Total-100 Marks (4 credit course) for each Sem-V and VI (Will be evaluated by two external examiner)
- Total-50 Marks (2 credit course) for each Sem-V and VI (Will be evaluated by one Internal examiner and one external examiner)
- Nature of question paper for practical examination will be provided by BOS before the practical examination.

***** Rules for UG Science (B. Sc.) Programme:

R.B.Sc.No.1

The three-year B. Sc. programme shall consist of 6 semesters which will have 132 credits altogether. However, the candidate who wishes to attempt a Four-Year B. Sc. (Hon./Research) may opt for 4th year which will have 44 credits. Hence, the Four-Year B. Sc. programme will be of 176 credits. (Please refer to the university regulations and structure of the programme for details).

The examination shall be held at the end of each semester.

The theory examination for 2 credits will be of 40 (Semester end examination) and 10 (Internal examination) marks. The practical examination for 2 credits will be 50 marks at the end of each semester.

R.B.Sc.No.2

Structure of B. Sc. programme is as shown in Annexure 1.

R. B. Sc. No.3

List of Courses:

Sem I	• Subject I: DSCI, DSCII, and Practical I
	• Subject II: DSC I, DSC II, and Practical I
	• Subject III: DSC I, DSC II, and Practical I
	• OE I (Theory/ Practical)
	• IKS I (Introduction to IKS)

B. Sc. I	Sem-II	• Subject I: DSCIII, DSCIV, and Practical II		
		• Subject II: DSCIII, DSCIV, and Practical II		
		• Subject III: DSCIII, DSCIV, and Practical II		
		• OE II (Theory/ Practical)		
		• VEC I (Democracy, Election and constitution)		
	Sem III	Major V, VI, and Major Practical III		
		• Minor V, VI, and Minor Practical III		
		• OE III (Theory/ Practical)		
		VSC I Practical (Major Specific)		
		• SEC I Theory/Practical		
		• AEC I (English)		
D G H		• CC		
B. Sc. II	Sem IV	Major VII, VIII, and Major Practical IV		
		Minor VII, VIII, and Minor Practical IV		
		• OE IV (Theory/ Practical)		
		SEC II Theory/Practical		
		• AEC II (English)		
		• VEC II (Environmental Studies)		
		• CEP		
	Sem V	Major IX, X, and Major Practical V, VI		
		Major I (Elective), Major (Elective) Practical- I		
		• OE V (Theory/ Practical)		
		VSC II Practical II Major Specific		
		• AEC III (English)		
		• OJT		
B. Sc. III	Sem VI	Major XI, XII, and Major Practical VII, VIII		
		Major II (Elective), Major ((Elective) Practical- II		
		VSC III Practical Major Specific		
		SEC III Practical		
		• AEC IV(English)		
		• IKS II (Major Specific)		
		• FP		

R. B. Sc. No. 4

(A) Skill Enhancement Course (SEC):

Skill Enhancement Course should be selected from the basket provided by University.

- (B) **Open Elective Course (OE):** Open Elective **Course should be selected from the basket provided by University.** This course is to be chosen compulsorily from faculty other than that of major or Geography or Mathematics or Statistics from OE basket.
- (C) Co-curricular Courses (CC): For Semester III one Co-curricular course such as Health and Wellness/ Yoga education / sports and fitness / Cultural Activities/ NSS / NCC / Fine Arts / Applied Arts / Visual Arts / Performing Arts is to be chosen compulsorily. The student should be engaged for four hours per week. The examination pattern will be decided by the

respective bodies.

(D) On Job Training (OJT):

The candidate should complete the work of **On Job Training of 4 credits in Semester V.** The execution of OJT examination pattern shall be as per the OJT guidelines of the University.

On-job training (OJT)/ Internship/ Apprenticeship of 120 hours must be completed by the candidate in industry/ health sectors / research labs/ public testing laboratories / diagnostic laboratories/ Chemical Industry / Pharmaceutical Industry.

(E) **Field Project (FP):** The guidelines and examination pattern will be decided by the respective board of studies.

R. B. Sc. No. 5

The student must earn at least 60% of the credits from his/her mother institute. The students may earn at the most 40% of the credits in any head, except major related courses and minor courses through online mode approved by the University.

R. B. Sc. No. 6

• The fees for the admission to B. Sc. Part I, B. Sc. Part II, B. Sc. Part III and B. Sc. Part IV Programme shall be as prescribed by the University from time to time.

R. B.Sc. No. 7

Detailed Syllabus:

The detailed syllabi for the various courses under this pattern shall be subject to such revision, modification etc. as may be made by the Academic council from time to time on the recommendations of the Board of Studies in different subjects. The textbooks and reference books for the various courses shall be those prescribed by the Academic Council from time to time on the recommendations of the respective Boards of Studies.

R. B. Sc. No. 8

The medium of instruction

For the Three Year (Six Semesters) B.Sc./ Four Year B.Sc. Degree Programme The medium of instruction for Major, Minor, VSEC, SEC, and AEC is English. The medium of instruction for OE, CEP, CC, OJT, FP, VEC and IKS may be either Marathi or English.

R. B. Sc. No. 9

- i. In B. Sc. Part II, the student can choose any one subject as major subject, one subject as minor subject from the three subjects (Discipline Specific Core) studied in B.Sc. Part I.
- ii. The student will continue for B. Sc. Part III with the major subject he/ she opted in B. Sc. Part II.

R. B. Sc. No. 10 Multiple Entry and Multiple Exit (MEME) :

- If an exited student wants to reenter, he/she can reenter within three years from exit.
- One should complete his/ her degree program within a period of a maximum of seven years.

R. B. Sc. No. 11

No candidate shall be allowed to appear the B. Sc. Part-III (or Three- Year Undergraduate Degree in Science) Examination unless the candidate has satisfactorily kept two terms for the programme at a college affiliated to/ university department of this University or any other recognized university. The principal of the college has to certify the attendance and the examination form of the candidate as per Ordinance O 31 and O 37. A candidate has to submit the University examination form as per the schedule and dates prescribed by the University for every examination to the University along with the prescribed fee through the Principal of the College.

R. B. Sc. No. 12

The Scheme of Physical Education has been made operative for B. Sc. Part-I. The students will get a maximum of 10 Marks after completing the Physical Education Tests conducted by the University authorities. The benefit of marks, obtained by the students shall be as under:

- If a student fails in up to four courses (of two credits each) of passing of the University examination (Theory/Practical) and has passed in all the remaining heads, the marks obtained by him / her in the Physical Education Test shall be added to maximum upto four courses (of two credits each) for passing in which he has failed as the case may be.
- 2. A student getting the benefit of Physical Education marks should not be given advantage of any other Ordinance. The Physical Education Marks

shall not be considered for the award of Class and for deciding merit.

- 3. If as a result of the addition of Physical Education marks a student does not pass the examination the marks obtained by him / her in Physical Education shall not be considered.
- 4. If a student is failing in more than four courses (of two credits each) the marks of the physical education test should not be added to any head.
- 5. The marks of Physical Education obtained by the unsuccessful students at the B.Sc. Part-I semester Examination shall be carried forward for their subsequent attempt/s.
- 6. The marks obtained in Physical Education shall not be considered for earning exemption in a subject of head of passing, but the marks will be carried forward for availing the benefit at the subsequent attempts.
- 7. The marks secured by the students under the Physical Education scheme, if not used for promotion, shall be added to the total of his marks in the examination irrespective of the fact of his passing or failure in the examination. The Physical Education marks shall be shown as "Total + P. E. Marks".
- 8. The Physical Education Test shall be conducted in the second semester.
- 9. The student can avail the benefit of marks of test of physical education only once in his three-year degree course.

R. B. Sc. No. 13

All Semester-end theory and practical examinations for B.Sc. Part I (Sem I and II), B.Sc. Part II (Sem II and IV), B.Sc. Part III (Sem V and Vi), B.Sc. Part IV (Sem VII and VIII) shall be held twice (i.e. April /May and October/November) a year.

R. B. Sc. No. 14

- a) A candidate who desires to seek a B. Sc. Degree in another Major course (DSE or ME), shall be permitted to do so. Selected major subject should be studied as Minor subject at level 5.0. Such candidate may appear at B.Sc. Part III (Semester V & VI) Examination on the submission of a new application for fresh admission and on payment of required fees. Such a candidate need not appear again for AEC and OE courses.
- b) The Candidate as above (in clause "a") shall not be eligible for a second

degree and a class, a prize, scholarship, medal, or any other award. The candidate will get the benefit of a new degree in a newcourse (subject) only if the candidate surrenders his first degree.

c) A candidate seeking degree in a specific course (subject) not offered at B.Sc. Part II and III, but offered only at B.SC. Part I, needs to reappear for B.Sc. Part II (Sem III and IV) and Part III (V and VI), including both theory and practical. Such a candidate passing the examination shall not be eligible for class or additional degree. He shall be granted a certificate of having passed the additional subject. The candidate shall get new degree provide they surrenders his first degree.

R. B. Sc. No. 15

- a) The result of the B.Sc. Part I (semester I and II) examinations shall be declared publicly in three categories
 - (i) Pass: Candidates who have passed the B.Sc. Part I (semester-I and II) examination.
 - (ii) Fail ATKT: Candidates who are allowed to proceed to the B.Sc. Part II (semester-III).
 - (iii) Fail: Candidates who are failed to proceed to the B.Sc. Part II (semester-III).
- b) The result of the B. Sc. Part II (semester III and IV) examinations shall be declared publicly in three categories.
 - (i) Pass: Candidates who have passed the B.Sc. Part II (semester-III and IV) examination in addition to the remaining courses, if any of privies examination.
 - (ii) Fail ATKT: Candidates who are allowed to proceed to the B.Sc. Part III (semester-V).
 - (iii) Fail: Candidates who are failed to proceed to the B.Sc. Part III (semester-V).
- c) If a candidate fails or remains absent in examination of all the courses of semester-I or not applied for semester I examination (provided he/she attended semester I) shall be allowed to proceed to semester II.
- d) If a candidate fails or remains absent in examination of all the courses of semester-III or not applied for semester III examination (provided he/she attended semester III) shall be allowed to proceed to semester IV.

- e) If a candidate fails or remains absent in examination of all the courses of semester-V or not applied for semester V examination (provided he/she attended semester V) shall be allowed to proceed to semester VI.
- f) No candidate shall be allowed to proceed to semester-V unless the candidate has cleared semester-I and semester-II in all courses.
- g) No candidate shall be allowed to proceed to semester-VII unless the candidate has cleared all previous semesters from –I to VI in all courses with a minimum 7.5 CGPA (or 75 % Marks).
- h) If a candidate fails or remains absent in examination of all the courses of semester-VII or not applied for semester VII examination (provided he/she attended semester VII) shall be allowed to proceed to semester VIII.
- i) Rules of ATKT made by the University will be applicable from time to time.

R. B. Sc. No. 16

- (A) The Results of the Examination will be declared based on marks obtained, Grade points obtained, Credit points, Status, Percentage of marks, Result, SGPA and CGPA with numerical grade points, and letter grades. The list of Courses, course codes, Paper numbers of programme, numerical grade & letter grade table, and calculation of SGPA and CGPA table shall be mentioned on the backside of the mark sheet.
- (B) In the case of a Three-Year B. Sc. Degree, the result of B. Sc. programme (Semester-I to VI) shall be declared in Grades by considering SGPA and CGPA (with percentage) based on the performances of all the courses at respective semesters. The award of scholarships and prizes for the B.Sc. programme shall be determined based on the aggregate performance of the candidate at the semester-I to VI examination.
- (C) In the case of a Four-Year B. Sc. Degree, the result of B. Sc. programme (semester-I to VIII) shall be declared in grades by considering SGPA and CGPA (with percentage) based on the performances of all the courses at respective semesters. The award of scholarships and prizes for the B.Sc. programme shall be determined based on the aggregate performance of the candidate at the semester-I to VIII examination.

Standard of Passing:

A) To pass the three year B.Sc. degree examination, a candidate shall be required to pass in semester I, II, III, IV, V

and VI examinations

- a) To pass each semester examination a candidate shall be required to obtain a minimum of 35% of the total marks in each course.
- b) A Candidate shall have to obtain 14 marks out of 40 for the semester end theory examination, 18 out of 50 for the semester end practical examination and 4 marks out of 10 in the internal examination in each semester. If the candidate fails/ absent in the internal examination then the candidate has to pass the internal examination as per University regulations.
- c) The candidate has to complete the other applicable courses like VSEC, SEC, VEC, AEC OE, IKS, CC, OJT, CEP and FP according to the criterion applicable for the respective courses.
- B) For Three year B. Sc Degree : Those of the successful candidates who obtain45% or more of the aggregate marks in Parts-I, II& III semester Examinations, (i.e. Semester-I to VI aggregate) shall be declared to have passed the B.Sc. Degree Examinations in Second Class and those obtaining 60% or more of the aggregate marks in Parts-I, II & III Examinations (i.e. Semester-I to VI aggregate) shall be declared to have passed the B.Sc. Degree Examinations of the aggregate marks in Parts-I, II & Examinations (i.e. Semester-I to VI aggregate) shall be declared to have passed the B.Sc. Degree Examinations in First Class and those obtaining 70% or more of the aggregate marks in Parts-I, II & III (i.e. Semester I to VI aggregate) shall be declared to have passed the B.Sc. Degree Examination in First Class with Distinction.
- C) For Four Year B. c. with (Hon./Research) Degree: Those of the successful 1 candidates who obtain 45% or more of the aggregate marks in Parts-I, II, III & IV Semester Examinations, (i.e. Semester-I to VIII aggregate) shall be declared to have passed the B.Sc. with (Hon./Research)Degree Examinations in Second Class and those obtaining 60% or more of the aggregate marks in Parts-I, II, III & IV Semester Examinations, (i.e. Semester-I to VIII aggregate) shall be declared to have passed the B.Sc. with (Hon./Research)Degree Examinations in Second Class and those obtaining 60% or more of the aggregate marks in Parts-I, II, III & IV Semester Examinations, (i.e. Semester-I to VIII aggregate) shall be declared to have passed the B.Sc. with (Hon./Research) Degree Examinations in First Class and those obtaining70% or more of the aggregate marks in Parts-

I, II, III & IV Semester Examinations, (i.e. Semester-I to VIII aggregate) shall be declared to have passed the B.Sc. with (Hon./Research) Degree Examination in First Class with Distinction.

R. B. Sc. No. 18

A candidate who has satisfactorily completed all courses at Semester-I of B. Sc. Part I of the Universities in the State of Maharashtra shall be allowed to join for the Semester II of the B.Sc. Part I in this university. However, a candidate who has satisfactorily kept one term in any of the Universities in the State of Maharashtra for B. Sc. Part I Semester-I examination shall not be allowed to join for the Semester II of the B.Sc. Part I in this university unless and until the candidate has to clear all the courses (papers) of Semester-I from that university

R. B. Sc. No.19

a) A candidate passing B.SC. Part-I (Sem I and Sem II) Examinations of the B.Sc. Degree programme of other Statutory Universities in State of Maharashtra can take admission to next semester of Shivaji University and the marks of earlier semesters of previous Statutory University be converted in proportion to Shivaji University, Marks structure and grades be awarded accordingly.

(b) Multiple entry and exit rules as per university Regulations and Academic Bank of Credit Regulations are applicable.

R.B. Sc. 20

Relevant amendments in the rules and regulations as per the guidelines notified by UGC / University shall be applicable.

Semester III

Cereals, Legumes and Oilseeds Technology –I (Major DSC V)

Credits 2

Course Outcomes: Upon successful completion of this course, the student will be able to....

- Know about structure and composition of cereals and millet.
- Understand the technology of milling of various cereals and millets.
- Evaluate the physical, chemical, and functional properties of cereals, and millets and their impact on product quality.
- Get exposure to preparing products from cereals and millets.

UNIT I

(15 Lectures)

Milling of Cereals

- Wheat Milling Introduction, Types, Milling methods and products of wheat
- Rice Milling Introduction, Types, Milling methods and products of rice
- Corn Milling- Introduction, Types, Milling methods and products of corn

UNIT II

(15 Lectures)

Milling of Millets

- Sorghum- Introduction, Types, Milling methods, Products and by products of sorghum
- Ragi- Introduction, Types, Milling methods, Products and by products of ragi
- Bajara Introduction, Types, Milling methods, Products and by-products of bajara
- Oats Milling (oatmeal, oat flour & oat flakes)

References:

1. Kent, N.L. (2003). Technology of Cereal, 5th Ed. Pergamon Press.

2. Chakraverty. (1988): Post Harvest Technology of Cereals, Pulses, and Oilseeds, revised Ed., Oxford & IBH Publishing Co. Pvt Ltd.

- 3. Marshall, (1994) Rice Science and Technology. Wadsworth Ed., Marcel Dekker, New York.
- 4. Manay, S. and Sharaswamy, M. 1987. Food Facts and Principles. Wiley Eastern Limited.
- 5. B Srilakshmi (2018), Food Science, New Age International Publishers, 7th Edition.
- 6. David A. V. Dendy and Bogdan J. Bobraszczyk, (2005), Cereal and Cereal Products, Springer.

Semester III

Fruits & Vegetables Processing Technology –I (Major DSC VI)

Credits 2

Course Outcome- After completing this course, students will able to

- Explain different processing and preservation of fruits products like jam, jelly, preserve, and candy.
- Explain and understand the process of canning of fruits and vegetables and its specifications.
- Acquaint with principles and methods of preservation and processing of fruits and vegetables into various products.
- Learn different drying method and types of dryers and acquire knowledge about freezing theory, different food freezers and quality of frozen food.

Unit I

(15 Lectures)

• Current Status of Production and Processing of Fruits and Vegetable.

Fruit Processing- Jam, jelly and marmalade

- Specifications, Processing and Problems in jam, jelly and marmalade
- Preserve and Candy -Specifications, Processing and Problems in preserve and Candy Production

Crystallized and Glazed fruits- Specifications, Processing and Problems in crystallized and glazed fruits

Pickles, chutney and sauces

- Pickles- Types, Problems, Defects and Spoilage in pickles
- Chutney and sauces Classification and processing

Canning of Fruits and Vegetables

- Principle and Process
- Containers for Packing of Canned Products Tin Cans and Glass containers
- Causes of Spoilage of Canned Foods Physical, Chemical and Microbial Changes

Unit II

(15 Lectures)

Drying/dehydration and concentration of fruits and vegetables

- Process of Drying/Dehydration of fruits and vegetables
- Types of Driers Air Convection Driers, Drum/Roller Driers, Vacuum Driers
- Spoilage of Dried Products
- Reconstitution test for Dried/Dehydrated Products
- Food Concentration Methods of Concentration
- Changes during Concentration
- Intermediate Moisture Food (IMF)

Freezing of Fruits and Vegetables

- Methods of Freezing,
- Changes during Freezing
- Changes during Storage

References

- 1) Fruit and Vegetable Preservation, Principles and Practices R P Srivastav and Sanjeev Kumar
- 2) Preservation of fruits and vegetables Girdhari Lal and T D Tandon
- 3) Principles of Fruit Preservation T.N. Morris
- 4) Handbook of fruit science and technology Salunkhe D.K, Kadam S.S
- 5) Preservation of fruit and vegetables Bhatiya Vijaya
- 6) Fruits: Tropical and Subtropical- T K Bose, S K Mitra, D Sanyal.
- 7) Modern Technology of Tomato Processing and Dehydration EIRI Board of Consultants and Engineers.
- 8) Food preservation Techniques Atul Agnihotri
- 9) Fruit and Vegetable preservation N.P. Singh
- 10) Fruit and Vegetable Preservation Techniques R. K. Narang

Laboratory Course - VII (DSC Major Practical III)

Credits 2

Group A: Cereals, Legumes & Oilseeds Technology - I

- 1. Physical characteristics of Wheat
- 2. Estimation of Gluten Content of flour
- 3. Process of flaking
- 4. Process of puffing
- 5. Physical Characteristics of Rice and paddy
- 6. Determination of water absorption power of flour
- 7. Determination of physical parameters of wheat and rice
- 8. Process of popcorn
- 9. Determination of particle size of flour
- 10. Determination of sedimentation value of flour

Group B: Fruits & Vegetables Processing Technology – I

- 1. Study of Equipments for Fruits and Vegetables Processing
- 2. Preparation of fruit Jam
- 3. Preparation of jelly
- 4. Preparation of pickle
- 5. Preparation of preserve
- 6. Preparation of chutney
- 7. Canning of fruits and vegetables.
- 8. Dehydration of fruits and vegetables
- 9. Reconstitution of dehydrated food
- 10. Preparation of Jam/Jelly Marmalade

Semester III

Food Packaging – I (Minor DSC V)

Credits 2

Course Outcomes: Upon successful completion of this course, the student will be able to

- Identify and explain the role and functions of food packaging in protecting, preserving, and promoting food products
- Know the importance of packaging in food industry.
- Explore and learn varieties of packaging material and its application in food industry.
- Apply and examine the properties of packaging material and its selection for food material.
- Gain knowledge of the types of packaging machines and their applications in the food industry.

UNIT I

(15 Lectures)

Basics of food packaging

- Introduction to food packaging
- History, functions and principles of food packaging.
- Classification of packages- Primary, secondary and tertiary

Packaging material

- Plastics- Introduction, types, properties and applications
- Metals- Introduction, types, lacquers and applications.

UNIT II

Packaging material

- Paper and Paper board Introduction, properties and Types
- Glass- Definition, Composition, properties and Types

Properties in packaging materials

- Thickness
- Tensile Strength
- The Bursting Strength
- Water Vapour Transition Rate
- Gas Transition Rate and Oxygen Transition Rate
- Grease and Tear Resistance for papers
- Impact strength test for Plastics
- Heat seal strength

(15 Lectures)

References:

1. P. Jacob John, A Handbook On Food Packaging (2017), Daya Publishing House, New Delhi.

2. Prof. Neelam Khetarpaul and Dr.Darshan Punia, Food Packaging (2017), Daya Publishing House, New Delhi.

3. Takashi Kadoya, Food Packaging (1990), Academic Press Inc., New York.

4. Jerry D'souza and JatinPradhan, Handbook of Food Processing, Packaging and Labelling,

5. Virag Gupta, The Food Safety and Standards Act, 2006 (2021), Commercial Law Publisher (India) Pvt. Ltd.

Semester III

Food Biochemistry – I (Minor DSC VI)

Credits 2

Course Outcomes: Upon successful completion of the Course, students will able to:

- Understand the carbohydrate metabolism.
- Know the protein metabolism in human health.
- Gain knowledge about amino acid pool in human body.
- Learn about metabolic defects in carbohydrate metabolism and protein metabolism.

Unit I

15 Lectures

Carbohydrate Metabolism

Introduction to different pathways of Carbohydrate metabolism, Digestion and Absorption of Carbohydrates, Glycolysis, Kreb's cycle, Electron Transport Chain, Gluconeogenesis, Glycogen synthesis, Glycogen Breakdown, HMP pathway, Galactose metabolism, Fructose metabolism. Metabolic defects associated with carbohydrates.

Unit II

15 Lectures

Metabolism of Proteins

Introduction to Protein metabolism, Digestion and absorption of proteins, Amino acid catabolism, protein synthesis, metabolic defects associated with proteins

Reference Books:

- 1. U.Satyanarayna, U.Chakrapani Biochemistry 6th edition, Elsevier, 2021
- 2. A.C.Deb, Fundamentals of Biochemistry,7th edition, New Central Book agency, 2001
- 3. Patricia Trueman Nutritional Biochemistry 1st edition MJP publishers 2019
- 4. D.C.Sharma, Devanshi Sharma Nutritional Biochemistry 1st edition CBS publishers, 2020
- 5. Biochemistry, Prof. Dulsy Fathima, Dr. R. P. Meyyan Pillai, Saras Publications, Seventh edition.
- 6. Lehninger Principles of Biochemistry, David L. Nelson, Michael Cox, Macmillan publication, eight edition

Laboratory Course - VIII (DSC Minor Practical III) Credits 2

Citu

Group A: Food Packaging - I

- 1. Identification of different types of plastic packaging materials.
- 2. Identification of different types of metal packaging materials.
- 3. Identification of different types of paper and paper board.
- 4. To measure the thickness of paper and paper board.
- 5. To measure basis weight of paper and paper board.
- 6. To measure water absorption of paper and paper board.
- 7. Determination of water vapour transmission rate of packaging number.
- 8. To measure GSM of packaging material.
- 9. Study of corrugated box
- 10. To study determination of grease resistance of paper.

Group B: Food Biochemistry - I

- 1. Study of Colorimeter
- 2. Verification of Beers Lamberts law
- 3. Determination of pH
- 4. Paper Chromatography
- 5. Estimation of glucose from urine sample
- 6. Estimation of creatinine from urine sample
- 7. Study of urinary deposits
- 8. Study of flame photometer

Semester III Open Elective – 03 (OE - 03) Credits 2

OE will be selected from basket as per regular B. Sc. Structure.

Semester III

Laboratory IX

Vocational Skill Course in Jam, Jelly & Ketchup Processing (VSC I - P)

Credits 2

Course Outcomes: After completing this programme, students will be able to:

- Understand the preparation of work area and process machineries for jam, jelly & ketchup processing
- Gain knowledge about raw materials for the preparation of jam, jelly & ketchup

• Learn manufacturing of jam, jelly and ketchup from fruits and vegetables either manually or mechanically

- Documentation and maintaining of records related to jam, jelly & ketchup processing.
- Apply the principles of food safety and hygiene in the work environment.

Overview of Food Processing Industry

- List of various sub sectors in food processing industry
- Explain different types of fruits and vegetables processing
- State the need for processing of fruits and vegetables
- List the various units within a fruits and vegetables processing unit
- State the methods of testing fruits and vegetables for accepted quality standards

Organizational Standards and Norms

- Roles and responsibilities of a jam, jelly and ketchup processing technician
- Personal hygiene and sanitation guidelines
- Food safety hygiene standards in the work environment

Preparation and Maintenance of Work Area and Process Machineries for Jam, Jelly and Ketchup Processing

- Materials and equipment used in the cleaning and maintenance of the work area
- Common detergents and sanitizers used in cleaning work area and machineries
- Methods of cleaning and sanitization
- Process of preparing the work area for scheduled production
- Functions to be carried out before starting production
- Different types of maintenance procedures

Production of Jam, Jelly and Ketchup

- Production planning for effective utilization of raw material and machineries
- Checking the quality of fruits and vegetables
- Demonstration and Production of the technique/ process of preparation of jam/ jelly/ ketchup (Washing, Cutting, Pulping/Juice extraction)
- Demonstration of packaging and analyse the quality of the finished product
- Demonstration of cleaning the machineries used with recommended sanitizers following CIP (clean-in-place) procedure

Documentation and Record Keeping Related to Production of Jam, Jelly and Ketchup

- Need for documenting and maintaining records of raw materials, processes and finished products
- Method of documenting and recording the details of raw material to final finished product

• Demonstration of process of documenting records of production plan, process parameters, and finished products

References

- 1) FICSI: Jam, Jelly and Ketchup Processing Technician, Level 4.
- 2) Fruit and Vegetable Preservation, Principles and Practices R P Srivastav and Sanjeev Kumar
- 3) Preservation of fruits and vegetables Girdhari Lal and T D Tandon
- 4) Principles of Fruit Preservation T.N. Morris
- 5) Handbook of fruit science and technology Salunkhe D.K, Kadam S.S
- 6) Food preservation Techniques Atul Agnihotri
- 7) Fruit and Vegetable preservation N.P. Singh
- 8) Fruit and Vegetable Preservation Techniques R. K. Narang
- 9) Preservation of fruit and vegetables Bhatiya Vijaya
- 10) Modern Technology of Tomato Processing and Dehydration EIRI Board of Consultants and Engineers.

Semester III Food Quality and Safety – I (SEC I) **Credits 2**

Course Outcomes: Upon successful completion of the course, students will be able to:

- Understand the fundamental concepts of food quality and the tools for quality assurance. •
- Familiarize students with national and international food standards and certifications. •
- Identify and analyse potential hazards in the food chain.
- Evaluate quality and safety of various food products.
- Understand concepts of quality assurance in food industries. •

Unit 1: Basics of Food Quality

- Definitions: Food Quality, Food Safety, and Food Security. •
- Attributes of food quality: Physical, chemical, sensory, and microbial aspects. •
- Quality evaluation methods: Sensory, instrumental, and microbiological. •

Food Laws and Standards

- National food laws: FSSAI regulations, BIS, AGMARK. •
- International food standards: Codex Alimentarius, ISO 22000, HACCP. •
- Labelling requirements and nutritional claims. •

Unit 2: Quality Assurance in Food Industry

- Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP). •
- Quality control vs. quality assurance. •
- Total Quality Management (TQM). •

Sampling and Inspection

- Principles and methods of sampling. •
- Statistical quality control (SQC): Mean, range, standard deviation, control charts. •
- Acceptance sampling plans. •

Reference books:

- 1. Bhat, R., Alias, A. K., & Paliyath, G. (Eds.). (2012). Progress in Food Preservation. John Wiley & Sons.
- 2. Gupta, A. (2017). Food Safety and Standards Act, 2006 with Rules and Regulations. LexisNexis.
- 3. Hubbard, M. R. (2018). Statistical Quality Control for the Food Industry (3rd ed.). Springer.
- 4. Jha, S. N. (2016). Rapid Detection of Food Adulterants and Contaminants: Theory and Practice. Elsevier.
- 5. Lawless, H. T., & Heymann, H. (2010). Sensory Evaluation of Food: Principles and Practices (2nd ed.). Springer.
- 6. Mortimore, S., & Wallace, C. (2013). HACCP: A Practical Approach (3rd ed.). Springer.
- 7. Potter, N. N., & Hotchkiss, J. H. (2012). Food Science (5th ed.). Springer.
- 8. Singhal, R. S., Kulkarni, P. R., & Rege, D. V. (1997). Handbook of Indices of Food Quality and Authenticity. Woodhead Publishing.

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(15 Lectures)

(15 Lectures)

Semester III Ability Enhancement Course - English (AEC I) Credits 2

AEC – I will be as per regular B. Sc. Structure

Semester III Co-curricular Course – I (CC I) Credits 2

CC – I will be as per regular B. Sc. Structure

Cereals, Legumes and Oilseeds Technology –II (Major DSC VII) Credits 2

Course Outcomes: Upon successful completion of this course, the student will be able to....

- Know about the processing of pulses and oilseeds.
- Understand the different technology of various pulses and oilseeds.
- Evaluate the physical, chemical, and functional properties of pulses, and oilseeds and their impact on product quality.
- Get exposure to preparing products from pulses and oilseeds.

(15 Lectures)

Processing of Pulses

- Morphology of legume. Classification and types of legumes and pulses. Chemical composition and nutritional value,
- Milling of pulses
- Antinutritional factors, their chemistry, methods of removal of antinutritional factors.
- Processing of legumes of Food uses: Home scale, Cottage Scale and commercial methods of dehulling.
- Modern techniques in Dal mills- Dal milling Principle, methods, equipments and effect on quality.
 Principle products, Dry and Wet milling of pulses,
- Fermented Products of legumes. Soaking Principles, Methods of socking Sprouting, Puffing, Roasting & Parboiling of Legumes, Physical and Biochemical changes during these processes.
- Cooking quality of dhal methods, factors affecting quality of dhal and cooking of dhal.
- Quick cooking dhal, Instant dhal.

Unit - II

Unit I

Processing of Oilseeds

- Chemical composition and characteristics of oil seed and Oils,
- Antinutritional factors, elimination Methods.
- Post Harvest Technology of Oil seeds, Handling Drying, Storage, Grading, Pretreatments, cleaning, Dehulling, Size reduction and flaking.
- Oil extraction: Traditional Methods, Ghani, Power Ghanis, Expellers Principle of Expeller, structure design of expeller.

(15 Lectures)

- Solvent extraction process: Principle, Pretreatment Breaking, Cracking, flaking. Extraction principles, factors affecting the extraction process. Desolventization. Refining of Oils Degumming, neutralization, bleaching, filtration, deodorization, their Principles and process controls.
- Refining of crude oil Modification of oil •Hydrogenation, fractionization, winterization
- Anti-nutritional factors in oilseed and nuts
- Quality assessment of oils and fats

References:

- 1. Hamilton R.J. and Bharti A.. Fats and Oils: Chemistry and Technology Applied
- 2. Wolf Hamm and Richard J. Hamilton (2004), Edible oil Processing, Blackwell publishing.
- 3. Salunkhe, D.K., Kada, Handbook of World Food Legume: Chemistry, Processing and Utilization.
- 4. Srilakshmi (2018), Food Science, New Age International Publishers, 7th Edition.

5. Shakuntala Manay, M Shadakshaksharaswamy (2023), Food Facts and Principles (Fifth revised edition), New Age International Publishers.

6. A. Chakraverty (2020), Post Harvest Technology of Cereals, Pulses, and Oilseeds, third Edition, CBS Publishers and Distributors Pvt, Ltd.

Fruits & Vegetables Processing Technology - II (Major DSC VIII) Credits 2

Course Outcome- After completing this course, students will able to

- Learn about processing of different fermented and unfermented fruit beverages, squash, cordial, nectar, cordial, wine and vinegar.
- Learn about processing of potato into different products, specification of different tomato products like puree, paste, ketchup and soup.
- Processing of different value-added products of fruits and vegetables.
- Acquire knowledge about utilization of waste from fruit and vegetable processing industry.

Unit I

Fruit Beverages

- Un-fermented Beverages- Classifications, processing of fruit juice, FPO specifications and Manufacturing of RTS, Squash, cordial, nectar, syrup and crush, fruit juice concentrate and fruit powder.
 - Fermented Beverages- Classifications and Manufacturing of wine, vinegar

Vegetable Processing

- Potato processing Important consideration and Products, peeling potatoes for processing, potato chips/wafers, French fries, potato flour and canned potato
- Tomato processing Specification and processing of tomato juice, tomato puree, paste, tomato sauce/ketchup, tomato chutney, tomato soup

Unit II

(15 Lectures)

(15 Lectures)

Value Added Products of fruits and vegetables

- Sauerkraut Principle, Processing, Defects and Spoilage Some Other Valuable Products from Fruits and Vegetables
- Processing of Amchur
- Processing of Mango Leather
- Processing of Fruit Cheese
- Processing of Fruit Butter
- Processing of Fruit Toffee
- Processing of Papain

Utilization of fruits and vegetable waste

References:

- 1) Fruit and Vegetable Preservation, Principles and Practices R P Srivastav and Sanjeev Kumar
- 2) Preservation of fruits and vegetables Girdhari Lal and T D Tandon
- 3) Principles of Fruit Preservation T.N. Morris
- 4) Handbook of fruit science and technology Salunkhe D.K, Kadam S.S
- 5) Preservation of fruit and vegetables Bhatiya Vijaya
- 6) Fruits: Tropical and Subtropical- T K Bose, S K Mitra, D Sanyal.
- 7) Modern Technology of Tomato Processing and Dehydration EIRI Board of Consultants and Engineers.
- 8) Food preservation Techniques Atul Agnihotri
- 9) Fruit and Vegetable preservation N.P. Singh
- 10) Fruit and Vegetable Preservation Techniques R. K. Narang

Laboratory Course - X (DSC Major Practical IV)

Credits 2

Group A: Cereals, Legumes & Oilseeds Technology – II

- 1. Malting of Legumes
- 2. Roasting effects on legumes and oilseeds
- 3. Bulk Density and Tapped Density
- 4. Angle of Repose
- 5. Thousand Kernal weight of Legumes
- 6. Fermented Products
- 7. Preparation of full fat soy flour
- 8. Preparation of Soymilk & Tofu
- 9. Determination of Saponification value of oil
- 10. Determination of Acid value of oil

Group B: Fruits & Vegetables Processing Technology - II

- 1. Preparation of RTS
- 2. Preparation of Squash
- 3. Preparation of cordial
- 4. Preparation of tomato ketchup
- 5. Preparation of tomato soup
- 6. Preparation of tomato chutney
- 7. Preparation of potato chips/ wafer
- 8. Preparation of sauerkraut
- 9. Preparation of fruit cheese
- 10. Preparation of fruit butter

Food Packaging – II (Minor DSC III) Credits 2

Course outcome: After completing this programme, students will be able to:

- Learn modern packaging techniques.
- Understand automation and technological advances in food packaging processes, such as vacuum sealing, modified atmosphere packaging (MAP), and thermoforming.
- Understand how to assess packaging's impact on transportation, storage, and inventory management.
- Demonstrate advanced knowledge and skills in selecting packaging materials and technologies based on the characteristics of food product and characteristics of packaging materials

UNIT I

(15 Lectures)

Modern Packaging Systems

- Introduction
- Active packaging
- Controlled and Modified atmospheric packaging (CAP and MAP)
- Aseptic packaging
- Packages for microwave ovens
- Biodegradable packaging
- Edible gums and coating

Modern food packaging machines

- Features of modern food packaging system
- Types- Primary and secondary
- Applications of modern food packaging machines in food industry.

UNIT II (15 Lectures)

Packaging Systems for different types of processed foods

- Dehydrated foods (snacks)
- Frozen foods and beverages
- Dairy Products
- Fresh and vegetables
- Bakery & cereals
- Meat, poultry and sea foods

- Novel Food Packaging for space foods
- Importance of Eco- friendly packaging and sustainability

Food packaging laws and regulations

- FSSAI guidelines on packaging and labelling of food products.
- Physical distribution of packaged foods
- Biodegradable packaging in food industry
- New trends in packaging design
- Emerging food packaging industry trends

References

- 1. P. Jacob John, A Handbook On Food Packaging (2017), Daya Publishing House, New Delhi.
- 2. Prof. Neelam Khetarpaul and Dr.Darshan Punia, Food Packaging (2017), Daya Publishing House, New Delhi.
- 3. Takashi Kadoya, Food Packaging (1990), Academic Press Inc., New York.
- 4. Jerry D'souza and JatinPradhan, Handbook of Food Processing, Packaging and Labelling,
- 5. Virag Gupta, The Food Safety and Standards Act, 2006 (2021), Commercial Law Publisher (India) Pvt. Ltd.

Food Biochemistry – II (Minor DSC IV)

Credits 2

Course Outcomes: Upon successful completion of the Course student will -

- Learn the different metabolic pathways of lipids and their significance.
- Understand utilisation and significance of ketone bodies and lipoproteins.
- Gain knowledge regarding the role of enzymes in metabolism and health.
- Learn about application of enzymes in food industry.

15 lectures

15 lectures

Lipid metabolism

Digestion and absorption of Lipids, Oxidation of fatty acids, Synthesis of Fatty acid, Metabolism of Adipose tissue, Ketone bodies synthesis, utilisation and significance, Lipoproteins, Metabolic defects of lipids

Unit II

Unit I

Enzymes

Introduction., Classification. Nomenclature, Enzyme Specificity, Mechanism of enzyme action, Factors affecting enzyme activity, Enzyme Inhibition, use of Enzymes in Food industry.

Reference Books:

- 1. U.Satyanarayna, U.Chakrapani Biochemistry 6th edition, Elsevier, 2021
- 2. A.C.Deb, Fundamentals of Biochemistry,7th edition, New Central Book agency, 2001
- 3. Patricia Trueman Nutritional Biochemistry 1st edition MJP publishers 2019
- 4. D.C.Sharma, Devanshi Sharma Nutritional Biochemistry 1st edition CBS publishers, 2020
- 5. Biochemistry, Prof. Dulsy Fathima, Dr. R. P. Meyyan Pillai, Saras Publications, Seventh edition.
- 6. Lehninger Principles of Biochemistry, David L. Nelson, Michael Cox, Macmillan publication, eight edition.

Laboratory Course - XI (DSC Minor Practical XI)

Credits 2

Group A: Food Packaging II

- 1. Identification of different food packaging material.
- 2. To study importance of quality evaluation of food packaging materials.
- 3. To study pre-packaging of fruits and vegetables.
- 4. To study cut-out examination of cans.
- 5. To study measurement of bursting strength of paper.
- 6. Preparation of food product label
- 7. To find chemical resistance of packaging film.
- 8. Determination of density of glass.
- 9. To study determination of tensile strength of given material
- 10. To study compliance of regulations on food packaging and labelling of given food packaging.

Group B: Food Biochemistry II

- 1. Estimation of Blood sugar
- 2. Estimation of Serum Proteins and determination of A:G ratio
- 3. Estimation of Blood Urea
- 4. Estimation of Serum Amylase
- 5. Study of Lipid profile tests
- 6. Study of glucose tolerance test
- 7. Estimation of Serum Calcium
- 8. Estimation of Serum Bilirubin
- 9. Detection of enzyme activity
- 10. Determination of enzyme activity with respect to substrate

Open Elective – 04 (OE - 04)

Credits 2

OE will be selected from basket as per regular B. Sc. Structure.

Food Quality and Safety – II (SEC II)

Credits 2

Course Outcomes: Upon successful completion of the course, students will be able to:

- Comprehend the importance of food safety and risk assessment.
- Study food safety management systems and their implementation.
- Develop and implement effective food safety management system.
- Develop critical thinking approach to problem-solving in food quality and safety.

Unit 1: Introduction to Food Safety

- Overview of foodborne illnesses: Biological, chemical, and physical hazards.
- Risk analysis: Assessment, management, and communication.
- Emerging concerns: GM foods, allergens, contaminants.

Food Safety Management Systems (FSMS)

- HACCP: Principles and applications.
- ISO 22000: Structure and key elements.
- FSSC 22000, SQF, and BRC standards.

Unit 2: Sanitation and Hygiene in Food Industry

- Cleaning and sanitation in food processing plants.
- Water quality and sanitation in food production.
- Role of Personal Hygiene and employee training in food safety.
- ✤ Food Adulteration and Traceability
- Common adulterants and detection methods.
- Food traceability systems: Concepts and implementation.
- Case studies on food safety breaches.

Reference Books:

- 1. Adams, M. R., & Moss, M. O. (2020). Food Microbiology (4th ed.). Royal Society of Chemistry.
- 2. Brennan, J. G., Grandison, A. S., & Baines, D. (Eds.). (2012). Food Processing Handbook (2nd ed.). Wiley-VCH.
- 3. De Vries, J. (2020). Food Safety and Toxicity (2nd ed.). CRC Press.
- 4. Forsythe, S. J. (2020). *Microbiology of Safe Food* (3rd ed.). Wiley-Blackwell.
- 5. Ghosh, D. (Ed.). (2019). Food Safety and Quality Systems in Developing Countries. Academic Press.
- 6. Lelieveld, H. L. M., Holah, J., & Napper, D. (Eds.). (2014). *Hygiene in Food Processing: Principles and Practice* (2nd ed.). Woodhead Publishing.

- 7. Marriott, N. G., & Schilling, M. W. (2018). Principles of Food Sanitation (6th ed.). Springer.
- 8. Roday, S. (2019). Food Hygiene and Sanitation (3rd ed.). Tata McGraw Hill Education.

Semester IV Ability Enhancement Course - English (AEC II) Credits 2

AEC – II will be as per regular B. Sc. Structure

Semester IV Value Education Course – Environmental Studies (VEC II) Credits 2

VEC – II will be as per regular B. Sc. Structure

Semester IV Community Engagement Programme – I (CEP I) Credits 2

CEP – I will be as per regular B. Sc. Structure

Nature of Question Paper and Marking Scheme

A. University Assessment for 40 Marks

B.Sc. (FTM) (Part-) (Semester	-) Examination
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Course Name (Course Code)

Day & Date:	Total Marks: 40	
Time:		
Instructions :1) All the questions are compulsory.		
2) Figures to the right indicate full marks.		
Q. 1) Select the correct alternatives from the given choices.		[08]
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
Q.2 Answer the following Questions (Any 2)		[16]
1.		
2.		
3.		
Q.3. Answer the following Questions (Any 4)		[16]
1.		
2.		
3.		
4.		
5.		
6.		
*	.**	

B. Internal Assessment for 10 Marks

B.Sc. (FTM) Part II Semester III - Assignment

B.Sc. (FTM) Part II Semester IV - Unit Test

B. Sc. (Part -) (Semester -) Examination

Food Technology and Management

Course Name (Course Code)

Day & Date:	Total Marks: 10
Time:	
Q.1. Answer the following Questions (Any One	e) 10 Marks
1.	
2.	
3.	
4.	
* *	*

C. Practical Examination: University Assessment for 50Marks

B.Sc. (FTM) (Part-) (Semester-___) Examination Course Name (Course Code)

Day & Date:

Total Marks:50

Time:

Instructions:

1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Draw neat labelled diagram wherever necessary.

Q.1. Principle Writing	5 Marks
Q.2. Perform the Experiment	25 Marks
Q.3. Journal	10 Marks
Q.4. Viva	10 Marks

* * * * *

* Equivalence of papers:

Old Course		Equivalent Course			
Sem No.	Course Code		Course Code	Title of New Course & Credits	Remark
Ι	DSC FTM-C1		-	-	Course shifted to First year
I	DSC FTM-C2	Food Biochemistry-I (02)	BSU0325MIL217C 02	Food Biochemistry-I	Slight modification in syllabus
I	DSC FTM-C3	Post-Harvest Technology-I (02)	-	-	Contents merged with other courses
Ι	DSC FTM-C4		BSU0325MML217 C02	Fruits and Vegetables Processing Technology- I (02)	Title of course changed; Syllabus reformulated
I	DSC FTM- C5	Grain Science and Technology-I (02)	BSU0325MML217 C01	Cereals, Legumes and Oilseeds Technology-I (02)	Title of course changed; Syllabus reformulated
I	DSC FTM -C6	Food Packaging-I (02)	BSU0325MIL217C 01	Food Packaging-I (02)	Slight modification in syllabus
Ι	DSC FTM- P3		BSU0325MMP217 C03	Laboratory Course VII (04)	Change in syllabus as per theory courses
Ι			BSU0325MIP217C 03	Laboratory Course VIII 04	Newly added practical & syllabus as per theory courses
п	DSC FTM-D1	Human Nutrition-II02	-	-	-

П	DSC FTM-D2	Food Biochemistry-II (02)	BSU0325MIL217D 02	Food Biochemistry- II 02	Slight modification in syllabus
п	DSC FTM-D3		-	-	Contents merged with other courses
П	DSC FTM-D4	Processing of Fruits and Vegetables-II (02)	BSU0325MML217 D02	Fruits and Vegetables Processing Technology- II (02)	Title of course changed; Syllabus reformulated
п	DSC FTM- D5		BSU0325MML217 D01	Cereals, Legumes and Oilseeds Technology-II (02)	Title of course changed; Syllabus reformulated
Π	DSC FTM- D6		BSU0325MIL217D 01	Food Packaging-II (02)	Slight modification in syllabus
П	DSC FTM-P4		BSU0325MM P217D03	Laboratory Course IX (04)	Change in syllabus as per theory courses
п			BSU0325MIP217D 03	Laboratory Course X (04)	Newly added practical & syllabus as per theory courses