

Estd. 1962

'A++" Accredited by NAAC (2021)

With CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR - 416004, MAHARASHTRA

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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



Estd.in1962

'A⁺⁺'Accredited by NAAC (2021) with CGPA3.52

Structure and Syllabus in Accordance with

National Education Policy- 2020

With Multiple Entry and Multiple Exit

Syllabus for

B.Sc. Part- II

Food Science & Technology

(Entire)

(Faculty of Science and Technology)

SEMESTER III AND IV

(To be implemented from Academic year June2025-26)

PREAMBLE

Food Science and Technology

Food Science and Technology is an exciting field that allows you to build a strong background for many career opportunities.

Food Science and Technology is a multidisciplinary field that combines principles from biology, Chemistry, physics, Nutrition and engineering to understand the Physical, chemical and Biological properties of food.

It involves the application of scientific principles to the production , processing, preservation , packaging , distribution and consumption of safe , nutritious and appealing food product.

	PROGRAM OUTCOMES				
PO1	Apply the scientific method to food science& Technology problems				
PO2	Apply critical thinking and analytical evaluation to contemporary food science & Technology information and literature.				
PO3	Apply principles from general chemistry ,microbiology, analysis biotechnology and biochemistry to food science& Technology problems.				
PO4	To provide knowledge and skills for better preservation techniques , processing and value addition to agricultural products.				
PO5	To promote research and development for food product and process and guarantee sanitation and safety of processed food items.				
PO6	Utilize advanced instruments and technologies to process and analyze food products and to solve food safety problems.				
PO7	Critically access and analyze food science & Technology information available in the public domain in an innovative and ethical way.				
PO8	Design food products that meet the various food regulation sand laws				
PO9	Utilize knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease processes.				
PO10	Taking roles as researchers, academics, practitioners, or professionals with reliable				
	skills, mastering concepts and theories ,and applying and developing food and related				
	sciences.				
PO9 PO10	Utilize knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease processes. Taking roles as researchers, academics, practitioners, or professionals with reliable skills, mastering concepts and theories ,and applying and developing food and related sciences.				

PROGRAM SPECIFIC OUTCOMES

PSO1	To impart knowledge in various aspects of Food Technology through Theory and Practical knowledge.
PSO2	To impart the knowledge about various compounds such as protein, carbohydrates ,lipids amino acids ,minerals ,vitamins etcassociated with the chemical composition so food, their structures and functions.
PSO3	The students can gain knowledge about so me very essential to pic of nutrition and its metabolism balance in side the body
PSO4	To make the students familiar with the technologies off processing and preservation of plant and animal foods ,cereals, pulses ,oilseeds, fruits vegetables, spices, meat, fish, poultry, seafood, milk and dairy products.
PSO5	To development students understanding and communication skills through various assignments which will enable the to develop skill sin writing an defective's interpersonal skills. A presentation in different topics enhances their confidence ,ability to express themselves & presentation skills .

	PROGRAM OBJECTIVES				
•	Understand the fundamental principles of food science and technology, including the physical chemical, and biological properties of food.				
•	Apply Scientific principles to the production , processing , preservation ,packaging , distribution and consumption of safe and appealing food.				
•	Develop problem skill to address challenges in food science and Technology ,including food safety , Quality and sustainability				
•	Food Chemistry Understand the chemical composition of food.				
•	Food Microbiology Understand the role of Microorganism in Food Spoilage and Safety.				
•	Food Processing and preservation Understand the principles of food Processing and preservation.				
•	Evaluate the Safety and efficiency of genetically modified food and apply principles to food product development.				
•	Evaluate the effect of packaging and distribution on food quality and safety.				
•	Develop innovative solution for the food industry.				
•	Help student gain practical skills through internship and collaborative project.				

Shivaji University, Kolhapur

Bachelor of Science (B.Sc.)

Under the Faculty of Science & Technology

Level	Programme		From Academic Year
Undergraduate	e Programme:	I	
Level 4.5	Undergraduate Certificate (One year or two semesters)	B.Sc.Part-I	2024-25
Level 5.0	Undergraduate Diploma (Two years or four semesters)	B.Sc.Part-II	2025-26
Level 5.5	Bachelor's Degree (Three years or six semesters)	B.Sc.Part-III	2026-27
Level 6.0	Bachelor's Degree with Honours /Research (Four years or eight Semesters)	B.Sc.Part-IV	2027-28

(Structure, Syllabus, Rules and Regulations in accordance with National Education Policy with effect from Academic Year 2024-25)

1. Implementation of Revised guidelines and rules:

The revised guidelines and rules shall be implemented gradually as mentioned below:

(If the candidate wants to exit after a certain level, the awards after completing specific level will be: Undergraduate Certificate in Science, Undergraduate Diploma in Science, B. Sc. And B. Sc. (Honours/Research) for Level-4.5 and additional 4 credits, Level-5.0 and additional 4 credits, Level-5.5 and Level- 6.0 respectively. Other provisions for multiple entry and multiple exit as per the university's rules and regulations are applicable).

2. Eligibility Criteria:

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):
 - 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):
 - i) 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).

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 Bodyrecognized 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.
- 3. Pattern of B.Sc. Programme: The pattern of program will be of semester type.
 - (A) Weightage: There shall be Undergraduate certificate in science program with 48 credits. There shall be Undergraduate diploma in science with 92 credits. There shall be Three Year B.Sc. Programme with 132 credits. The 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).

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

Course Name		Total Credits	% of total credits	
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		
Indian Knowledge System(Generic)	IKS	02	10.60	
Value Education Courses	VEC	04		
Skill Enhancement Courses	SEC	06		
Co-Curricular Courses(NSS/NCC/Sports/Cultural Activities)	СС	02	- 6.06	
TOTAL		132	100%	

	c) Course Name d)		Total Credits	% of total credits
	Major			
	Major Mandatory	MM	80	
	Major Elective	ME	16	
	Vocational Skill Courses	VSC	06	
	On Job Training	OJT	08	65.91
	Field Project	FP	02	
	Research Projects*	RP	00	
	Indian Knowledge System	IKS	02	
Сс	ommunity Engagement Programme	CEP	02	
	Major Total Credits		116	
	Minor	MIN	24	15 91
	Research Methodology	RM	04	10101
	Open Elective/Generic Elective Courses	OE	10	5.68
	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	СС	02	4.55
	Activities)			
	TOTAL		176	100%

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

c. Programme (Honours with Research Degree):

Course Name		Total Credits	% of total credits
Major			Creates
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	OE/GE	10	5.68
Courses			
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			
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.

5 .Scheme of Examination: Total marks shall be 50 for 2 credit course.

- 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 semester- end examination. The division of internal assessment and semester-end examination for B. Sc. will be as follows:
- 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.

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

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 genuinereasons, 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:

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
	Semester– VIII	Case Study/ Field Work/ Project Work	10 marks

- 5. Ordinances regarding the examination: O. B.Sc.2,3 and 4 shall prevail.
- 6. 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 he/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.

7. 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.

% of Marks Obtained	Numerical Grade (Grade Point)	CGPA	Letter Grade
Absent		-	-
0 – 34	0	0.0 – 4.99	F (Fail)
35 – 44	5	5.00 – 5.49	C
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 >= 0.5shall 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)

 $\Sigma(\text{Course credits}\times\text{Grade points obtained})$ of a semester

SGPA = _____

 Σ (Course credits) of respective semester

2. Cumulative Grade Point Average (CGPA)

CGPA

 \sum (Total credits of a semester \times SGPA of respective semester) of all semesters

 \sum (Total course credits) of all semesters

- 8. **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.
- **9. Revised Rules** These revised rules shall be gradually implemented with effect from the academic year 2024-25 for B.Sc. Degree programme. However the existing (i.e. pre-revised) rules shall remain in force for the students of old semester pattern during the transition period.

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

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	Maior V. VI. and Maior Practical III
		Minor V. VI. and Minor Practical III
		• OF III (Theory/ Practical)
		 VSC Practical (Major Specific)
		• SEC Theory/Practical
		• AFC I (English)
B. Sc. II	Sem IV	Major VII VIII and Major Practical IV
5.00.11	Jenniv	Minor VII VIII and Minor Practical IV
		OE IV (Theory (Practical))
		• SEC II Theory/Practical
		• SEC II (English)
		ACCII (English) ACCII (English) ACCII (English)
	Corre 1/	
	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)
		• OJF
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.
- 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.
- 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.
- 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.
 - 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.

R. B. Sc. No. 17

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 in Farts-I, II & III 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 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 I 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 First Class and those obtaining70% or more of the aggregate marks in Parts-I, II, III & IV Semester-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 Examinations, (i.e. Semester-I to VIII aggregate) shall be declared to have passed the B.Sc. with(Hon./Research) begree 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.

SHIVAJI UNIVERSITY, KOLHAPUR

NEP-2020 (2.0): Credit Framework for UG (B.Sc.)Programme under Faculty of Science and Technology

SEM (Level)		COURSES		OE	VSC/SEC	AEC/VEC/IKS	OJT/FP/CEP /CC/RP	Total Credits	Degree/Cum. Cr. MEME
	Course-1	Course-2	Course-3						
SEMI(4.5)	DSC-I Food Chemistry – I (2) DSC-II Principles of Food preservation – I (2) DSCP-I Lab Course I (Based on DSC I & II(2)	DSC-I Food Microbiology –I (2) DSC-II Human Physiology (2) DSCP-I Lab Course II (Based on DSC I& II)(2)	DSC-I Human Nutrition -I (2) DSC-II Processing of Fruit & Vegetables – I (2) DSCP-I Lab course III(Based on DSC I & II (2)	OE-1 Marketing skill I (2)(T)		IKS-I Introduction to IKS (2)		22	UG Certificate 44
SEMII(4.5	DSC-III Food Chemistry- II (2) DSC- IV Principles of Food preservatio n II (2) DSCP-II Lab Course IV (Based on DSC III & IV(2)	DSC-III Food Microbiology II (2) DSC-IV Food Analysis (2) DSCP-II Lab course V (Based on DSC III & IV) (2)	DSC-III Human Nutrition II (2) DSC-IV Processing of fruit and Vegetables (2) DSCP-II Lab Course VI (Based on DSC III & IV) (2)	OE-2 Marketing skill (2) (T)		VEC-I (2) (Democracy, Election and Constitution)		22	
Credits	8(T)+4(P)=12	8(T)+4(P)=12	8(T)+4(P)=12	2+2=4(T/P)		2+2=4		44	ExitOption:4creditsNS QF/Internship/Skillcours es

	MAJOR	MINOR						
SEMIII(5.0)	Major V Dairy Technology – I (2) Major VI Food Quality & Safety Management I (2) Major P III)Lab course VII (Based on Major V & VI(2)	Minor V Food Biochemistry (2) Minor VI Cereal & Bakery Processing I(2)Minor PIII Lab course VIII (Based on Minor V & VI(2)	OE-3 (2) (T/P)	VSCI Lab course IX Jam ,Jelly& Ketchup Processing (2)(P) (Major specific)SEC I Lab course X Design & Development of New Product (2)(P)	AECI(2) (English)	CC-I(2)	22	UG Diploma 88
SEMIV (5.0)	Major VII Dairy Technology II (2) Major VIII Food Quality & Safety Management II(2)Major P IV Lab course XI (Based on Major VII & VIII) (2)	Minor VII Sugar Confectionary Technology (2) Minor VIII Cereal & Bakery Processing II (2)Minor P IV Lab course XII (Based on Minor VII & VIII (2)	OE-4 (2)(T)	SEC-II Lab course XIII . Design & Development of New Product (2)(P)	AEC-II(2) (English) VEC-II(2) (Environmental studies)	CEP-I(2)	22	
Credits	8(T)+4(P)=12	8(T)+4(P)=12	2+2=4(T/P)	4(T/P)+2(P)=6	2+4=6	2+2=4	44	ExitOption:4creditsNS QF/Internship/Skillcours es

SEM V (5.5)	Major IX Legumes & Oilseed Technology I (2)Major X Meat ,Fish, Poultry Technology I (2) Major P V Lab course XIV (Based on Major IX & X) (4)	Major I (ELEC) Food Packaging / Functional Food Processing(2) Major P- I(ELEC)Lab Course XV (Based on Major I ELEC)(2)	-	OE-5 (2)(T/P)	VSCII Bakery Processing (2) (Major specific) Lab Course XVI Dairy Technology (P)	AECIII(2) (English)	ОЈТ(04)	22	UG Degree 132
SEMVI(5.5)	Major XI Legumes & Oilseed Technology II (2) Major XII . Meat ,Fish, Poultry Technology II(2)Major P VI Lab Course XVII (Based on Major XI & XII) (4)	Major II Food Additives & Technology /Snack Food Processing (ELEC) (2) Major P-II Lab Course XVIII (Based on Major II)(FLEC)(2)	-		VSCIII Snack & Savory Processing (2) (Major specific)Lab Course XIX Dairy Processing (P)SEC III Entrepreneurship Skill (2)(T/P)	AECIV(2) (English)IKS2 (Major specific) Indigenous Preservation Technology (2)	FP-(02)	22	
Credits	8(T)+8(P)=16	4(T)+4(P)=8	-	2(T/P)	2(T/P)+4(P)=6	4+2=6	4+2=6	44	
Total Creits	40+20=	=60	24	10	12	16	10	132	ExitOption

SEMVII (6.0)	Major –XIII Plantation Crop I (4)Major –XIV Fermentation Technology (4)Major(P)VII Lab Course XXI (Based on Major XIII) (4) Major(P)VIII Lab Course XXII (Based on Major XIV)(2)	MAJORIII Beverage Technology /Function Food & Nutraceutical (4)(ELEC)	RM-I(4)	-	-	-		22	UG Honors Degree 176
SEMVIII (6.0)	Major –XV Plantation Crop II (4)Major –XVI Fermentation Technology II (4)Major (P)-IX (4) Major(P)X(2)	MAJOR IV Enzymes in Food Industry /Plant Hygiene & Sanitation /Food Supply Chain Management (4)(ELEC)	-	-	-	-	ОЈТ(04)	22	
Credits	16(T)+12(P)=28	8(T)	4	-	-	-	04	44	
									Exit Option
Total Credits	68+28=	96	28	10	12	16	14	176	

SEMVII	Major-XIII Animal	MAJOR	RM-I(4)	-		-	RP-4	22	
(6.0)	Product Technology	Beverage							UG Honors
(0.0)	Major-XIV	Technology							withRese
	Fermentation	/Function							archDegr
	Technology I(4)	Food &							ee176
	Major(P)VII Lab	Nutraceutical(
	Course XXI (Based	4)(FLEC)							
	on Major XIII &	-/()							
	XIV)(2)								
	Major-XV Animal	MAJOR		-		-	RP-8	22	
SEMVIII	Product rechnology	Enzymes in							
(6.0)	I (4) Maior-XVI	Food							
	Fermentation	Industry/Plant							
	Technology II(4)	Hygiene &							
	Major(P)-VIII Lab	Sanitation /							
	Course XXII (Based	Food Supply							
	on Maior XV & XVI	Chain							
	(2)	Management							
	()	(4)(FLFC)							
Credits	16(T)+4(P)=20	8(T)	4	-	-	-	12	44	
		-(-)	•						
TotalC	60+28=8	38	28	10	12	16	22	176	
redits									

Note:

- University may decide to offer maximum of three subjects(Courses) in the first year. The student may selection subject out of combination of three subjects (Courses), (which a student has chosen in the first year) as a MAJOR subject (Course) and one subject (Course) as MINOR Subject in the second year .There by itisinferredthattheremainingthirdsubject(Course)shallstanddiscontinued.
- **DSC** :Discipline Specific Course
- MAJOR :Mandatory/Elective
- MINOR: Course may be from different disciplines of same faculty of DSC Major
- OE(OpenElective):Electivecourses/OpenElectivetobechosencompulsorilyfromfacultyotherthanthatoftheMajor.
- VSC/SEC:Vocational Skill Courses(MAJOR related)/Skill Enhancement Courses
- AEC/ VEC / IKS: Ability Enhancement Courses (English, Modern Indian Language)/Value Education Courses/ Indian Knowledge System(Generic& Specific))
- OJT/FP/RP/CEP/CC:On-JobTraining(Internship/Apprenticeship)/FieldProject(Majorrelated)/ResearchProjects(Majorrelated)Community Engagement (Major related)/ Co-Curricular courses(CC) such as Health& Wellness, Yoga Education, Sport, and Fitness, Cultural activities ,NSS/NCC and Fine /applied/visual/performing Arts/Vivek Vahini etc.

TEACHING & EXMINATION SCHEME

	SEMESTER-III									
Sr.	Course Code	Teaching	Schem	e	Examina	ation So	cheme			
No.		Theory a	nd Prac	tical	Univers Assessn	ity nent(U	A)	Interna Assess	al ment(IA)	
		Lecture s (Per week)	Practi cal hours (Per week)	Cred it	Max Marks	Min. Mar ks	Exa m. Hours	Max .Mar ks	Min. Marks	Exam Hours
1	Major- V Dairy Technology-I	2	-	2	40	14	1.5	10	04	1
2	Major VI Food Quality & Safety Management I	2	-	2	40	14	1.5	10	04	1
3	Major Practical III :Lab Course VII(Based on Major V & VI)	-	2	2	50	18	4	-	-	1
4	Minor V Food Biochemistry	2	-	2	40	14	1.5	10	04	1
5	Minor VI Cereal & Bakery Processing I	2	-	2	40	14	1.5	10	04	1
6	Minor Practical III: Lab Course VIII(Based on Minor V & VI)	-	2	2	50	18	4	-	-	
7	OE III	2	-	2	40/ 50	14/ 18	1.5/ 4	10	04	1
8	VSC I Lab Course IX Jam , Jelly & Ketchup Processing	-	2	2	50	18	4	-	-	
9	SEC I X Design & Development of New Product	-	2	2	40	14	1.5	10	04	1
10	AEC I English	2	-	2	40	14	1.5	10	04	1

Note – The marking scheme of CC and CEP will be as per B.Sc regular structure of Shivaji University Kolhapur.

			S	EMEST	ER-IV						
Sr.	Course Code	Teaching	Scheme		Examin	ation Sc	heme				
No.		Theory ar	Theory and Practical		Univers Assessn	ity nent(UA))	Interna	Internal Assessment(IA)		
		Lectures (Per week)	Practic al hours (Per week)	Cred it	Max. Marks	Min. Marks	Exam. Hours	Max. Marks	Min. Marks	Exam Hours	
1	Major VII Dairy Technology-II	2	-	2	40	14	1.5	10	04	1	
2	Major VIII Food Quality &Safety Management II	2	-	2	40	14	1.5	10	04	1	
3	Major Practical IV :Lab Course XI (Based on Major VII & VIII)	-	2	2	50	18	4	-	-		
4	Minor VII Sugar & Confectionary Technology	2	-	2	40	14	1.5	10	04	1	
5	Minor VIII Cereal & Bakery Processing II	2	-	2	40	14	1.5	10	04	1	
6	Minor Practical IV: Lab Course XII (Based on Minor VII & VIII)	-	2	2	50	18	4	-	-		
7	OE IV	2	-	2	40/ 50	14/ 18	1.5/ 4	10	04	1	
8	SEC II Lab Course XIII Design & Development of New Product	-	2	2	50	18					
9	AEC II English	2	-	2	40	14		10	04	1	
10	VEC II Environmental Studies	2	-	2	40	14		10	04	1	

Note – The marking scheme of CC and CEP will be as per B.Sc regular structure of Shivaji University Kolhapur.

Theory and Practical	Total Marks for B.Sc Food Science &
Lectures: 60 Minutes Each	Technology (Entire)Part-I:1100
SEC- Skill Enhancement Course	Total Credits for B.Sc Food Science &
OE-Open Elective	Technology(Entire)Part-II(Semester III&IV):44
VEC: Value Education course	
AEC-Ability Enhancement Course	
VSC- Vocational Skill Course	
	Duration of Practical Examination as
	per respective BOS guidelines
	Separate passing is mandatory for
	Theory, Internal and Practical
	Examination.

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Equivalence of Second Year B.Sc Food Science and Technology

Semester III and IV

The Equivalence for the subjects/courses of Food Science and Technology at Second Year B. Sc Semester III and IV pre-revised Program under the faculty of Science and Technology is as follows.

Sr. No	Second Year B. Sc (Food Science & Technology) Semester III Pre-revised syllabus	Second Year B.Sc (Food Science &Technology) Semester III Revised syllabus	Remark
1.	Cereal and Legume Technology I	Dairy Technology I	Change in Subject
2.	Cereal and Legume Technology II	Food Quality &Safety Management I	Change in subject
3.	Post Harvest Technology I	Food Biochemistry	Change in Subject.
4.	Post Harvest Technology II	Cereal & Bakery Processing I	Change in Subject.
5.	Bakery and Confectionary Technology I	OE III	Added according to NEP 2.0 structure
6.	Bakery and Confectionary Technology II	VSC I Vocational Skill Course in Jam, Jelly & Ketchup	Added according to NEP 2.0 structure
7.	AEC :Environmental Studies	AEC English	Added according to NEP 2.0 structure
8.	SEC	SEC Design and Development of New Product	Added according to NEP 2.0 structure
9.	-	СС	Added according to NEP 2.0 structure

Second Year B. Sc semester III
Sr. No	Second Year B. Sc (Food Science) Semester IV Pre- revised syllabus	Second Year B. Sc (Food Science) Semester IV Revised syllabus	Remark
1	Processing of Fruit &Vegetable I	Dairy Technology II	Change in Subject
2	Processing of Fruit &Vegetable II	Food Quality & Safety Management	Change in Subject
3	Oil Seed & Nuts Technology-I	Sugar & Confectionary Technology	Change in Subject
4	Oil Seed & Nuts Technology-II	Cereal & Bakery Processing II	Change in Subject.
5	Food Packaging -I	OE IV	Added according to NEP 2.0 structure
6	Food Packaging -II	AEC English	Added according to NEP 2.0 structure
7	Environmental Studies	VEC Environmental Studies	No Change
8	SEC	SEC Design and Development of New Product	Added according to NEP 2.0

CEP

9

structure

structure

according to NEP 2.0

Added

Second Year B. Sc semester IV

CODE ASSIGNMENTTOPAPER

Sr.	Course Name	Course Code (Sem III)
No.		
1	Major- V Dairy Technology-I	BSU0325MML216C1
2	Major VI Food Quality & Safety Management I	BSU0325MML216 C2
3	Major Practical III :Lab Course VII(Based on Major V & VI)	BSU0325MMP216C1
4	Minor V Food Biochemistry	BSU0325MIL216C1
5	Minor VI Cereal & Bakery Processing I	BSU0325MI216C2
6	Minor Practical III: Lab Course VIII(Based on Minor V & VI)	BSU0325MIP216C1

Sr.	Course Name	Course Code(Sem IV)
No.		
1	Major VII Dairy Technology-II	BSU0325MML216D3
2	Major VIII Food Quality &Safety Management II	BSU0325MML216 D4
3	Major Practical IV :Lab Course XI (Based on Major VII & VIII)	BSU0325MMP216D2
4	Minor VII Sugar & Confectionary Technology	BSU0325MIL216D3
5	Minor VIII Cereal & Bakery Processing II	BSU0325MIL216D4
6	Minor Practical IV :Lab Course XII (Based on Minor VII & VIII)	BSU0325MIP216D2

Semester III

SUBJECT I Major V- Dairy Technology I

Credits 2(Marks50)Hours30,Lecturesof60Minutes

Course Outcomes :The students will be able to

CO 1. To understand the scope the dairy industry in India , dairy industry layout and its sanitation .

CO 2. To explain the organization and operations involved in milk processing unit.

CO 3.The student able to explain understand food value, composition of milk and milk processing unit.

Unit I	Hours Allotted
Introduction to Dairy Industry Source & Composition of milk. Factor affecting composition of milk. Nutritive & Physicochemical properties of milk. Types of milk . Cleaning, buying & collection of milk Manufacture, packaging, transportation & storage of milk Cleaning & Sanitization of dairy equipment Judging & Grading of milk Flavor defect in milk, there causes & prevention Uses of milk	15
Unit II	Hours Allotted
Special Milks Sterilized, Homogenized, Soft-curd, Flavored Milk ,Vitaminzed , Fermented, Standardized, Rehydrate, Recombine, Toned, Double toned milk Cream Classification, Composition, Nutritive Value, Physico-chemical properties, Manufacture of cream Judging and grading of cream Defect of cream, their causes and prevention Uses of cream	15

References

Sukumar De Dairy Technology

James .N. Warner Principle of dairy processing

Walstra .p ,Taylor and Francis Dairy Science and Technology 2 nd edition ,2006

P. F. FOX , P.L.H Mcswenny Dairy Chemistry & Biochemistry

Eckles , Combs and macy Milk and Milk product

Semester III Subject I Major VI Food Quality & Safety Management I

Credits 2 (Marks 50) Hours 30, Lectures of 60 Minutes

Course Outcome - The students will be able to

CO 1 .To Understand the food quality ,food safety and food related hazard.

CO2. Demonstrate the functional role and safety issue of food contaminants , adulterations,

additives , packaging, & labelling.

CO3.To get knowledge of food safety management tools.

CO 4. Understand the various regulatory aspect for food business operations.

Unit I	Hours Allotted
Introduction Of Food Quality & Safety	
Important Functions Of Quality Control	
Quality Attributes & Their Role In Food	
Sensory Evaluation Of Food Quality	
Panel Screening	
Methods Of Sensory Evaluation & Evaluation Cards Difference/	15
Decimation Procedures , Cards – Ranking & Rating Procedure ,	
Food Assessment Quality Assessment Of Food Materials- Fruits &	
Vegetables , Cereals & Legumes , Dairy Products , Meat, Poultry, Egg	
&Processed Food Products.	
Definitions and importance of Food Safety	
Hazards and Types of Hazards	
Factors Affecting Food Safety	
Importance Of Safe Food	
Microbiological Consideration In Food Safety	15
Toxicity	

Reference -

1) Frank .D. Gunstone Vegetable & Oils in food technology

2)John Wiley & Son Bailey's industrial Oil & Fat product 4th edition.

3) S.C.Sighal , OTA Modern technology in the oils & fats industry.

4) Norman N-Potter, Joseph H. Hotchkiss, Food Science CBS Publishers & distributors, New Delhi, 1997 5th edition

5) The Food Safety & Standards Act 2006. Professional Book Publishers Delhi

Semester III Subject II Major V Food Biochemistry

Credits 2(Marks50)Hours30,Lecturesof60Minutes

Course Outcome : The students will be able to

- CO 1.To evaluate the food component on qualitative and quantative basis
- CO2. Be able to know the laboratory technique and different methodology for biological assay.
- CO3. To apply principles of laboratory techique.
- CO4. Have suffcient knowledge of food boichemistry to control reaction in foods.
- CO5 To identify appropriate technique for analysis.

Unit I	Hours Allotted
Introduction , Definition of Food biochemistry	
pH and Buffers , The atom and Chemical bond.	
Catabolism , Metabolism	
Enzymes and Co- enzymes , Classification and Function,	
Carbohydrates metabolism –	
Digestion and Absorption of carbohydrates .	15
Basis of Metabolic Pathway	
Glycolysis	
Krebs Cvcle	
Unit II	Hours Allotted
Metabolism of protein –	
Urea cycle , Diseases in protein metabolism	
Nucleic acid – Introduction , Definition ,Double helical structure,	
Denaturation and Renaturation, DNA structure, RNA structure	
Metabolism of Fat and Lipids	
Glycogen metabolism ,HMP pathway	15
Galactose metabolism, Fructose metabolism	
Digestion and absorption of Lipids	
Oxidation of fatty acids	
Ketone bodies	

Reference

- 1) Lehninger , Principle of biochemistry
- 2) Steryer , Biochemistry
- 3) Ponald .JVOET ,Principles of biochemistry
- 4) Anusha Bhaskar, V.G. Vidhya, Enzyme Technology

Semester III

SUBJECT II Major VI- Cereals & Bakery Processing I

Credits 2(Marks50) Hours30,Lectures of 60 Minutes

COURSE OUTCOME : The students will be able to

CO1 .To understand structure and chemical composition, criteria for flour, quality, milling method of wheat.

CO2. To understand structure and chemical composition, types and milling of rice, parboiling technology of Rice.

CO3 Capable of converting cereals into bakery goods

CO4 List the typical issues and their root causes in bakery products

	Allotted
Wheat: Structure and chemical composition of wheat grain Wheat milling	
Grades of wheat flour Dough rheology Rice:	
Structure and chemical composition of rice gram Milling of rice	45
Modern rice milling unit operation	15
Rice Parboiling technology	
Unit II	Hours
	Allotted
Introduction of Bakery product –	
Introduction and Importance of bakery , principal used in bakery	
product .Essential and optional ingredient ,	
Role of each ingredient and their Function.	
Types of flour, various Dough and their Use	15
Equipment:	
Working, principle and application	
1. Dough mixer	
2. Molding machine	
3. Oven machine	

Reference

1) Dubey .S.C 4^{Th} edition Basic baking

2) Y. H .Hui , Bakery product Science & Technology

3) Acharya N. G. Ranga , Bakery & Confectionary product

4) Cereal Processing Technology, Gavin Owens, WoodHead Publishing Ltd, 2000

5) Post Harvest Technology of Cereals, Pulses and Oilseeds, A.Chakraverty, Oxford and IBH Publishing Company, 2014

SHIVAJI UNIVERSITY,KOLHAPUR Syllabus as per National Education Policy (NEP)2020 B.Sc. Food Science& Technology SEMESTER–III OE III Credits: 2 Semester End 40 Internal Assessment: 10 Total: 50 Introduces From June 2025

Syllabus as per Regular B. Sc Structure

Suggested Readings:

Semester III Laboratory IX

Vocational Skills 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 AtulAgnihotri
- 7) Fruit and Vegetable preservation N.P. Singh
- 8) Fruit and Vegetable Preservation Techniques R. K. Narang
- 9) Preservation of fruit and vegetables BhatiyaVijaya

10) Modern Technology of Tomato Processing and Dehydration – EIRI Board of Consultants and Engineers.

SHIVAJI UNIVERSITY,KOLHAPUR Syllabus as per National Education Policy (NEP)2020 B.Sc. Food Science& Technology

SEMESTER-III

SEC – I Design & Development of New Product Processing

Credits: 2

Introduces From June 2025

Unit I	Hours
	Allotted
Basics of Food Product Development	
Definition , Classification of new product	
Reason for new food , Product development –social concern, Health	
concern.	
New product development team ,concept of market and marketing	15
steps in Food Product Development.	
Unit II	Hours
	Allotted
Technology for New Product & Scale up Trials	
Adaptable technology and sustainable technology for standardized	
formulation for process development.	
process control parameter	15
Scale up production trials for new product development at lab and pilot	
scale.	
Quality assessment of new developed product.	
Market testing and Marketing plan.	
Costing and economics evaluation of developed product.	
Commercialization product launch for marketing.	

SHIVAJI UNIVERSITY, KOLHAPUR Syllabus as per National Education Policy (NEP)2020 B.Sc. Food Science& Technology SEMESTER–IV AEC I English Credits: 2 Semester End 40 Internal Assessment: 10 Total: 50 Introduces From June 2025

Syllabus as per Regular B. Sc Structure

SHIVAJI UNIVERSITY ,KOLHAPUR Syllabus as per National Education Policy (NEP)2020 B.Sc. Food Science& Technology SEMESTER–III CC - I Credits: 2 Introduces From June 2025

Syllabus as per Regular B. Sc Structure

B.Sc food Science and Technology

SEMESTER III

Subject I Major practical III Labcourse VII (Based on Major V & VI)

Credits 2

- 1) Determination of Natural Acidity of Milk.
- 2) Milk Quality test.
- 3) Milk Aduitrations Test.
- 4) Preparation of Flavoured Milk.
- 5) Preparation of Dahi.
- 6) Preparation of Chakka.
- 7) Preparation of Shrikhand.
- 8) Prepations of Lassi.

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- 9) Sensory Evaluation by Different Method.
- 10) Detection of Adultraions in common Food Product.
- 11) Determination of Food by Texture Analyzer.

B.Sc food science and Technology

SEMESTER III

Subject I Minor practical III Labcourse VIII (Based on Major V & VI)

Credits 2

- 1. Qualatitive Analysis of Carbohydrates.
- 2. Retention of Carbohydrets

a) Glucose b) Fructose c) Sucrose

- 3. Demonstration & Working of Oven.
- 4. Physico-chemical properties grains
- 5. Introduction to utensils and equipment used in bakery.
- 6. Effect of kneading on the development of gluten.
- 7. Determination of gluten content in wheat flour.
- 8. Quality testing of flour and yeast
- 9. Effect of water ratio on cooking quality of rice
- 10. Preparations of Cake.
- 11. Preparations of Pancake.
- 12. Preparations of Cream Biscuit.

Semester IV

SUBJECT I Major VII- Dairy Technology II

Credits 2(Marks50)Hours30,Lecturesof60Minutes

Course Outcomes : The students will be able to

- CO 1. To know the scope the dairy industry in India , dairy industry layout and its sanitation .
- CO 2. To explain organization and operations involved in milk processing unit.
- CO 3.To understand food value, composition of milk and milk processing unit.
- CO 4. To understand utilization of by product.

Unit I	Hours Allotted
Butter – Definition , classification, composition	
Physico-chemical properties, Manufacture of Butter	
Judging and grading of Butter	
Defect of Butter, their causes and prevention Uses of Butter.	
Ghee Definition , classification, composition	
Physico-chemical properties,	15
Manufacture of Ghee.	
Anti –Oxidants as preservative	
Judging and grading of Ghee	
Defect of Ghee, their causes and prevention	
Uses of Ghee.	
Unit II	Hours Allotted
Ice cream - Definition , classification, composition	
Nutritive value, Role of constituents,	
Properties of mixture, Method of Manufacturing , packaging , hardening and storage.	
Soft Ice cream , Judging and grading of ice cream.	
Defect of ice cream , their causes and prevention	
Uses of Ghee.	
Cheese Definition , classification, composition ,	15
Nutritive value , Manufacture of cheese , types of cheese ,	

References

- 1) Sukumar De Dairy Technology
- 2) James.N. Warner Principle of dairy processing
- 3)Walstra .p ,Taylor and Francis Dairy Science and Technology 2 ndedition ,2006
- 4) P. F. FOX , P.L.H Mcswenny Dairy Chemistry & Biochemistry
- 5)Eckles , Combs and macy Milk and Milk product

Semester IV Subject I Major VIII Food Quality & Safety Management II

Credits 2 (Marks 50) Hours 30 ,Lectures of 60 Minutes

Course Outcome -The students will be able to

- CO 1 . To Understand the food quality ,food safety and food related hazard.
- CO2. Demonstrate the functional role and safety issue of food contaminants , adulterations,

additives , packaging, & labelling.

- CO3.To get knowledge of food safety management tools.
- CO 4. Understand the various regulatory aspect for food business operations.

Unit I	Hours
Statistical Quality Control Of Foods:- Consumer Studies Types Of Consumer Studies Preference Studies ,Acceptance Studies Factors Affecting Consumer Acceptance Food Safety Management Tools:- Basic Concept Of Food Safety pre-requisites- GHPs, GMPs, HACCP, ISO series TQM- Concept & need for quality	Allotted 15
Food laws &standards:- AGMARK & Bureau Of Indian Standards Additional Food Laws Federal Poultry Products Inspection Act Of 1957 Federal Trade Commission Act Infant Formula Act Of 1986 Nutrition Labelling & Education Act Of 1990 Consumer Protection Act Food Safety & Standards 2006 Other Laws & Standards Related To Food Control Of Food Quality	15

Reference -

1) Frank .D. Gunstone Vegetable & Oils in food technology

2)John Wiley & Son Bailey's industrial Oil & Fat product 4th edition.

3) S.C.Sighal , OTA Modern technology in the oils & fats industry.

4) Norman N-Potter, Joseph H. Hotchkiss, Food Science CBS Publishers & distributors, New Delhi, 1997 5th edition

5) The Food Safety & Standards Act 2006. Professional Book Publishers Delhi

Semester IV

SUBJECT II Minor VII Sugar & Confectionary Technology

Credits 2 (Marks50) Hours30, Lectures of 60 Minutes

Course Outcome – The students will be able to

CO1. To Understand Importance of confectionary in food Industry.

CO2. To Understand Chocolate Processing.

CO3.To Understand Sugar Confectionary.

CO 4. To Understand Boiled Sweets.

Unit I	Hours
	Allotted
Introduction to Confectionary technology	
Confectionary terms	
Small and large equipment used in confectionary	
Introduction to Confectionary product	
Principle involved in confectionary product	
Classification of confectionary	
Types of confectionary product	15
Characteristics of confectionary product	15
Indian confectionary	
11-24-11	
Unit II	Allotted
Cocca and chocolate processing	
Introduction , Composition , Grading , Processing , Cocca product	
Chocolate introduction, Ingredient used in chocolate	
Chocolate processing , Defect	
sugar confectionery	
Chewing gum and buddle gum	
Fondant, Eudge, Caramel, Toffee, Nut brittles.	
Gelatin sweets – Fruit chews , jellies , gums	15
Defect in Confectionery	

Reference

- 1) Dubey .S.C 4^{Th} edition Basic baking
- 2) Y. H .Hui , Bakery product Science & Technology

3) Acharya N. G. Ranga , Bakery & Confectionary product

Semester IV

SUBJECT II Minor VIII - Cereals & Bakery Processing II

Credits 2(Marks50) Hours 30, Lectures of 60 Minutes

COURSE OUTCOME - The students will be able to

CO1 .To understand structure and chemical composition , criteria for flour, quality , milling method of Corn.

CO2. To understand structure and chemical composition, types and milling of Barley,

CO3 Capable of converting cereals into bakery goods

CO4 List the typical issues and their root causes in bakery products

Unit I	Hours Allotted
Corn Structure and composition of corn grain (different types) Wet and dry milling High fructose syrups and their uses Barley Structure and composition of barley Barley malting process Significance of malting Different types of malts and their food applications	15
Unit II	Hours Allotted
 Processing of bakery product: Procedure of different types of bakery products (bread, cookies, crackers, cake and biscuits) Defects of baked products Millets Oat / Rye, Importance of Millet, composition, processing of millet Preservation of bakery products Freezing and frozen storage of baked products Safety and hygiene of bakery plants 	15

Reference

1) Dubey .S.C 4Thedition Basic baking

2) Y. H .Hui , Bakery product Science & Technolog

3) Acharya N. G. Ranga, Bakery & Confectionary product

4)Cereal Processing Technology, Gavin Owens, WoodHead Publishing Ltd, 2000

5) Post Harvest Technology of Cereals, Pulses and Oilseeds, A. Chakraverty, Oxford and IBH Publishing Company, 2014

B.Sc food science and Technology

SEMESTER IV

Subject I Major practical IV Labcourse XI (Based on Major VII & VIII)

Credits 2

- 1) Milk Aduitrations Test.
- 2) Preparations of paneer.
- 3) Preparations of Rasgulla.
- 4) Preparations Of Khoa.
- 5) Preparations of Gulabjam.
- 6) Preparations of Rabadi.
- 7) Analysis of colour by Lovibond Tintometer.
- 8) Adulteration in raw materials
- 9) Determining Critical Control Point (CCP) for various foods
- 10) Quality tests for raw materials of different foods.

B.Sc food science and Technology

SEMESTER IV

Subject I Minor practical IV Labcourse XII (Based on Major VII & VIII)

Credits 2

- 1) Preparations of Bread
- 2) Preparations of Nankhatae,
- 3) Preparations Of Caramel.
- 4) Preparations of Peanut Chikki.
- 5) Preparations of Fondant.
- 6) Preparations of Chocolate.
- 7) Preprations of Fudge.
- 8) Prparations of Toffee.
- 9) Preparations of Candy.
- 10) Preparations of Muffin

SHIVAJI UNIVERSITY ,KOLHAPUR Syllabus as per National Education Policy (NEP)2020

B.Sc. Food Science& Technology

SEMESTER-IV

OE IV

Credits: 2

Semester End 40 Internal Assessment: 10 Total: 50

Introduces From June 2025

COURSE OUTCOME

Syllabus as per Regular B. Sc Structure

SHIVAJI UNIVERSITY,KOLHAPUR Syllabus as per National Education Policy (NEP)2020 B.Sc. Food Science& Technology SEMESTER–IV SEC – Design & Development of New Product (Lab) Credits: 2 Semester End 40 Internal Assessment: 10 Total: 50 Introduces From June 2025

- 1) Market Survey of existing various product.
- 2) Formulation of new product based on corporates decision /need based.
 - a. Protein energy rich
 - b. Low calorie (fat replace)
- c. Low sodium content
 - d. Glycaemic index based
- e .cholestrolemic index based
- 3) Product development based on above formulation depending local sources /technology.
- 4) Quality Assessment
 - a. New product development for
 - b. Infant Weaning foods
 - c. Geriatric

d. Physiological status.5) Visit to Industry.

SHIVAJI UNIVERSITY,KOLHAPUR Syllabus as per National Education Policy (NEP)2020 B.Sc. Food Science& Technology SEMESTER–IV AEC II English Credits: 2 Semester End 40 Internal Assessment: 10 Total: 50 Introduces From June 2025

To be referred from Shivaji University Website

SHIVAJI UNIVERSITY ,KOLHAPUR Syllabus as per National Education Policy (NEP)2020 B.Sc. Food Science& Technology SEMESTER–IV VEC II Environmental Studies Credits: 2 Semester End 40 Internal Assessment: 10 Total: 50 Introduces From June 2025 Syllabus as per Regular B. Sc Structure

SHIVAJI UNIVERSITY, KOLHAPUR Syllabus as per National Education Policy (NEP)2020 B.Sc. Food Science& Technology SEMESTER-III CEP - I Credits: 2 Introduces From June 2025

Syllabus as per Regular B. Sc Structure

NATURE OF QUESTION PAPER FOR B.Sc. PART – II, (40 + 10 PATTERN) ACCORDING TO REVISED STRUCTURE AS PER NEP – 2020 TO BE IMPLEMENTED FROM ACADEMIC YEAR 2025-26

Maximum Marks: 40 Duration: 1.5 hrs. A. University Assessment for 40Marks

B. Sc Food Science & Technology (Semester-) Examination

Course Name (Course Code)

Day & Date: Total Marks: 40Time:

Instructions:

1.

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]

2. 3. 4. 5. 6. 7. 8. Q.2 Answer the following Questions (Any 2 out of 3) [16] 1. 2. 3. Q.3. Answer the following Questions (Any 4 out of 6) [16] 1. 2. 3. 4. 5. 6.

B. Internal Assessment for 10 Marks

B.Sc.(Food Science& Technology) Part II Semester III – B.Sc.(Food Science& Technology) Part II Semester IV –

C. Practical Examination:

University Assessment for 50 Marks

B. Sc Food Science & Technology (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 Writing5 Marks
- Q.2. Perform the Experiment 25 Marks
- Q.3. Journal 10 Marks

Q. 4. Viva 10 Marks
