

 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 दूरध्वनी ०२३१-२६०९०९४ ०२३१-२६०९४८७		
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Ref.No.SU/BOS/Science/146

Date: 26/05/2026

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

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

B.Sc.Part-III (Sem. V & VI) as per NEP-2020 (2.0)			
1.	Animation (Entire)	6.	Food Science and Technology (Entire)
2.	Food Science (Entire)	7.	Food Technology & Management (Entire)
3.	Biotechnology (Entire)	8.	Environmental Science (Entire)
4.	Computer Science (Entire)	9.	Sugar Technology (Entire)
5.	Information Technology (Entire)		

This syllabus, nature of question and equivalence shall be implemented from the academic year 2026-2027 onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in>Syllabus>Syllabus as per NEP2020.

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2026 & March/April 2027. 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

Encl: as above

for information and necessary action

Copy to:

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.Sc.-M.Sc. Exam Section	9	Affiliation Section (T.1) (T.2)
5	Internal Quality Assurance Cell (IQAC Cell)	10	P.G. Seminar Section

SHIVAJI UNIVERSITY , KOLHAPUR



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Structure and Syllabus in Accordance with

National Education Policy- 2020

With Multiple Entry and Multiple Exit

Syllabus for

B.Sc. Part- III

Food Science & Technology (Entire)

(Faculty of Science and Technology)

SEMESTER V AND VI

(To be implemented from Academic year June2026-27)

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.

As food systems evolve with new challenges, including climate change, food security, and consumer preferences, food scientists strive to develop innovative solutions that improve food production, reduce waste, and enhance health benefits. This field is essential for public health, economic development, and environmental sustainability, making it a cornerstone of modern food industries and policies.

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 regulations and 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.

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 etc. associated with the chemical composition so food, their structures and functions.
PSO3	The students can gain knowledge about so me very essential topic of nutrition and its metabolism balance inside 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.

Bachelor of Science (B.Sc.)

Shivaji University, Kolhapur

Under the Faculty of Science & Technology

(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 guide line and rules shall be implemented gradually as mentioned below:

Level	Programme		From Academic Year
Undergraduate Programme:			
Level4.5	Undergraduate Certificate(One year or two semesters)	B.Sc. Part-I	2024-25
Level5.0	Undergraduate Diploma(Two years Or our semesters)	B.Sc . Part-II	2025-26
Level5.5	Bachelor's Degree (Three years or six semesters)	B.Sc.Part-III	2026-27
Level6.0	Bachelor's Degree with Honours /Research(Four years or eight Semesters)	B.Sc. Part-IV	2027-28

(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 entries and multiple exit as per the university's rules and regulations are applicable).

1. 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 or admission to B.Sc. Part-I(Level4.5):

i) 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 there to.

OR

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

1. Eligibility requirements for admission to B.Sc. Part-II (Level5.0):

1. 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

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

OR

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

OR

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

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

1. 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

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

OR

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

3. Eligibility requirements for admission to B.Sc .Part-IV(Level6.0):

1. 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 Honors/ Honours with Research).

OR

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

Eligibility Application requirement: e

1. Students who reseeking admission for Level 4.5 need to apply for eligibility.
2. 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.
3. 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) Weight age: 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 4th year 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).

1. 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	
Field Project (FP)	FP	02	
Indian Knowledge System	IKS	02	
Community Engagement Programme	CEP	02	
Major Total Credits		76	
			57.58
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	
Co-Curricular Courses (NSS/NCC/Sports/Cultural Activities)	CC	02	
TOTAL		132	100%

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

Course Name		Total Credits	% of total credits
Major			65.91
Major Mandatory	MM	80	
Major Elective	ME	16	
Vocational Skill Courses	VSC	06	
On Job Training	OJT	08	
Field Project	FP	02	
Research Projects*	RP	00	
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/General 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	4.55
Co-Curricular Courses(NSS/NCC/Sports/Cultural Activities)	CC	02	
TOTAL		176	100%

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

Course Name		Total Credits	% of total credits
Major			65.91
Major Mandatory	MM	72	
Major Elective	ME	16	
Vocational Skill Courses	VSC	06	
On Job Training	OJT	04	
Field Project	FP	02	
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 Courses	OE/GE	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	4.55
Co-Curricular Courses(NSS/NCC/Sports/Cultural Activities)	CC	02	
TOTAL		176	100%

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

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

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

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

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	10marks
	Semester–II	Unit test	10marks
5.0	Semester–III	Unit test	10marks
	Semester–IV	Oral examination/ Group discussion	10marks
5.5	Semester–V	Seminar/ Group discussion/ Field Work/Project Work	10marks
	Semester–VI	Study tour/Field Work/ Project Work/Seminar	10marks
6.0	Semester–VII	Case Study/Field Work/ Project Work	10marks
	Semester–VIII	Case Study/Field Work/ Project Work	10marks

6. Ordinances regarding the examination:

O.B.Sc.2,3 and 4 shall prevail.

1. 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 NEP1.0/CBCS scheme should be converted into equivalent credits in NEP2.0. 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.

2. 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

(A) There shall be a separate head of passing for semester end examination and internal examination.

(B) Minimum 18 marks out of 50 are required for passing of practical examination of each course.

(C) 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	B
55–64	7		6.50-7.49	B+
65–74	8		7.50-8.49	A
75–84	9		8.50-9.49	A+
85–100	10		9.50-10.0	O(Outstanding)

Gradation Chart:

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)

$$\text{SGPA} = \frac{\sum (\text{Course credits} \times \text{Grade points obtained}) \text{ of a semester}}{\sum (\text{Course credits}) \text{ of respective semester}}$$

2. Cumulative Grade Point Average (CGPA)

CGPA

$$\text{CGPA} = \frac{\sum (\text{Total credit of a semester} \times \text{SGPA of respective semester}) \text{ of all semester}}{\sum (\text{Total course credits}) \text{ of all semesters}}$$

3. **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.

4. **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 2credits will be 50 marks at then do for each semester.

R.B.Sc .No.2

Structure of B.Sc. programme is as shown in Annexure1.

R.B.Sc.No.3

List of Courses:

B.Sc. I	Sem I	• Subject I: DSCI, DSCII ,and Practical I • Subject II: DSCI ,DSCII ,and Practical I • Subject III: DSC I, DSCII ,and Practical I • OEI(Theory/Practical) • IKSI (Introduction to IKS)
	Sem II	• Subject I :DSC III ,DSC IV ,and Practical II • Subject II: DSCIII, DSC IV, and Practical II • Subject III: DSC III, DSC IV, and Practical II • OEII(Theory/Practical) • VECI(Democracy, Election and constitution)
B.Sc. II	Sem III	• Major V, VI, and Major Practical III • Minor V, VI, and Minor Practical III • OEIII(Theory/Practical) • VSC I Practical(Major Specific) • SEC I Theory/Practical • AECI(English) • CC
	Sem IV	• Major VII, VIII ,and Major Practical IV • Minor VII, VIII, and Minor Practical IV • OEIV(Theory/Practical) • SECII Theory/Practical • AECII(English) • VECII(Environmental Studies) • CEP
	Sem V	• Major IX, X ,and Major Practical V,VI • Major I(Elective),Major(Elective)Practical-I • OEV(Theory/Practical) • VSC II Practical II Major Specific • AECIII(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 • AECIV(English) • IKSII (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 be 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 text books 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

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 PartI.

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):

7. If an exited student wants to re enter ,he/she can re enter within three years from exit.
8. 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.

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 up to 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.
- 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.
- 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".
- The Physical Education Test shall be conducted in the second semester.
- 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

1. 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.
2. 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 new course (subject) only if the candidate surrenders his first degree.
3. 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) examination shall be declared publicly in three categories
 - Pass :Candidates who have passed the B.Sc. Part I (semester-I and II) examination.
 - Fail-ATKT: Candidates who are allowed to proceed to the B.Sc. Part II (semester-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.
 - Pass: Candidates who have passed the B.Sc. Part II (semester-III and IV) examination in addition to the remaining courses, if any of previous examination.
 - Fail-ATKT: Candidates who are allowed to proceed to the B.Sc. Part III (semester V).
 - 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.

- a. 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).
- b. 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.
- c. 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

- To pass each semester examination a candidate shall be required to obtain a minimum of 35% of the total marks in each course.
- 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.
- 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 obtain 45% 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 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 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 obtaining 70% 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 on to terminate 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

B.Sc. Food Science and Technology Part – III

SEM Level	COURSES			OE	VSC/SEC	AEC/ VEC/ IKS	OJT/ FP/ CEP/ CC/ RP	Total Credits	Degree/ Cum. Cr. MEME
SEM V (5.5)	Major IX Legumes & Oilseeds Technology I (2) Major X Meat ,Fish & Poultry Products Technology I (2) Major P V(a) Laboratory course XIV (Based on Major IX) (2) Major P V(b) Laboratory course XV (Based on Major X) (2)	Major Programme Elective I (2) 1. Food Packaging 2. Nutraceutical & Functional Foods Laboratory Course XVI(Based on Major Programme Elective I) 1. Food Packaging Lab 2. Nutraceutical & Functional Foods Lab (2)	-	OE-5 (2)(T/P)	VSCII – Laboratory Course XVII Vocational Skills For Bakery Products Manufacturing (2)	AECIII(2) (English)	OJT (04)	22	UG Degree 132
SEM VI (5.5)	Major XI Legumes & Oilseeds Technology II (2) Major XII . Meat ,Fish & Poultry Products Technology II(2) Major P VI (a) Laboratory Course XVIII (Based on Major XI) (2) Major P VI (b) Laboratory Course XIX (Based on Major XII) (2)	Major Programme Elective II (2) 1. Food Additives 2.Snack Food Processing Laboratory Course XX (Based on Major Programme Elective II) 1. Food Additives Lab 2.Snack Food Processing Lab (2)	-		VSCIII – Laboratory Course XXI Vocational Skills For Snack & Savoury Products Manufacturing (2) SEC III- Food Industrial Economics and Management Skills (2) (T)	AEC IV (2) (English) IKS 2 Traditional & Functional Aspect of Indian Spices (2)	FP-(02)	22	
Credits	8(T)+8(P)=16	4(T)+4(P)=8	-	2(T/P)	2(T)+4(P)=6	2(T)+4(T)=6	4(T)+2(T)=6	44	

.Abbreviations:

MIN: Minor

OE: Open Elective

OEC: Open Elective

Course SEC: Skill

Enhancement Course

VSC: Vocational Skill

Course

AEC: Ability Enhancement

Course VEC: Value Education

Course

CEP:Community Engagement

Programme CC: Co-curricular

Courses

Note:

- a. University may decide to offer maximum of three subjects(Courses)in the first year. The student may select one subject to utof combination of three subjects(Courses),(which a student haschoseninthe first year) asaMAJORsubject (Course) andonesubject (Course) asMINORSubject inthesecond year. Thereby it is inferred that the remaining third subject (Course) shall stand discontinued.
- b. **DSC:**DisciplineSpecificCourse
- c. **MAJOR:**Mandatory/Elective25
- d. **MINOR:**Coursemay befromdifferentdisciplines ofsamefacultyofDSCMajor
- e. **OEOpen Elective):**Electivecourses/ OpenElectiveto bechosencompulsorilyfromfacultyother than that of the Major.
- f. **VSC/SEC:**VocationalSkillCourses(MAJORrelated)/SkillEnhancementCourses
- g. **AEC/VEC/IKS:**AbilityEnhancement Courses(English, ModernIndianLanguage)/ValueEducation Courses/ Indian Knowledge System (Generic & Specific))
- h. **OJT/FP/RP/CEP/CC:**On-JobTraining(Internship/Apprenticeship)/FieldProject(Majorrelated)/ Research Projects (Major related) 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 / VivekVahini etc

B.Sc Food Science & Technology Part III (Entire)

Academic year 2026-27

TEACHING & EXMINATION SCHEME

SEMESTER- V						
Sr. No.	Course Code	Teaching Scheme			Examination Scheme	
		Theory and Practical			University Assessment (UA)	Internal Assessment (IA)
		Lectures (Per week)	Practical hours (Per week)	Credit	Max Marks	Max .Marks
1	Major- IX Legumes & Oilseeds Technology I	2	-	2	40	10
2	Major X Meat ,Fish & Poultry Products Technology I	2	-	2	40	10
3	Major P V(a) Laboratory course XIV (Based on Major IX)	-	4	2	50	-
4	Major P V(b) Laboratory course XV (Based on Major X)		4	2	50	
5	Major Programme Elective -I 1.Food Packaging . 2.Nutraceuticals& Functional Foods	2	-	2	40	10
6	Major Programme Elective I Laboratory Course XV (Major Programme Elective – I) 1.Food Packaging Lab 2.Nutraceuticals& Functional Foods Lab	-	4	2	50	-
7	OE V	2	-	2	40	10
8	VSC II (Laboratory Course XVI) Vocational skills for Bakery products Manufacturing	-	4	2	50	-
9	AEC III English	2		2	40	10
10	OJT		-	4	80	20
	Total			22	480	70

SEMESTER-VI						
Sr. No.	Course Code	Teaching Scheme			Examination Scheme	
		Theory and Practical			University Assessment (UA)	Internal Assessment (IA)
		Lectures (Per week)	Practical hours (Per week)	Credit	Max. Marks	Max. Marks
1	Major XI Legumes & Oilseeds Technology II	2	-	2	40	10
2	Major XII Meat ,Fish, Poultry products Technology II	2	-	2	40	10
3	Major P VI (a) Laboratory Course XVIII (Based on Major XI)	-	4	2	50	-
4	Major P VI (b) Laboratory Course XIX (Based on Major XII)		4	2	50	-
5	Major Programme Elective II 1.Food Additives 2.Snack food processing	2	-	2	40	10
6	Major Pogramme Elective – II Lab Course XX (Major Programme Elective -II)1.Food Additives Lab 2.Snack food processing Lab	-	4	2	50	-
7	VSC III (Laboratory Course XXI) Vocational Skills for Snack & savory products Manufacturing	-	4	2	50	-
8	SEC –Food Industrial Economics and Management Skills	2	-	2	40	10
9	AEC IV English	2	-	2	40	10
10	IKS Traditional & Functional Aspect of Indian Spices	2	-	2	40	10
11	FP	-	-	2	40	10
	Total			22	480	70

Note - The marking scheme of OE ,VSC ,AEC ,VEC ,OJT, IKS and FP as per B.Sc regular structure as per Shivaji University Kolhapur.

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

Equivalence of Third Year B.Sc Food Science and Technology

Semester V and VI

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

Third Year B. Sc semester V

Sr. No	Third Year B. Sc (Food Science & Technology) Semester V Pre-revised syllabus	Third Year B.Sc (Food Science & Technology) Semester V Revised syllabus	Remark
1.	Animal Product Technology I	Meat Fish Poultry Product Technology I	Change in Name
2.	Fermentation Technology I		Added in B.Sc part 4 th
3.	Food Quality & Safety Management I		Added in 2 nd Year
4.	Food Additives & Toxicology I	Food Additives	Change in Name & slight change in syllabus
5.	AEC English	AEC English	No Changes
6.		Legumes & Oilseeds Technology I	Added according to NEP 2.0 Structure
7.		OJT	Added according to NEP 2.0 Structure

Equivalence of Third Year B.Sc Food Science and Technology

Semester V and VI

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

Third Year B. Sc semester VI

Sr. No	Third Year B. Sc (Food Science & Technology) Semester V Pre-revised syllabus	Third Year B.Sc (Food Science & Technology) Semester V Revised syllabus	Remark
1.	Animal Product Technology II	Meat Fish Poultry Product Technology II	Change in Name
2.	Fermentation Technology II		Added in B.Sc part 4 th
3.	Food Quality & Safety Management II		Added in 2 nd Year syllabus
4.	Food Additives & Toxicology II	Food Additives	Change in Name & slight change in syllabus
5.	AEC English	AS Equal	
6.	SEC	SEC - Industrial Economics and Management Skills	Added according to NEP 2.0 structure
7.		Legumes & Oilseeds Technology II	Added according to NEP 2.0 structure
8.		IKS Traditional & Functional Aspect of Indian Spices	Added according to NEP 2.0 structure
9.		FP	Added according to NEP 2.0 structure

Semester V

Subject I :Major IX – Legumes & Oil seeds Technology I

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

Course Outcomes :The students will be able to

CO 1. Explain the physical and chemical composition of major legumes and oilseeds.

CO 2 Describe the structure and nutritional properties of pulses and oil-bearing seeds.

CO 3. Identify storage problems in legumes and oilseeds.

CO4. Explain rancidity, lipid oxidation, and prevention methods.

Unit I	Hours Allotted
Legume processing Introduction to legumes : Definition, Classification, Structure and Major types of legumes used in Indian Diets Nutritional composition and health benefits : Macro-nutrients and Micro-nutrients in legumes, Dietary role of legumes in Indian cuisine Processing techniques : Soaking ,germination, Decortications and Milling Advanced Processing technique : Cooking and Fermentation Anti nutritional factors in legumes	15
Unit II	Hours Allotted
Oil Seed Processing Introduction to oil seeds, soybean , sesame) Composition and Nutritional profile :: Definition, Classification and structure of major oil seeds (Groundnut Proximate composition and Nutritional value of oil seeds Toxicants and anti nutritional factors in oil seeds Oil extraction methods : Traditional, Mechanical and advanced technique Packaging, storage and quality management of oils	15

References :

- 1) A. K. Singh, Modern Processing of Legumes and Oilseeds .
- 2) Potter N.N.& Hotchkiss .J .H .(1966); Food Science 5th edn, CBS Publisher & distributor .
- 3) ShrilaxmiB .(2003) Food Science 3rdedn . New International (P) Limited Publisher.
- 4) Manay S.N & Shadaksharwswamy M .(2001) Food Facts and Principles ,2nd New Age International (P) Limited Publisher.
- 5) K.P. Singh Handbook of Vegetable Legumes
- 6) P.J. Fellows ,Food Processing Technology

Semester V
SUBJECT I Major X – Meat, Fish & Poultry Products Technology I

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

Course Outcomes: The students will be able to

CO 1. Describe the structure and composition of meat, fish, and poultry.

CO 2. Explain post-mortem biochemical changes

CO 3Discuss nutritional value and functional properties of muscle foods.

CO 4. Describe fish handling and on-board processing product.

Unit I	Hours Allotted
Introduction to Meat Industry: - Status of livestock processing industry in India- Opportunities and challenges Composition and nutritivevalueof Meat Structure of Muscle Pre-slaughtering operations Slaughtering Procedure of Live Stock Rigor mortis Post Mortem of Meat Post Mortem Quality Problem, By-Products of Live Stock, Meat Inspection, Meat Grading, Processed Meat Product Meat Cookery, Meat Micro-Biology & Safety Preservation &packaging	15
Unit II	Hours Allotted
Introduction Definition and classification of Fish Composition & Nutritive Value of Fish Nutritional Benefits Preservation & Processing of Fish Factors Affecting Quality of Fish Packaging, Fish Spoilage, Products of Fish	15

References:

1. Shrilaxmi B. (2003) Food science 3rd edn . New International (P) Limited Publisher.
2. Manay S.N & Shadaksharwamy M .(2001) Food Facts and Principles ,2nd New Age International (P) Limited Publisher.
3. NIIR Board ; preservation of meat product 1st, Asia pacific Business Press.
4. Potter N.N.& Hotchkiss .J .H .(1966); Food Science 5th edn, CBS Publisher & distributor.

Semester V

SUBJECT I Major Programme Elective I – Food Packaging

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

Course Outcomes : The students will be able to

CO 1. Explain the roles of packaging in the food industry and the legislation involved.

CO 2. Describe the making process, suitability, and functionality of each type of packaging materials for a specific product

CO 3. Explain the principles of innovative packaging technologies for use with food products

CO 4 Evaluate different packaging materials based on various types of analysis in the laboratory.

Unit I	Hours Allotted
Introduction and importance of food packaging. properties of packaging material. Material used in packaging rigid, semi rigid and flexible . Types of container. Wood and paper packaging – wood, structure, wooden container, paper and paper board .	15
Unit II	Hours Allotted
Plastic packaging – packaging material, plastic banned in India, Classification of polymer, testing of plastic packages Technique and method used for packaging . Glass Packaging – glass, composition, properties, structure, types. Metal Packaging – properties, steel plate, Aluminum containers, aluminum foil, corrosion of metal cans. Oxygen absorbents -	15

References :

1. P.Jacob John International Pvt.Ltd.New Delhi-110002 A Handbook on Food Packaging,
 2. Prof. Neelam Khetar paul and Dr.Darshan Punia Food Packaging,
 3. TakashiKadoyaFoodPackaging,
 4. JerryD'souzaand Jatin Pradhan Handbook of Food Processing, Packaging and Labelling,
- .

Semester V

SUBJECT I Major Programme Elective I – Nutraceutical & Functional Foods

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

Course Outcomes: The students will be able to

CO1: Understand the basic concepts of nutraceuticals and functional foods.

CO2.Acquire knowledge on the bioactive components (carbohydrates, lipids, peptides).

CO3: Gain knowledge on prebiotics, probiotics, and their health benefits.

CO5: Comprehend the significance of nutraceuticals in disease management.

Unit I	Hours Allotted
Introduction to Nutraceuticals and Functional Foods: Definition, History and Classification Perceived Effects of Functional Foods Introduction to Probiotics, Prebiotics and Symbiotic Probiotics: Taxonomy and Important Features of Probiotic Microorganisms Health Effects of Probiotic Microorganisms Probiotics in Various Foods Prebiotics: Non-Digestible Carbohydrates/ Oligosaccharides, Dietary Fiber, Resistant Starch, Gums	15
Unit II	Hours Allotted
Polyphenols: Flavonoids, Catechins, Isoflavones, Tannins Pigments: Carotenoids, Lycopene, Curcumin Introduction to Anti-nutritional Factors, examples Sources and role of Resveratrol, Kaempferol, Quercetin, Cinnamaldehyde, Crocin, Lutoline, Capsaicin, Piperine, Gingerol, Eugenol, Rosmarinic acid, Apigenine, Thymoquinone	15

References

1. Wildman, R. E. (2016). Handbook of Nutraceuticals and Functional Foods. CRC Press
2. Gibson, G. R. and Williams, M. C. (2001). Functional Foods Concept to Product. CRC Press.
3. Vatter, D.A. and Maitin V.(2016). Functional Foods, Nutraceuticals and Natural Products, Concepts and Applications. DEStech Publications, Inc
4. Gupta, R. C. (2016). Nutraceuticals: Efficacy, Safety and Toxicity. Academic Press.

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

Vocational Skill Course (VSC) II (P)
(Laboratory Course XVII)

Vocational Skills for Bakery Products Manufacturing Credits: 2 Marks: 50

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

CO1: Understand and list the steps and equipments used in bakery product manufacturing

CO2: Prepare flow charts and design a small-scale plant layout

CO3: Identify and explain food safety risks in manufacturing process.

CO4: Gain knowledge about the feasibility of a business plan

CO5: Implement documentation and record keeping protocols for a business

Practicals

1. Preparation a flow chart for bakery product manufacturing process.
2. Operation and maintenance of bakery equipment.
3. Designing of small-scale bakery plant layout.
4. Developing a bakery business plan
5. Preparation of mandatory documentation for setting up a bakery unit.
6. Design and develop a food safety plan for bakery unit.
7. Packaging and labeling of any one major bakery product.
8. Visit to Bakery Unit and submission of visit report.

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

B.Sc. Food Science& Technology

SEMESTER–V

AEC III English

Credits: 2

Semester End 40 Internal Assessment: 10 Total: 50

Introduces From June 2025

To be referred from Shivaji University Website

Syllabus as per National Education Policy (NEP) 2020

B.Sc. Food Science & Technology

SEMESTER – V On Job Training (OJT)

Credits : 04 (100 Mark)

Introduces From June 2025

Guidelines for 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- (OJT)/Internship/Apprenticeship of 120 hours must be completed by the candidate in food industries/ hospitals / research labs/ food testing laboratories.

A job training student will be assessed by the following points:

1. Seminar based on OJT
2. Submission of report based on OJT
3. Attendance (minimum 80%) and Certificate of student

The scheme of evaluation for On Job Training (OJT) is given below –

Sr. No.	University Assessment (UA)	Internal Assessment (IA)	Total marks
On Job Training (OJT)	80	20	100

After successful completion of On Job Training (OJT) the assessment for 100 marks shall be done by External and Internal Examiners as under:

Sr. No.	Particular	Marks
1	Quality and effectiveness of presentation	10
2	Depth of knowledge and demonstration skills	10
3	Variety and relevance of learning experience	10
4	Practical applications and relationships with concepts taught	10

5	Internship Report	30
6	Attendance record, student log, supervisor evaluation	30

Major practical V Laboratory Course

B.Sc Food Science and Technology

SEMESTER V

Major P V(a)

Laboratory course XIV (Based on Major IX)

Credits 2 (Marks: 50)

1. Determination of Impurities test in Oil.
2. To Preparations of Kharidal .
3. To Preparations of Moong Dal .
4. To Preparations Popcorn .
5. Determination of soaking in Legumes .
6. Determination Swelling capacity in Legumes
7. Determination of Germination in various Legumes.

Major P V(b)

Laboratory course XV (Based on Major X)

Credits 2 (Marks: 50)

1. Slaughtering and dressing of meat Animal.
2. Study of post – mortem changes in meat.
3. Cutting Meat.
4. Preservation of meat by different method.
5. Quality evaluation of fish . (Physical parameter)
6. Determination of Tenderizations in Meat.
7. To preparation of Meat Kabab.
8. Visit and submission on visit report .

B.Sc Food Science and Technology

SEMESTER V

Major Programme Elective I

Laboratory Course XVI (Based on Major Programme Elective I)

Food Packaging Lab

Credit 2

- 1) Determination on water vapor transmission Rate .
- 2) Determination of GSM of different packaging Material .
- 3) Examination of cut out of can.
- 4) Polymer Identification .
- 5) Working of tearing strength tester.
- 6) Determination of Thickness of packaging material.
- 7) Identification of packaging material .
- 8) Visit to packaging section and its report .

B.Sc food Science and Technology

SEMESTER V

Major Programme Elective I

Laboratory course XVI (Based on Major Programme Elective I)

Nutraceuticals and Functional Foods Lab

Credit 2

1. Product based market survey .
2. Preparations of probiotic buttermilk .
3. Development polyphenol rich functional herbal drink .
4. Development of pre –biotic based fibre rich product .
5. Comparative study of Anti – nutritional factor Reduction by Soaking .
6. Determination of Dietary Fiber in selected Foods.
7. Isolations of bacteria from probiotic foods like Curd /Yoghurt .

Semester VI

SUBJECT I Major XI – Legumes & Oilseed Technology II

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

Course Outcomes : The students will be able to

CO 1. Explain the physical and chemical composition of major legumes and oilseeds.

CO 2 Describe the structure and nutritional properties of pulses and oil-bearing seeds.

CO 3. Identify storage problems in legumes and oilseeds.

CO4. Explain rancidity, lipid oxidation, and prevention methods

Unit I	Hours Allotted
Processing of Legumes Soaking, roasting, steaming, cooking, and germination techniques. Factors affecting cooking quality of legumes (e.g., varietal differences, water hardness, heat treatment). Advanced processing: De-cortication, milling, and fermentation methods. Soybean processing and value-added products (e.g., soymilk, tofu, tempeh). Storage problems in legumes (e.g., moisture control, insect infestation, fungal growth) and solutions	15
Unit II	Hours Allotted
Oilseeds Processing, Products, and Quality Management Extraction from major oilseeds: Groundnut, soybean, sunflower, gingelly (sesame), coconut, mustard, olive, cottonseed. Value-added products: Fortification techniques; processing of margarine, mayonnaise, peanut butter, lard, tallow, and cocoa butter. Rancidity and lipid oxidation: Types (hydrolytic, oxidative), causes, measurement, and prevention methods (antioxidants, packaging). Packaging, storage, and quality management of oils and oilseed products (e.g., light/oxygen barriers, shelf-life extension).	15

References :

- 1) A. K. Singh, Modern Processing of Legumes and Oilseeds .
- 2) Potter N.N.& Hotchkiss .J .H .(1966); Food Science 5th edn, CBS Publisher & distributor .
- 3) ShrilaxmiB .(2003) Food Science 3rd edn . New International (P) Limited Publisher.
- 4) Manay S.N & ShadaksharwswamyM .(2001) Food Facts and Principles ,2nd New Age International (P) Limited Publisher.
- 5) K.P. Singh Handbook of Vegetable Legumes
- 6) P.J. Fellows ,Food Processing Technology

Semester VI

SUBJECT I Major XII – Meat, Fish, Poultry Products Technology II

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

Course Outcomes : The students will be able to

CO 1. Describe the structure and composition of poultry and poultry products.

CO 2. Explain post-mortem biochemical changes

CO 3. Discuss nutritional value and functional properties of muscle foods.

CO 4. Describe fish handling and on board processing product.

Unit I	Hours Allotted
Eggs Structure and Composition, Nutritive Value Functional Properties Quality Of Eggs Internal Quality Evaluation Deterioration During Storage Microbial Spoilage of Eggs Preservation & Storage Methods Packaging & Transportation of Eggs Egg Cookery	15
Unit II	Hours Allotted
Poultry Types of Poultry, Structure of muscle Composition, Chemical & Nutritive Value. Poultry Dressing & Slaughtering Methods Postmortem Changes Preservation Grading Packaging of Poultry Meat Poultry Products	15

References:

- 1) Shrilaxmi B.(2003) Food Science 3rdedn . New International (P) Limited Publisher.
- 2)Manay S.N & Shadaksharwswamy M .(2001) Food Facts and Principles ,2nd New Age International (P) Limited Publisher.
- 3) NIIR Board ; preservation of meat product 1st, Asia pacific Business Press.
- 4) Potter N.N.& Hotchkiss .J .H .(1966); Food Science 5th edn, CBS Publisher & distributor.

SUBJECT I Major Programme Elective II – Food Additives

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

Course Outcomes: The students will be able to

CO1 Students will be able to describe the various additives and ingredients used in food industries.

CO2 Students will be able to describe the mechanisms of food additives involved in foods.

CO3 Students will be able to explain the significance of different additives in food quality, preservation and storage

CO4 Students will be able to describe the safety of use of food additives and ingredients

Unit I	Hours Allotted
Food additives- definitions, classification and functions Preservatives class I and II Antioxidants- mechanisms of oxidation inhibition, natural and synthetic antioxidant colours and flavours- classification (synthetic and natural), sources, applications in food industry Antimicrobial agents: Introduction, Types of antimicrobial agents.	15
Unit II	Hours Allotted
Emulsifiers- function, mechanism and application Sequestrants, humectants, hydrocolloids, sweeteners, acidulants, buffering salts, anticaking agents	15

References:

- 1) Fennema.O.R Principles of food science part – I
- 2) Potter N.N.& Hotchkiss .J .H .(1966); Food Science 5th edn, CBS Publisher & distributor .
- 3) ShrilaxmiB .(2003) Food Science 3rdedn . New International (P) Limited Publisher.
- 4) Manay S.N &ShadaksharwamyM .(2001) Food Facts and Principles ,2nd New Age International (P) Limited Publisher.
- 5) FuriaT.E .Vol –I & II Food Science Handbook of Food Additives .

Semester VI

SUBJECT I Major Programme Elective II – Snack Food Processing

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

Course Outcomes : The students will be able to

CO 1. To give knowledge of various development of snack food products.

CO 2. The student will be able to practically prepare snack foods from a variety of raw material

CO 3. The student will be competent in analyzing the shelf life and quality of snack food

CO4 Provides knowledge about shelf life and quality characteristics of snack food product.

Unit I	Hours Allotted
Introduction to snack Food Technology Importance, Scope and global/ Indian Market trends in snack foods. Snack Food Ingredients Common ingredients ; Cereals(Maize, rice), Pulses, Oils/Fats, Spices, Flavors, Preservatives and additives Physical, Chemical and functional attributes and their roles Packaging and Quality Evaluation Packaging materials and techniques Quality parameters :- Sensory, Physical , Microbial and Nutritional evaluation Standards (FSSAI, HACCP) and Shelf -life testing	15
Unit II	Hours Allotted
Fried and Nut Based snacks Potato chips and simulated potato chips (Slicing , frying , de-oiling) Meat based snacks (Mincing , forming , frying) Nut based snacks (Salted, spiced , sweetened: roasting, coating) Savory mixed and farsans Traditional Indian Snacks Processing of papad, chips and waters Indian savory sweets (Sev and gathiya)Application of seasonings and flavors Puffed, Baked and Popcorn snacks Popcorn-based snacks	15

References

- 1) FICSI:Savory and snack and ProcessingTechnician,Level4.
- 2) RP Srivastav and Sanjeev Kumar Fruit and Vegetable Preservation,Principles and Practices.
- 3) GirdhariLal and TDTandon Preservation of fruits and vegetables
- 4) SalunkheD.K,KadamS.Handbook of fruit science and technology
- 5)Atul Agnihotri Food preservationTechniques

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SEMESTER–VI

Vocational Skill Course (VSC) III (P)

(Laboratory Course XXI)

Vocational Skills for Snack & Savoury Products Manufacturing

Credits: 2 Marks: 50

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

CO1: Understand and list the steps and equipments used in snack & savoury product manufacturing

CO2: Prepare flow charts and design a small-scale plant layout

CO3: Identify and explain food safety risks in manufacturing process.

CO4: Gain knowledge about the feasibility of a business plan

CO5: Implement documentation and record keeping protocols for a business

Practical

1. Preparation a flow chart for snack and savoury product manufacturing process.
2. Operation and maintenance of snack and savoury product manufacturing equipment.
3. Designing of small-scale snack and savoury products manufacturing plant layout.
4. Developing a Snack and Savoury Product Manufacturing business plan
5. Preparation of mandatory documentation for setting up a snack and savoury unit.
6. Design and develop a food safety plan for snack and savoury unit.
7. Packaging and labelling of any one major snack and savoury product.
8. Visit to Snack and Savoury Unit and submission of visit report.

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SEMESTER–VI

SEC III .Food Industrial Economics and Management Skills

Credits: 2

Semester End 40 Internal Assessment:10Total:50

Introduces From june2026

Course Outcomes :The students will be able to

. CO1.Understand the key management principles

CO 2. Get basic knowledge of management concepts

CO 3. Understand the basic knowledge of business economics

CO 4. Get basic knowledge of demand analysis

Unit I	Hours Allotted
Principles of Management Introduction, definition and importance of management Functions of Management Planning, Organizing, Staffing, Coordinating, Directing, Motivating and Controlling. Concept and Structure of an Organization Types of industrial organization a) Line organization b) Functional organization c) Line and Functional organization Hierarchical Management Structure Top, middle and lower-level management	15
Unit II	Hours Allotted

Business Economics and Demand Analysis Meaning and features of Business Economics Meaning and determinants of demand Law of demand, Demand forecasting Elasticity of Demand- Concept, types and importance Production Function and Economic Markets Meaning & Features of Production Function Law of Variable Proportion, Law of Return to Scale Perfect Competition Market, Monopoly Market: Meaning Characteristics Monopolistic Competition Market, Oligopoly Market: Meaning Characteristics	15
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References:

- Principles and Practice of Management by Shyamal Bannerjee: Oxford and IBM Publishing Co, New Delhi.
- Financial Management by MY Khan and PK Jain, Tata McGraw Hill Publishing Co., 7, West Patel Nagar, New Delhi.
- Modern Management Techniques by SL Goel: Deep and Deep Publications Pvt Limited Rajouri Garden, New Delhi.
- Management by James AF Stoner, R Edward Freeman and Daniel R Gilbert Jr. : Prentice Hall of India Pvt Ltd, New Delhi.
- Fundamentals of Business Economics- Mithani D.M., Himalaya Publishing House, New Delhi.
- Business Economics- Mankar V. G., Himalaya Publishing House, New Delhi.
- Business Economics- G. N. Zambre, Pimplapure Publisher, Nagpur.
- Managerial Economics- D. M. Mithani, Himalaya Publishing House, New Delhi.

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SEMESTER–VI

AEC IV English

Credits: 2

Semester End 40 Internal Assessment: 10 Total: 50

Introduces From June 2026

To be referred from Shivaji University Website

SHIVAJI UNIVERSITY, KOLHAPUR

Syllabus as per National Education Policy (NEP) 2020

B.Sc. Food Science & Technology

SEMESTER–VI

Traditional and Functional Aspects of Indian Spices

Credits: 02

After completion of the course, students will be able to:

CO1: Explain the concept of Ahara (food) in Indian Knowledge Systems.

CO2: Classify spices using Ayurvedic parameters.

CO3: Identify bioactive compounds and functional properties of major spices.

CO4: Evaluate the relevance of traditional spice knowledge in modern functional food development.

Unit No	Content	No. of Hours
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1	Introduction to Indian Spices History of Indian spices and their role in global trade. Indigenous classification and identification of spices Composition of spices Major and minor spices of India Indigenous drying, roasting, tempering (tadka) and grinding practices	15
2	Medicinal aspects of spices Traditional blending techniques Functional aspects: Spices in food preservation and digestion Nutraceutical properties of spices Spices in Ayurveda and Siddha medicine	15

References

- 1) Handbook of Spices in India: 75 Years of Research and Development
Edited by P. N. Ravindran, K. Sivaraman, S. Devasahayam & K. Nirmal Babu
- 2) Indian Spices: The Legacy, Production and Processing of India's Treasured Export
Edited by Amit Baran Sharangi
- 3) N. Shakuntala Manay and M. Shadaksharaswamy, Food Facts and Principles, 5th Edition, New Age International (P) Limited, publishers

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SEMESTER–VI

Field Project (FP)

Credits: 2 (50 mark)

As per NEP 2020, students of B Sc. III (Semester VI) need to perform a Field Project (FP) for TWO (2) Credits i.e. 50 Marks.

The guidelines regarding the field project are as follows:

- 1) The total time allocation for the student to carry out field project is 60 hours.
 - 2) Students should participate in field-based projects under the supervision of faculty.
 - 3) Assignment of project topics to individual students or groups of students (2 to 4 students in one group) and one faculty member from the department will act as Guide for the student or group of students.
 - 4) For a SURVEY based project related questionnaire (15 or more questions) should be prepared by students.
 - 5) For an Experimental based project work, report should include Sample collection/Data collection/ Experiment performances in laboratory.
 - 6) The departmental coordinator/guide should check the questions and finalize the questionnaire.
- The question that may create unnecessary complications should be avoided. The questions should be qualitative as well as quantitative.
- 7) The student should compile all the relevant data and carry out its analysis.
 - 8) A project report should be written individually in the standard format (2 Copies): Index, Introduction, Review of Literature, Materials and Methods, Results and Discussion, Summary and Conclusion/, References (APA Format) etc.
 - 9) The project report should be of minimum 20 pages (excluding Title page, Certificate, Index, Acknowledgement etc.). Submit the project report with the Guide's signature to the department.
 - 10) The oral presentation for all the projects should be arranged in the department. To evaluate the project, examiner should be appointed by Board of studies.

11) The total project work including preparation of questionnaire to presentation should be evaluated for 2 credits (50 Marks).

12) The scheme of evaluation for field project is given below –

Sr. No.	University Assessment (UA)	Internal Assessment (IA)	Total marks
Field Project (FP)	40	10	50

Appendix I
GUIDE INTERACTION DIARY FORM

I, the undersigned Ms /Mr. _____ Roll No. _____
_____ studying in the _____ Year of _____ Full time
Course is doing my project work under the guidance of Dr./Ms./Mr.
_____, wish to state that I have met my Internal guide on
the following dates mentioned below for Project Guidance:-

Sr. No.	Date	Signature of Guide

Signature of the Candidate

Signature of Guide

B.Sc Food Science and Technology

SEMESTER VI

Major practical VI (a)

Laboratory course XVIII (Based on Major XI)

Credits 2 (50 Mark)

1. Preparations of Soya Milk.
2. Preparation of Tofu .
3. Preparation of Peanut Butter .
4. Preparations of Mayonnaise .
5. Preparations of Chocolate.
6. Determination of Germination process in Legumes .
7. Cooking method of Different Legumes.

Major practical VI (b)

Laboratory course XIX (Based on Major XII)

Credits 2 (50 Mark)

1. Effect on Method of Cooking on Coagulations property of Egg.
2. Quality Evaluations of Egg.
3. Calculation of shape & size index of egg.
4. Identification of Eggs.
5. Preparations of Scrambled Egg.
6. Slaughtering and dressing of poultry Bird.
7. Preparations of Chicken Tit Bit .
8. Industrial Visit report .

B.Sc Food Science and Technology

SEMESTER VI

Major Programme Elective II

Laboratory course XX (Based on Major Programme Elective II)

Food Additives Lab - Credits 2 (50 Mark)

1. Write the application of additives used in given food sample.
2. Effect of thickener in food product.
3. Effect of Gelling agent in food product.
4. Effect of emulsifier in food product.
5. Effect of bread improver in Bread.
6. Effect of Flavors in food Product.
7. Effect of Colors in Food product.
8. Estimation of Salt Percentage .

B.Sc Food Science and Technology

SEMESTER VI

Major Programme Elective II

Laboratory course XX (Based on Major Programme Elective II)

Snack Food Processing Lab - Credits 2 (50 Mark)

- Preparation of Potato Chips
 - Preparation of Banana Chips
 - Preparation of Extruded Snacks .
 - Preparation of Namkeen Mixtur
 - Preparation of Sev and Gathiya
 - Preparation of papad .
 - Preparation of Puffed Rice Snacks .
 - Packaging and Shelf-life Study of Fried Snacks.
 - Preparation of Khakhra .
- .

**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) 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 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 100 Marks

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

Course Name (Course Code)

Day & Date: Total Marks: 100

Time:

Instructions:

- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Draw neat labelled diagram wherever necessary.
-

Q. 1. A)Perform the experimental arranged on table [25]

B)Perform the experimental arranged on table [25]

Q.2. Journal . [20]

Q. 3. Viva [20]

Q.4 A) Write----- [05]

B) Write----- [05]

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 Writing 5 Marks

Q.2. Perform the Experiment 25 Marks

Q.3. Journal 10 Marks

Q. 4. Viva 10 Marks